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# The Caucasian Tiger

**SUSTAINING  
ECONOMIC  
GROWTH IN  
ARMENIA**

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THE WORLD BANK



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**THE WORLD BANK**

Washington, D.C.

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1 2 3 4 5 10 09 08 07

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Cover design: Drew Fasick, Serif Design Group

#### **Library of Congress Cataloging-in-Publication Data**

The Caucasian tiger : sustaining economic growth in Armenia / Saumya Mitra . . . [et al.].

p. cm.

Includes bibliographical references and index.

ISBN-13: 978-0-8213-6811-4

ISBN-10: 0-8213-6811-7

ISBN-13: 978-0-8213-6812-1 (electronic)

1. Armenia (Republic)--Economic conditions--1991- 2. Armenia (Republic)--Economic policy--1991- 3. Investments--Armenia (Republic)
4. Industrial policy--Armenia (Republic) I. Mitra, Saumya, 1951-  
HC415.17.C28 2007  
330.94756--dc22

2007007772

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## Preface

This book is the result of work carried out by the World Bank's economic team charged with providing analysis and policy advice to the Armenian government in the years 2005–6. These were years in which Armenia had established a decade-long solid record of sustained economic growth amid conditions of economic stability, low inflation, and modest fiscal deficits and external debt. For an economy that had endured a collapse of economic output and hyperinflation in its immediate post-Soviet period, this was a signal achievement, particularly when it is noted that the country is poorly endowed with natural resources, and its two major borders have been closed by its neighbors to trade and labor movement since its independence.

The attribution for the emergence of Armenia as the Caucasian Tiger lies in the creation of an environment of macroeconomic stability and the determined pursuit of reforms aimed at establishing a market economy that was integrated with the world. This book describes that story. But the central focus of the book remains the reform agenda for the future. It is argued that the continuation of high rates of growth would require building defenses against economic shocks the country may face, and this would entail addressing the key vulnerabilities in today's economy. Thus the book is intended not only as a case study of success in post-Soviet economic transition, but also as a candid piece of policy advice for the Armenian authorities.

This book was written by a team headed by Saumya Mitra and consisting of Doug Andrew, Gohar Gyulumyan, Paul Holden, Bart Kaminski, Yevgeny Kuznetsov, and Ekaterine Vashakmadze. It utilizes the contributions of Reza Ghasimi, Karen Grigorian, Armine Khachatryan, Artsvi Khachatryan, Matin Kholmatov, Miles Light, Gareth Locksley, Stephen Miller, Thomas Rutherford, Sue Rutledge, Vahe Sahakyan, Eduardo Siandra, and Michel Zarnowiecki. Comments from Shahrokh Fardoust, Felipe Jaramillo, Samuel Otoo, Christian Petersen, Roger Robinson, and Roberto Zaghera are gratefully acknowledged. The

book has benefited from close cooperation with the IMF team, headed by Hassan Al-Atrash, working on Armenia. It was processed by Zakia Nekaiien-Nowrouz.

The authors are particularly grateful to Donna Dowsett-Coirolo and Cheryl Gray for their judicious guidance and steadfast support for this work. The authors are also indebted to the Armenian economic team headed by Vardan Khachatryan, minister of finance, for its many valuable observations on the analysis contained in this book.

The book draws on sector-specific studies that have been carried out by colleagues at the World Bank; in particular, the study on poverty assessment (World Bank 2006), prepared by a team headed by Alexandra Posarac, and the study on the financial sector assessment program (World Bank and International Monetary Fund 2005c), prepared by a team headed by Hormoz Aghdaey.

The responsibility for the text is entirely that of the authors.

## Introduction

This book is intended to explain the factors underlying the stellar growth record that has led to Armenia's emergence as the Caucasian Tiger and to provide policy advice to the Armenian authorities to ensure the continuation of this growth. The book is presented in two parts, with Part I containing the analysis and the policy advice and Part II containing detailed background papers. In Part I, Chapter 1 sketches the pattern of growth, indicates the opportunities for broadening growth and establishes linkages to employment and poverty. Chapter 2 examines the record of reform and the principal constraints to growth in the future, using a growth diagnostics framework being piloted in the World Bank and making use of comparisons with the experiences of more advanced post-transition reformers. Chapters 3–6 investigate the key opportunities for reform: strengthening the framework for competition, lowering the costs of financial intermediation, developing policies that will deepen the integration of the economy into global markets, and creating the conditions for building on knowledge assets and promoting innovation.

### GROWTH, POVERTY, AND EMPLOYMENT

Over the past half-decade the Armenian economy has grown by double-digit rates annually on average—reminiscent of the east Asian tiger economies—and high growth rates have been registered for over a decade. This impressively consistent performance can be attributed to the steadfast pursuit of market-oriented reforms, assisted by large external inflows on grant or soft terms. Nevertheless, Armenia remains poor, with income per head at around US\$2,100 today or about a third of that in the Baltics. Growth has now begun to make a significant dent in poverty, but its impact on employment has been muted. This book will examine the reasons for the weak transmission link to employment and

will suggest policy reforms. It will discuss the major sources of risk to the continuation of high growth and will outline the policy adaptations necessary to place growth on firmer foundations. To meet the aspirations of the public, economic policies will have to be designed to maximize the prospects for growth; and, thus, impediments to growth will have to be addressed early and vigorously.

Armenia was quick to recover from the output shock experienced by transition economies: its upturn in output, dating from 1994, corresponds to the experience of Central Europe and the Baltic States and predates by four to five years the recovery in the rest of the former Soviet Union (FSU). Growth has been driven by productivity gains in the private sector as macroeconomic stability took hold; the role of private markets was rapidly expanded; the public sector remained small as a share of the total economy; and important institutional measures were adopted to ensure free price formation, liberal trade in goods services and investment, private ownership of assets (including land), and industrial restructuring. Moreover, the adoption of responsible fiscal and monetary policies in the late 1990s led to the defeat of inflation and to predictability in the stance of financial policies. Thus, first-generation structural and institutional reforms were achieved and have laid the foundations of the impressive growth performance.

The recent period of growth has resulted in a sharp rise in the consumption of the poor. The poorer quintiles of the income distribution have gained more from growth than the richer quintiles, with the extremely poor showing the greatest gain. Overall poverty fell from over half to one-third of the population between 1998 and 2004 and extreme poverty fell from over 20 percent to just 6 percent of the population over the same period. The reduction in poverty has been driven by consumption growth rather than by redistribution effects. The capital city of Yerevan has reaped large dividends from the fall in poverty, with other urban areas benefiting to a much lesser degree.

Despite the impressive GDP growth, unemployment, according to survey data, stands at around one-fifth of the labor force; and a dual labor market has emerged with large underemployment or subsistence employment coexisting with a more skilled labor force that has enjoyed large real wage gains in expanding sectors of the economy. The causes of the weak response of employment to investment and growth lie in a business climate that has discouraged the flexible use of labor and in inadequate skills among the unemployed. Addressing the binding constraints to the formation and expansion of firms remains central to raising employment. More broadly, this book argues that the incompleteness of structural reforms and inadequacies in the development of institutions and practices that encourage competition are factors leading to the persistence of unemployment.

This book suggests that the continuation of high rates of productivity gains in the economy requires Armenia to make use of new opportunities in reforms directed at sharpening the competition framework of the economy, achieving closer integration with international trade and capital markets, deepening financial markets, and creating the conditions for the absorption of knowledge leading to higher technological sophistication. Should the country fail to seize the opportunities to advance in this second generation of reforms and to overcome the associated institutional and political difficulties, high rates of growth over the next decade would be put at risk. Growth remains narrowly based, despite some widening of the base in recent years, exports remain concentrated by product and markets, significant barriers to domestic and private investment remain within a context of a weak competition framework and high policy-induced costs, and the country has made poor use of opportunities for knowledge and innovation. All these factors make up constraints to growth over the medium term. The challenge to policy makers now lies in seizing the opportunities for reform by breaking through these constraints and capitalizing on the solid reform achievements thus far.

### **SEIZING NEW OPPORTUNITIES FOR REFORM**

As experience has repeatedly shown—not least among the south-east Asian tigers—rapid growth over prolonged periods can conceal underlying weaknesses in an economy and can lull policy makers into complacency. Armenia has begun to address the second generation of reforms somewhat fitfully. Utility reform and privatization have proceeded, and some improvements to the business environment have been made; however, a primitive state of corporate governance, poor property rights enforcement, arbitrary practices in the tax and customs administrations, the distortions associated with corruption, and stunted financial markets all act to impose a large risk premium on investment. Surveys conducted over a number of years and using varying methodologies provide robust evidence of the importance of these factors in inhibiting business. Policy shortcomings in the telecommunications and civil aviation regimes in particular effectively levy a large tax on all economic activities. This environment of weak second-generation reforms has resulted in a dualistic output market (parallel to the dual labor markets), in which entrepreneurs enjoying property rights protection, benefiting from distortions in tax and customs practices, and having recourse to internal financing, gain from being incumbents, while potential entrants to the market are placed at a disadvantage.

The policy adaptations discussed above are also essential to dealing with the weak response of employment to high rates of economic growth in Armenia. The initial output and price shocks of transition led to a shift of labor to subsistence agriculture and to the development of a large informal economy. Macroeconomic stability, privatization, and enterprise restructuring have promoted flexibility in labor markets, but deficiencies in the business environment, some rigidities in the employment regime, and inadequate financial markets have led to a dual labor market: there is a market of real wages that are rising on the strength of impressive productivity gains, and another market (a larger one) which is informal, stagnant, and immobile. This book can be seen as an attempt to analyze the policy responses necessary to make the growth in rates of employment commensurate with output growth.

Investment has been financed to a disproportionate degree from external sources, though the domestic share of investment financing has been rising in recent years. The opportunity offered by a further bout of external grant financing over the medium term, with Armenia qualifying for a large increase in U.S. bilateral assistance in the form of the Millennium Challenge Corporation, can prove a prize if the policy environment is reformed so as to deal with the weaknesses outlined above; or it can be a curse if, in a weak policy setting, private investment is crowded out and excessive consumption or nonsustainable public investment is encouraged. Again, as experience shows, under conditions of grant inflows, the pursuit of reforms can become more difficult and the quality of growth can often be sacrificed. This underscores the importance of redoubling reform efforts in a farsighted manner in order to position the economy for the time when external support will dwindle. The rest of the book focuses on how to make the best use of this window of plentiful external funds.

## SHARPENING COMPETITION

Within the Armenian economy, competition is hobbled by weaknesses in the law and its application (as with the competition law and the law on contracts) in formal and informal institutions and their workings (such as corporate governance arrangements); by business regulations and governance rules and practices (such as arbitrary and unpredictable behavior of the tax and customs administrations); and by policy-induced high costs that fall on the shoulders of all enterprises (such as telecommunications and transport costs). The competition law, a recent innovation, needs to be strengthened in both structure and implementation, notably by clarifying what is meant by collusive behavior and

dominant market practices, and by modernizing the basis for judging pricing practices. Implementation is bedeviled by a weak commission and by the inadequate legal powers of the commission. The commercial transactions law offers insufficient safeguards, with the result that contracts tend to be informal.

Equally worrisome is the state of corporate governance, where laws, regulations, and institutions are particularly weak. Regarding several key transparency issues—notably public access to company registries and lists of founders and shareholders—Armenia is among the weakest of the CIS countries. The quality of corporate financial reporting also remains deficient. Moreover, while the securities law has some weaknesses, the greatest corporate governance deficiencies are found in the company law and other basic legislation affecting the corporate sector. Weak corporate governance practices reinforce the dominant position of a limited number of businessmen and undermine investor confidence. Furthermore, informal barriers to competition—such as the system of interlocking obligations arising from favors and interventions among businessmen—act as a substantial barrier to entry for foreign investors as well as for new local businesses.

Despite satisfactory indicators in a number of categories measuring the ease of doing business (such as ease of formal entry, hiring employees, and business exit), Armenia falls short in other areas, the weakest of which are the registration of property, access to credit, property rights, and large severance payments (at least until the recent reform of the Labor Code, now being put into effect). Overall, however, even in the most streamlined and reformed areas, the level is well below the best practices in transition economies. In addition, Armenia has a large informal economy, with the main incentives to informality being the arbitrary behavior of public servants, the burden of administrative regulation, and a poor record in establishing the rule of law. Absent in Armenia is a major attraction of formality—the access to credit for which formal registration is a precondition.

Such constraints to enterprise activity have implications for efficiency and also carry growth costs. The weaknesses in market institutions act as a barrier to the development of financial markets, and, in turn, this leads to the dominance of the incumbent in markets. Financial intermediation is shallow, and the cost of funds is high.

## DEEPENING FINANCIAL INTERMEDIATION

Confidence in banks is affected by the shortcomings in corporate governance, notably the lack of transparency regarding the ownership and control of banks. Moreover, the opaque ownership structure of

the corporate sector makes it more difficult for the banking sector to assess risks concerning corporate sector exposures. Official disclosures of direct and indirect ownership are substantially weaker than in other transition economies. No disclosure of beneficial owners is required under Armenian law. This limits the ability of banks to ensure compliance with prudent limits on loan portfolio concentrations and related party transactions. These shortcomings in corporate governance can be addressed through legal, institutional, and supervisory reforms. The Central Bank of Armenia has developed a proposal to accelerate improvements in corporate governance in the banking sector through legislative and supervisory means and by introducing upward-consolidated supervision.

The protection of creditor rights is one of the main legal problems hindering the growth of bank lending. The enforcement of collateral is difficult for banks, and this translates into high lending rates. In Armenia, movable property cannot be used effectively as collateral to secure loans. There are numerous problems with the secured transactions framework. Floating pledges are not allowed, and there are no registries that allow pledges to be perfected. Repossession is time-consuming and costly. A particular problem with financing exports is that there is no provision that allows the use of future production as collateral, so financing against export orders is not feasible. A similar problem arises with imports because there is no provision for pledging goods that are not in the possession of the borrower; goods that are being imported, even though they have been paid for by letter of credit, cannot be seized in the event of default. The effect of the inadequacies of the collateral framework extends throughout the economy, with the result that banks correctly perceive lending as extremely risky.

Overall, Armenia lacks a regularized system of credit that should be stimulated by mechanisms providing efficient, transparent, and reliable methods for recovering debt. Armenia's financial sector (possibly with help from the Central Bank and the Ministries of Finance and Justice) should promote an informal, out-of-court process for dealing with cases of enterprises with financial difficulties in which banks have a significant exposure.

Finally, given the vital role played by the generation and transmission of information on creditworthiness in ensuring low intermediation costs, it is suggested that the Central Bank adopt an active role in facilitating private credit bureau development by making credit bureau reports a requirement for lending. This requirement should be coupled with mechanisms that ensure efficient entry and exit by credit bureaus, thereby avoiding abuse of their exclusive rights; and, in order to ensure greater privacy protection, there should be a requirement

that borrowers must give explicit consent prior to any access to their files. In addition, improving governance in credit bureaus and raising the quality of information disseminated remain important.

## REMOVING BARRIERS TO INTERNATIONAL INTEGRATION

Armenia enjoys an admirably open regime in trade in goods and services and in capital and investment flows. No legal restrictions are in place for foreign capital inflows; the foreign investment regime provides for national treatment, most favored nation (MFN), and full repatriation of capital and earnings. Access to Armenian markets of goods is liberal in terms of official border and behind-the-border arrangements. Tariffs are low not only by CIS standards but by international standards as well. Although both its weighted and unweighted average MFN tariff rates are twice as high as in the European Union (EU), they are still well below 5 percent. Furthermore, commitments made upon accession to the World Trade Organization (WTO) have infused a considerable degree of stability and predictability into Armenia's foreign trade policy and have also reduced the potential for the capture of foreign trade decisions by narrow interest groups by providing the government with tools for taming the rent-seekers. Armenia's two-band tariff regime, with applied MFN tariff rates at zero or 10 percent *ad valorem*, has been locked.

Armenia has made highly liberal commitments under the WTO General Agreement on Trade in Services (GATS). Except for telecommunications, Armenia's bound sectoral commitments are extensive in terms of both coverage and market access across different modes of supply of services. The number of subsectors in which exceptions are placed on a mode of supply (that is, unbound) is very small in Armenia's schedule.

Yet neither commitments under the WTO agreements nor legal provisions protecting private property rights and enforcing contracts alone have ensured the high contestability of Armenia's domestic markets. First, the capacity of courts remains weak, as they operate slowly in enforcing contracts and mediating commercial disputes. Second, the computerization of customs has not to date much improved the quality of customs services, and customs procedures have yet to achieve WTO standards of transparency. The time needed to complete customs clearance is grossly excessive. Value added tax (VAT) reimbursements do not occur quickly enough and are underpaid by the government, though there was a substantial improvement in 2005.

Weaknesses in the provision of backbone services add greatly to the cost of participating in the emerging division of labor. Falling

transportation and communications costs create opportunities for outsourcing, just-in-time production, and supply-chain management. The high transportation and communications costs in Armenia are barriers to participation in the division of labor based on production fragmentation. This is illustrated particularly by services in telecommunications and civil air transport. The government's decision to grant a legal monopoly (originally until 2013) to ArmenTel, the local telecommunications company owned by a foreign investor, has led to greatly increased costs and to a considerably lowered quality of service in this key economic activity. The cost of using the Internet in Armenia was 41 percent higher than the average for the CIS. The prices charged by ArmenTel for high-speed connections are 30 times those of countries with competition in telecommunications. Armenia has a surprisingly low number of Internet users, well below the CIS average.

The poor quality of the information technology infrastructure is a barrier to the development of the economy, and the very high telecommunications costs severely exacerbate the disadvantage associated with Armenia's geographical location. ArmenTel's dominant position has been reduced by the introduction of a cellular competitor in 2005, and provision has been made for a second cellular operator in 2009. However, the new mobile operator was licensed in a process that was not transparent and fell far short of international good practice; it is unlikely that a competitive regime will emerge. Duopolies can produce outcomes close to monopolies unless competition law is actively applied to prevent tacit collusion.

The analysis of this book suggests that the regulator should be given enhanced powers in an attempt to countervail the adverse effects of ArmenTel's continuing dominant market position. Furthermore, future policy should be developed and announced now. This policy should stipulate that all government-imposed economic entry barriers would be removed at the same time that the regulator is given enhanced powers; in addition, the available and necessary radio frequency spectrum should be auctioned off well before 2009 so that further mobile operators, to the extent that they consider they would be commercially viable, would be able to enter the market as soon as restrictions are lifted. After 2013, with the termination of ArmenTel's right to exclusivity, the market at that point should be regulated only by competition law.

Freight shipped by air from Yerevan fell by more than two-thirds between 1997 and 2005—a dramatic development considering that the value of exports of goods rose 4 times in dollar terms. The fall in the share of the most dynamic worldwide mode of transport—air transport—can be attributed to the fall in the competitiveness of air transport services, largely because of a restrictive aviation policy. Armenia

has operated a bilateral system of air transport regulations that is based on a restrictive positive list approach, which limits the provision of services to those services that are explicitly permitted.

The empirical evidence from countries that have deregulated the domestic aviation sector (for example, the United States and the EU countries) is robust: passengers and air freight shippers in both the EU and the United States have experienced a dramatic and continuing decline in airfares. The costs of bilateral aviation agreements are not confined simply to the higher prices of air transport but include more difficult-to-estimate costs of forgone opportunities. These costs are potentially large, as lower airfares boost tourism, stimulate important flows of ideas and human capital, and deepen networks. For a small, land-locked economy aiming to maximize its long-term economic growth rate, the best aviation policy would be to eliminate government-imposed entry barriers to air transport. Armenia could gain considerably from following Open Skies arrangements among CIS countries modeled on the EU European Civil Aviation Area Model as well as joining the many countries that have signed Open Skies agreements with countries such as the United States.

Because of the limited contestability of markets and deficiencies in backbone services, information, communications, and technology (ICT) firms have not been able to crest the recent change in the ICT sector worldwide. Armenian firms have successfully entered software and imaging technology niches, but they have failed to enter other stages of the production and delivery processes—in particular as providers of front-end customer contact/support services or suppliers of components.

## CAPITALIZING ON INNOVATION AND KNOWLEDGE

The generation and diffusion of knowledge and the use of innovative technology are important factors behind growth, in general, and the raising of labor productivity, in particular. Information technology externalities that promote the expansion of producer services (such as communications, sophisticated financial and insurance products, and marketing) explain a significant portion of the total factor productivity growth. Armenia has the advantage of a large proportion of highly educated population; however, this educated segment has largely obsolete specialized skills and has eroded through emigration, low public spending on education, and delayed reforms in university education. The country has experienced an entrepreneurial diaspora; and it also suffers from weak local entrepreneurship, in which clusters and value chains are not developing. Entrepreneurs and policy

TABLE 1 KEY POLICY RECOMMENDATIONS

<b>Matching Reform Priorities to Policies and Instruments</b>		
<i>Reform priorities</i>	<i>Policy objectives</i>	<i>Instruments and interventions</i>
Create macroeconomic policies to foster growth.	Raise the domestic investment ratio, raise public investment, and increase the effectiveness of public spending.	<ul style="list-style-type: none"> <li>• Improve the business climate, simplify regulations and tax code, and create measures to fight corruption.</li> <li>• Redirect budget resources to public investment, particularly to enhance human capital and build rural infrastructure.</li> </ul>
Sharpen competition.	Foster competition and encourage private sector development by lowering cost of doing business.	<ul style="list-style-type: none"> <li>• Strengthen the competition law by clarifying collusive behavior and dominant market practices and by modernizing the basis for judging pricing practices.</li> <li>• Enhance the administrative capacity of the competition commission to review cases and enforce its rulings.</li> <li>• Modify the commercial transactions law to strengthen safeguards.</li> </ul>
Integrate into global markets for goods and services.	Create infrastructure that facilitates and encourages firms to engage in international trade.	<ul style="list-style-type: none"> <li>• Establish a “white list” of firms eligible for special treatment by Customs and VAT Administration, including quick customs clearance.</li> <li>• Use provisions of the WTO Agreement on Customs Valuation instead of using reference prices.</li> <li>• Create an effective scheme that provides duty waivers and exemptions from other restrictions on imported inputs.</li> <li>• Give rebates of VAT as soon as exports are cleared by customs.</li> <li>• Extend direct transfer input to all customs houses.</li> <li>• Bring customs-related documents in line with what is really required under a computerized system such as the Automated System for Customs Data (ASYCUDA).</li> <li>• Simplify customs clearance procedures for exports with a strict time limit on releasing a shipment; if it is exceeded, a shipment should be immediately released.</li> <li>• Support participation in international R&amp;D networks (such as the EU 6th Framework Program).</li> <li>• Sign the WTO Information Technology Agreement.</li> </ul>

Support international integration.	Liberalize air services markets. Maximize the contribution of ICT.	<ul style="list-style-type: none"> <li>• Deepen implementation of liberalised government civil aviation policy.</li> <li>• Increase and add new services under “open skies” type arrangements.</li> <li>• Pass the new telecommunications law and pass to the Public Services Regulatory Commission (PSRC) responsibility for implementation, including the ArmenTel license.</li> <li>• Promote cellular competition.</li> <li>• Have the PSRC prepare a regulatory policy statement that, among other things, lays out an implementation plan for the entry of a third service provider by 2009.</li> </ul>
Deepen financial markets.	Strengthen corporate governance standards and practices. Build legal foundations for protection of creditor rights. Improve information flows and promote capital markets. Foster investment activity through expanding access to bank credit to small and medium firms.	<ul style="list-style-type: none"> <li>• Implement new law on corporate governance of banks.</li> <li>• Strengthen official disclosures of direct and indirect ownership.</li> <li>• Make disclosure of beneficial owners required by Armenian law.</li> <li>• Ensure public access to the company registry and lists of founders and shareholders.</li> <li>• Implement law on creditor rights and secured transactions with streamlining of judicial procedures.</li> <li>• Strengthen supervision of capital markets.</li> <li>• Implement unified supervision of financial and capital markets, with new standards for supervision of insurance, pensions, and housing finance institutions.</li> <li>• Promote the development of a credit bureau.</li> </ul>
Capitalize on innovation and technology.	Foster competitiveness by introducing basic innovation skills and encouraging adoption and application of new ideas.	<ul style="list-style-type: none"> <li>• Provide business advisory and support services, such as SME and microenterprise support agencies.</li> <li>• Facilitate access to finance (including microfinance).</li> <li>• Develop management and skills.</li> </ul>
	Support market development and entry into global value chains by fostering strategic alliances and certain in-house innovation capabilities.	<ul style="list-style-type: none"> <li>• Develop internet-based information services.</li> <li>• Support technology adoption and adaptation projects.</li> <li>• Adopt cluster-based approaches to stimulating innovation.</li> <li>• Support participation in international R&amp;D networks (such as the EU 6th Framework Program).</li> </ul>
	Diffuse experience of innovation leaders as role models for the rest of the economy.	<ul style="list-style-type: none"> <li>• Encourage participation of national innovation leaders in national advisory bodies, technology foresight, and cluster processes.</li> </ul>

makers alike do not appreciate (and hence do not seek to improve) the value of intangibles (such as brand names, business reputations, marketing and managerial skills, and networks).

The policy challenge lies in the mobilization and recombination of the existing human capital, triggered by an initially modest investment in intangibles, such as mechanisms of knowledge and skill transfer from the diaspora to Armenia. International experience suggests that, although major reform efforts from the top are vital, bottom-up experiments in Armenia, some of which are already under way, need to mature. Central to the policy task are improvements in what may be called the innovation system (that is, the network of organizations, rules, and procedures that affect how a country acquires, creates, disseminates, and uses knowledge). Traditional measurements for an innovation system include indicators of expenditure on R&D, activity in high-technology sectors (biotechnology, ICT), patenting activity (numbers, intensity), and number of researchers per 10,000 population. These indicators proxy the ability to generate new knowledge. Key organizations for the creation of knowledge include universities, public and private research centers, and policy think tanks. Private firms are at the center of the innovation system. If the private sector has little demand for knowledge, the innovation system cannot be effective. Effective R&D-industry linkages are vital to transform knowledge into wealth. Therefore, networking and interactions among the different organizations, firms, and individuals are critically important. The intensity of these networks, as well as the incentives for acquiring, creating, and sharing knowledge, are influenced by the economic incentive regime in general.

## Acronyms and Abbreviations

ACF	Average Cost of Funds
ADA	Armenia Development Agency
AIA	Armenian International Airlines
ASA	Air Service Agreements
ASYCUDA	Automated System for Customs Data
ATC	Air Traffic Control
BA	British Airways
BEEPS	Business Environment and Enterprise Performance Survey
CAA	Civil Aviation Administration
CEEC	Central and Eastern European Countries
CEM	Country Economic Memorandum
CES	Constant Elasticity of Substitution
CGE	Computable General Equilibrium
CIF	Cost, Insurance, and Freight
CIS	Commonwealth of Independent States
CMEA	Council for Mutual Economic Assistance
CNC	Computer Numerical Control
CPEC	Commission for the Protection of Economic Competition
CPI	Corruption Perception Index
CRS	Computer Reservation Services
DSA	Debt Sustainability Analysis
EASA	European Aviation Safety Agency
EBRD	European Bank for Reconstruction and Development
EC	European Commission
ECA	Europe and Central Asia
EDC	Electricity Distribution Company
EIF	Enterprise Incubator Foundation
EIR	Economic and Institutional Regime/Economic Incentive Regime

EQ&R	Education Quality and Relevance
ERC	Energy Regulatory Commission
EU	European Union
FAT	Foreign Affiliate Transfers
FDI	Foreign Direct Investment
FIAS	Foreign Investment Advisory Service
FSU	Former Soviet Union
GAMS	General Algebraic Modeling System
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GDCA	Director General of Civil Aviation
GDP	Gross Domestic Product
GDS	Gross Domestic Savings
GERD	General Expenditures on Research and Development
GNI	Gross National Income
GNS	Gross National Savings
GSM	Global System for Mobile Communications
GTAP	Global Trade Analysis Project
GVA	Gross Value Added
HDI	Human Development Index
HH	Household
HSBC	Hong Kong and Shanghai Banking Corporation
IAP	International Aviation Policy
ICAO	International Civil Aviation Organization
ICT	Information Communication Technology
IDA	International Development Association
IEF	International Enterprise Foundation
IFC	International Finance Corporation
IFRP	Integrated Financial Rehabilitation Plan
ILCS	Integrated Living Conditions Survey
ILO	International Labour Organization
IMF	International Monetary Fund
IO	Input-Output
IP	Internet Protocol
IPR	Intellectual Property Rights
ISAM	Internal Single Aviation Market
ISIC	International Standard Industrial Classification
ISP	Internet Service Provider
ITA	International Technology Agreement
JAA	Joint Aviation Authorities
JAC	Junta de Aeronáutica Civil de Chile
KAM	Knowledge Assessment Methodology
KE	Knowledge Economy
KEI	Knowledge Economy Index
K4D	Knowledge for Development
KI	Knowledge Index
LCC	Low-Cost Carriers

LHS	Left-Hand Side
LIL	Learning and Innovation Loan
MCA	Millennium Challenge Account
ME	Maximum Entropy
MFN	Most Favored Nation
MoU	Memorandum of Understanding
MTEF	Medium-Term Expenditure Framework
NBER	National Bureau for Economic Research
NSS	National Statistical Service
OECD	Organisation for Economic Co-operation and Development
PPORF	Practical Program of Revolution in Factories and Other Organizations
PPP	Purchasing Power Parity
PRSP	Poverty Reduction Strategy Paper
PSRC	Public Services Regulatory Commission
R&D	Research and Development
RA	Representative Agent
RCA	Revealed Comparative Advantage
RCS	Regulatory Cost Survey
REER	Real Effective Exchange Rate
RHS	Right-Hand Side
S&T	Science and Technology
SAC	Structural Adjustment Credit
SAM	Social Accounting Matrix
SAS	Scandinavian Airline Systems
SEE	Southeastern Europe
SIMA	Statistical Information Management & Analysis
SITC	Standard International Trade Classification
SME	Small and Medium Enterprises
SNA	System of National Accounts
SOE	State-Owned Enterprise
SRI	Structural Reform Index
SWOT	Strengths, Weaknesses, Opportunities, Threats
TCS	Teaching Company Scheme
TFP	Total Factor Productivity
ULC	Unit Labor Cost
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
USPTO	United States Patent and Trademark Office
VAT	Value Added Tax
VoIP	Voice over Internet Protocol
WBI	World Bank Institute
WDI	World Development Indicators
WITS	World Integrated Trade Solution
WTO	World Trade Organization
YBF	Yerevan Brandy Factory



# **Part I: Policies to Sustain Economic Growth**



## CHAPTER 1

# The Pattern of Growth

Armenia's macroeconomic performance has been a success.<sup>1</sup> Moderate but robust economic growth in the initial years of the recovery (5 percent on average over 1994–2000) accelerated in the late 1990s, reaching an average annual rate of 11 percent since 2001. Growth has been fostered by a sound macroeconomic stance and a steady pursuit of first-generation structural reforms, and has relied on exceptionally high foreign assistance. Poverty began to fall at the end of the 1990s.

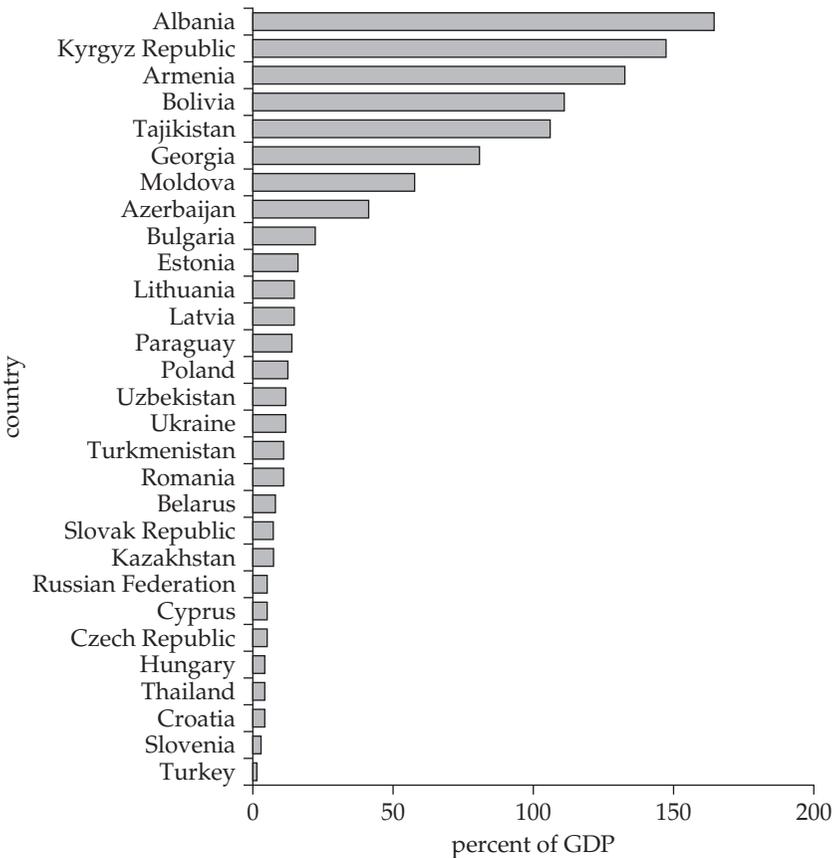
Yet unemployment has persistently remained at double-digit levels and every third Armenian was still below the overall poverty line in 2004.<sup>2</sup> On average, roughly one out of five economically active people is unemployed (based on survey data) and two-thirds of formal workers depend on incomes from low-productivity agriculture and trade. The brain drain had not been reversed as of 2005, indicating that there are limited employment opportunities across a wide range of skills. As in other transition economies, the formal labor market has seen strong gains in real wages based on rises in productivity but little increase in employment; informal labor markets have been stagnant.

The impact of growth on poverty and extreme poverty has been strong. The initial phase of growth (1994–2000) had a moderate and uneven impact on poverty reduction, but, with the sharp acceleration in growth since 2000, poverty has fallen massively. The favorable effects from recent growth have been uneven across the regions, with the greatest benefit occurring in Yerevan. Urban areas outside of Yerevan, in particular, have experienced a lesser improvement. The present growth pattern rests on concentrated and volatile sources. The impact of growth on the generation of employment continues to be disappointing.

Growth has been dependent on foreign aid. During the entire transformation period Armenia has benefited from exceptionally generous international assistance (Figure 1.1) and has also been aided by a high level of remittances and private transfers from diaspora Armenians. Income and investment in Armenia continue to rely heavily on foreign savings, while gross domestic savings, although on an increasing trend, are still low at about 9 percent of GDP.

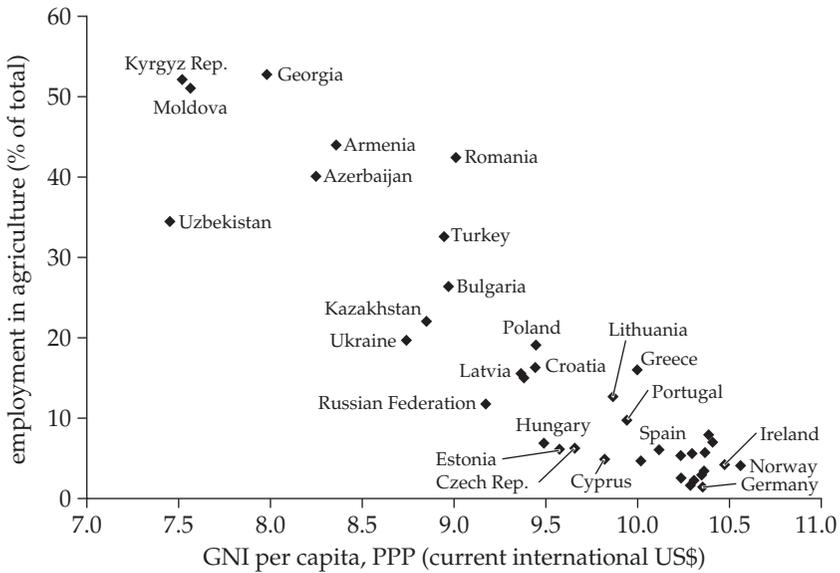
Financial deepening and the economic diversification of industry, manufacturing, and services have not taken off (see Figure 1.2 for a comparison with other Europe and Central Asia [ECA] countries). Agriculture's contribution in Armenia to GDP is around 30 percent,

FIGURE 1.1 OFFICIAL DEVELOPMENT ASSISTANCE, CUMULATIVE 1992–2003



Source: World Development Indicators (WDI).

FIGURE 1.2 ECA COUNTRIES, INCOME PER CAPITA AND EMPLOYMENT IN AGRICULTURE, 2003



Source: WDI.

and to employment it is more than 45 percent, well above the levels of 4.5 percent and 20 percent, respectively, in new EU member states. The services sector, concentrated in public administration and trade, generates about 35 percent of GDP in Armenia compared to more than 60 percent in new EU member countries. As a small developing economy Armenia depends critically on external markets. With a population estimated at 3.2 million and a GDP per head of about US\$1,600 distributed quite unevenly, Armenia faces considerable challenges in both development and poverty reduction.

Armenia is a land-locked country with high transportation costs. Two important neighbors, Azerbaijan and Turkey, closed their borders with Armenia for political reasons soon after Armenia's independence. Border closures have imposed costs on the economy, with the main surface trade link limited to (i) low-capacity rail and road connections with Georgia and its Black Sea ports, and (ii) Iran via a single road. High transport costs arise from border closures, but also, importantly, from policy weaknesses in the transport and communications regimes. Overcoming policy-induced and structural problems such as these makes development and poverty reduction challenges even more complicated.

## SUSTAINED GROWTH WITH IMPRESSIVE PRODUCTIVITY GAINS

As noted, Armenia's macroeconomic performance during the transition has been very successful. A sharp 60 percent decline in output between 1991 and 1993 was reversed by a rapid recovery. Since 1994, Armenia has grown at a remarkable average annual rate of over 8.0 percent, and by 2005 its real GDP reached 120 percent of its pretransition level. This growth pattern is comparable with the Central and Eastern European (CEEC) and Baltic countries, where the resumption of growth dates from 1996–97,<sup>3</sup> rather than with the CIS (Figure 1.3).

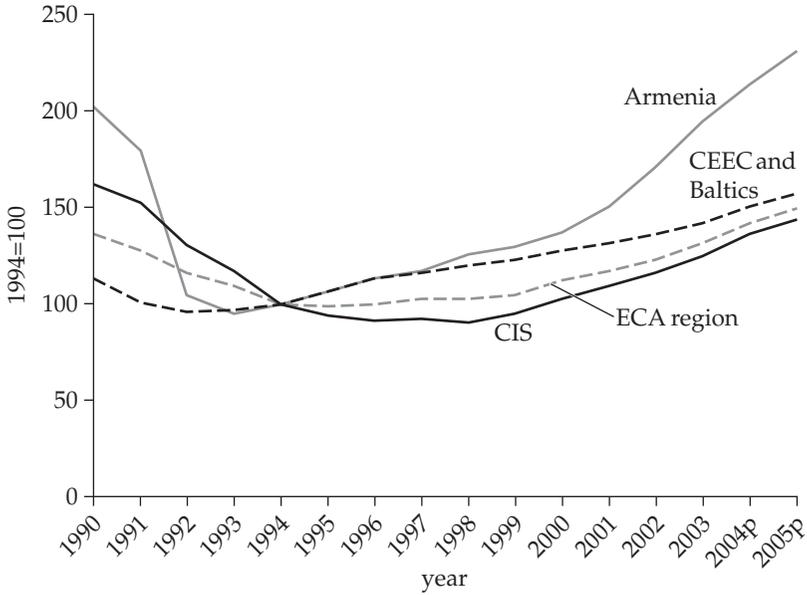
Growth was robust for the entire past decade (Figure 1.4). It started moderately in the first years of economic recovery (1994) and accelerated toward the end of the decade in response to the strong contribution from investments. The macroeconomic impact of the regional financial crisis (1998–99) was moderate. The authorities have mitigated the negative impact by the timely implementation of precautionary measures. In addition, the initiation of diamond exports and subdued imports have compensated for the temporary erosion of other sources of growth in 1999.

The regional crisis, however, had a strong adverse impact on the terms of trade for agriculture, with an associated impact on poverty. It also dampened remittances with a painful effect on household incomes. Economic growth accelerated in 2000 and was led by growth in consumption, while net exports contribution was small as both exports and imports showed strong expansion (Figure 1.5).

As noted, growth has been dependent on foreign aid. During the entire transition period Armenia has benefited from exceptionally generous international assistance and has also been aided by a high level of remittances and private transfers from diaspora Armenians.<sup>4</sup> The current account balance has seen considerable improvement as a result of steady reduction in trade deficit (Figure 1.6). The foreign trade and exchange regime was liberalized in the early 1990s and has contributed to promoting trade and investment. In addition to a prudent monetary policy, the large import content of the consumer price index also helped to hold down the rate of inflation when import prices fell in the late 1990s.

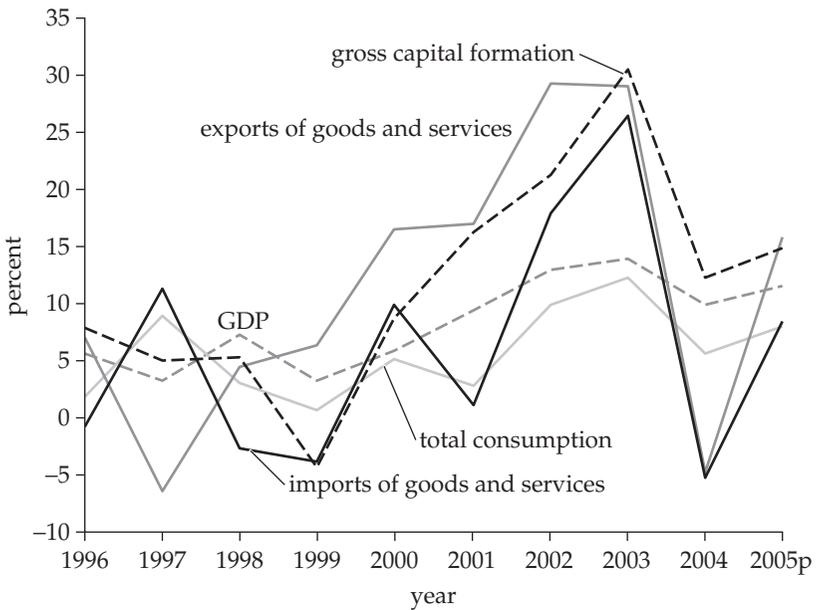
Total factor productivity, reflecting efficiency gains from macroeconomic stabilization and structural changes, has driven GDP growth in Armenia. During the 1990s and early 2000s, Armenia realized much of the "catch up" potential which arose following the economic transformation. Labor productivity growth outperformed GDP growth and capital productivity growth was also high. As a result, the productivity gap between Armenia and the industrialized countries has narrowed, but it remains substantial (Figure 1.7).

FIGURE 1.3 INDEX OF REAL GDP, 1990–2005



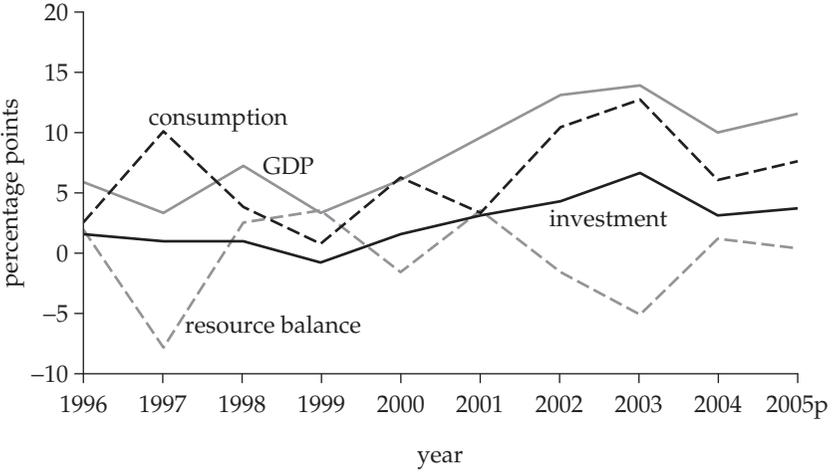
Source: World Bank, ECA Regional Tables.

FIGURE 1.4 GDP GROWTH RATE, 1996–2006



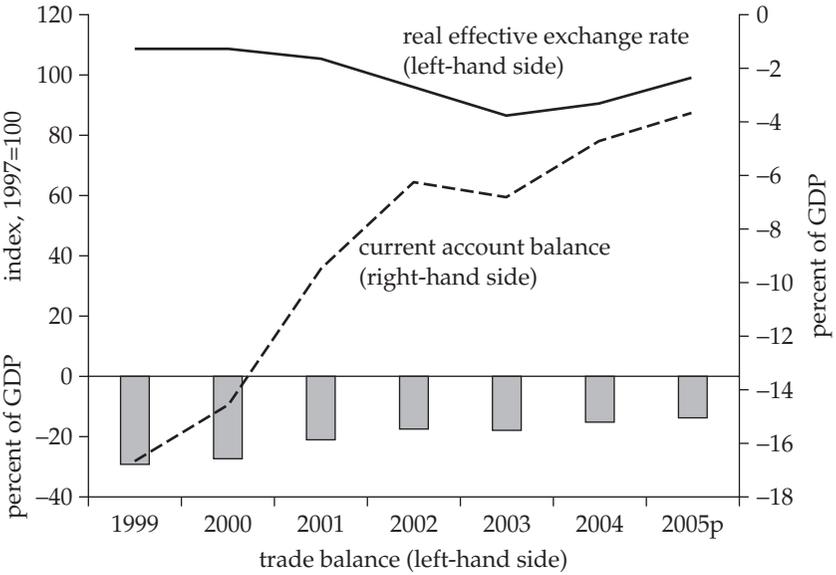
Source: NSS.

FIGURE 1.5 GDP GROWTH AND CONTRIBUTION OF EXPENDITURE TO GDP, 1996–2005



Source: NSS.

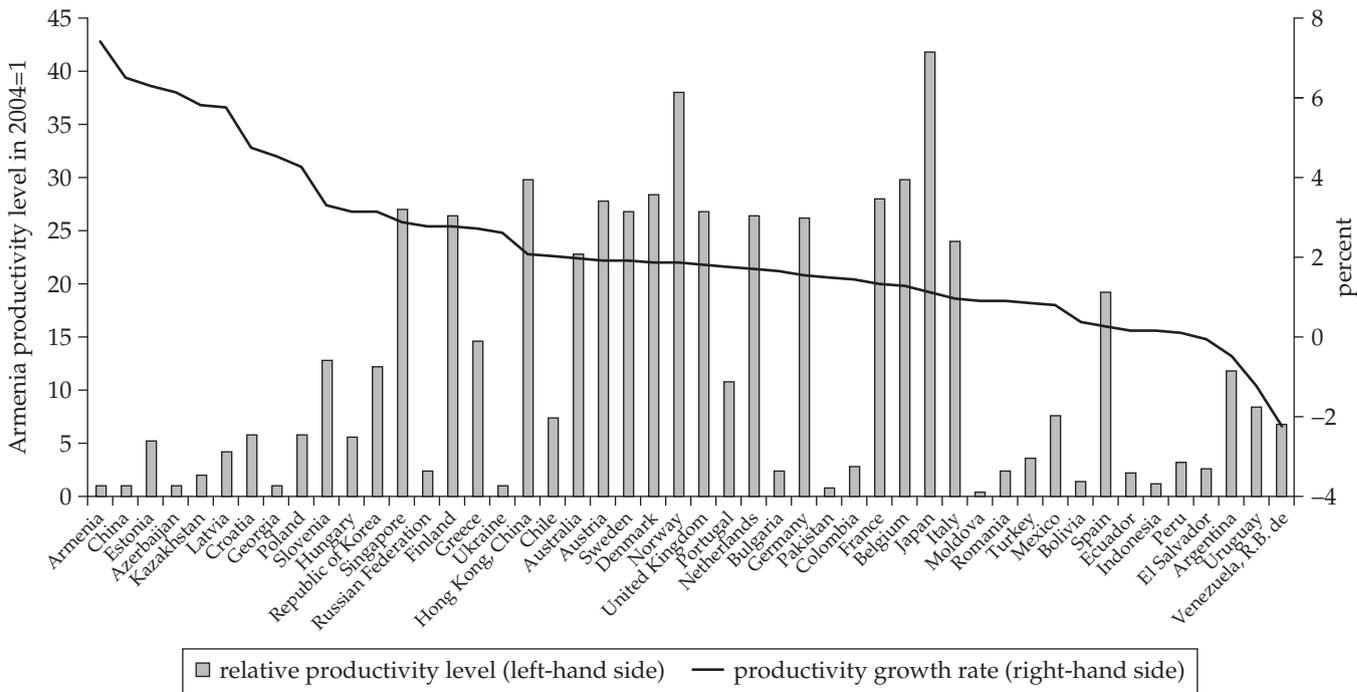
FIGURE 1.6 EVOLUTION OF REER, TRADE BALANCE, AND CURRENT ACCOUNT BALANCE, 1999–2005



Source: NSS.

CAB = current account balance; REER = real effective exchange rate.

FIGURE 1.7 RELATIVE PRODUCTIVITY LEVEL AND PRODUCTIVITY GROWTH RATE, LATEST DATA

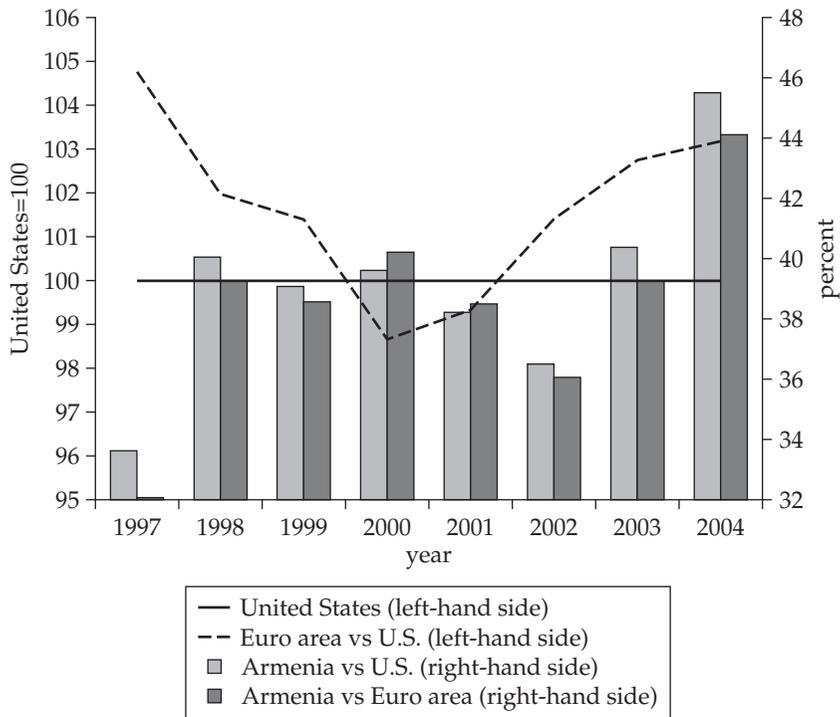


Source: WDI, Staff Calculations.

Note: Data are for 2004; 2003 data are used if 2004 data are not available.

Armenia's unit labor cost (ULC) generally compares favorably to neighboring markets. This is mainly due to Armenia's comparative advantage in having an educated and skilled workforce and the country's strong tradition of highly skilled craftsmen. In the mid-1990s the real wage increase outperformed the increase in labor productivity. This was partially due to the wage adjustment from a very low base. Unit labor costs did not rise during the 1990s as the real exchange rate depreciated. The early 2000s were characterized by strong productivity gains and, except in 2003, outperformed the increase in real wages. The unit labor cost started to increase in late 2002, reflecting both the increase in employment compensation and the real effective exchange rate (REER) appreciation and declined again in 2005 in response to wage stability and strong productivity growth. Over the 1990s, the unit labor cost increased to about 46 percent of the U.S. level (about 44 percent of the euro-area level) from as low as less than 3 percent in the early 1990s (Figure 1.8).

FIGURE 1.8 RELATIVE UNIT LABOR COST INDEX, 1997–2004



Source: OECD, WDI.

Productivity gains have risen because of the enterprise restructuring and the contemporaneous macroeconomic discipline that enabled enterprises, through competition and trade, to realize efficiency improvements in the areas of management, marketing, and technology. They have also risen because of labor shedding from declining economic activities and sectors and the absorption of labor by new enterprises. In contrast, productivity fell in agriculture for reasons discussed earlier.

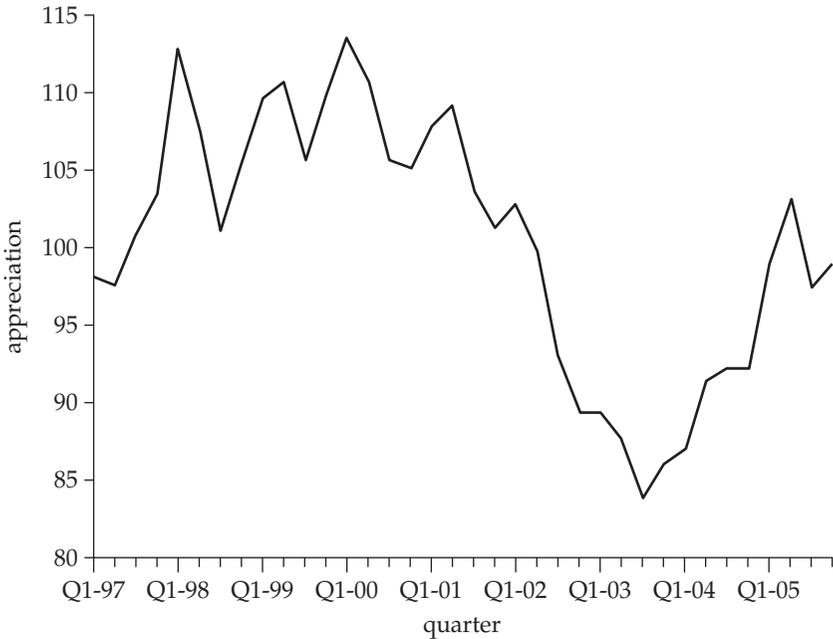
Armenia's exchange-rate regime has been stable since the national currency was introduced, and the REER depreciated gradually until 2004 (Figure 1.9). The strong appreciation of the dram (the Armenian currency) since early 2004, in response to sustained high rates of growth and productivity gains in the economy (the Balassa-Samuelson effect), has ensured the continued importation of price disinflation to the benefit of economic performance.

### **INCREASINGLY EXPORT-LED GROWTH**

Following an initial prolonged period of export weakness, partly owing to adverse geopolitical conditions peculiar to Armenia, extremely strong export growth has been registered since the late 1990s. This development reflects a transition to market conditions in three ways. First, exports have been based on restructured industrial capacities. The inherited industrial capacities that were incompatible with market disciplines have been dismantled. No other CIS economy recorded such a strong growth in 1999–2004. Armenian firms have also outperformed other non-oil CIS competitors in both CIS and EU markets, with their shares in respective markets increasing very significantly in the 1999–2004 period. The export share in total EU imports doubled in 2003 alone. Against the background of falling Russian imports from most CIS countries, the Armenian performance is particularly impressive, with the value of exports of goods more than doubling between 1999 and 2004. Trade with the CIS appears no longer driven by the post-Soviet hysteresis in trade patterns, with the emerging trade reflecting a comparative advantage in these increasingly competitive and market-oriented markets.

Second, the readjustment in the geographical pattern of trade, reflecting the economic weight of regional markets, appears to be complete. While in 1995 Russia, together with other CIS countries, took 56 percent of Armenia's exports and supplied 49 percent of Armenia's imports of goods, these shares fell to 25 percent and 27 percent, respectively, in 1999 and to 19 percent and 29 percent in 2005. The shift has been largely toward the EU-15, whose share in Armenian exports rose

FIGURE 1.9 REER QUARTERLY INCREASE, INDICATING APPRECIATION



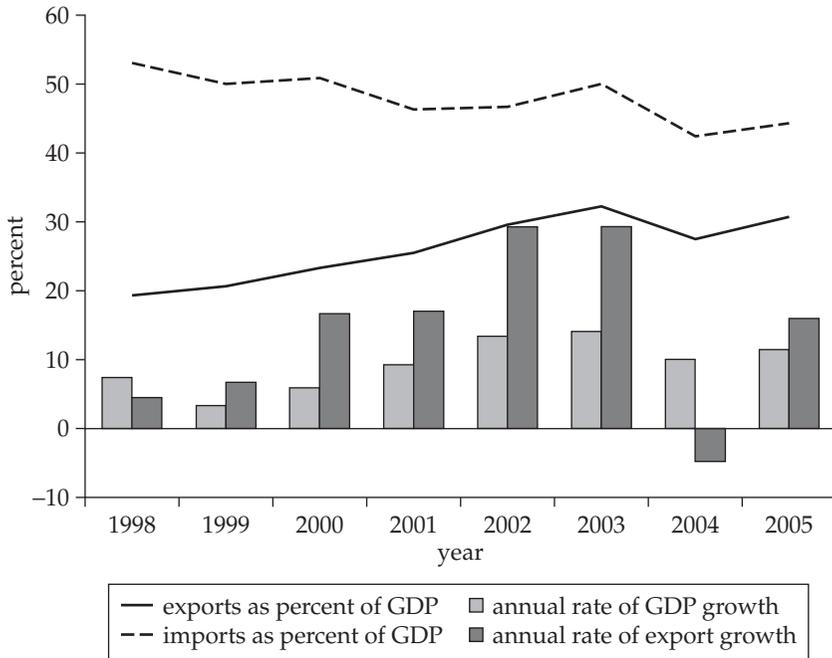
Source: Central Bank of Armenia.

from 26 percent in 1995 to 46 percent in 2005 and in imports from 15 percent to 26 percent over the same period.

Third, the expansion in exports has not been confined to goods but has also included services, especially if the estimate that puts exports of ITC services at around US\$100 million rather than the US\$11 million reported in the balance of payments category of “computer and information services” is broadly correct. With or without a revised figure for these services, revenues from services increased more than expenditures. With a revised figure, the balance of trade in services swung to the surplus in 2003, and the overall deficit in trade in goods and services was significantly lower.

Finally, Armenia’s growth has become export-led, as exports growth has far outstripped GDP growth. (Figure 1.10). Moreover, a strong GDP growth performance considerably lessened an overall potentially adverse macroeconomic impact of trade imbalances. In terms of the GDP, the trade deficit fallen rather rapidly from 38 percent in 1997 to 12 percent in 2005.

FIGURE 1.10 KEY ECONOMIC INDICATORS OF EXTERNAL PERFORMANCE, 1998–2005



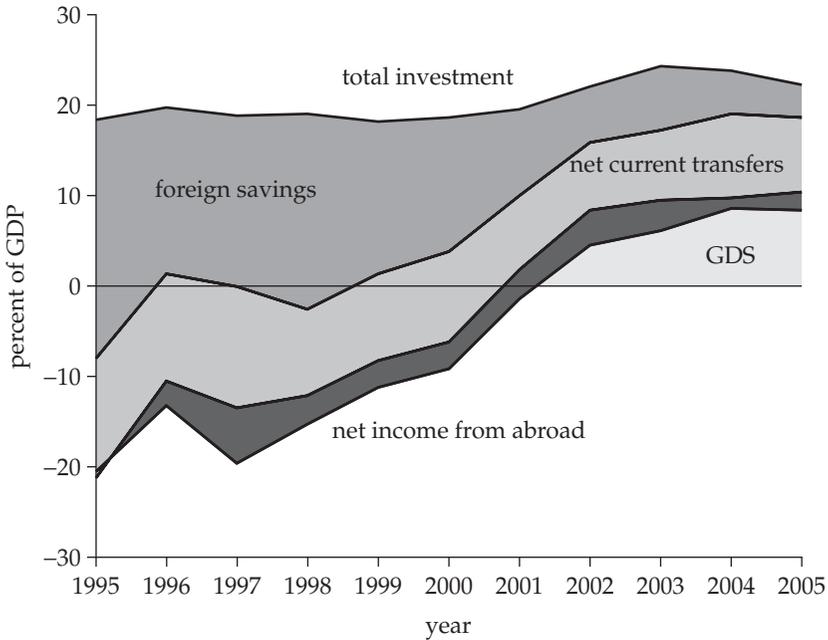
Source: NSS.

The composition of exports of goods has registered some encouraging developments, with exports diversifying toward high value-added goods. Yet a significant weakness is that manufactures, other than diamonds, have been conspicuously absent in Armenia's exports. Although the share of manufactures increased in Armenia's total exports from 39 percent in 2000 to close to 70 percent in 2005, this was mainly due to the increase in exports of diamonds. Other manufactured exports fell in terms of value with their share in total exports falling from 29 percent in 2000 to 10 percent in 2003 alone.

### CONTINUING HEAVY RELIANCE ON EXTERNAL SAVINGS

Armenia's heavy reliance on foreign savings to finance its investment needs has declined over time but remains large (Figure 1.11). In 2005 about 20 percent of total investment was financed through foreign

FIGURE 1.11 SAVINGS AND INVESTMENT BALANCE, 1994–2005



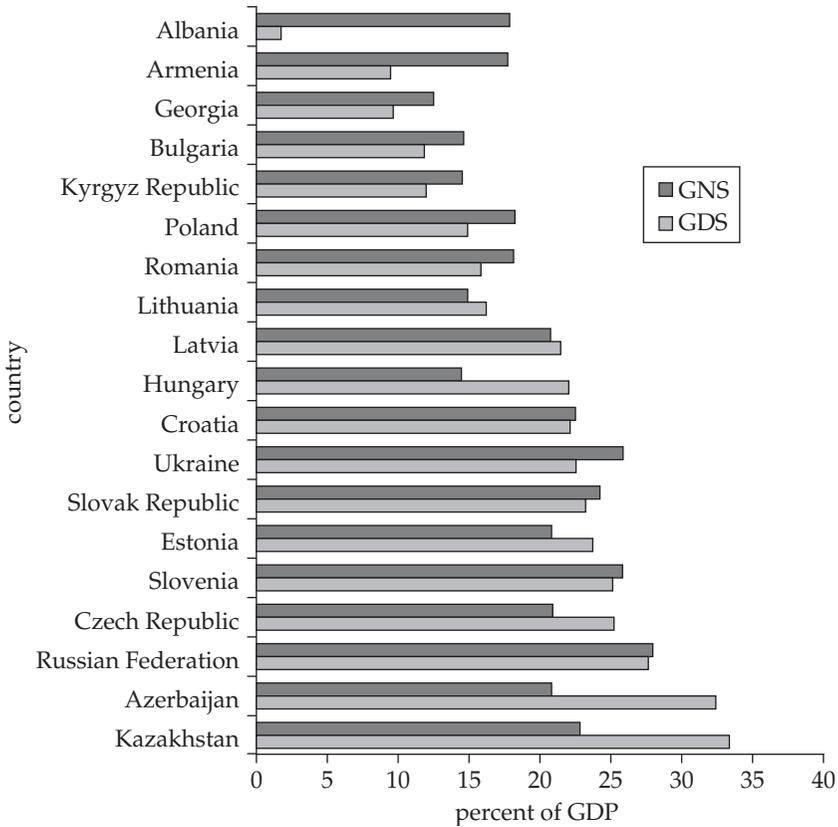
Source: NSS.

GDS = gross domestic savings.

savings as compared to 90 percent in 1999. This reduction in reliance on foreign savings did not entail a decline in investments, as a commensurate rise in gross domestic savings has taken place. But the investment share in GDP has risen only modestly (growth has been driven by productivity) and the rise in investment necessary for sustained growth will require a greater domestic savings effort. Total investments averaged 19 percent of GDP during 1996–2000, increasing to 23 percent of GDP in 2001–05, but Bank projections show that the investment-to-GDP ratio will need to rise to around 28 percent by the end of the decade to sustain growth, assuming a return to a steady rate of productivity growth.

Gross domestic savings remain low as shown by international comparisons; and gross national savings fall short of those in some other CIS countries. Though the external debt and current account positions are comfortable, these figures illustrate the dependence of the economy on income and transfers from abroad to finance investment needs (Figure 1.12).

FIGURE 1.12 GROSS DOMESTIC SAVINGS AND GROSS NATIONAL SAVINGS, 2004

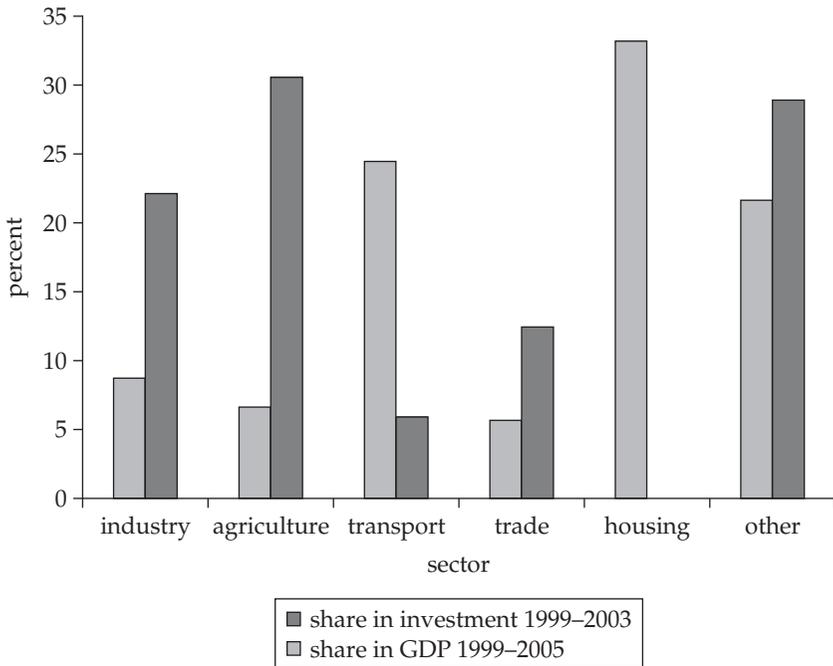


Source: World Bank ECA Regional Tables.

GDS = gross domestic savings; GNS = gross national savings.

Investment has been broad-based, but with a tilt toward housing construction. The structure of investments by sectors during 1999–2005 (Figure 1.13) shows that housing represents over 30 percent of total investment. Infrastructure has also attracted a considerable share of investment. Several profitable and competitive traditional sectors have attracted private investment during the process of economic transformation (for example, gem cutting, brandy distillation, electric motors, hotels, high-technology manufacturing, and software services). A significant source of investment financing has been foreign direct investment (FDI), but associated with large transactions. A large part of the

FIGURE 1.13 SECTORAL SHARES IN GDP AND INVESTMENT BY SECTORS, AVERAGE, 1999–2005



Source: NSS.

FDI, particularly in infrastructure (telecommunications through the privatization of the national telecommunications company, ArmenTel) and in industry (privatization of the gas distribution network) was the direct result of large-scale privatization.

### COMFORTABLE OUTLOOK FOR EXTERNAL DEBT

A debt-sustainability analysis (DSA) carried out for Armenia shows that the country is considered to be at a low risk for debt distress, with all debt indicators well below the relevant country-specific debt-burden thresholds, including when subjected to stress tests (see Table 1.1).

The baseline DSA has been developed on a cautious set of assumptions, including: (i) a real GDP growth of 5 percent per year over the period 2008–12 and 4 percent thereafter; (ii) an inflation rate of 3 percent throughout the projection period; (iii) an overall fiscal deficit of 2.9 percent of GDP through the Poverty Reduction Strategy Paper

TABLE 1.1 ARMENIA'S EXTERNAL DEBT BURDEN INDICATORS

	Threshold <sup>a</sup>	Armenia's Ratios	
		2005	2025
<i>NPV of debt in percent of:</i>			
Exports	200	60	25
GDP	50	15	8
<i>Debt service in percent of:</i>			
Exports	25	6	2

Source: IMF-WB Staff calculations

a. Threshold values are based on the guidelines for low-income country DSAs, among which Armenia is considered to be a strong performer.

NPV = net present value.

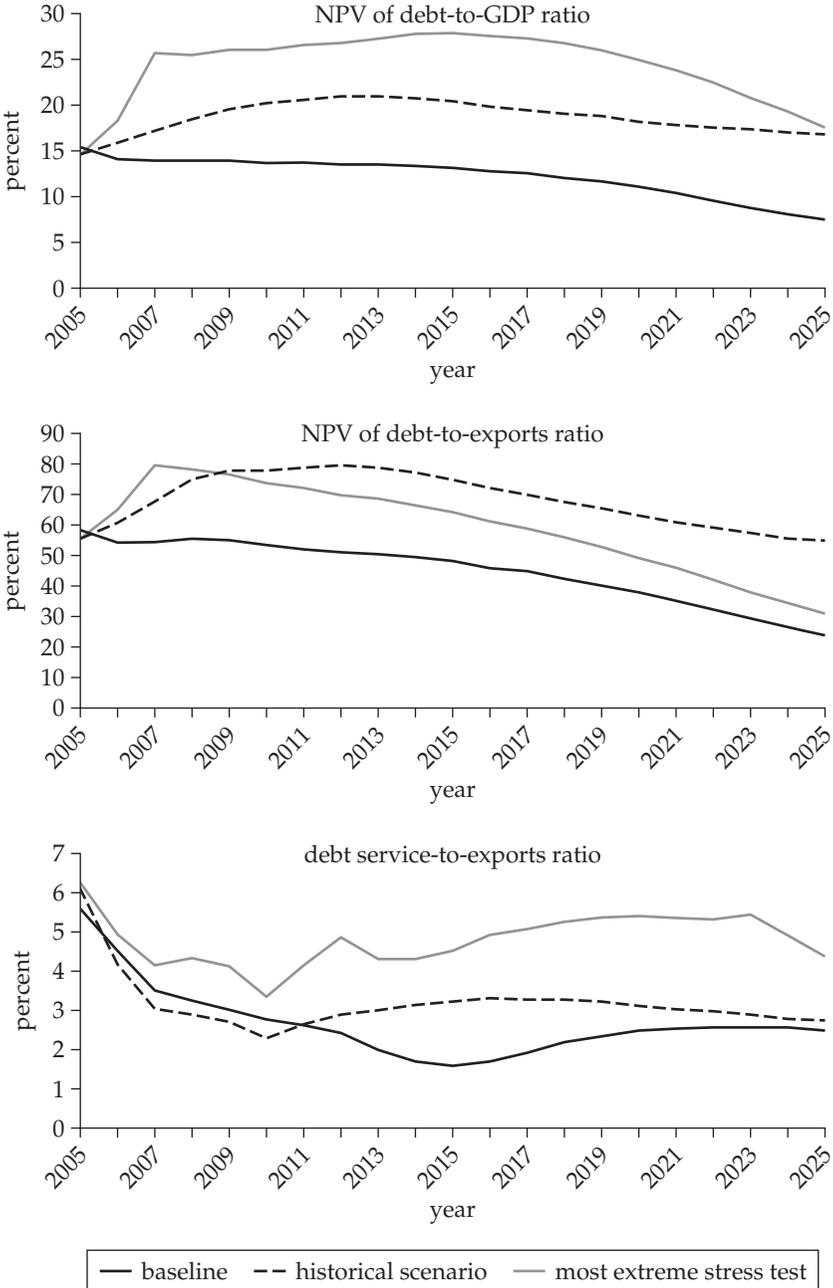
(PRSP) horizon of 2015 and 2.3 percent of GDP thereafter (implying a debt-stabilizing primary balance); (iv) a steady increase in the share of both exports and imports as a proportion of GDP, leading to a gradual improvement in the current account balance over the projection period; and (v) a shift away from highly concessional forms of external financing.

Under the baseline scenario the fiscal position remains sustainable. The net present value (NPV) of the ratio of debt to revenue and NPV of the ratio of debt service to revenue remain relatively stable throughout the projection period. In particular, the NPV of external debt falls steadily from around 15 percent of GDP in 2005 to just over 8 percent by 2025, the NPV of the debt-to-exports ratio falls from just over 60 percent to around 25 percent over the same period, and the debt service-to-exports ratio declines from just under 6 percent in 2005 to around 2 percent by the end of the projection period (Figure 1.14).

The framework for low-income country DSAs also incorporated alternative scenarios and bound tests aimed at identifying the sensitivities of the baseline projection to a range of potential shocks. Based on these scenarios and tests it can be seen that Armenia's debt outlook is particularly sensitive to (i) a lasting shock to the growth outlook and (ii) a slowdown in export growth. Nevertheless, even under these scenarios, Armenia's debt outlook is likely to remain manageable.

The DSA also considered the possible impact on debt sustainability of a "significant" fiscal event, such as the assumption by the government of pension liabilities. Assuming such an event was to occur in 2010, costing around 10 percent of GDP, the NPV of the public debt-to-GDP ratio in 2025 would remain manageable at about 40 percent. While the historical scenario (which can be considered as a "no-reform"

FIGURE 1.14 INDICATORS OF PUBLIC AND PUBLICLY GUARANTEED EXTERNAL DEBT UNDER ALTERNATIVE SCENARIOS, 2005–25



Source: IMF-WB Debt Sustainability Analysis for Armenia.

scenario) also projects debt ratios below the threshold indicators, the ratios generally continue on an upward trend through the projection period. This finding underlines the importance of continuing the process of structural reform and preserving macroeconomic stability in order to safeguard the debt outlook.

## KEY MACROECONOMIC CHALLENGES

Despite the success of macroeconomic management thus far and the sustainability in medium-term fiscal and external accounts, the authorities have to remain vigilant regarding the major sources of vulnerability to economic performance. Economic projections to the year 2010 indicate that even with some moderation of growth to an average of 6 percent per year, external debt and debt service indicators will fall sharply, thereby creating both fiscal space and greater private sector funds for financing investment. On reasonable assumptions of productivity growth and incremental capital-output ratios, the investment-to-GDP ratio will have to rise by around 4 percentage points in the rest of this decade. This rise in the investment-to-GDP ratio is projected to be financed equally by external savings (as grant inflows into the economy rise substantially) and private sector savings.

Thus, the macroeconomic management challenge will lie in ensuring stability that leads to the generation of greater private savings and efficient use of official inflows. The task of monetary and exchange rate policies will be to bear down on inflation, which has flared up periodically in recent years. The appreciation of the dram that is under way will help to fight inflation. In an economy with rapid productivity growth such as Armenia's, a real appreciation of the currency is to be expected and is the mechanism for establishing a balance between the tradables and the nontradables sectors. The Central Bank is entirely right in permitting the nominal appreciation seen thus far: were it to seek to hold the nominal rate down, the real appreciation would be realized through higher inflation. It is particularly important to permit the exchange rate to be determined entirely through market forces, as the bank lacks the long-duration financial instruments necessary for sterilization activities. One-year bills currently being issued will help in short-term liquidity control and in operations to dampen day-to-day volatility in the exchange rate.

The fiscal deficit over the medium term should be confined to a range of 2.5 to 3 percent of GDP. This will require some broadening of the fiscal base and a rise in the revenue mobilization ratio to finance priority social expenditure needs. The narrowness of the fiscal base and the insufficient reliance on direct taxes lead to a lack of balance in the tax structure and to a mobilization ratio that is too low to fund

priority social expenditure needs. Changes in tax policy to enhance the role of direct taxes<sup>5</sup> and in tax administration to ensure minimal evasion and fair treatment of all taxpayers will go a long way to stabilizing the fiscal base. As labor taxes and social contributions are high, particularly given the high unemployment and the large informal economy, consideration could be given to a shift toward direct taxes. Any temptation to relax on tax reforms against a background of large donor grant inflows should be resisted.

Questions also arise as to the capacity of the economy to efficiently absorb the large volume of the external grant funds flowing from the Millennium Challenge Account (MCA) and other sources. Constraints to efficient absorption arise from macroeconomic factors, institutional and managerial factors, and infrastructure. Projected inflows equivalent to 2 percent of GDP will not be inconsistent with the macro-stability provided that the monetary and exchange rate stance is as discussed above, the import content of the counterpart to the grant financing is high (as would be the case with infrastructure capital spending), and domestic spending (for example, on salaries) is controlled. In this manner, the inflationary impact and the real appreciation of the dram will be minimized. Macroeconomic challenges will also arise if grant financing is substituted for domestic revenue mobilization or if it leaks into public consumption—these situations would pose a danger to fiscal sustainability over the medium term.

On the institutional side, the appropriate budgeting of inflows and the selection of projects to reflect high-priority needs as identified in the PRSP action plan, as well as careful management of the public investment program, are essential if absorption is to be efficient. Moreover, infrastructure constraints to efficient absorption will be eased if priority is given—as envisaged—to addressing needs in the transport and water sectors (especially in rural areas).

There is a concomitant need to ensure high quality in public expenditures. Over 2005–06, a large increase in teacher salaries took place as salaries were grossly inadequate to attract quality services. This increase is related to productivity increases (the pupil-teacher ratio rises). In subsequent years, expenditures must shift from wages to items that enhance service quality as envisaged in the medium-term expenditure framework, such as curricular reform and education aids, the broadening of education services, primary health care, and increasing the real rate of the poverty benefit as well as targeting the benefit more sharply. A strategic approach to capital spending based on an overall public investment plan that explicitly makes sector choices is also necessary, particularly in the context of the MCA disbursements.

## GROWTH AND A PRONOUNCED FALL IN POVERTY

The most recent period of growth has resulted in a sharp, disproportionate rise in consumption by the poor (Table 1.2).<sup>6</sup> Growth incidence curves are useful for analyzing the impact of aggregate economic growth across households, as they plot the growth rate in consumption for individuals ranked according to their consumption. Figure 1.15a–d presents growth incidence curves for the period from 1998–99 to 2004. The vertical axis is ordered by increasing the levels of per-adult equivalent consumption. A downward sloping incidence curve indicates that people in the poorest quintiles of the population have benefited from growth more than the average. The horizontal line parallel to the horizontal axis indicates the growth rate in mean.

In 2004 per adult equivalent consumption was about 10 percent higher than consumption in 2001, while output in Armenia grew by a cumulative 30 percent during the same period. This trend was not uniform across the capital and noncapital urban and rural areas. Overall, this pattern appears to be driven by the distribution of the growth impact in the capital city and the rural areas. In contrast, with the exception of the people below the tenth percentile, whose consumption increased by 10 percentage points on average, the consumption of the non-Yerevan urban population was either unchanged or declined in 2004 compared to 1998–99.

The population across all deciles, with the exception of non-Yerevan urban areas, experienced consumption growth, except for the richest population above the ninetieth percentile, which experienced a negative growth rate everywhere except in the capital city. The poorer quintiles of the income distribution gained more from economic growth than the richer quintiles. The extremely poor have gained the most

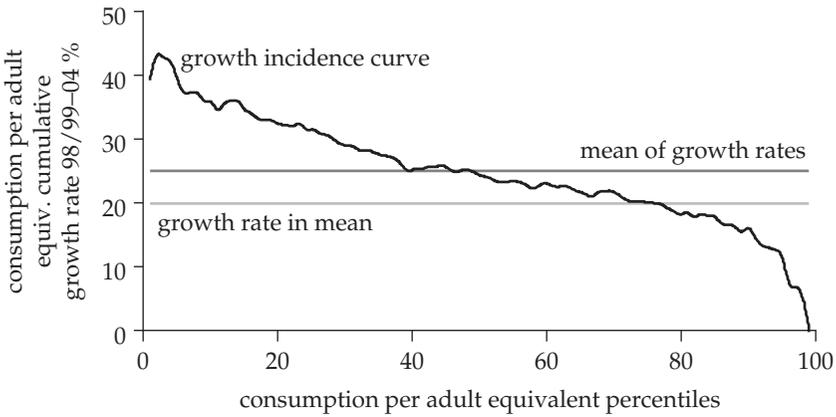
TABLE 1.2 ARMENIA'S POVERTY INDICATORS, 1999–2004  
(percent)

	<i>Poverty incidence (%)</i>				
	<i>All</i>	<i>Urban</i>	<i>Yerevan</i>	<i>Other urban</i>	<i>Rural</i>
<b>Extreme poverty</b>					
1998/99	26.1	32.1	29.6	34.5	18.0
2004	6.4	7.5	6.1	9.2	4.4
<b>Overall poverty</b>					
1998/99	56.3	62.7	58.7	66.5	47.7
2004	34.6	36.4	29.2	43.9	31.7

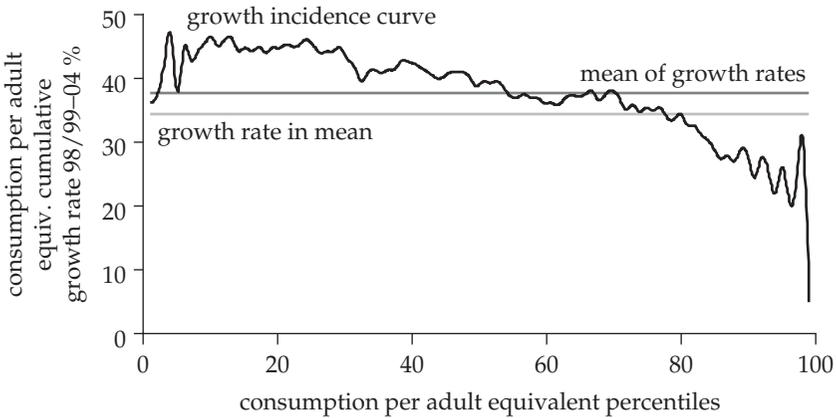
Source: Integrated Living Conditions Survey (ILCS); Armenia 1998/99–2004.

FIGURE 1.15 GROWTH INCIDENCE CURVES, 1998/99–2004

**a. Armenia: Growth Incidence Curve, 1998/99–2004**



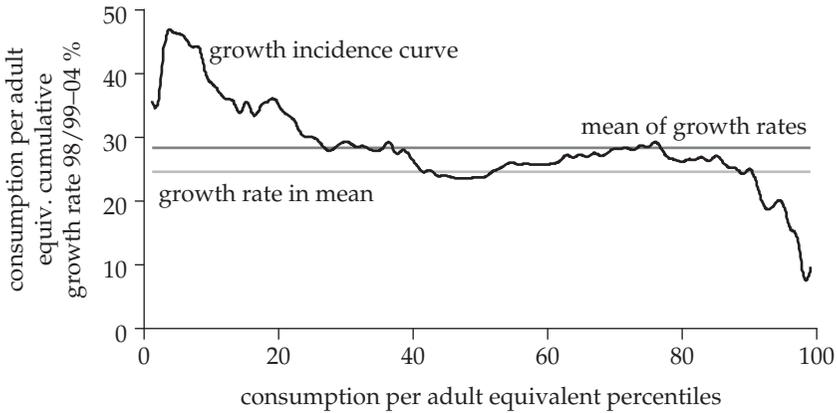
**b. Armenia: Growth Incidence Curve in Yerevan, 1998/99–2004**



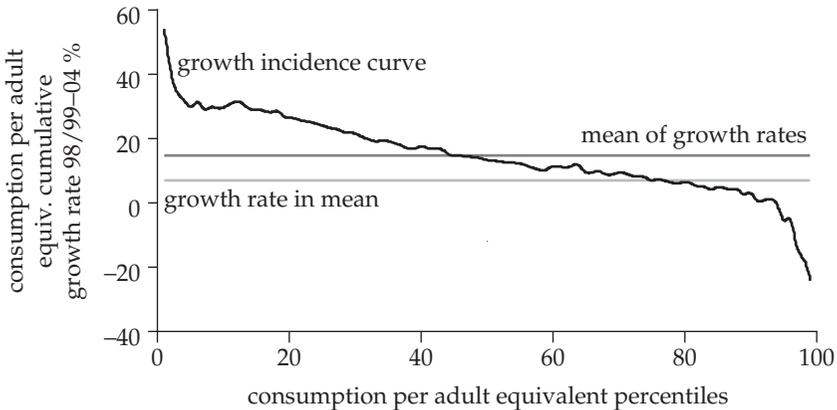
from the recent economic growth. This evidence is consistent with the evolution of inequality for the period—the Gini coefficient decreased from a value of 0.32 in 1998–99 to a value of 0.23 in 2004—and indicates that the growth was accompanied by a compression in the overall structure of the consumption distribution. This favorable pattern has been driven by the increase in nonfactor income and indicates the effectiveness of the social protection policy through the improved

FIGURE 1.15 (CONTINUED)

**c. Armenia: Growth Incidence Curve in Other Urban Areas, 1998/99–2004**



**d. Armenia: Growth Incidence Curve in Rural Areas, 1998/99–2004**



Source: ILCS; Armenia 1998/99–2004.

Note: The curve refers to the period of 5 years and 9 months.

targeting of the family poverty benefit system and the increased social transfers (such as pensions, family poverty benefits, and others), and also points to the effect of remittances and the multiplier effect from externally driven demand sources.

The consumption figures shown above fit in well with the data on poverty indicators. The strong gains for both poverty and extreme poverty in Yerevan are consistent with growth rates of about 17 percent

TABLE 1.3 ARMENIA: GROWTH AND INEQUALITY  
 DECOMPOSITION OF CHANGES IN POVERTY  
 INCIDENCE BETWEEN 1998–99 AND 2004  
 (average effects)

	Total	Urban	Yerevan	Other urban	Rural
<b>Extreme poverty</b>					
Change in poverty incidence	-20.6	-25.9	-26.3	-25.4	-13.5
Growth component	-14.2	-22.6	-21.4	-21.7	-4.1
Redistribution component	-6.4	-3.4	-4.8	-3.6	-9.5
<b>Overall poverty</b>					
Change in poverty incidence	-24.3	-32.0	-36.7	-26.8	-13.8
Growth component	-22.5	-31.1	-33.3	-27.4	-7.8
Redistribution component	-1.8	-0.9	-3.4	0.6	-6.0

Source: ILCS; Armenia (various years).

in the mean consumption of the bottom three deciles, as compared to about 6 percent for the same deciles in the non-Yerevan urban areas and 12 percent in the rural areas. Armenia's poverty is skewed toward being an urban problem (outside of the capital).

The reduction in poverty is mostly driven by consumption growth. The decomposition of poverty reduction into a growth and a distributional component, developed by Datt and Ravallion (1992), gives better insight into the poverty effects of decreasing inequality (Table 1.3). Calculations for both extreme and overall poverty incidence reveal that the growth and redistribution components worked in the same directions in influencing the reduction in poverty. However, most of the observed poverty decline is attributed to the growth component (around two-thirds, on average). Changes in consumption distribution played a more important role in extreme poverty reduction than in overall poverty reduction. Decreased inequality contributed about 31 percent to extreme poverty reduction and 7 percent to overall poverty reduction. Thus, the importance of the inequality component in explaining changes in overall poverty in Armenia is similar to that in other CIS countries where changes in inequality explained 5 percent of the changes in poverty (Alam et al. 2005).

In the capital city of Yerevan and other urban areas, consumption growth was the most important source of the reduction in poverty (extreme and overall), as its contribution was over 80 percent. For rural poverty, on the other hand, both components—the decline in inequality and consumption growth—were almost equally important. Extremely poor rural households benefited mainly from the decline in inequality, as 70 percent of the reduction in rural poverty was attributable to decreased inequality.

## GROWTH WITHOUT JOBS

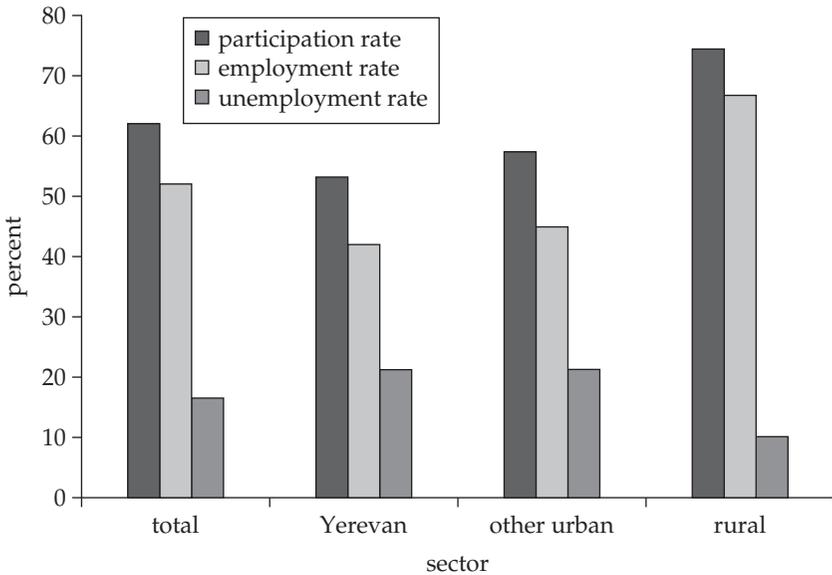
An analysis of the impact of growth on employment is bedeviled by the change in economic regime. First, a market-based economy has replaced the command economy directed at realizing economies of scale on a narrow range of products—such as electronics and synthetic rubber—for dispatch to the rest of the Soviet Union. Second, upon independence the economy experienced large external price, output, and infrastructure shocks. In the initial phase (1992–94), there occurred a massive shift of labor to subsistence agriculture in response to the initial price and output shocks, and labor hoarding took place in enterprises that continued to function at considerably shrunken levels of output.

The strong growth in output seen over the past decade has not resulted in a commensurate rise in employment until very recently. Output growth has been supported by strong labor productivity increases. Though registered unemployment stands at around 10 percent of the labor force, survey data point to rates twice as high, and the labor force has been affected by weak participation rates (Figure 1.16) and large migration, both skilled and unskilled. Much of the work force is to be found in subsistence agriculture or in the informal economy and underemployment is endemic. The weak demand for labor has persisted for a decade, and the rapid growth in productivity in formal activities has translated into rising real wages rather than more demand for labor. The labor market is segmented and has weak geographical mobility within the country.

This phenomenon, called “jobless growth,” is not specific to Armenia but is typical of most transition economies, where initial growth is mostly based on large productivity gains due to structural changes and labor shedding in the process of labor rationalization and more efficient utilization of labor resources rather than through an increased use of the labor force. According to a recent study, Armenia has actually registered a significant “job loss growth” (Kuddo 2006). Over the last 15 years since 1990, employment has declined by 34 percent from 1.63 million people to around 1.1 million in 2004. In the process of the country’s search for new equilibrium, the destruction of unproductive jobs has been accompanied by the creation of new and more productive jobs. Job losses usually exceed job gains, leading to a net fall in employment. Only the World Bank’s (2004a) Integrated Living Conditions Survey (ILCS) has recorded some increase in the employment rate among the population. Recent positive trends in employment indicate that Armenia may have reached a new equilibrium, and that growth will start to rely increasingly on improved labor utilization.

The cities have been most deeply affected by transition, with labor participation and employment higher in rural areas. Other key

FIGURE 1.16 PARTICIPATION, EMPLOYMENT, AND UNEMPLOYMENT RATES IN URBAN AND RURAL AREAS (POPULATION AGED 15 AND OLDER)



Source: ILCS (2004) and NSS (2006).

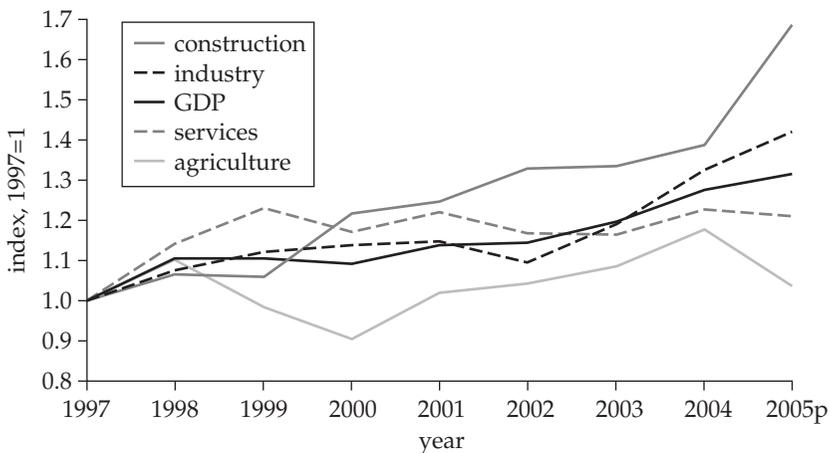
features of labor conditions in Armenia include the high percentage of youth that are neither in work or in study; the significant gender differences in participation; the extremely long duration of unemployment; the considerable regional disparities in participation; and the notable shift of employment from the state sector to the private sector in recent years.

In comparison to the structural changes seen in the economies of the new members of the EU, those in Armenia have been much less profound thus far. The share of agriculture in GDP is today around 30 percent and agricultural employment accounts for more than 45 percent of total employment, well above the levels of 4.5 percent and 5 percent, respectively, in new EU member states. Activity is concentrated in low value-added agriculture (dairy, meats, and grains). The services sector, concentrated in public administration and trade, generates about 35 percent of GDP in Armenia, compared to more than 60 percent in new EU member countries. Subsistence agriculture, which is susceptible to supply shocks, remains overmanned, and those who rely on subsistence agriculture remain economically vulnerable.

The impact of growth on formal job creation outside the construction and trade sectors has been weak. Agriculture, which had been growing more slowly than the rest of the economy during the 1990s, has absorbed a surplus of (unskilled) labor released in the process of economic transformation. Part of the decline in the share of agriculture in total output from over 30 percent to 25 percent over the 1990s was related to changes in relative sector prices (that is, a decline in agriculture terms of trade since the 1998 Russian crisis) (Figure 1.17). Agricultural prices have been declining until recently, while prices in services (led by the utility price adjustment) and industrial prices have been consistently increasing. The special conditions that drove up the price of oil recently required another round of relative price adjustment. Agricultural prices saw another considerable decline in 2005. Clearly, such price shifts benefit the urban consumer and lead to the shift in resource allocation away from agriculture. But they have not led to the expected fall in employment in agriculture. In contrast, the fastest growing sector of the economy—construction—has made a significant contribution to job creation: the share of the labor force employed in construction has risen from 4 to 9 percent over the past five years. Job creation in industry in recent years was mostly concentrated in new private enterprises. Out of 26,500 jobs created in industry during 1999–2003, 22,000 were established in newly created private enterprises.

Recent enterprise surveys indicate that there is a potential for employment growth. Average capacity use in Armenian firms, as

FIGURE 1.17 CHANGE IN SECTOR PRICES, NOMINAL VALUE-ADDED DEFLATOR

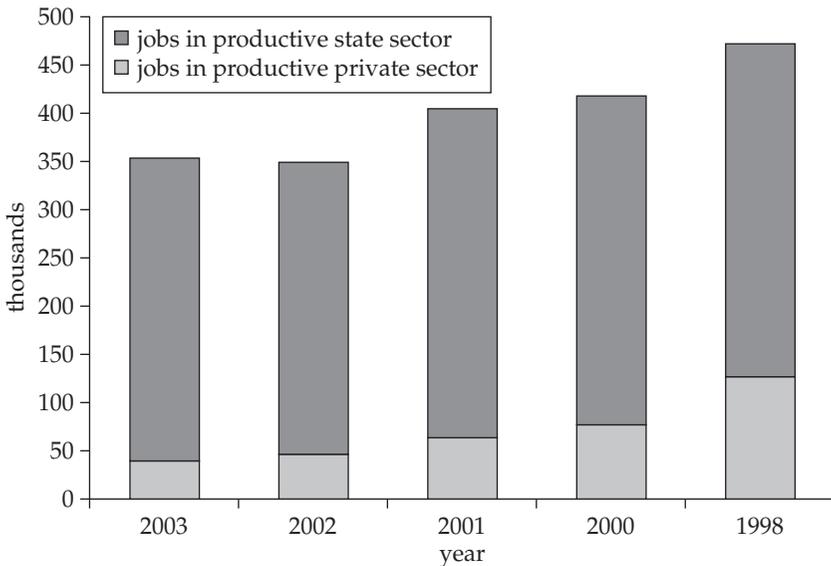


Source: NSS.

surveyed by the 2005 Business Environment and Enterprise Performance Survey (BEEPS 2005), equals 82 percent, indicating that new jobs can be generated using the available capital stock. Moreover, employers point out that the optimal employment level in their firms compared to the current level implies an expansion of the workforce by 12.1 percent. This is more than the average in the ECA region of 8.6 percent of potential new employment in existing firms. GDP growth is expected to be more employment-intensive, since the rate of production growth in service sectors is expected to rise.

Public employment has been constrained by the political choice of a small public sector in the economy. Other labor-intensive sectors and sectors with a demand for skilled labor, such as banking and light manufacturing, have been growing slowly since 2003 (Figure 1.18). The share of unskilled labor in total employment rose from 50 percent in 1990 to 75 percent in 2002. This development reflects some out-migration of skilled labor and possibly a worsening of the skills mismatch in the labor force after the collapse of central planning, as skills that were in demand under a planned economy were not needed under market conditions. (Labor-market research under way will examine such factors).

FIGURE 1.18 NONAGRICULTURAL JOBS IN THE PRODUCTIVE STATE AND PRIVATE SECTORS, 1998–2003



Source: NSS and authors' calculations.

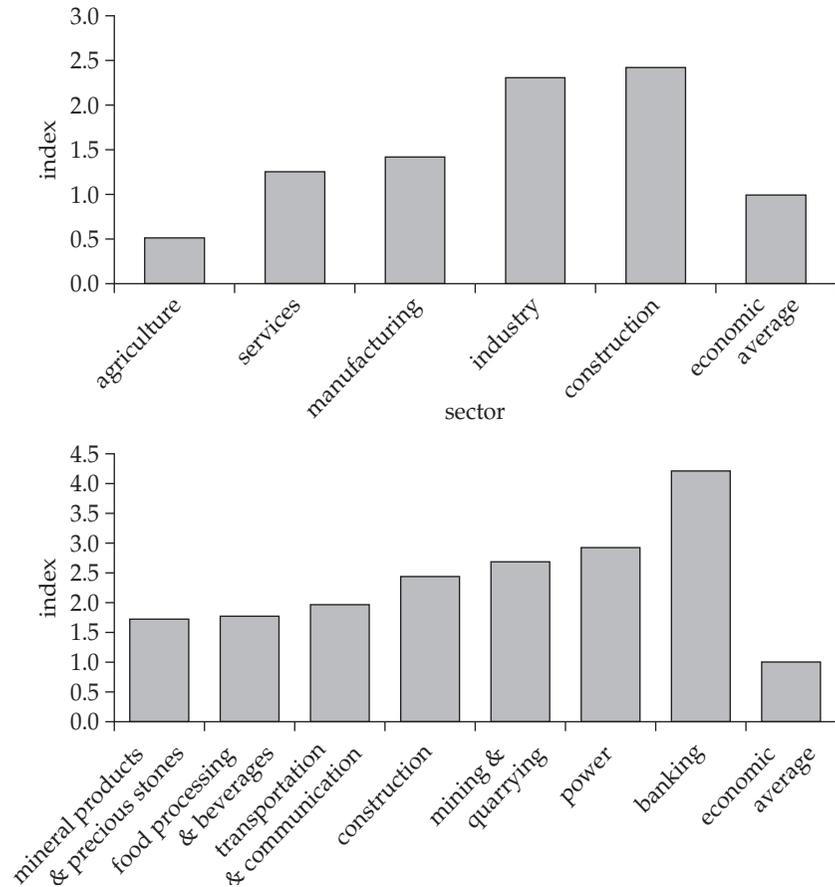
Strong labor productivity growth and the increases in the ULC appear to have curtailed the potential for new employment in the short term. This trend has been reversed very recently with the increased reliance of growth on labor utilization. From an international perspective, the Armenian labor market is still characterized by relatively low participation (65.9 percent compared to 70 percent in EU-19 and OECD) and employment rates, along with high unemployment rates (above 20 percent in 2004). In general, growth in labor productivity, if associated with slower growth in real wages, reduces ULCs and creates room for new employment. In Armenia, rapid growth in labor productivity was accompanied by increases in hourly compensation above the productivity growth level and related increases in ULC. The benefits of recent economic growth secured stronger earnings for current workers but did not generate higher employment, and the increase in labor costs contributed in part to jobless growth during the mid-1990s.

Figure 1.19 illustrates the mismatch between the rapidly expanding sectors and labor productivity. The contrast between the rapidly growing sectors and formal employment indicates that the majority of the labor force has benefited only modestly from rapid economic expansion.

The causes of the weak employment response to investment and growth lie in a business climate that discourages the flexible use of labor (business surveys provide evidence for this statement and are discussed in detail in Part 1, Chapter 3, of this book). Thus, a central policy task is to create conditions that will lead to an expansion of jobs. Raising the rate of job creation would require addressing the binding constraints to the formation and growth of firms. The principal weaknesses in Armenia are uncertainty in property rights, poor enforcement of contracts, arbitrary and predatory behavior on the part of public authorities, restrictiveness in the formal regime governing employment, and stunted financial intermediation.

Considering that the labor market situation may be aggravated due to the fact that during the decade the labor supply will increase significantly, while the generation born at the birthrate peak in the 1980s will enter the labor force, Armenia will need to create more and better jobs. Thus, in addition to improving the business climate, Armenia will need to reform labor market institutions to create an adaptive labor market—that is, a market in which employers have the incentives to hire and workers have the incentives and required skills to take up available jobs. The upgrading of the labor force, or vertical mobility, is a precondition for rapid structural and technological change, for competitiveness, and for raising the share of high value-added products and services. The new role of employment services should be specified

FIGURE 1.19 RELATIVE LABOR PRODUCTIVITY BY SECTOR



Source: NSS and authors' calculations.

and the overall state of the labor market should be thoroughly analyzed, including new forms of employment, underemployment, and unemployment; the components of labor force growth; age structure; industry and occupation structure; labor market segregation (for example, by age or gender); and regional imbalances.

In contrast to some other CIS countries, the long record of stable macroeconomic management in Armenia reduces policy uncertainties. Moreover, with privatizations and enterprise restructuring being completed, labor hoarding has practically been eliminated. In addition, wage-setting mechanisms are market-based and are decentralized to the firm level. However, employment protection legislation is restric-

tive and dismissal costs are high in terms of severance pay, though enforcement is erratic (see Chapter 3 and Table 3.5).

Thus, the muted employment response to growth reflects the incompleteness of structural reforms and of the development of institutions and practices that would encourage competition and enterprise activity. To encourage employment growth, policy makers need to focus on property rights and all aspects of the rule of law, including rules-based regulation and regulatory behavior, bureaucratic arbitrariness and corruption, and the creation of a framework for bank and capital markets development.

The persistent, very high rates of unemployment and the associated large, informal economy entail risks for the continuation of “tigerish” rates of growth. At a time when the memory of Soviet full employment (even if of the “we pretend to work and they pretend to pay us” variety) and the adequate provision of very basic goods is still strong, the creation of haves and have-nots in the employment world—with large increases in real wages for a minority and with no clear prospect of a strong generalized growth in employment—diminishes support for the reform agenda still to be addressed. The strong association between unemployment and poverty makes reform even harder to promote. The worst affected by unemployment and poverty are middle-aged workers who may be less attuned by attitude and skills to the new economy.

The remainder of this book is structured as an analysis of the policy response necessary to raise employment growth to the rates in comparable tiger economies. Such an analysis will deal with questions of competition, the impediments to enterprise activity, the absorption of knowledge, the use of finance for investment, and the benefits of the international division of labor.

## SUMMARY

Armenia’s growth performance has been impressive and has had a sharp impact on poverty reduction. But growth has been dependent on foreign inflows (although the share of national savings has risen substantially), and growth has had a muted impact on lowering unemployment until very recently. The economy is insufficiently diversified; the export base remains narrow. The economy can be characterized as having a dual labor market: one formal, with rising productivity and real wages; the other, informal and stagnant. Thus, growth has been based on rising investment and productivity gains rather than on higher employment—a phenomenon seen in other CIS states. Broadening the base of growth and generating new jobs will

require changes in the business climate, sharper competition conditions, and a shift in taxation away from labor and social security taxes and charges and toward direct income taxation.

## NOTES

1. A background analysis for the pattern of growth can be found in Chapters 7 to 9 of Part II of this book.

2. Survey-based data show unemployment rates of around one-third; registered unemployment is around 10 percent. In the EU-15 (the 15 EU members prior to the most recent enlargement of membership) and EU-10 (the 10 most recent members) less than 0.5 percent and 5.4 percent of the population, respectively, live below the poverty threshold of US\$2 a day.

3. For a more detailed cross-country comparison see Loukoianova and Unigovskaia (2004).

4. Armenia has a very large diaspora of about 5 million compared to the country's population of about 3.2 million people. The diaspora is spread over the world and is large in the Middle East, the United States, Russia, and Western Europe.

5. Indirect tax rates are high (VAT [value-added tax] is levied at 20 percent) and the tax base is commendably broad; thus the scope for further action on indirect taxes is small. The tax system is discussed in Part 2 of this book.

6. A detailed study of developments in poverty can be found in ILCS; Armenia (various years).

## CHAPTER 2

# Constraints to Sustained Growth

### THE RECORD

As has been noted, Armenia has an impressive decade-long record of double-digit rates of growth on average, although incomes remain well below those in countries such as Lithuania. Armenia's strong growth record has been fostered by sound macroeconomic performance: namely, modest fiscal deficits, low inflation, and a stable (recently appreciating) currency. Exports have accelerated and the current account deficit has declined from over 20 percent of GDP in the mid-1990s to less than 5 percent in 2005. Gross international reserves remained at about four months of imports. Armenia has pursued a prudent debt management strategy. By now, almost all nonconcessional debt, accumulated during the first years of independence, has been settled<sup>1</sup> and the debt burden has been kept under control. Macroeconomic projections, on the assumption of continued stability-oriented policies, indicate a comfortable fiscal sustainability and plunging indicators for debt service and debt burden (as discussed in Chapter 1 of this book).

Armenia has already implemented an impressive range of market-oriented reforms, including free price formation in a highly open market with a liberal regime for trade and investment, a liberal financial system, total private ownership of land, and privatization of both small and medium enterprises (SMEs) and large enterprises. Accession to the WTO in December 2002 has locked Armenia into a liberal foreign trade regime. The early and swift privatization of land was particularly impressive and stands in contrast to all other CIS countries. Land ownership reforms have continued with an acceleration of land registration processes and streamlined titles issuance to farmers. These actions have been followed by the development of rural land

markets. The government adopted a privatization program in 2000 that resulted in privatization of 75 percent of the large public enterprises and almost all of the SMEs. For those enterprises that were not sold following three attempts at privatization, the government established appropriate exit strategies for public enterprise reorganization or liquidation.

The government implemented several structural reforms in the energy sector, which included undertaking the financial and technical restructuring of the sector, increasing tariffs, establishing a regulatory framework, improving the collection of electricity bills, and reducing cross-subsidization. The price of electricity reflects cost recovery. In addition, the government mitigated the adverse impact of tariff increases on the poor through increasing the well-targeted family benefits. Furthermore, the government privatized the Electricity Distribution Company (EDC) in 2002. Since its privatization, the EDC has improved its financial performance significantly. The government has ensured that the privatized electricity distribution company will comply with its license.

The government also carried out a wide range of reforms to improve the regulatory framework for utilities and infrastructure, especially for the power sector. The role and the independence of the Energy Regulatory Commission (ERC) were strengthened and a strategy was developed to improve the efficiency of the nonprivatized parts of the power sector. In addition, the government established a single utility regulator based on the ERC; adopted the necessary legal framework to ensure its financial autonomy; and transferred the economic regulations of the energy, drinking water, and telecommunications sectors to the single Public Services Regulatory Commission (PSRC). The government also carried out performance monitoring and a public information program to ensure that people are made aware of the power sector's performance in a timely and credible manner.

Other utilities also underwent deep reforms and experienced a gradual increase in private sector participation. The government adopted the Integrated Financial Rehabilitation Plan (IFRP) for public utilities—covering electricity, drinking water, irrigation, and urban electric transport—to guide the policy reforms and to ensure the ultimate commercialization of the utilities. The government made adequate provisions in the annual budgets to support the financial recovery plan of the transport and water sectors in order to ensure that full payments are made to the energy sector. Reforms in the water sector included the financial restructuring of drinking water companies, tariff increases, the adoption of a new water code, and improved collections. In addition, the government adopted a schedule for irrigation tariff increases in 2002–07 to provide full cost recovery tariffs for the irrigation system by 2007.

The government undertook several reform measures in the banking sector to improve the lending environment. The government restructured two weak and failing banks, adopted the law on the bankruptcy of banks, increased the minimum capital requirements of the banks, and modernized the loan classification system. In the area of banking supervision, the Central Bank developed manuals both on- and offsite, started on-site supervision, and introduced regulations for the internal control of banks. The payments system was improved, diagnostic studies were completed that resulted in the revoking of the licenses of six banks, a credit registry at the Central Bank was introduced, and confidence in the banking system was enhanced by the introduction of a deposit guarantee system and a series of accounting standards. The government also adopted the law on insurance, took initial steps to strengthen creditor rights and corporate governance for banks, established a regulatory and supervisory environment for insurance, and adopted regulations and procedures for the Securities Commission. These reforms contributed to enhancing confidence in the banking system and accelerating credit growth.

## THE RECORD IN A COMPARATIVE CONTEXT

Some interesting comparative insights can be gleaned from the examination of European Bank for Reconstruction and Development (EBRD) transition indicators of progress (normalized for the purpose of this analysis) in the liberalization of prices, small-scale privatization, and foreign trade and exchange rate regimes (EBRD, various years).<sup>2</sup> They all comprise measures at the core of the first-generation reforms (see Figure 2.1). Armenia and Lithuania began their journey toward a market-based economy from the same level, estimated at around 35 percent of the “desired” level. Nevertheless, while Lithuania made a big leap in 1993–94, Armenia initially lagged behind. However, both countries had largely completed first-generation reforms by 1998. It is interesting to note that the SEE-4 economies, although at the same starting point in terms of EBRD scores, have lagged behind Armenia in implementing first-generation reforms.

## CONSTRAINTS TO FUTURE GROWTH

The preceding section of this chapter has argued that the factors underpinning Armenia’s impressive growth performance are durable stability in macroeconomic stance and the pursuit of first-generation structural reforms, price and trade liberalization, a liberal foreign exchange regime, the privatization of all small enterprises and some medium

## BOX 2.1 ARMENIA—PRODUCTION STATISTICS BY SECTOR

Sector	Output		Value added	
	US\$	Sector share in total	US\$	Sector share in total
Wheat, potatoes, and legumes	155.5	3.6	98.7	4.6
Vegetables and fruits including grapes and dried fruits	132.5	3.1	115.4	5.4
Vegetable oils and fats	15.8	0.4	1.0	0.0
Crops not elsewhere classified	103.1	2.4	81.1	3.8
Diary products including eggs and milk	342.6	7.9	168.2	7.8
Beef, pork, mutton, and poultry meat	159.0	3.7	66.9	3.1
Energy—oil and natural gas	75.7	1.7	0.0	0.0
Mining and quarrying	65.9	1.5	39.4	1.8
Food processing and beverages	430.7	9.9	158.1	7.4
Tobacco products	80.9	1.9	13.7	0.6
Light manufacturing and textiles	52.6	1.2	5.3	0.2
Chemicals, rubbers, and plastics	53.0	1.2	10.4	0.5
Mineral products and precious stones	269.3	6.2	40.7	1.9
Metals and metal products	109.9	2.5	43.6	2.0
Machinery, equipment, and motor vehicles and precision optical equipment	88.7	2.0	5.8	0.3
Other manufacturing	61.2	1.4	17.9	0.8
Electricity, gas, and water supply	152.0	3.5	111.6	5.2
Electricity supply and distribution	163.2	3.8	102.1	4.8
Construction	518.3	11.9	298.6	13.9
Transport and communications	259.9	6.0	153.1	7.1
Retail and wholesale trade and public catering	447.2	10.3	288.6	13.5
Banking, lending, and insurance	51.6	1.2	35.7	1.7
Governance, defense, and public procurements	362.5	8.4	197.7	9.2
Other services not elsewhere classified	93.7	2.2	23.6	1.1
Housing and dwellings	92.6	2.1	68.2	3.2
Total agriculture	908.6	20.9	531.3	24.8
Total manufacturing	1,036.4	23.9	251.9	11.7
Total industry	403.5	9.3	194.7	9.1
Total construction	518.3	11.9	298.6	13.9
Total services	1,470.8	33.9	869.0	40.5
Total	4,337.6	100.0	2145.5	100.0

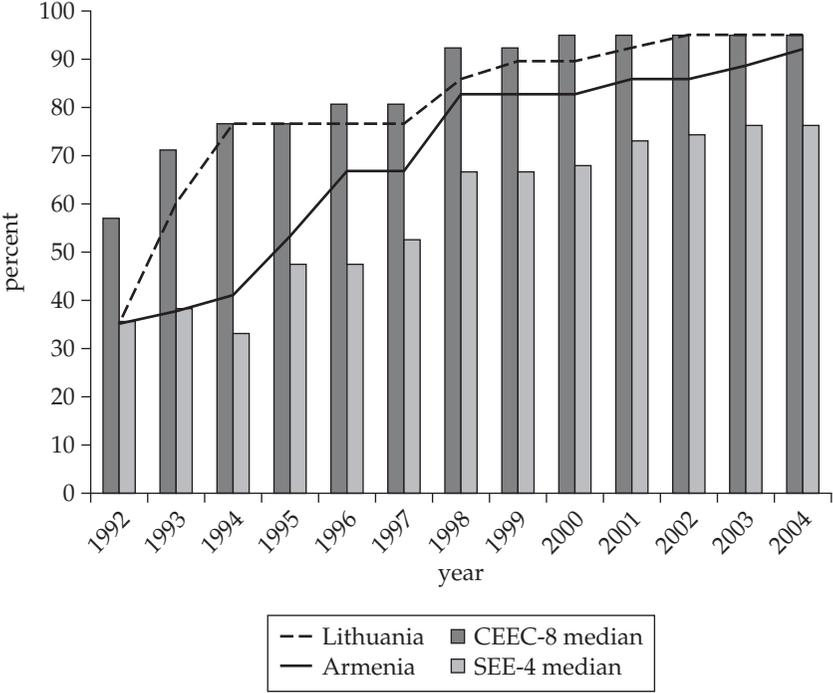
Source: Armenia Social Accounting Matrix (SAM) 2002. See Part 2 of this book.

Note: The above table displays Armenia's production and trade statistics for 2002. The largest single *output* sectors were construction, trade, and processed foods. Other large activities include the public sector, cut gems, transportation services, and electricity output. Food is probably more important to the Armenian economy than it appears in this table. If we combined the three largest food industries (processed foods, dairy, and meats and grains), then consumable food would be the largest single industry in Armenia. The total combined output for these four industries accounts for 25.1 percent of total production. If we reorganize these statistics according to *value added*, a different story emerges. Value added is generally high in the nontradable sectors such as construction, trade, banking, and public services. Food and food products (crops, vegetables, and fruits) are the leading tradable sectors in the economy. Growth in these sectors is more likely to contribute to higher personal income for Armenians in the short term. Other manufacturing sectors such as machinery and gem cutting have

<i>Supply to domestic market</i>		<i>Exports</i>		<i>Import</i>	
<i>US\$</i>	<i>Share in output</i>	<i>US\$</i>	<i>Share in output</i>	<i>US\$</i>	<i>Share in Armington supply</i>
155.2	99.8	0.3	0.2	50.7	24.6
126.9	95.8	5.6	4.2	24.0	15.9
15.8	100.0	0.0	0.0	14.7	48.1
98.1	95.2	5.0	4.8	19.9	16.9
342.1	99.9	0.5	0.1	6.8	2.0
158.9	99.9	0.1	0.1	23.1	12.7
75.7	100.0	—	—	156.7	67.4
27.2	41.3	38.7	58.7	1.1	4.0
379.6	88.1	51.1	11.9	46.7	11.0
77.3	95.6	3.6	4.4	30.0	28.0
23.5	44.7	29.1	55.3	40.2	63.1
44.7	84.4	8.3	15.6	81.8	64.6
11.3	4.2	258.0	95.8	206.4	94.8
65.3	59.4	44.7	40.6	55.3	45.9
33.0	37.2	55.7	62.8	185.7	84.9
56.1	91.8	5.0	8.2	52.1	48.2
152.0	100.0	—	—	0.0	0.0
149.8	91.8	13.4	8.2	5.6	3.6
512.1	98.8	6.2	1.2	2.8	0.5
172.2	66.3	87.7	33.7	24.0	12.2
447.2	100.0	—	—	0.0	0.0
44.9	87.0	6.7	13.0	11.3	20.1
354.8	97.9	7.7	2.1	7.8	2.2
23.1	24.6	70.6	75.4	60.5	72.4
92.6	100.0	—	—	0.0	0.0
897.0	98.7	11.5	1.3	139.3	13.4
690.9	66.7	455.5	43.9	698.3	50.3
254.9	63.2	38.7	9.6	157.8	38.2
512.1	98.8	6.2	1.2	2.8	0.5
1,284.7	87.3	186.1	12.7	109.2	7.8
3,639.6	83.9	698.0	16.1	1,107.4	23.3

the lowest share of value added in production, which implies that these industries comprise mostly intermediate inputs and that the short-term spillover effects from these sectors are insignificant. These sectors have, however, the highest *export potential* and have considerable implications for the medium-term and long-term growth of the Armenian economy. Some industries, such as cellular telecommunications, mining, or utilities, may exhibit a high degree of value added in production, but since those industries are capital-intensive, their contribution to personal income will depend upon who collects the capital rents. For example, a foreign-owned mine may capture significant rents, but most of this income could be forwarded offshore. The table above also displays exports, imports, and total domestic supply for each sector. Import and export volume is dominated by a single sector: uncut and cut gems. This sector alone represents about one-fourth of total trade volume for Armenia. Export potential is highest in the manufacturing sector, as most of the manufacturing subsectors show high export/output shares.

FIGURE 2.1 PROGRESS IN FIRST-GENERATION REFORMS AS REVEALED IN VALUES OF THE EBRD-BASED AGGREGATE INDEX IN 1992–2004 IN SELECTED TRANSITION ECONOMIES



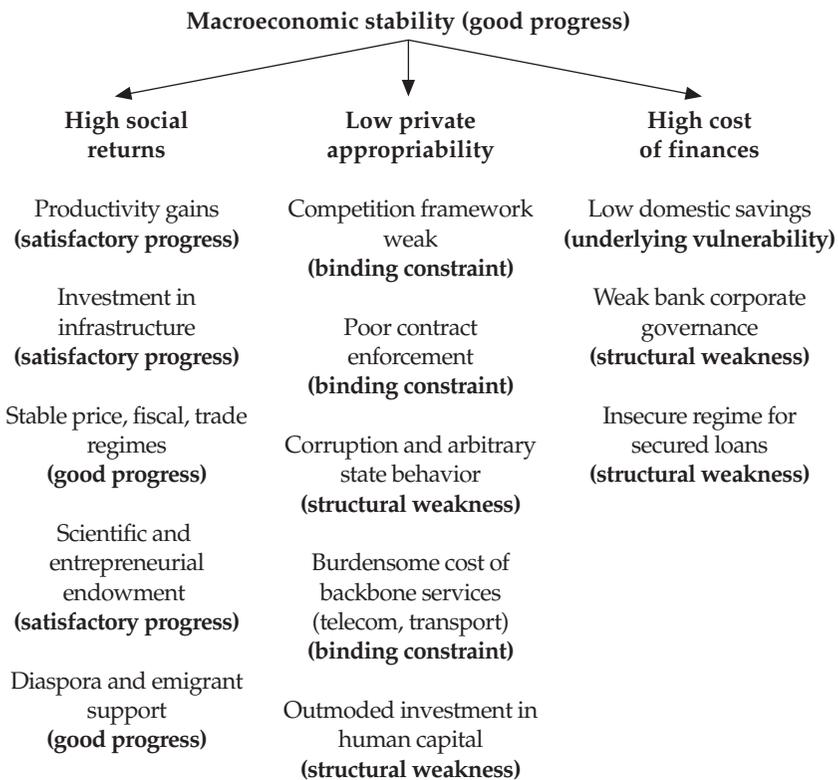
Source: Authors' calculations based on data from EBRD *Annual Transition Reports*.

Note: The aggregate is the average of scores ranging between 1 (no liberalization) and 4.5 (liberalization at the levels of highly developed market economies) for prices, foreign trade and exchange rate regime, and small privatization. It has been normalized with 1=0 and 4.5=100. SEE-4 includes Albania, Bosnia and Herzegovina, Macedonia, and Serbia and Montenegro.

and large enterprises, and the reversion of land to private ownership. The experience of advanced transition countries (CEEC and the Baltics) suggests that the following factors are important for sustained rates of growth: undertaking deep structural and institutional reforms centered on creating contestable and competitive conditions for economic activity, entrenching property rights, facilitating banking and capital markets to provide low-cost intermediation, fostering an environment for innovation and product diversification, and locking in integration with international services and factor markets.

In identifying the constraints to the maintenance of high growth rates, the framework building on the idea of growth diagnostics<sup>3</sup> can be useful. This permits a focus on the **country-specific constraints** to growth as the first step toward identifying a growth strategy for the country. The question to be answered is not so much, “What creates success?” but rather, “What are the constraints to better performance?” The work on growth diagnostics suggests that constraints could be shown as a tree diagram (see Figure 2.2). The driving factors of growth are seen as the private return to accumulation (that portion of the social return which is subject to private appropriability) less the cost of financing accumulation. In Armenia, observation indicates that social

FIGURE 2.2 CHALLENGE OF SUSTAINING AND DIVERSIFYING SOURCES OF GROWTH TOWARD THOSE WITH STRONGER SPILLOVER EFFECTS



Source: World Bank staff.

returns are high, based on the rising productivity of factor use, but private appropriability is compromised by poor property rights protection and enforcement, inflexible labor regimes, and arbitrary customs and tax administration. The cost of finance remains high, partly because of low domestic savings rates but more fundamentally because of barriers to intermediation related to secured transactions and extremely weak corporate governance.

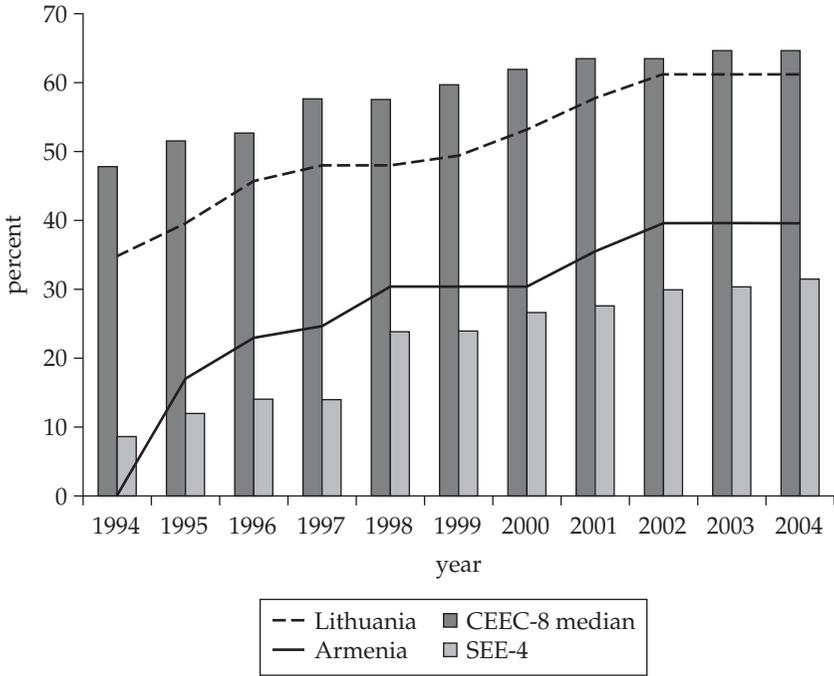
The evidence suggests that the high growth rates of the past decade have resulted from productivity gains in the use of labor, with little additional labor use. Evidence for weaknesses in private appropriability and inadequacies in the competition framework comes from the large degree of informality in the economy (discussed in detail in Chapter 3), the use of informal mechanisms for the protection of property rights, and the perpetuation of monopoly positions in production and distribution. Evidence for the intermediation constraint arises from the internalization of finance through firms and business groups, the high shadow price of capital, and the dependence of investment on external financing.

## EVALUATING THE STATE OF THE BINDING CONSTRAINTS

While progress in first-generation reforms (such as free price formation, the convertibility of domestic currency for current account transactions, liberal trade and investment regimes, and private ownership) can be readily assessed, this is not so with second-generation reforms covering, as a rule, actions, policies, and institutions where progress can be gauged, at times, only indirectly. Moreover, the binding constraints are usually highly intertwined. Progress in one area can be neutralized by the lack of progress in another area. For example, large-scale privatization may be completed, but its benefits may not materialize if privatized companies are subsidized by still state-owned banks (the situation in the Czech Republic in the mid-1990s), or if competition policy is too weak. Excessive minimum capital requirements or instabilities in tax or customs policy or administration may offset the benefits for business formation and growth offered by the simplicity of procedures for business entry.

Figure 2.3 compares structural reform progress in Armenia to three other country groupings. The figure uses a structural reform index (SRI), which was derived from EBRD transition indicators for competition policy, government and enterprise restructuring, large-scale privatization, banking reform and interest rate liberalization, and policy and regulations for security markets and nonbank financial institutions.<sup>4</sup>

FIGURE 2.3 PROGRESS IN STRUCTURAL REFORMS:  
VALUES OF SRI, 1994–2004



Source: Authors' calculations based on data from EBRD *Annual Transition Reports*.

Note: The aggregate is the average of scores ranging between 1 (no liberalization) and 4.5 (liberalization at the levels of highly developed market economies) for government and enterprise restructuring, competition policy, banking reform and interest rate liberalization, security markets and nonbank financial institutions, and large-scale privatization. It has been normalized with 1=0 and 4.5=100. SEE-4 includes Albania, Bosnia and Herzegovina, Macedonia, and Serbia and Montenegro.

The results presented in Figure 2.3 show that moving to the institutional environment of highly developed countries takes time. The median value of an SRI for new EU CEEC-8<sup>5</sup> member states stood in 2004 at 66 percent of the level of mature market economies. While this figure is above the level of institutional maturity achieved by Armenia (40 percent), the CEEC-8 countries have a long way to go to catch up with the highly developed countries.

So does Armenia. The greatest "distance" (Table 2.1) separating it from institutions in Lithuania is in competition policy (at 29 percent of the "normal" desired level) and in security markets and nonbank financial institutions (29 percent). Competition policy and financial

intermediation are key binding constraints. Other institutional areas where the SRI index is below average for second-generation reforms are government and enterprise restructuring (38 percent) and banking reform and interest rate liberalization (38 percent). The most advanced area of structural reforms is large-scale privatization (67 percent).

Another interesting observation that can be derived from data in Figure 2.3 is that Armenia's reforms have moved in leaps that extended over three to four years and that they appear to have slowed in the areas of competition policy, financial sector reforms, and governance over the past three years.

The critical weaknesses in competition deserve particular attention. Although reforms and large investments in infrastructure have generated a strong short-term growth response, the creation of a strong monopoly in the area of communications—a strategic sector—damages competitiveness and future growth. Telecommunications infrastructure in Armenia is currently one of the least developed in the CIS, despite the fact that it was among the earliest of the CIS to privatize. The 15-year monopoly granted to a private investor has led to the extremely high cost and poor quality of telecommunications services. Research shows the large and often economy-wide impact of the cost and diversity of telecommunications services on investment, international integration, and growth.

Competition in the backbone sectors remains restricted. Competition forces tariffs down and boosts the quality of services, thus facilitating progress in all other sectors. It also encourages utilization of a skilled, technically qualified labor force, which has traditionally been a comparative advantage for Armenia. Competition in backbone services has strong spillover effects on household welfare and employment through multiple channels. Competition and transparency in backbone services can also stimulate private investment (both domestic and foreign) and can entail technology transfer and technological capacity building, as well as human resources development. (Box 2.2 discusses gains to be made from the liberalization of the service sectors.)

The quality of service links is critical in the location decisions of multinational corporations and in a country's capacity to attract outsourcing activities. Services linking production operations include procedures for the simplification and harmonization of international trade; the state of infrastructure and its management; and the provision of such backbone services as telecommunications, banking, insurance, transportation, and business services. Together with customs, related border clearance regulatory procedures, technical standards regulations, and port efficiency, service links shape the ease and speed with which goods and services move across national borders and,

TABLE 2.1 PROGRESS WITH SECOND-GENERATION REFORM, 1994–2004

Country	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<b>Large-scale privatization</b>											
Armenia	0	29	57	57	57	57	57	57	67	67	67
Lithuania	57	57	57	57	57	57	57	67	76	76	76
<b>Government and enterprise restructuring</b>											
Armenia	0	29	29	29	29	29	29	29	38	38	38
Lithuania	29	29	57	48	48	48	48	48	57	57	57
<b>Banking reform and interest rate liberalization</b>											
Armenia	0	29	29	38	38	38	38	38	38	38	38
Lithuania	29	57	57	57	57	57	57	57	57	57	57
<b>Security markets and nonbank financial institutions</b>											
Armenia	0	0	0	0	29	29	29	29	29	29	29
Lithuania	29	29	29	38	38	48	57	57	57	57	57
<b>Competition policy</b>											
Armenia	0	0	0	0	0	0	0	29	29	29	29
Lithuania	29	29	29	38	38	38	48	57	57	57	57

Note: The EBRD transition scores ranging between 1 (absence of institutions supporting competitive markets) and 4.5 (presence of institutions at the levels of highly developed market economies) are normalized with 1 = 0 and 4.5 = 100. The difference between 100 and the actual value represents the distance to the level prevailing in highly developed market economies.

Source: EBRD (various years).

**BOX 2.2 GAINS FROM THE LIBERALIZATION OF THE SERVICES SECTORS**

The importance of backbone services such as finance, telecommunications, and transport is threefold. First, these services constitute major inputs into the production of goods and services—including agriculture—and their cost often accounts for a major share of the total cost of production. Considering that services contribute on average around 10–20 percent to the production cost of a product and account for all trading costs (including transport, trade finance, insurance, communications, and distribution services), the savings from liberalization of the services sector can be substantial (Hodge, 2002).

Second, services related to education, training, and health influence the productivity and quality of human capital. Thanks to lower input costs and higher quality inputs, these services help industries and agriculture improve their capacity to compete with imports.

Last but not least, cheap backbone services combined with efficient and unobtrusive customs is necessary for domestic firms to participate in the emerging division of labor based on international outsourcing, just-in-time production, and supply-chain management. The poor quality of backbone services and trade facilitation deters foreign firms from incorporating domestic firms into their supply chains and also acts as a barrier to other types of trade. This so-called supply chain network has been the fastest growing component of world trade over the last two decades, generating employment and assuring access to most dynamic markets.

The liberalization of the services sector and its opening to external competition will improve the quality of these services and reduce their prices. Empirical research suggests that liberalization may generate gains that substantially exceed those that come from merchandise trade liberalization undertaken in isolation. Cross-country growth regressions for ECA economies, juxtaposing EBRD transition indicators and per capita GDP growth, point to a strong, linear, positive relationship between service sector policy reform and per capita GDP growth (World Bank, 2005b). The econometric study of the impact of liberalization in basic telecommunications on sectoral performance in 86 countries has found that complete liberalization has paid off in terms of higher teledensity (8 percent higher than in countries following the route of partial liberalization) and labor productivity. See Fink, Mattoo, and Rathindran (2002).

therefore, are crucial to trade in goods. The weakest link in the “service chain” in a country may tip the balance against including a firm in the global supply chain. As a consequence, improvements in the domestic business climate may limit positive economic effects if they are not accompanied by similar improvements in trade facilitation. In

short, weaknesses in any of these services may lead to the exclusion of a country by firms searching to outsource activities abroad.

Finally, it may be noted that the indicator of progress in structural reforms appears also to provide a good measure of the quality of governance and the incidence of corruption. The value of the correlation coefficient for the values of the SRI for 27 transition economies in Europe and Central Asia and the Corruption Perception Index (CPI) compiled by Transparency International was 73 percent in 2004. The positive correlation is higher for governance indicators (which are an average of political stability, government effectiveness, and regulatory quality)<sup>6</sup> as compiled by the World Bank. For the 1998–2002 averages, its value was 93 percent. In other words, countries with higher values for the structural progress indicator are better governed and are less corrupt.

## SUMMARY

Armenia's strong growth performance is due to the completion of first-generation structural reforms and the persistence of the conditions for macro-stability. In these respects, Armenia's growth performance is much closer to the record of the CEEC-8 countries than to the CIS countries or the Balkan nations. Future opportunities for growth will depend on the pursuit of second-generation reforms: competition policy, banking and capital markets, deeper international integration, and the laying of the base for innovation and knowledge. The chief binding constraints to growth are the weak conditions for fair competition and the shallow nature of financial intermediation. A strong monopoly in telecommunications raises costs, and restrictive air transport policies also handicap the landlocked and blockaded economy; these are policy-induced failures. Such weaknesses prevent the emergence of strong supply chains, to the detriment of future growth.

## NOTES

1. Armenia's external debt management has improved over time. Bilateral debt to Russia has been settled through a number of debt-to-equity swap operations, which improved Armenia's financial position but increased its dependence on Russia through the monopoly gas suppliers Gasprom and Itera.

2. These three policy areas constitute the core of the first-generation reforms. Scores for each area range between 1 for no reforms and 4.5 for reaching the average conditions in highly developed economies. These scores have been normalized for this analysis, with 1 = 0 and 4.5 = 100. The average of these three indicators amounts to the achieved progress in first-generation reforms.

3. Hausman, Rodrik, and Velasco (2004).

4. The average of scores in each of these areas—normalized for a minimum score of 1 = 0 and a maximum score 4.5 = 100—is the indicator of progress in structural reforms. For countries that achieved institutional maturity in terms of establishing institutions supporting competitive markets, the indicator is equal to 100, whereas for those that have not started the process it equals zero.

5. The CEEC-8 are the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovenia, and the Slovak Republic.

6. There are two arguments in favor of focusing solely on these indicators: First, these indicators are critical dimensions of a business climate. Political stability affects investment decisions and, in extreme situations, its absence may disrupt economic activities. The quality of regulation is of little relevance unless supported by the government's capacity to enforce regulations. Second, three other indicators pertinent to such dimensions of governance—the rule of law, the control of corruption, and voice and accountability—are not taken into account because they do not yield extra information. For all transition economies, they are strongly correlated with the selected three indicators, with the values of correlation coefficients equal to or above 0.9. For the explanation and data, see [www.worldbank.org/wbi/governance/gov\\_data.htm](http://www.worldbank.org/wbi/governance/gov_data.htm).

## CHAPTER 3

# The Framework for Competition

Within the Armenian economy, competition is hobbled by weaknesses in the law such as the competition law and the law on contracts. Moreover, the implementation of laws is undermined by the prevalence of informal institutions, such as in corporate governance arrangements, by business regulation and governance rules and practices, such as arbitrary and unpredictable behavior of tax and customs administrations, and by policy-induced high costs, such as telecommunications and transport costs, that fall on the shoulders of all enterprises. The conditions for competition in Armenia diverge from the ideal of a level playing field, particularly in sectors related to trade and distribution, where monopoly profits are being earned and welfare losses are being imposed on the public. This chapter examines the interplay of these factors on the state of competition and the prospects for sustained growth.<sup>1</sup>

### GOVERNANCE THAT HINDERS COMPETITIVENESS

Given the intimate link between the governance standards and the level playing field essential for fair competition, this section provides an analysis based on tools developed by the World Bank to measure the quality of governance (Kaufmann, Kraay, and Mastruzzi 2003). As international experience shows, FDI inflows and competition move up with improvements in the quality of governance. Table 3.1 reports the values of three indicators of governance (political stability, government effectiveness, and regulatory quality).<sup>2</sup> A single aggregate index of governance is a simple average of the values of these three governance indicators. Their values range between -2.5 (the worst case) and +2.5 (the best case).

TABLE 3.1 SELECTED INDICATORS OF THE QUALITY OF GOVERNANCE, 1998–2004

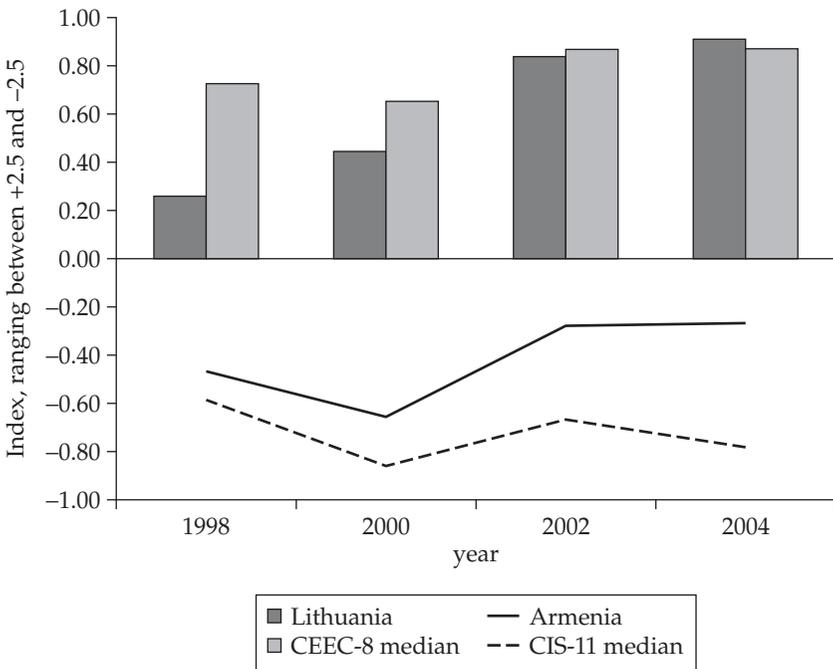
<i>Countries</i>	<i>Political stability</i>				<i>Government effectiveness</i>				<i>Regulatory quality</i>				<i>Aggregate (average)</i>			
	<i>1998</i>	<i>2000</i>	<i>2002</i>	<i>2004</i>	<i>1998</i>	<i>2000</i>	<i>2002</i>	<i>2004</i>	<i>1998</i>	<i>2000</i>	<i>2002</i>	<i>2004</i>	<i>1998</i>	<i>2000</i>	<i>2002</i>	<i>2004</i>
Armenia	−0.5	−0.7	−0.5	−0.5	−0.5	−0.9	−0.4	−0.3	−0.5	−0.4	0.1	0.1	−0.5	−0.7	−0.3	−0.3
Lithuania	0.4	0.4	0.9	0.9	0.2	0.4	0.6	0.7	0.2	0.5	1.0	1.2	0.3	0.4	0.8	0.9
CEEC-8 median	0.9	0.8	1.0	0.9	0.5	0.6	0.7	0.7	0.8	0.6	0.9	1.1	0.7	0.7	0.9	0.9
CIS-11 median	−0.2	−0.5	−0.4	−0.9	−0.7	−0.9	−0.8	−0.8	−0.9	−1.2	−0.8	−0.6	−0.6	−0.9	−0.7	−0.8

Source: Derived from data available at [www.worldbank.org/wbi/governance/gov\\_data.htm](http://www.worldbank.org/wbi/governance/gov_data.htm).

The quality of governance in Armenia has improved significantly since 1998, although the pace slowed down somewhat in 2002–04. The value of the aggregate indicator of governance, after a significant deterioration in 2000 triggered by both political instability and a contraction in the state’s capacity to govern, improved considerably in 2000–02 and registered a less pronounced improvement in 2002–04 (see Figure 3.1). The improvement over 2000–02 coincided with progress made in second-generation reforms as captured in EBRD structural indicators, where the largest push came during this period.

Armenia scores high among transition economies in terms of the overall quality of governance. Only the CEEC-8, new members of the EU, and three other countries in the EU-accession pipeline had, in 2004, higher values in the aggregate quality of governance. Furthermore, Armenia’s lead over other CIS economies increased significantly in 2002–04. While the median value of the aggregate quality of governance in CIS-11 also increased in 2000–02, trends diverged in 2002–04, albeit with Armenia recording a limited improvement (Figure 3.2).

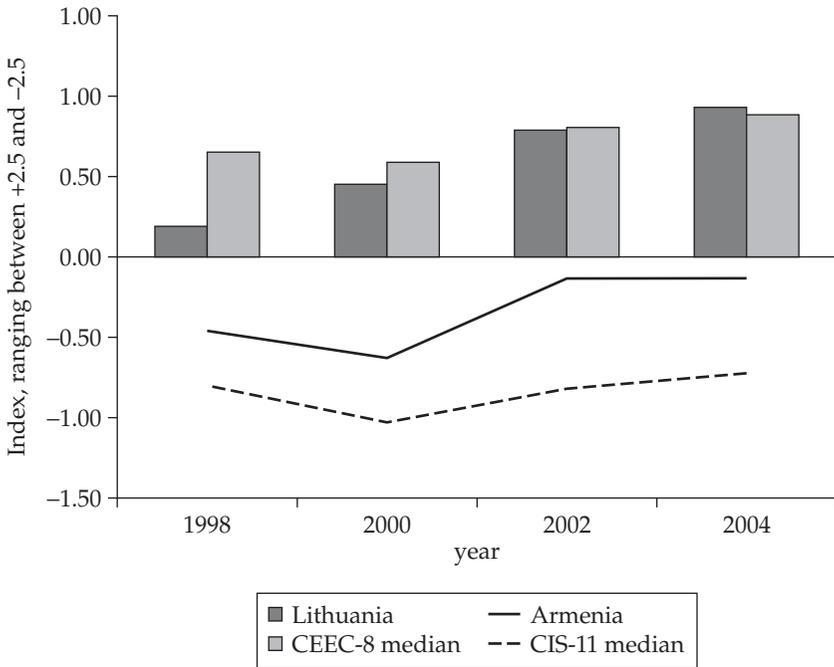
FIGURE 3.1 AGGREGATE QUALITY OF GOVERNANCE, 1998–2004



Source: Derived from data available at [www.worldbank.org/wbi/governance/gov\\_data.htm](http://www.worldbank.org/wbi/governance/gov_data.htm).

Note: CIS-11 countries do not include Armenia.

FIGURE 3.2 THE AVERAGE OF GOVERNMENT EFFECTIVENESS AND REGULATORY QUALITY, 1998–2004



Source: Derived from data available at [www.worldbank.org/wbi/governance/gov\\_data.htm](http://www.worldbank.org/wbi/governance/gov_data.htm).

Note: CIS-11 countries do not include Armenia.

But much remains to be done. Although the quality of governance is higher in Armenia than in other CIS economies, it is significantly lower than in Lithuania or in a “median CEEC-8” economy. It is also significantly lower than in Bulgaria, Romania, and Croatia.

In areas directly relevant to setting the level playing field essential for fair competition (government effectiveness and the quality of regulations), the average of these indicators is higher than the overall quality of governance. The greatest progress Armenia has achieved is in regulatory quality, the only area in which the value of the indicator is in a “positive” domain. However, decent levels in terms of regulatory quality, in the presence of a low capacity of the state to effectively implement policies and regulation, will not lead to significant welfare gains.

Since better governance usually implies a lower level of corruption, the question is whether international investors—surveyed by Transparency International—have noticed the improvement. The point to

TABLE 3.2 VALUES OF CPIs FOR SELECTED COUNTRIES AND GROUPS, 1999–2000 AND 2002–04

<i>Countries</i>	1999	2000	2002	2003	2004	<i>Index,</i>
						<i>2004</i>
						<i>1999=100</i>
Armenia	2.5	2.5	3.0	3.0	3.1	124
Lithuania	3.8	4.1	4.8	4.8	4.6	121
Median CEEC-8	4.4	4.2	4.4	4.4	4.6	105
Median SEE-5	2.5	n.a.	2.5	2.7	2.7	108
Median EU-15	7.7	7.6	7.3	7.7	8.4	109
Armenia in percent of CEEC-8 median	57	60	68	68	67	118

*Source:* Derived from data available at the website of Transparency International: <http://www.transparency.org>.

n.a. Not applicable.

be borne in mind is that the two conditions, although significantly correlated, are different, as governance also embraces the supply of public goods and services and their quality. The values of the CPIs provide information on international investors' judgment of corruption in a country in a comparative context. International investors' perception of the Armenian investment climate has improved substantially since 1998 (Table 3.2).

While progress in reducing opportunities for rent seeking has not been impressive, Armenia has maintained its edge over other CIS economies. However, while the values of the CPI for Armenia in relation to CEEC-8 increased between 1999 and 2002, no perceptible improvement has occurred since then. Since the values of the CPI are low, indicating high levels of graft, the challenge is to introduce measures that will enhance transparency and simplify regulations. Considering fairly low levels of government capacity (as indicated by the value of government effectiveness indicator) in the implementation and enforcement of laws and regulations, simplicity and clarity in the design of regulations is of importance.

### REGULATORY ENVIRONMENT WEAKNESSES THAT IMPEDE COMPETITION

While the Transparency International CPI scores and the World Bank governance indicators capture either the perception of investors of the extent of graft in a country or an overall assessment of a country's

capacity to govern, the World Bank's Doing Business Survey captures tangible "legal" components of the investment climate together with the cost burden and time burden imposed on businesses across 145 countries (Djankov, La Porta, Lopez-de-Silanes, and Shleifer 2000).<sup>3</sup> The survey is a useful diagnostic tool for conducting an initial assessment of the quality of the business environment, identifying most binding constraints, and assessing the overall ease/difficulty of doing business in Armenia in comparison with a selected group of countries (CIS and CEEC-10 economies). Armenia performs strikingly well in many measures of regulation and the business environment, but *nevertheless has a large informal economy*, estimated to be in the range of one-third to nearly one-half of the size of the registered economy (Tunyan 2005).

The next section of this chapter considers why this might be so, and attempts to drill down into the specific factors in the regulatory regime that constitute the binding constraints to fair competition. In particular, attention is paid to the interactions between the various characteristics of the business climate. Thus, for example, strong foreign trade facilitation measures will be of little relevance if the domestic environment discourages the entry of new businesses and encourages the exit of firms either for good or to the informal economy. Similarly, the limited capacity of firms to recover due payments from other firms discourages increased ties and limits the intensity of business activity, with negative consequences for domestic production and exports.

### THE EASE OF DOING BUSINESS IN TRANSITION COUNTRIES

Table 3.3 presents the ranking of CIS and CEEC-10 economies in terms of the formal ease of doing business.<sup>4</sup> Armenia ranks sixth among 20 transition economies. Doing business across all areas is on average easier than in three new EU member states—Hungary, Poland, and Slovenia—and in all other CIS countries as well as Bulgaria and Romania. Only the Baltic states, the Czech Republic, and the Slovak Republic—all of them with strong reform credentials—score higher than Armenia.

Armenia owes its high ranking to the procedural ease in hiring and firing employees, the simplicity and effectiveness of enforcing contracts, and effective procedures for closing a business. Its weakest areas are the registering of property, access to credit, and the large severance payments that must be made when staff is fired.<sup>5</sup> Overall, however, even in the most streamlined and reformed areas, the level is well below the best practice in transition economies. The gap is particularly large for labor market flexibility and registering property for Armenia.

TABLE 3.3 RELATIVE EASE OF DOING BUSINESS IN CIS AND CEEC-10 ECONOMIES, 2005

<i>Country</i>	<i>Starting business</i>	<i>Flexibility of employment</i>	<i>Registering property</i>	<i>Enforcing contracts</i>	<i>Closing business</i>	<i>Protecting investors</i>	<i>Getting credit</i>	<i>Ease of doing business</i>
Armenia	47	<b>64</b>	38	<b>65</b>	<b>68</b>	50	37	53
Azerbaijan	44	33	29	56	43	33	24	38
Belarus	18	50	48	54	44	17	44	39
Bulgaria	35	46	19	48	41	33	69	42
Czech Republic	33	56	28	72	18	100	89	57
Estonia	40	37	40	83	45	67	63	53
Georgia	39	51	18	54	53	83	56	50
Hungary	34	38	27	76	36	83	40	48
Kazakhstan	41	69	18	60	24	83	23	45
Kyrgyz Republic	70	54	22	28	53	50	31	44
Latvia	48	30	15	77	100	83	70	61
Lithuania	58	37	74	86	68	100	40	66
Moldova	33	50	26	51	41	50	36	41
Poland	32	49	19	51	60	67	57	48
Romania	79	17	17	51	27	33	53	39
Russian Federation	43	69	21	62	77	50	13	48
Slovak Republic	39	100	27	49	31	100	54	57
Slovenia	28	28	20	45	27	67	48	38
Ukraine	27	17	14	65	32	50	28	33
Uzbekistan	33	39	10	45	47	67	39	40
Worldwide	52	0	10	77	58	86	54	48

Source: Authors' calculations based on data in World Bank Doing Business database.

### **“REVEALED” EASE OF DOING BUSINESS**

The Doing Business Survey indicators measure the extent to which a country deviates from the best practice on each indicator within each area; they do not provide information on the comparative restrictiveness of indicators within a country. An examination of the size of the informal economy throws light on such restrictiveness. Three causes of informality are important: the chances of getting credit, the fear of predatory administration, and a lack of trust in the state capacity to enforce contracts. While the survey captures both getting credit and contract enforcement, it does not capture informal administrative interventions. Furthermore, the overall ranking procedure assigns the same weight to all areas of doing business. This book takes the average of the performance in terms of the informal economy and the ease of doing business as an indicator of the quality of the business environment. This indicator is referred to as the “revealed” ease of doing business.

The large size of the informal sector, as is the case in Armenia, suggests that the hassle cost of doing business is higher than its high score would indicate. This observation applies also to other transition countries, as the value of a correlation coefficient between the values of the overall ease of doing business indicators and the respective size of the informal economy, though negative, is very low at 38 percent. This runs counter to the expectation that in countries with higher values of the aggregate “ease of doing business” indicator, the informal economy should be smaller. In other words, the ranking in terms of formal overall ease of doing business diverges rather significantly from the ranking based on the size of the informal sphere. Furthermore, while the ranking in terms of the size of the informal sector in transition countries is highly correlated with the incidence of corruption as measured by Transparency International’s CPI (correlation coefficient of 79 percent), the ranking in terms of formal ease of doing business is not so correlated; the value of the correlation coefficient is only plus 33 percent.

None of the above comes as surprise. The ease of doing business indicators for CIS and CEEC countries cannot capture all of the factors determining the quality of the business environment. First, they have not been designed to do so, as they do not capture all variables relevant to the cost of doing business. For example, they do not take into account the fact that predatory tax administration operating according to ad hoc rules may dramatically increase the hassle cost of doing business, discouraging start-ups and encouraging exit from business activity. Second, the procedure used here to rank transition economies gives equal weights to all variables describing the formal regime of doing business. Countries with best practices on most counts may

rank relatively high in rankings despite weaknesses on other counts. For example, a small number of procedures, speed, and low administrative fees to start a business would matter little in the presence of a huge minimum capital requirement.

Since the size of the informal sector, which for transition economies happens to go in hand with the increase in the incidence of corruption, appears to be negatively linked to the friendliness of a business environment, a comprehensive assessment of the quality of the business climate should take into account both the formal ease of doing business and the size of the informal sector. One way of doing this is simply to normalize the size of the informal sector in terms of its lowest level among transition economies (that is, the Slovak Republic with 18.9 percent, would be 100) and incorporate it into the final measure referred to as “revealed” overall ease of doing business.<sup>6</sup> Table 3.4 presents the ranking in terms of revealed ease of doing business.

The “fall” in Armenia’s position, as well as in the position of other CIS economies, is a reminder that not only do other factors (not covered in the Doing Business Survey) determine the quality of the business environment but also that, within various areas, binding constraints exist that neutralize the positive impact of other changes. The ranking approximates well the progress achieved by the countries in building an institutional environment to support private business activity. It illustrates that in Armenia (as in Georgia and Russia), an apparently friendly regime is not sufficient to curb informality, an outcome that is detrimental to economic growth and productivity. The factors that countervail the strengths of the regime are discussed next.

### **WEAKNESSES AND STRENGTHS OF FORMAL REGULATORY REGIME**

The formal regulatory burden of conducting business in Armenia is relatively low, especially when benchmarked against the CIS and CEEC-8 economies. Table 3.5 presents values of respective indicators for Armenia, the CIS economies, Russia, the CEEC-8, and New Zealand. It also provides information on the best practice across the globe for each indicator. Indicators describe formal arrangements in terms of time and complexity in the following seven areas: starting a business, hiring and firing workers, registering property, enforcing contracts, closing a business, protecting investors, and getting credit. Armenia outperforms Russia in all indicators except the following: it is more difficult to hire in Armenia, it costs more to enforce a contract, and creditors recover less in terms of the value of a loan. Armenia represents the best practice in the CEEC and CIS in two indicators: the

TABLE 3.4 THE SIZE OF THE INFORMAL ECONOMY AND THE “REVEALED” EASE OF DOING BUSINESS

	<i>Informal economy, percent of 2003 GNI</i>	<i>“Revealed” ease of doing business indicator</i>	<i>Previous ranking</i>	<i>Difference between current and previous</i>	<i>Memorandum: CPI, 2000–04</i>
Armenia	46.3	46.8	6	5	3.0
Azerbaijan	60.1	34.5	18	2	1.9
Belarus	48.1	39.2	17	1	4.1
Bulgaria	36.9	46.4	13	–1	4.0
Czech Republic	19.1	77.8	4	–2	3.9
Estonia	n/a	74.0	5	–2	5.7
Georgia	67.3	39.3	7	10	2.1
Hungary	25.1	61.5	10	–5	4.9
Kazakhstan	43.2	44.6	11	3	2.3
Kyrgyz Republic	39.8	45.8	12	1	2.2
Latvia	39.9	53.9	2	5	3.8
Lithuania	30.3	64.2	1	3	4.7
Moldova	45.1	41.4	14	2	2.3
Poland	27.6	58.2	8	–2	3.8
Romania	34.4	47.2	16	–6	2.7
Russian Federation	46.1	44.4	9	6	2.7
Slovak Republic	18.9	78.5	3	–2	3.8
Slovenia	27.1	53.7	19	–11	6.0
Ukraine	52.2	34.6	20	–1	2.3
Uzbekistan	34.1	47.7	15	–6	2.5

*Source:* Authors’ calculations based on data in World Bank’s Doing Business database and data from Web site of Transparency International.

*Note:* CPI is the average for 2000–04. It assumes values between 1 (maximum incidence of corruption) and 10 (minimum).

difficulty of firing index and the cost of closing a business (Table 3.5). However, neither indicator is necessarily an indication of the superior quality of the formal arrangements in the corresponding areas of hiring and firing workers and closing a business.

Since the worst indicator *does the most* to discourage business activity and thus contributes to the higher size of the informal sector under most circumstances, the following question is pertinent to an overall assessment of the regulatory and policy hassle felt by businesses: which aspects of Armenia’s regulatory environment are the most burdensome for private firms? While in each area Armenia’s overall

score is high compared to its peers in the CIS and CEEC-8 countries, within some areas indicators point to weaknesses. These areas are labor markets (firing and hiring), getting credit, and contract enforcement. Contract enforcement takes more money than in CIS and CEEC-8 countries (18 percent of the debt as compared with 14 percent), but other indicators favor Armenia.

Despite its importance as a dimension of labor markets, Armenia's business environment has significant weaknesses even when benchmarked only against other CIS countries. The high value of the "difficulty of hiring" index combined with an obligation to pay the wages of a fired worker over a period of 30 weeks reduces the flexibility of Armenia's labor market significantly. More favorable values for the remaining two indicators do little to lessen the constraints on businesses in hiring when the demand for their product goes up and in firing when conditions deteriorate.

Considering that research shows the crucial importance of labor market flexibility for both reducing unemployment and boosting investment, Armenia's poor performance in this area is a serious shortcoming. While the relationship between low unemployment rates and high flexibility is empirically firmly established, the impact of labor market flexibility on FDI appears to be significant as well. A recent study (Javorcik and Spatareanu 2004b) using the labor market indicators from the Doing Business database for 2002 shows that, all else being equal, flexibility in labor markets has a significant impact on FDI flows. For example, if the flexibility of the host country's labor market increases from the level of the Slovak Republic (inflexible prior to reforms in 2003) to the level of Hungary (flexible), the volume of investment goes up by between 14 and 18 percent. Moreover, FDI in the services sectors appears to be more sensitive to labor regulations than investments in manufacturing.

Armenia also scores relatively low in terms of protection of investors, with the disclosure index of 3 putting it on a par with Russia. The absence of regulations compelling disclosure has several negative consequences: investments are lower as potential investors fear expropriation, the stock market is undercapitalized, economic growth is lower than under full disclosure, and returns from investment are lower. (World Bank 2005a, pp. 56–57).

But more powerful financial constraints to doing business relate to other legal underpinnings of financial markets in Armenia. Although the cost of creating collateral is very low by both regional and international standards, and the legal rights index is within a median range, there are countervailing deficiencies. The lack of market information on the quality of borrowers, combined with the absence of a

TABLE 3.5 DOING BUSINESS IN ARMENIA AND SELECTED COMPARATORS IN 2004

<i>Area</i>	<i>Indicator</i>	<i>Armenia</i>	<i>CIS median</i>	<i>Russia</i>	<i>CEEC-8 median</i>	<i>Best practice in CEEC and CIS</i>	<i>New Zealand</i>	<i>Best practice</i>
<b>Starting a business</b>	Number of procedures	10	10	9	9	5	2	2
	Time (days)	25	32	36	46	18	12	2
	Cost (% of income per capita)	7.0	14.2	6.7	12.0	3.7	0.2	0.0
	Minimum capital (% of income per capita)	4.5	23.3	5.6	47.9	0.0	0.0	0.0
<b>Hiring and firing workers</b>	Difficulty of hiring index (0–100)	33	33	0	33	0	11	0
	Rigidity of hours index (0–100)	40	60	60	60	20	0	0
	Difficulty of firing index (0–100)	10	60	20	60	10	10	0
	Rigidity of employment index (0–100)	28	44	27	44	10	7	0
	Firing costs: severance payments in weeks of wages) <sup>a</sup>	30	21	17	21	17	0	0
<b>Registering property</b>	Number of procedures	4	7	5	5	3	2	1
	Time (days)	18	71	354	72	3	2	1
	Cost (% of property value)	0.9	2.2	9.5	2.1	0.5	0.2	0.0
<b>Enforcing contracts</b>	Number of procedures	24	29	29	24	17	19	11
	Time (days)	195	324	395	333	150	50	27
	Cost (% of debt)	17.8	18.0	9.5	10.8	8.1	4.8	4.2

TABLE 3.5 (CONTINUED)

<i>Area</i>	<i>Indicator</i>	<i>Armenia</i>	<i>CIS median</i>	<i>Russia</i>	<i>CEEC-8 median</i>	<i>Best practice in CEEC and CIS</i>	<i>New Zealand</i>	<i>Best practice</i>
<b>Closing a business</b>	Time of insolvency (years)	1.9	3.8	1.5	2.5	1.1	2.0	0.41
	Cost (% of estate)	4.0	7.4	4.0	18	4.0	4.0	1.0
	Recovery rate (cents on the US\$)	39.6	5.3	48.4	39.8	85.0	71.4	92.0
<b>Protecting investors</b>	Investors disclosure index (0–7)	3	3	3	5	6	5	7
<b>Getting credit</b>	Cost to create collateral (% income per capita)	0.9	3.6	11.6	3.7	0.6	0.0	0.0
	Legal rights index 0–10	4	5.0	3	6	9	9	10
	Credit information index (0–6)	..	0.0	0	4	5	5	6
	Public registry coverage (per 1,000 adults)	..	0.0	0	6	44	0	637
	Private bureau coverage (per 1,000 adults)	0	0.0	0	17	380	978	1,000

Source: Data from World Bank (2005a).

a. As noted, this cost will be greatly eased once the new labor code is put into effect.

.. Negligible.

secured transactions framework, is a binding constraint on lending in Armenia. Movable property cannot be used effectively as collateral to secure loans, as repossession is time-consuming and costly. Neither can collateral-based lending function effectively in the absence of an effective framework for creating and enforcing claims. Banks price in the corresponding (large) risk into the lending spread.

Armenia's disadvantage is lower in registering property: the number of procedures is only slightly higher (4 versus 3) but it takes significantly more time to complete the process (18 days versus 3 days). The same applies to closing a business. The time of insolvency is longer (1.9 years versus 1.2 years), although it is lower than in New Zealand (2 years), with the "best international practice" at 0.41 years. The recovery rate (that is, the percent of what creditors collect on their debt) of 39.6 cents on the U.S. dollar is below Lithuania's level, but similar to the CEEC-8 median of 39.8 cents. An indicator in starting a business area that is lagging behind comparator values is the cost of starting business, which is higher than in Lithuania but lower than the median value for the CEEC-8.

Although Armenia appears to be a top performer among CIS countries, it still has to neutralize the negative effects of being land-locked, as well as its remoteness to the centers of gravity of global markets. The frame of reference for Armenia's regulatory reforms should be at least the best practice in the CIS/CEEC-10 region, if not best international practice. Compared to either reference point, the differences are huge, even though Armenia fares quite well overall compared to other former centrally planned economies.

## **THE LINK BETWEEN THE FORMAL EASE OF DOING BUSINESS AND THE LARGE INFORMAL ECONOMY**

Surveys covering various areas of the business environment record a general dissatisfaction of businesses with the quality of regulations, administrative requirements, and bureaucratic behavior of state agencies, despite some improvements since 2002. The reasons for this assessment are manifold.

The first barrier to conducting business arises from the difficulties encountered in interaction with tax administration, compounded by unstable and frequently changed rules and tax rates. This is perceived as a bigger problem than corruption by both local- and foreign-owned firms, and for the former it continues to be regarded as a significant barrier.<sup>7</sup> Administrative Regulatory Cost Surveys (RCSs), which have been conducted annually in Armenia by the Foreign Investment Advisory Service (FIAS) since 2000, persistently identify tax administration as the

biggest obstacle. For example, in both 2003 and 2004 more than 80 percent of respondents identified tax administration as the largest obstacle. This view appears to be shared by foreign-owned firms to the tune of 90 percent of all respondents (FIAS 2003). Furthermore, foreign-owned businesses complained that the tax burden in 2003 increased considerably compared with 1999. Uncertainty associated with frequent changes in policy was flagged by around three-fourths of RCS respondents.

The second barrier relates to the cost that businesses must incur in order to meet the requirements of the country's administrative regulations. According to the RCS, the costs remain huge and there has been no major improvement over the past several years. The costs are not related to formal and informal payments but above all to the burden in terms of time and resources that firms need to allocate to assure regulatory compliance.

A corrupt bureaucracy applies regulations arbitrarily. The high level of corruption results in firms' directing activity underground in order to reduce their vulnerability to extortion by government officials. Changes in legislation are only rarely announced or publicly disclosed before implementation. Bureaucratic procedures can be burdensome and time-consuming when an investor negotiates a contract with the foreign government, as the contract may require the approval of several ministries. Widespread corruption continues to affect business and most often takes the form of bribery.

According to a business climate survey carried out by the World Bank in 2004, 84 percent of companies surveyed were dissatisfied with legislative and administrative regulations in the country (World Bank 2005a). Armenia's business legislation in general is good, but implementation of the laws has been poor, which has hampered business operations. The prevailing negative sentiment had worsened compared with previous years: the indicator stood at 63 percent in 2003 and 50 percent in 2002. The unequal treatment of companies by the authorities and unfair competition were the most widely cited impediments to doing business.

The third barrier is the practice by customs of extracting "irregular" payments from businesses, a complaint that is corroborated by nontransparent procedures. Customs clearance procedures are applied with equal zeal not only to imports but also to exports, which further corroborates the opinions about customs erecting a nontariff trade barrier; generally, in other countries, customs efforts are largely directed only at imports. The time needed to complete customs clearance and the amount of effort undertaken by firms to deal with customs are shocking, especially for exports. Furthermore, the most obvious benefits of the computerization of customs services (that is, reducing the release time of consignments and slashing the documentation or

bureaucratic burden placed on a trader or a customs broker) have so far failed to materialize. Neither traders nor customs brokers have access to the system. The old practice of bureaucratic delays fueling corruption, combined with a lack of capacity in customs administration, continues.

Although Armenia is no exception to the generally poor record in most transition countries in establishing the rule of law and strengthening the courts, the situation has improved on several important counts.<sup>8</sup> For example, Armenia has made gains in judicial reforms. Armenia is “the only country where significantly more respondents viewed the courts as fair in 2002 than in 1999” (Anderson, Bernstein, and Gray 2005). However, considering that in 2000 only 2 percent of firms surveyed viewed judges as honest (CES 2000), the improvement should be measured from the low starting point. Fairness, however, is only one dimension of efficiently functioning courts.

Other important dimensions from the point of view of conducting business include the perception of the honesty or dishonesty of judges, the capacity to implement enacted commercial laws, and the ability to adjudicate disputes in an efficient and timely manner. It appears that firms regard Armenia’s courts as relatively honest. In response to a question about the frequency of unofficial payments when dealing with the courts, firms surveyed under BEEPS identified the courts as not extracting bribes on a significant scale. The percent of firms negatively assessing courts in this dimension was among the lowest in the region—on a par with Slovenia, Estonia, and Lithuania. Moreover, Armenia, together with Lithuania, recorded the greatest improvement among 26 transition economies between 1999 and 2002. Although most respondents perceive courts in transition countries as neither honest nor fair, the percent of those that do not share this view is comparatively high at 30 percent, putting Armenia in the same group as Croatia and Latvia.

Armenia, like most other transition economies, has experienced a growing gap between the enacted legislation setting the grounds for the market economy and the capacity of the courts to implement new commercial laws. This gap between the extent of commercial legislation existing in 1999 (“legal extensiveness”) and the degree to which it was being implemented at that time (“legal effectiveness”) was particularly high for Armenia—well above the level in other transition countries (EBRD 1999). Although this “implementation gap” persisted in 2002, it has fallen sharply to levels similar to that in the Czech Republic.

The ability of courts to adjudicate disputes in an efficient and timely manner reduces uncertainty in actual or potential business deals. Armenia, together with Hungary, the former Yugoslav Republic

of Macedonia, Latvia, Lithuania, and the Czech Republic, showed the largest improvement in the perceived speediness of courts between 1999 and 2002. While in 1999 only 10 percent of firms viewed courts as rapid in Armenia, this proportion rose in 2002 to 25 percent of respondents—the level comparable to Hungary. This proportion should rise further once the case management and court administration systems currently developed are put in place.

To summarize, the reasons for the large size of the informal sector in Armenia include the high regulatory compliance costs due to official and unofficial payments, instabilities in state policies affecting the business sector, and predatory tax and customs administrations, rather than weaknesses in the judicial system. While efforts designed to reform the judiciary should continue, improving tax and customs administrations together with injecting stability into business regulations and policies stand out as major “other” ingredients accounting for the gap between the formal and revealed ease of doing business in Armenia.

#### **LAW AND INSTITUTIONS: FORMAL AND INFORMAL**

The state is not able to protect high levels of competition in domestic markets. Laws and institutions underpinning antitrust policies in Armenia provide a good illustration of the welfare and growth implications of the gap between the quality of regulations and their often opaque enforcement. Competition law is a recent innovation in Armenia. The law establishing the Commission for the Protection of Economic Competition (CPEC) was passed in 2000 and the CPEC itself began prosecuting cases in 2001. An analysis of the key aspects of the law shows the following:

- The law prohibits collusion among enterprises but fails to distinguish between vertical and horizontal collusion. Generally, economists view horizontal collusion as being potentially much more damaging to consumers. Vertical agreements can also present problems, but the circumstances under which this occurs need investigation and analysis, case-by-case, within clear guidelines requiring the assessment of economic benefits and costs. Potential problems could arise in Armenia because the technical capacity for this analysis with the CPEC is limited.
- Article 4 of the law prohibits anticompetitive practices between loosely connected groups, although the criteria for determining such behavior are loosely set out and would require intensive investigation and several different levels of complexity.

- Article 6 of the law indicates that a firm may be considered having a dominant position in the market if it is not exposed to substantial competition, or if it commands a market share of more than one-third of total sales. Depending on the definition of markets, and the degree of concentration in the market under consideration, this threshold could be too low. Generally, public policy should be concerned with “conduct” and “performance” rather than with market structure as such.
- The law forbids the abuse of dominant market power. In Armenia, the CPEC keeps a list of firms with such power and supposedly tracks them to ensure that their behavior does not involve abuse. Most of the cases brought by the CPEC have involved firms that are in this list. Cases have been prosecuted under Article 7 of the law, which applies to the abuse of dominant market position. FIAS has criticized this approach on the grounds that the CPEC appears to have an attitude that any firm on the list is automatically suspect, which essentially means any large company. Once a firm is on the list of dominant firms, scrutiny intensifies and transactions costs for the firm rise sharply.
- The CPEC has brought a number of cases of “unjustified pricing” based on a methodology involving comparisons between the selling prices of the company and general price indices. This makes little analytical sense, in that there is no analysis of entry barriers or sunk costs or allowance for shifts in relative prices. Moreover, such a methodology implicitly assumes that profits or rates of return on investments should not differ between products, companies, and sectors, regardless of differences in risk.
- Article 8 of the law defines market concentration and control through mergers and acquisitions and revolves around a market share of 35 percent or more. Combined with Article 10 of the law, which prohibits concentration unless it fosters competition, Article 8 is used to justify action against such companies.
- Article 9 requires that firms with substantial market power must be registered as being dominant.

Consideration should be given by the government to bringing the competition law into line with the EU or U.S. model so that regulators and courts are better able to use well-established methodologies and precedents. Allowing private enforcement of the law can also contribute to efficiency.

Implementation of the competition law presents a number of problems. The weak institutional framework that exists in Armenia appears to result in some cases not being prosecuted, especially in the areas

outlined in later sections of this chapter, whereas there may excessive targeting of other firms. As in many other areas of competition in Armenia, the law itself is not the primary problem. The existing legislation, while inadequate in some areas, could be used to prosecute anticompetitive behavior. Rather, the problems lie in the application of the law, the protection that some groups appear to have, and the generally weak private sector business environment that limits opportunities for new entrants. These issues are explored at greater length below.

Arm's length contracting is a requirement of a well-functioning economic system. In Armenia, the law governing commercial transactions is inadequate, with the result that contracts tend to be informal and take place between people who know each other well. The effect is a barrier to entry and increased incentives for informal behavior, which is widely observed in Armenia. Problems with the law include the following:

- Decisions on issues related to commercial transactions are based on an agglomeration of civil code laws, making the applicability of contract provisions uncertain.
- Contractual agreements are based on "unless otherwise governed by law" provisions rather than on "unless otherwise stated in the contract" provisions. Since many commercial transactions are subject to a wide range of laws rather than a more unified commercial code, this provision requires a full knowledge of all the laws and implementing regulations that may apply to an agreement, which compounds the problem of the unavailability of translations.
- Not only does precedent not play a role in court decisions, but there is no record of cases being kept, although this is partly being addressed by a World Bank legal reform project.
- In addition to the uncertainty arising from the commercial code, judges are widely viewed as less than competent or honest. As a result, businesses have little recourse if they are the victims of anticompetitive behavior.

Laws, regulations, and formal institutions in corporate governance are particularly weak in Armenia. The EBRD ratings on corporate governance and enterprise restructuring place Armenia at the same level as Russia, but behind the Baltics and the Balkans. On several basic issues related to transparency, notably public access to the company registry and lists of founders and shareholders, Armenia is among the weakest of the CIS countries. The quality of corporate financial reporting also remains weak.

Moreover, while the securities law has some weaknesses, the greatest corporate governance deficiencies are found in the company law and other basic legislation affecting the corporate sector. The extent of such weaknesses also places an undue burden on government regulators. In the area of financial regulation, for example, the central bank is obliged to provide for extensive guidelines and proposed legislation to make up for the shortfalls. Company legislation permits state-owned enterprises to get away with weak corporate structures, as seen, for example, in railways.

Such limitations in the law and institutions for corporate governance have serious implications for fair competition. Particularly in emerging markets, corporate governance has become recognized as an important part of the business climate. In virtually all of the CIS countries, weak corporate governance reinforces the dominance of a limited number of businessmen. At the same time, weak corporate governance undermines investor confidence in the capital markets, which as a result fail to provide adequate financing for capital-worthy projects and new enterprises. In the CIS countries, stock markets are littered with publicly traded companies that are little traded.

Informal institutions and practices play an important role in determining the fairness of the framework for competition. Many private sector participants in Armenia frequently make facilitation payments to ensure that dealings with the public sector proceed without undue delay. Unlike other countries, the system has so far not degenerated into massive corruption, although undoubtedly there is corruption that extends to the highest levels. Rather, it has evolved into one in which interlocking obligations arising from favors and interventions govern much of the interaction in the business community as well as between businesses and the legal system. A person who acts to intercede on behalf of another becomes a *roof*, and the benefactor incurs an obligation to return the favor in one form or another at some point in the future. In Armenia, there appear to be few rules which cannot be modified or adjusted through the intervention of a roof even within the judicial system. In sectors where a powerful roof exists, the incumbents appear to have the power to make life extremely difficult for new entrants.

Foreign investors often do not have a network that would provide them with a roof and so frequently are more likely to have difficulty navigating their way through the various bureaucracies and the judiciary, as noted in all the surveys on foreign investment in Armenia. In addition, companies that are only exporters claim that they are singled out for unfavorable treatment, especially with respect to VAT refunds.

The roof phenomenon can act as a substantial barrier to entry in the economy for both foreign investors and new local businesses that attempt to compete with well-established companies and individuals. Although there have been improvements recently, subtle methods are used to impose severe operating constraints on new competition, ranging from problems in clearing goods through customs to inspections of various types by government officials.

### **LARGE WELFARE LOSSES FROM WEAK COMPETITION IN PETROLEUM DISTRIBUTION**

As the economic effects of deficiencies in the competition framework for the utility (telecommunications) and transport (civil aviation) industries are discussed in subsequent parts of this book, this section considers the welfare losses imposed by lack of competition in the distribution of petroleum products. Having no oil or natural gas resources, Armenia is totally dependent upon imports of fuel products, which constitute about 20 percent of total imports. This import group includes two major components in terms of volume: petroleum products (including gasoline and diesel) and natural gas imports.

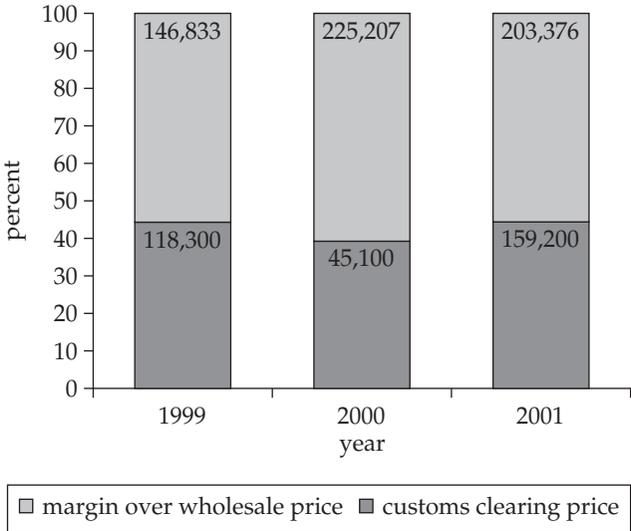
Statistics on petroleum product imports appear to have been underreported. In spite of very rapid growth, gasoline and diesel imports into Armenia show that in 2000 there was a sharp drop in the import volumes and only very modest growth afterwards. This occurred in spite of a very sharp increase in automobile imports, which rough statistics indicate exceeded 14,000 vehicles per year, compared with 1,200 per year in 1999. Although oil prices rose in 2000, and demand may have been depressed by the fuel efficiency of recently imported automobiles and the conversion of some motor vehicles from gasoline to natural gas, it does not seem likely that in the face of such rapid growth fuel consumption could go down. The most likely explanation for the flat fuel imports is that there is smuggling of petroleum.

The structure of market concentration underwent changes in the 1999–2000 period. In 1999 there was only one gasoline importer in Armenia, so that market power was located inside the borders of the country. In 2000 and 2001 the number of importers into the country increased; therefore, looking only at the number of operators within Armenia, the market could not be defined as uncompetitive. However, an analysis of the import chain reveals that there is only one supplier that provides the bulk (88 percent) of imported gasoline to importers. While the concentration of direct importers has declined, the virtually single sourcing of supply for gasoline importers means that the supply

chain remains highly concentrated. Even though it has been reported that one more company started to supply importers with gasoline in 2002, the share of the incumbent supplier firm remained dominant. It constituted about 70 percent of the total supply to importers.

What is more interesting is that, even though the large number of retail companies operating in Armenia ensures retail competition, the retail mark-up price was substantially higher than the imported (wholesale) price (which we took to be the customs clearing price). The gross profit mark-up, most of which probably occurred at the wholesale level, constituted more than half of the retail price in 2001 (Figure 3.3). Since competition at the retail level is strong, it is unlikely that excess profits are being earned by retailers—most of the profits probably accrue to the wholesalers. These calculations (see Box 3.1) indicate that there appear to be large welfare losses arising from the concentration of the petroleum market that could amount to the equivalent of over 1 percent of GDP. This loss figure could be even higher if we consider that there is a further profit margin earned by the single-source monopoly supplier of imports. This is not included in the calculations of the deadweight loss, which can occur as a result of the monopoly power of the one supplier of importers. This loss figure could also be higher if we also consider that the same situation dominates in similar markets (such as the diesel market).

FIGURE 3.3 GASOLINE PRICE STRUCTURE FOR THE PERIOD 1999–2001 (DRAMS PER TON)



Source: NSS.

### BOX 3.1 THE PETROLEUM DISTRIBUTION MARKET

To stress the negative impact of noncompetitive behavior in the gasoline market we made a simple calculation of welfare losses (Table 1). (For the explanation of the terms used in the analysis below one is referred to Tirole 1988). We assumed a linear market-specific demand curve and estimated its slope and intercept considering price-increase v.s. demand-decrease scenarios during 1999–2000 (such a decrease in demand is mainly explained by price increase in international oil prices in contrast to the observed non-price impact (such as increased imports of cars after 2000) on demand during later years).

WELFARE CALCULATIONS IN THE PETROLEUM MARKET

	1999	2000	2001
Retail Price (drams per ton)	265,000	370,000	362,500
Customs Clearing Price (drams/ton)	118,300	145,100	159,200
Quantities Consumed (tons)	258,100	181,400	187,500
Total Profit (drams, billion)	37,9	40,8	38,1
Estimated Slope of the Demand Curve	-1.4	-1.4	-1.4
Estimated Intercept of the Demand Curve	626,000	626,000	626,000
Quantities under Customs Clearing Price (tons)	363,000	343,800	333,700
Deadweight Loss (drams, billion)	7,7	18,2	14,8
Deadweight Loss (US\$, million)	14,5	33,3	26,1
GDP (in US\$, million)	1,845	1,911	2,118
Deadweight Loss as a percentage of GDP	0.8	1.8	1.3

It turns out that welfare loss, as a result of non-competitive behavior in the gasoline market alone, was averaged on 1.3% of GDP. This loss figure can be even higher if we consider that there is a double marginalization (we have not include in the calculations the deadweight loss, which can occur as a result of monopoly power of one supplier of importers) and that the same situation dominates in many other similar markets (such as in diesel market).

Moreover, the fact that the concentrated rather high gasoline market profits (about 3.7% of GDP) have not contributed to reducing unequal distribution of income in the country accentuates the importance of liberalizing the petroleum oils market.

Source: NSS and authors' calculations.

## ECONOMIC IMPLICATIONS AND POLICY CONCLUSIONS

Lack of competition can be detrimental to efficiency over the long run. In addition, the apparent concentration of wealth among incumbents could reduce political support for reform and limit the benefits of rapid growth. There is ample evidence of poverty in Armenia, even in Yerevan; outside the capital it is far worse. Poverty reduction requires that the benefits of growth are spread to a substantial number of people, because even at current growth rates it will be some time before Armenia can afford adequate social safety nets. The more competition is restricted and activities are reserved for incumbents, the less likely it is that the benefits of growth will be widespread.

There are other consequences of the dominance of incumbents in some sectors. The concentration of wealth provides substantial ability to grant “favors” to government officials to subtly (and sometimes, not so subtly) hinder competitors entering the market. The phenomenon of *roofs* or protection rackets is one manifestation of the way in which incumbents maintain their market power. In other cases, it appears that there are direct attempts to prevent competition. Widespread subversion of the “rules of the game” by the rich and powerful sends strong messages to those who are on the outside. It contributes to a general attitude that taxes should not be paid, officials should be bribed, and goods smuggled. This does nothing to develop the foundation for a modern competitive economy.

In the long run, promoting competition in Armenia is inseparable from promoting private sector development in the country. The ability to restrict competition frequently arises because the institutions that underlie private sector activity are underdeveloped, providing strong incentives for informal behavior. In Armenia, the public goods that provide the foundation for private sector development are weak. The court system does not function effectively and arm’s length contracting is risky, so that transactions tend to take place between those who know and trust each other. This gives powerful advantages to incumbents.

Similarly, the financial system remains extremely underdeveloped even by the standards of low income countries.<sup>9</sup> Hence, those that have substantial financial resources are in a strong position to maintain and strengthen their market dominance. The development of institutions supporting the private sector is the only long-run solution to promoting a competitive market environment. Legal reform and the reform of the secured transactions framework are two measures that will greatly enhance private sector activity. In addition, government institutions need to support the private sector rather than being the instruments for maintaining anticompetitive behavior that they are

now. In particular, reform of the customs service is the key to promoting competition.

Should the CPEC be one of the pillars of a policy to promote competition in Armenia? There are concerns that it could become yet another layer of bureaucracy that leads to corrupt “inspections,” harassment of entrepreneurs, and protection of the incumbency. This concern can be addressed by emphatically assigning to the CPEC as its core role, within a strengthened statutory framework, the implementation of competition laws and the duty of advising the government on regulatory reform.

Arguments in favor of strengthening the CPEC recognize that it could be one way to address the restrictions on competition that abound in several sectors of the economy. The view of this book is that in its present form the CPEC is not a significant bulwark against anticompetitive behavior.<sup>10</sup> It does not have the necessary skills, staff, or facilities to operate effectively. Although it has been successful in a limited number of cases, it is not a force in areas where competition is obviously restricted. Its report on the petroleum market is deficient in terms of depth as well as analysis.<sup>11</sup>

This does not mean that attempts to assist the CPEC should be abandoned. Over the longer term it could be one of the instruments for promoting competition in Armenia. Modest technical assistance is warranted to help the CPEC to better implement the law and improve its ITC resources. It is unrealistic, however, to perceive it as useful in the shorter term. The CPEC needs several years to evolve into any sort of instrument against restrictions on competition. Nevertheless, its continued existence is assured and the interests of the private sector lie in its improving its technical competence.

## SUMMARY AND KEY RECOMMENDATIONS

Governance, though improving, remains a hindrance to competition, particularly in the areas of government effectiveness, quality of regulations, and excessive discretionary behavior in the tax and customs administrations at the expense of rules-based discipline. Armenia does well in a CIS comparison, but lags far behind good international practice in setting a fair and attractive competition framework for investors. The large informal economy is illustrative of the high costs of doing business (especially taking into account the “hassle” factors) and of high labor (payroll) taxes, as well as weak incentives to going formal, such as the possibility of being able to obtain credit from banks. Formal laws and institutions addressing competition and

corporate governance are weak, enforcement is erratic, and informal barriers to competition abound.

- Strengthen the competition law by clarifying collusive behavior and dominant market practices, and by modernizing the basis for judging pricing practices.
- Enhance the administrative capacity of the competition commission to review cases and enforce its rulings.
- Modify the commercial transactions law to strengthen safeguards.

## NOTES

1. Background material supporting the analysis of this chapter can be found in Chapters 10 and 11 of Part II of this book.

2. As has been mentioned in Chapter 2 (note 13), there are two arguments that focus solely on these indicators. First, these indicators are critical dimensions of the business climate. Political stability affects investment decisions and, in extreme situations of its absence, may disrupt economic activities. To be relevant, the quality of regulation must be supported by government capacity to enforce regulations. Second, three other indicators pertinent to dimensions of governance—the rule of law, the control of corruption, and voice and accountability—are not taken into account and do not yield extra information. All transition economies are strongly correlated with the selected three indicators, with the values of correlation coefficients equal to or above 0.9.

3. It provides data on the tangible components shaping the cost of conducting business in Armenia and allows casting them in a comparative perspective. The survey covers the following eight areas: starting business, flexibility of employment, registering property, contract enforcement, doing business, protection of investors, getting credit, and ease of doing business. Each area has several different indicators ranging from 1 (protection of investors) to 5 (getting credit and labor market flexibility) (see <http://www.doingbusiness.org/>)

4. The procedure used to assess the ease of doing business in Armenia is as follows. In order to assess Armenia's relative position among transition economies in terms of overall ease of doing business, we aggregate seven areas identified in the Doing Business Survey. We identify best practice indicators not worldwide but among transition countries. Indicators for countries are expressed in terms of percent of the best practice set at 100. We average indicators for each area covered by the survey, which yields an overall assessment of the ease of doing business for each country.

5. The new labor code in effect since 2005 greatly eases the severance pay burden for enterprises.

6. It is “revealed” because it takes into account the extent to which businesses express a preference to opt out of the official economy or to stay in it.

7. According to the 2004 Regulatory Cost Survey, 71 percent of respondents identified corruption as a persistent problem, up from 66 percent over the previous year. Interestingly, corruption appears to be much less of a problem for foreign-owned firms than for domestic companies (FIAS 2003).

8. According to the World Bank study reviewing progress in judicial reform in transition economies, this progress has been much weaker in all transition countries than in other areas of institutional reform since 1990. Furthermore, firms’ perceptions of the legal and judicial systems in transition countries are worse than comparable perceptions in most other regions of the world, according to a recent world wide survey of business executives (Anderson, Bernstein, and Gray 2005).

9. Discussed in the next chapter.

10. The commission has investigated a number of recent cases, among which was the successful elimination of a monopoly granted by the airport operator to a taxicab company. There have also been several hearings concerning the abuse of monopoly power by ArmenTel. The company had cut off the telephone lines of some Internet service providers without prior notification, suspecting them of providing voice-over-IP service in Armenia.

11. A four-page analysis concluded that there is competition in the distribution of petroleum because of the fact that there are several wholesalers/importers within Armenia. The paper does point out that there is only one supplier/seller to the wholesalers but appeared not to view this as a problem.



## CHAPTER 4

# Finance as a Barrier to Accumulation

### SHALLOW FINANCIAL INTERMEDIATION AND HIGH COST OF FUNDS

Comparisons with CEEC and CIS countries show the shallowness of financial intermediation in Armenia (see Table 4.1).

The financial system in Armenia remains small and bank dominated. A wave of bank failures since the end of 2000 has reduced the number of banks from 31 to 20. One foreign bank (a subsidiary of a large first-tier international bank) is a dominant player with about 18 percent of all assets and a quarter of all deposits. Total assets of the banking sector were a paltry 19 percent of GDP in 2004, substantially below the CIS average of about 30 percent in 2003. Broad money, which excludes foreign currency cash in circulation, remained flat at about 15 percent of GDP, compared with an average of about 20 percent for CIS countries. Foreign currency cash holdings are large and have been roughly estimated at one-third of GDP. The nonbank financial sector plays a negligible role in intermediation. The insurance sector is tiny, with an annual premium income of only about US\$5 million.

Since the savings to-GDP-ratio in Armenia is not dissimilar to those in countries with much deeper intermediation (such as the Baltics and Central Europe), the supply base of potential deposits for banks is clearly not a constraint. One explanation for the low intermediation arises from the importance of remittances from abroad and the informality of the economy. The substantial inflow of remittances from abroad provides a source of funds to finance real estate and investment expenditures, which reduces reliance on the financial sector. Remittances reach a significant percentage of the population and provide individuals and small firms with funds for investment

TABLE 4.1 FINANCIAL INDICATORS IN SELECTED COUNTRIES

Countries	M2X/GDP (percent)		Credit/GDP (percent)		B/GDP (percent)	
	1995–01	2004	1995–01	2004	1995–01	2004
Armenia	8.34	15.10	5.75	7.52	5.2	6.97
Azerbaijan	11.63	17.95	12.98	10.94	7.56	8.16
Czech Republic	67.83	66.63	69.75	41.44	21.57	10.36
Estonia	28.81	41.12	27.44	65.40	11.69	11.79
Georgia	6.67	13.27	4.9	18.83	4.96	8.40
Kyrgyz Republic	13.1	20.60	5.93	6.17	9.01	13.16
Latvia	25.16	38.27	12.22	51.29	11.94	13.01
Moldova	18.12	25.43	16.29	23.13	10.65	16.61
Poland	34.85	41.02	21.83	27.46	8.72	7.83
Russian Federation	17.15	31.63	11.02	25.94	7.68	14.21
Ukraine	12.58	36.36	7.94	25.67	6.99	12.27

Source: National central banks of countries presented in table.

in small businesses and real estate purchases or improvements. The large informal economy, which is unofficially estimated to be at least one-third of GDP, also does not rely on the formal financial sector. The firms and individuals in this economy rely exclusively on cash for transactions, partly to evade taxes. This significantly diminishes the potential deposit base of the banking system and the market for products offered by banks and other financial institutions.

But if deposit mobilization is weak, lending is weaker still. For example, the largest bank in Armenia, Hong Kong and Shanghai Banking Corporation (HSBC), lends a much smaller proportion of its liabilities (10 percent) to private business than it does in other countries in which it operates (60 to 70 percent). Moreover, commercial banks hold large and growing excess reserves at the Central Bank, indicative of their comfortable liquidity positions even at low levels of deposit mobilization. Thus, deep structural problems lie at the heart of the abysmally low rates of bank lending to enterprises.

Both the high cost of loans (averaging about 20 percent) and the lack of finance for business not only act as a deterrent to formality but also are a factor behind weak competition that reflects inefficiencies in the financial system. According to the 2003 FIAS RCS, more than half of the firms that participated in the survey believe that financing is the fourth leading constraint to the expansion of firms. Potential competitors cannot obtain finance, either in the form of working capital or for foreign trade. The result is that incumbents' market dominance is rarely threatened by new entrants and that wealth remains concentrated among them.

The rapid growth (albeit from the low base described above) in credit and monetary aggregates since 2004 is encouraging. The annual rate of growth of deposits has accelerated from 15 percent on average in 2001–03 to 22 percent in 2004 (exceeding 50 percent in eight banks) and 18 percent in 2005. Similarly, the annual rate of growth of gross domestic nongovernment credit (excluding loans classified as losses) has accelerated from 24 percent in 2001–03 to 37 percent in 2004 (exceeding 65 percent in six banks) and 32 percent in 2005.

### IMPACT OF INSTITUTIONAL WEAKNESSES ON COSTS

Banks have a limited capacity to assess risks and limit their lending to the insiders and activities with guaranteed returns (such as consumer lending) and require high and liquid collaterals. Some importers do use the banking system to raise letters of credit but the practice is not widespread. There is little export financing. The practice of using irrevocable letters of credit as a basis for providing funds to fulfill export orders appears to be nonexistent. As a result, the financial system cannot be said to support the growth of trade that, in turn, is the key to promoting more competition in Armenia. The essential skills in raising letters of credit are confined to a small number of banks. Before exporting under letters of credit can occur, training in the details of the procedures will be required for most banks in Armenia.

Two indicators point to the limited degree of competition within the banking industry. The bank concentration indicator—the assets of the five largest banks as a share of total assets of the banking system—is given in Table 4.2. It points to a notable increase in bank concentration over the recent past.

Moreover, out of these five banks, one large bank has about one-fifth of the total banking assets and almost a quarter of the banking sector deposits. Despite the recent increase in banking intermediation, the degree of concentration and the associated lack of competition among banks do not augur well for long-term financial stability.

Second, the interest rate spreads remain high, also indicating concentration and lack of competition (see Table 4.3); with very high

TABLE 4.2 BANK CONCENTRATION INDICATOR, 2000–04  
(IN PERCENT)

	2000	2001	2002	2003	2004
Share of the assets of five largest banks in total assets of the banking system	46.8	48.4	54.1	54.5	56.3

Source: Central Bank of Armenia.

TABLE 4.3 DECOMPOSITION OF INTEREST RATE SPREADS,  
1999–2004

<i>Total bank percentages</i>	1999	2000	2001	2002	2003	2004
1. II/L	28.32	20.70	17.24	12.96	12.30	12.29
2. IC/D	13.52	12.34	7.38	4.85	3.41	3.10
3. II/L–IC/D(spread)	14.80	10.17	11.91	9.87	10.47	10.78
4. Sum of factors below	14.65	8.87	8.46	7.21	7.95	7.76
5. NII/D(–)	5.01	3.62	4.72	6.17	6.06	5.76
6. NIC/D	10.42	8.38	8.11	8.18	7.69	7.38
7. Net prov/D	3.08	3.62	3.35	3.99	1.50	0.52
8. ROA * A/D	3.89	–1.16	0.34	0.18	3.84	4.88
9. II/L * r	2.27	1.66	1.38	1.04	0.98	0.74
Residual (ε) 3–4	–0.15	–1.30	–3.44	–2.66	–2.52	–3.02

*Source:* Central Bank of Armenia. Financial Sector Assessment Paper (FSAP), update team preliminary calculations.

*Note:* Definitions used in the table: II—interest income of banks; L—assets ensuring interest income, IC—interest expenses of banks; D—interest-bearing liabilities of banks, II/L—derived interest income of banks, IC/D—derived interest expenses of banks, NII—noninterest income of banks; NIC—noninterest expenses of banks; Net prov.—net assignments to reserve funds on loans, securities, and receivables. ROA \* A/D—the ratio of total assets in cost-bearing liabilities weighted by ROA; ROA—return on assets; Residual (ε)—Residual emerges as we compare the statement data on income and expenditures of commercial banks (flow indicators) with the balance sheet indicators (supply indicators), and consider a simplified assumption that commercial banks invest the total nonreserved part of the attracted interest-taking liabilities into the interest-earning assets.

nominal and real interest rates for loans being prevalent. The cost of interest-bearing liabilities has declined significantly and reached extremely low nominal levels that approximate to low single-digit rates in real terms in the recent past.

The principal factors behind the high and rigid spread structure in Armenia are the poor state of corporate governance; weak institutions and practices that affect banking transactions, such as the availability and flow of information on borrowers; the ease with which secured transactions can take place; the costs experienced in contract enforcement, as well as the costs associated with the management of banks; and the high unit costs of bank activities arising from diseconomies of scale. These factors point clearly to the role that structural reforms can play in alleviating finance as a barrier to sustained economic growth.

Banks' administrative and noninterest-bearing costs are very high; at the same time banks make significant earnings from noninterest-bearing transactions, which indicates heavy reliance on nonbank operations. The incompetence of the bank management itself can become a risk to the system. First of all, it can support the growth of low-quality

loans owing to the lack of capacity to implement proper credit analysis. Second, if the quality of financial services does not improve in line with the credit growth, this can “force” clients to use “nonbank alternatives” for financing. Table 4.3 substantiates the above description. The indicators provide evidence that the costs of the interest-bearing liabilities of banks have declined significantly over the last years. At the same time the earnings of interest-bearing assets declined at a lower speed.

Analysis makes it clear that the main factors contributing to the higher interest rate spread remain the noninterest costs of banks. This indicates that the banking system suffers from inefficient bank management and high administrative costs.

These costs are even higher if we exclude the largest bank in Armenia, which perhaps indicates that the presence of this foreign-owned bank alone does not create competitive pressure on the domestic banking system to increase its efficiency and push the interest rate spreads down.

Another factor contributing to the higher spread is the ratio of total assets in cost-bearing liabilities weighted by the return on assets. This indicator has high volatility due to the significant restructuring of the banking system over the last years. It shows a growing tendency over the last two years; although this indicates a profitable allocation of the low-cost resources, its rapid growth contains future risks for the banking system.

It is only through greater competition, brought about by improvements in the lending environment, that spreads will decline sustainably. Since the cost of interest-bearing liabilities is very low, the fall in spreads will come through a lowering of lending rates.

The key challenge for the authorities is to extend the recent deepening in intermediation and entrench confidence in the financial system while maintaining macroeconomic stability. Steps to be taken are summarized in Box 4.1. Rapid credit growth is a necessary element in the expansion of still shallow financial intermediation; moreover, such growth poses a limited immediate risk, as the banking system is highly liquid and well capitalized. Further steps are needed to improve the quality of financial intermediation and to increase the range and penetration of financial services. The rest of this chapter considers the policy reform tasks ahead.

## **CORPORATE GOVERNANCE DEFICIENCIES AND THE COST OF FINANCIAL INTERMEDIATION**

Central to weak corporate governance is lack of transparent ownership and control of banks. The Detailed Assessment of Compliance with the OECD Principles of Corporate Governance indicated that,

## BOX 4.1 PRIORITIES IN REFORM OF FINANCIAL AND CAPITAL MARKETS

### ACTION

#### Liquidity management

- Raise the stock of local currency monetary instruments.
- Lengthen the maturity of T-bills and bonds.

#### Bank supervision and regulation

- Amend bankruptcy law for banks to extinguish bank owners' shareholder rights in case of insolvency.
- Revise central bank law to explicitly protect supervisors from civil liability.
- Strengthen bank corporate governance based on the proposal by the Central Bank.
- Enhance consolidated supervision, especially with respect to risk exposures of beneficial owners and affiliated companies.

#### Insurance supervision and the insurance sector

- Complete regulations implementing the new insurance law.

#### Corporate governance

- Strengthen coverage and enforcement of the company law, especially on fiduciary duties and accountabilities of boards.
- Improve accounting and auditing practices, financial reporting, and creditor rights and strengthen disclosure by beneficial owners.

#### Pension reform

- Develop actuarial projections and analyze impediments to reform options before deciding on a pension reform strategy linking benefits to wages.

#### Housing finance

- Focus reform on the development of a primary market for housing finance.
- Develop a liquidity facility to facilitate longer-maturity mortgage lending while ensuring that there are no implicit guarantees.

Source: Based on Financial Sector Assessment Paper (FSAP).

while company law governing open and closed joint stock companies is sound, implementation is weak. Only a few banks and corporations choose to operate under this law, covered under the securities legislation and enforced by the exchanges and securities commissions. Many of the banks and corporations are closely held and have few owners, who do not see the benefits of adopting a more formal governance structure and who are not publicly traded. The enforcement of sound corporate governance practices through securities legislation and securities regulators is weak. Clearly, there is a need for a fundamental reform to enhance the coverage and enforcement of company law if corporate governance, disclosure, and accounting are to improve. Improvements in transparency and accounting are basic first-generation reforms in corporate governance.

The opaque ownership structure of the corporate sector makes it more difficult for the banking sector to assess the risks of corporate-sector exposures. Official disclosures of direct and indirect ownership are substantially weaker than in other transition economies. No disclosure of beneficial owners is required under Armenian law. This limits the ability of banks to ensure compliance with prudent limits on loan portfolio concentrations and related party transactions. Although legislation requires all companies to prepare their financial accounts in line with the Accounting Standards of the Republic of Armenia, in practice these standards are not observed or are implemented only partly due to lack of training. Steps should be taken to improve accounting and auditing practices and financial reporting requirements and to strengthen public information; this should include beneficial owners of banks and publicly traded companies. Furthermore, the supervising boards of Armenian companies are not sufficiently effective or accountable. The company law should clearly establish the right of shareholders to decide on owner-manager relations (in cases, for example, where a separation of company owners from company managers may be desirable and should be provided for), subject to the protection of the contractual rights of minority shareholders. Moreover, legislation should strengthen and clarify the fiduciary duties and accountability of boards of directors.

The above-mentioned shortcomings in corporate governance can be addressed through legal, institutional, and supervisory reforms. Given the weak implementation of company law, the Central Bank has developed a proposal to accelerate improvements in corporate governance in the banking sector through legislative and supervisory means, and through the introduction of upward-consolidated supervision to address exposures to beneficial owners. There are a number of specific reforms applying to the corporate sector that should be implemented to address the shortcomings in corporate governance. These reforms include improvements in accounting and auditing practices;

provision of financial reporting requirements; enhanced disclosure of the shareholders of corporations; improved access to information by the public, in particular by making the company registry publicly available; and the strengthening of the role of boards of directors.

Such shortcomings in corporate governance detract from confidence in the banking system, lead to information gaps that raise the cost of loans through higher risk premia, and impose a “tax” that disadvantages local enterprises. The Central Bank has started to address governance, including the areas of accounting and audit requirements and transparency in reporting through regulations. However, a number of key weaknesses remain which, unless addressed, would add to risks and intermediation costs:

- Banks should reform corporate governance practices with a view to adopting the legal form of open joint stock companies to increase the transparency of ownership.
- The responsibilities and accountabilities of bank owners and boards of directors should be explicitly defined in law, including taking responsibility for the safe and sound operation of the institution; being informed of their banks’ operating condition, in part through ensuring an adequate external and internal audit process; and providing accurate and truthful reporting to the public and the central bank.
- Central Bank remedial actions should extend to both boards of directors and significant participants in the case of unsafe and unsound bank operation and significant compliance breaches.

In late 2005, the Central Bank adopted a plan for the strengthening of corporate governance in banks. Specifically, measures are envisaged to protect shareholder rights (especially those of minority shareholders), to clearly define the powers of the boards and the executives of banks, delineate the fiduciary responsibilities of management, and publicize bank activities.

Improvements in the legal and regulatory framework and procedures have strengthened the supervisory process, but some weaknesses remain. It is encouraging that the Central Bank conducts a rigorous supervisory process, with enforcement grounded in legislation, regulatory reporting, and prudential norms. But there are weaknesses. Bank corporate governance and risk management, including the evaluation of risks in new banking products, requires further strengthening. Furthermore, a framework should be established to strengthen the monitoring of the parent and affiliated companies of banks in the context of consolidated supervision. The Law on Banks and Banking should be amended to allow the Central Bank to reject bank licenses if the legal and managerial structure does not permit adequate identi-

fication of ownership and control, thereby hindering effective supervision. The dialogue between the Central Bank and the external auditors should be substantially improved, if necessary through legislation. In addition, the law should be amended to obligate external auditors to report to the Central Bank on issues of material importance arising from their audits. Communication among regulators should be established, and formal agreements for information sharing put in place. The Law on Banks and Banking should explicitly provide for protection for supervisors from civil liability.

### **CREDITOR RIGHTS AND SECURED TRANSACTIONS FRAMEWORK**

A recent National Bureau for Economic Research (NBER) paper used a sample of 129 countries to show that “stronger legal rights of creditors are associated with a higher level of development of private credit markets” (Djankov, McLiesh, and Shliefer 2005, p. 16). The paper underlines the fact that this is mainly true in developed countries where the legal framework and contracting rules are more developed.

The protection of creditor rights is one of the main legal problems that hinder the growth of bank lending. The enforcement of collateral is difficult for banks and this, as we have already observed, translates into high lending rates. Although the legislation on allowing secured creditors to sell collateral without resort to a court is adequate, the enforcement and the infrastructures supporting the laws are very weak and underdeveloped and do not work in practice. Collateral enforcement is difficult because of the absence of a unified and digitally accessible registry for immovable items and title issues related to the ownership of property. The judicial capacity is weak owing to lack of experience, corruption, insufficient capacity, and the long lead time required to adapt to the new legislation. Measures are being implemented to improve the legal and institutional arrangements relating to secured credit, the registration of ownership, and security interests, and to reduce the inefficiencies in court systems that impede debt recovery, which should address most of the existing weaknesses in creditor rights.

In Armenia, movable property cannot be used effectively as collateral to secure loans. There are numerous problems with the secured transactions framework. Floating pledges are not allowed, and there are no registries which allow pledges to be perfected. Repossession is time-consuming and costly. A particular problem with financing exports is that there is no provision which allows the use of future production as collateral, so that financing against export orders is not feasible. A similar problem arises with imports because there is no

provision for pledging goods that are not in the possession of the borrower; goods that are being imported, even though they have been paid for by letter of credit, cannot be seized in the event of default. The effect of the inadequacies of the collateral framework extends throughout the economy, with the result that banks correctly perceive lending as extremely risky.<sup>1</sup> The stages necessary for establishing a framework for secured transactions are as follows:

- **Creation.** The process by which the creditor establishes a security interest in a specific property (the collateral)
- **Priority.** The process by which the lender establishes the priority of the security interest
- **Publicity.** The process that makes public the priority status of the security interest
- **Enforcement.** The process by which, upon the debtor's default, the creditor will seize and sell the collateral to satisfy his/her claim

Each of these stages must function effectively for collateral-based lending to occur. Currently, in Armenia, none of them work well.

In this context, efforts by the authorities to reform the framework for secured transactions are most encouraging. But a reform program is likely to require several phases, given the complexity and the multi-sectoral nature of the task involved. Comprehensive collateral reform requires that the whole process for the pledging of property be reviewed and changed. While rewriting the laws governing the ability of property to serve effectively as collateral is an integral part of this process, it is a long way from being all that is needed. Without a thorough revision of the whole system, collateral reform will remain elusive.

There have been many attempts at such reform in other countries, most of them unsuccessful. Legal analysis, without corresponding analysis by economists of suggestions for reform, has failed in most countries in which it has been tried. Internationally known legal practice may not represent best economic practice. In many places model laws have provided the foundation for attempts to reform the collateral framework. Thus, a good project requires close coordination among economists, international expert lawyers, local lawyers, and technical experts.

Examples of successful reform do exist and serve as a model of what could be done in Armenia. A recent reform of the secured transactions framework in Romania has transformed Romania's lending environment by facilitating the use of collateral as security for lending, not only from the banking system, but also from equipment suppliers, wholesalers, and agricultural suppliers. Before this reform there were many similarities between the Romanian financial sector and

that in Armenia—severe financial underdevelopment, the inability of a large sector of the economy to access credit, and a distrust of banks. Furthermore, Romania is also a civil code country. Use of this model could have significant potential for the development of the Armenian financial system and could substantially reduce barriers to entry. The secured transactions reform in Romania tightly integrated diagnosis, drafting, and regulations, and this integration is one of the main reasons for its success. This methodology has rarely been followed in reform efforts elsewhere.

Legislation before Parliament is intended to strengthen creditor rights. Specifically, measures are planned to make the seizure of collateral property and its disposition easier, to broaden the category of properties that may be used for collateral, and to abridge rights that may interfere with seizure of collateral.

Overall, Armenia lacks a regularized system of credit that can be stimulated by mechanisms that provide efficient, transparent, and reliable methods for recovering debt, including the seizure and sale of immovable and movable assets and the sale or collection of intangible assets, such as debt owed to the debtor by third parties. An efficient system for enforcing debt claims is crucial to an efficient functioning of the credit system in Armenia.

Armenia's financial sector (possibly with help from the Central Bank and the Ministries of Finance and Justice) should promote an informal, out-of-court process for dealing with cases of enterprises with financial difficulties in which banks have a significant exposure. Armenia's credit-based economy requires predictable, transparent, and affordable enforcement of both unsecured and secured credit claims by efficient mechanisms. Although commercial transactions in Armenia have become complex as more sophisticated techniques are developed for pricing and managing risks, the basic rights governing these relationships and the procedures for enforcing these rights have not changed much. Those rights that should enable parties to rely on contractual agreements, fostering confidence that fuels lending, are not in place. Therefore, uncertainty about the enforceability of contractual rights increases the cost of credit to compensate for the increased risk of nonperformance.

### **THE ROLE OF INFORMATION FLOWS IN REDUCING INTERMEDIATION COSTS**

The NBER study<sup>2</sup> emphasizes that information sharing through public and private credit registries is a significant factor promoting intermediation. The authors also find that "in addition, public credit bureaus are strongly associated with private credit in the poorer, but

not the richer, countries, pointing to a possible role of government in facilitating information sharing" (Djankov, McLiesh, and Shliefer 2005, p. 26).

The credit registry, which was introduced by the Central Bank in January 2003, aims to reduce credit risks by the creation of an information system on the creditworthiness of customers of banks and credit organizations operating in Armenia. However, while the credit registry has been beneficial to banks' supervisors, this information is limited to debtors of banks only. A private credit bureau began operations in early 2004 and focused in its first year on obtaining information on debtors from the banks, other financial institutions, utility companies, and government offices. This information should improve creditors' ability to evaluate prospective borrowers' creditworthiness. However, the credit bureau has faced difficulties because most banks are reluctant to provide information for free and then to have to pay for services. Furthermore, based on tradition and culture, Armenian borrowers are reluctant to share their information with others, and ensuring privacy protection substantially constrains the effectiveness of the credit bureau. This credit bureau is currently revisiting its operating model and expanding ownership to include banks with a view to remedying these obstacles.

In countries where credit bureaus have been established successfully, the central bank plays an important role in creating incentive mechanisms for commercial banks to share information on their customers. In Armenia, the Central Bank proved to be less than enthusiastic, apparently because the credit bureau would compete with information that it sells. The lack of support by the Central Bank has, in turn, led to a waning of enthusiasm on the part of the commercial banks for the new credit bureau and only one has signed up for its services. In other countries in which credit bureaus have been established successfully, it has usually been necessary for the central bank to insist that the commercial banks share information on their customers.

Given the vital role played by the generation and transmission of information on creditworthiness in ensuring low intermediation costs, it is suggested that the Central Bank adopt an active role in facilitating private credit bureau development by the following means:

- Make credit bureau reports a requirement for lending coupled with mechanisms to ensure efficient entry and exit by bureaus to avoid the abuse of their exclusive rights.
- Require a borrower's explicit consent prior to anyone's gaining access to their files to ensure more privacy protection. Other actions that may prevent privacy violations include strict bank

policies on gathering certain kinds of information, conditions on right to access, and validation of own files, and rules on the elimination of individual files after a certain period.

- Adhere to the following membership policies. Access to information by borrowers and credit institutions should be granted on the basis of membership. In other words, the principle of reciprocity should guide credit bureaus and should be stated in the contractual agreement between the bureau and the credit institutions. Membership should not be based on fees of any form. However, credit bureau activity should be profit-oriented. In cases where a member provides inaccurate information or fails to provide data, sanctions (ranging from fines to loss of membership and hence denial to the bureau's files) should be imposed.
- Adopt a balanced ownership policy. Credit bureaus are exposed to potential conflicts of interest, especially if they are owned by a group of lenders: lenders want to exploit the information provided by other lenders without disclosing their own. Therefore, Armenia should adopt a balanced ownership policy. For example, credit bureaus could be incorporated as private companies and owned by a consortium of lenders to create the incentive for information exchange. Alternatively, independent ownership, coupled with a proper membership policy, could provide incentives for lenders to exchange information.
- Regulate the quality of disclosed information. Apart from the efficiency debate and the coexistence of different institutional arrangements, there is concern regarding the optimal amount of information sharing and the content of the information. In contrast to relying on the general statement that information dissemination reduces adverse selection problems (due to bad risks in the population of credit seekers) and makes the information on which the banks base their lending decision homogenous, the policy for the development of an efficient system for sharing credit information should be focused on the regulation of the quality of disclosed information.

## MONETARY OPERATIONS AND MONEY MARKETS

While monetary policy has ensured low inflation, it has been constrained by a low volume of securities for use in liquidity management; the stock of local-currency government debt is low at about 3 percent of GDP. As a result, the Central Bank must rely on foreign exchange operations as its primary market instrument to manage local

currency liquidity. This worsens the classic tradeoff between exchange rate volatility and a buildup of excess liquidity, which could pose an inflation risk.

An increase in the supply of local currency securities would enable monetary operations in local currency to concentrate on liquidity management. This would free foreign exchange operations to focus on managing large capital inflows. The recent agreement between the government and the Central Bank to increase the supply of securities will enhance the role of money markets.

The monetary transmission mechanism is weak because banks are highly liquid, money market activity is low, and dollarization is high. Monetary transmission can be strengthened by the development of money markets, which should lead banks to move away from buy-and-hold investment strategies, to hold lower excess reserves, and to rely to a greater extent on money markets. Improvements in monetary transmission should also result from a strengthening of the broader financial system infrastructure, including corporate governance and creditor rights, which would contribute to the narrowing of lending margins and lead banks to become less liquid by reducing lending risks.

Finally, an increase in reserve requirements from their current level of 6 percent to reduce banking system liquidity could be considered if it would be difficult for market instruments alone to absorb the excess liquidity. But this instrument (which is effectively a tax on banks) is a blunt one, and market- or price-based instruments are preferred.

## **INSURANCE, PENSION, AND HOUSING FINANCE REFORM**

The new Law on Insurance adopted in 2004 is comprehensive, but may be ambitious in light of the current level of supervisory expertise. The authorities should finalize and implement key regulations to improve accounting, auditing, and financial reporting, and solvency and reserves. The oversight of reinsurance also needs strengthening.

The supervisory authorities should align the regulations implementing the new insurance law to international best practice and implement them as soon as possible. Key areas include the following:

- **Licensing.** Given the very small size of the market, the existence of 24 insurers seems inefficient. The increase in minimum capital levels will help address this.
- **Accounting, auditing, and financial reporting.** Accounting, auditing, and financial reporting practices in the market are weak, as is monitoring of insurers' market conduct for consumer protection. Regulations in these areas should move the market toward international practices.

- Solvency and technical reserve requirements. Regulations need to be in place for the industry to be able to take on and prudently manage additional risk.
- Reinsurance. Given that 98 percent of risks are currently reinsured, the supervisors should make the oversight of the quality of reinsurance programs a high priority.

The insurance supervisory unit has to build its credibility and staff capabilities. A major effort is needed to upgrade the institutional capacity for insurance supervision and the technical competence of the staff. In addition, it is critical to launch an education campaign to explain to the public the potential uses of insurance products. While the Insurance Association is best placed to take the lead in organizing such a campaign, the government should support its drive to do so where possible.

Armenia currently has a pay-as-you-go, first pillar, defined benefit pension system. The system provides quite low pension benefits and is widely seen as unfair because it does not link the level of benefits to the level of wages (averaging a replacement value of just over 20 percent of average salaries). Pension benefits total only about 3 percent of GDP. The low pensions are due to (i) demographics, including an aging population and emigration by working-age Armenians; and (ii) tax evasion by employers and employees in the large informal economy. The contributor base is less than half of the working population and the ratio of contributors to pensioners is virtually 1:1.

The government has formed a working group on pension reform, which is preparing a concept paper for transition to a three-pillar pension system and has already conducted actuarial projections on reform options. The concept under consideration includes replacing the current system with a compulsory funded pillar and establishing the framework for voluntary funded pension insurance while ensuring a minimum level of pensions for all through budget support. Contributions to the mandatory and voluntary pillars would be placed in individual accounts and invested in financial instruments. However, there are a significant number of considerations for the government to keep in mind in contemplating the direction, shape, and pace of pension reform, including the following:

- Conflicting objectives. The objectives of the plan involve significant tradeoffs among key policy objectives. In particular, during the transition period (which can last 30 years), there would be a direct tradeoff between utilizing reserves to increase current pensions or using them to fund individual accounts. Finding the appropriate balance between these objectives could be important for achieving public support for reform.

- **Fiscal policy sustainability.** During the transition period to a compulsory funded pillar, supplementary budget support may be needed to pay current pensions and fund mandated levels of contributions to individual accounts. However, budget support should be provided only within a sound fiscal policy framework and appropriate limits on the size of public debt and debt servicing requirements.
- **Lack of financial instruments in Armenia's financial sector.** Armenia has few financial instruments that pension funds could invest in aside from bank deposits. The government debt market and corporate securities markets are quite small. In the initial years of funded pensions, a substantial portion of assets would have to be invested in foreign assets.
- **The need to develop regulatory capacity and expertise.** Funded pension systems are usually privately managed and have to be regulated. Before such a system could be established in Armenia, the government would need to form a regulatory body and build up its expertise. An appropriate financial institution with the requisite capacity would have to be found to act as custodian for pension fund assets (an Armenian bank that intended to receive deposits from pension funds should not be eligible).
- **Scale of contributions.** Given the small size of Armenia's pension system, the size of the pool of funds that would be created in the initial years of funded pensions would probably be too small to attract interest from qualified foreign pension fund managers, or to be financially viable in light of the fees that would be charged. A transitional set of arrangements might be needed during a start-up phase before a critical mass of funds was achieved and management by private pension companies was implemented. The transitional arrangements should also cover the creation of pension plans by interested employers.
- **Public skepticism of financial institutions.** While there is discontent with the current pension system, the Armenian public also holds some distrust of financial institutions as a consequence of previous experience with bank failures. There could be doubts on the part of the public that contributions to pension funds would ultimately be paid. A gradual transition could be beneficial, under which private accounts would accumulate slowly in the initial years, allowing confidence to grow over time.

The Armenian housing finance market is at a promising early stage of development, but risks and weaknesses exist that could be reduced with limited government intervention to meet the needs of the broad population. Banks lent an estimated US\$7.1 million in 2003—1.5 per-

cent of total bank assets. Most mortgage lending is to upper-income households, in U.S. dollars, at fixed interest rates ranging between 14 and 18 percent, for low loan-to-value ratios of 50 percent, at an average short-term maturity of five years.

**The main focus of reforms to housing finance should be on the development of the primary market** for moderate- and low-income households. Key areas of reform include improving the technical capacities of lenders, enhancing public sector processes and systems, and improving the legal and regulatory framework. The government has proposed important reforms to strengthen the legal basis for property markets and mortgage lending, including defining real estate as a combination of land and structures, and improving the enforceability of the mortgage pledge. These reforms should be rapidly adopted. The government should shorten and simplify the process for title transfer and the registration of the mortgage pledge. The Central Bank should adjust provisioning rules to address the mismatch between the currency denomination of mortgage loans and the denomination of borrowers' incomes. The government and banks should more systematically gather and publicly disclose data on housing prices, transactions, mortgage lending, and mortgage performance to improve transparency and liquidity. The government should promulgate consumer disclosure regulations on loan terms and risks, especially for non-dram mortgages.

## SUMMARY AND KEY RECOMMENDATIONS

Financial intermediation is shallow and the cost of funds is high. Ratios of both deposits and loans to GDP are amongst the lowest in the CIS countries, and the interest rate spread is high. The cost of intermediation is raised by weak corporate governance, where even first-generation reforms related to transparency, disclosure of ownership, and accounting are still to be implemented. Creditor rights are being reformed but have been weak thus far, and the framework for secured transactions has been largely missing. Moreover, institutions to support the flow of information to support credit risk analysis need strengthening. Current reforms that are in progress, if implemented with determination, would lead over time to a lowering of costs and to a greater provision of bank credit to support growth.

- Implement a new law on corporate governance of banks.
- Strengthen official disclosures of direct and indirect ownership.
- Require by Armenian law the disclosure of beneficial owners.
- Ensure public access to the company registry and lists of founders and shareholders.

- Implement a law on creditor rights and secured transactions with streamlining of judicial procedures.
- Strengthen the supervision of capital markets.
- Implement the unified supervision of financial and capital markets, with new standards for the supervision of insurance, pensions, and housing finance institutions.
- Promote the development of a credit bureau.

## NOTES

1. Some advocate “relationship lending,” in which banks make loans on the basis of the analysis of business plans and the borrower’s history as an entrepreneur. This is unlikely to happen. First, most lending to businesses in the United States is secured by collateral. Second, the skills available for drawing up business plans are scarce. Third, those who have run businesses successfully are often the entrenched interests in Armenia, so that loans go to those who have tight control of the business sector.

2. Djankov, McLiesh, and Shliefer (2005), referred to in the preceding section of this chapter.

## CHAPTER 5

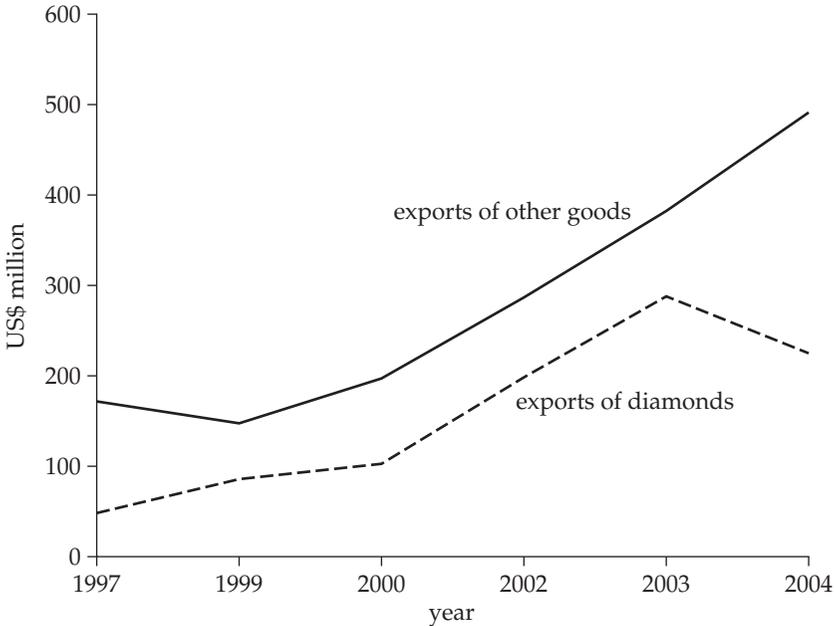
# Impediments to International Integration

In chapter 3, the impact of the weak framework for competition on economic efficiency and growth was discussed. The deficiencies in competition policy also affect the integration of the Armenian economy into international goods, services, and factor markets. For a small economy, the key to fast economic growth is integration into global markets. While Armenia has entered into a diamond global value chain (see Table 5.1), it has failed to exploit the opportunities offered by participation in other global networks, and other opportunities for production and distribution, owing to weaknesses in the business environment.

Given the country's geographic isolation, global integration depends vitally on export opportunities in the services trade, which has grown impressively. Armenian participation in the international outsourcing of ICT-related services as well as other services sectors (such as tourism and transportation) is below its potential owing to lack of competition and regulatory constraints.

The composition of exports illustrates three structural weaknesses in international integration. First, exports of unskilled labor-intensive products appear low given Armenia's abundance in low-skilled labor. Moreover, other countries that are less intensive in low-skilled labor have a higher share of low-skill intensive exports than does Armenia. Thus, the share of unskilled labor-intensive products in Armenia's total exports was 1 percent in 2003, compared to 15 percent of Czech exports, 28 percent of Lithuanian exports, and 41 percent of Albanian exports. The deviation is smaller when set against the performance of other CIS economies: Georgia has the same share as Armenia, Kazakhstan's is even lower (0.3 percent), and the Kyrgyz Republic's is 15 percent. This second group of countries (like Armenia) *has yet to*

FIGURE 5.1 ARMENIAN EXPORTS, 1997–2004



Source: NSS.

become part of the global garments value chain. Armenia has succeeded in entering the diamond value chain (characterized by skilled labor activity) but has failed to capitalize on its large reserves of cheap, unskilled labor. While garments have accounted for a huge share of manufactured exports from European transition economies, this has not been the case with Armenia.

Second, Armenian firms have not become integrated into the production and distribution networks. Trade in such networks as furniture, the automotive industry, and the information revolution (or e-network) has driven export expansion for recent Central European entrants to the EU. Despite outstanding success in the development of the ICT sector, trade in the e-network (which includes electronics, office equipment, and telecommunications) has remained modest at best. This is also the case in the furniture sector, which is less technologically demanding. Furthermore, not a single Armenian firm has become a supplier to a major producer of automobiles.

Third, ICT firms have not been able to take full advantage of the recent change in the ICT sector worldwide. With the disappearance of the global “one-stop-shop” industry structures in the early 1990s,<sup>1</sup> opportunities have emerged for new entrants. Armenian firms have

successfully entered software and imaging technology niches. However, they have failed to enter other stages of the production and delivery processes, such as providing front-end customer contact and support services or supplying components (such as metal, plastics, and electronics components).<sup>2</sup>

The cost of missed opportunities seems to be significant. The incorporation of local producers into the clothing chain, production and marketing networks, and the supply of ICT consumer services usually brings new technologies and managerial know-how as well as direct access to larger markets, and thus benefits of economies of scale. Incorporation boosts exports without local firms having to incur marketing expenses and provides for greater stability in earnings, thanks to the global reach of a “parent” company. The fragmentation of production eliminates the need to gain competency in all stages and aspects of production and allows a small country to focus on a subset of activities. At the same time, production sharing can broaden the range of final products whose components are produced in the small country and thus protect the country from a demand shock to a particular good.

The reasons for failure to tap into these opportunities can be related to the unfinished agenda of demanding and complex structural reforms together with trade facilitation measures. This unfinished agenda constitutes a barrier to a deeper involvement of Armenian firms in a finer global division of labor based on just-in-time production, inventory management, and complex Internet-based communication links. The fundamental impediments to a deeper international integration are discussed in this chapter.

## CONTESTABILITY OF DOMESTIC MARKETS

The major constraints to the contestability of Armenia’s domestic markets for goods, services, and capital are lack of transparency and inconsistent implementation of regulations and laws.<sup>3</sup> The legal arrangements concerning entry to these markets are liberal with one exception—telecommunications services are not open to external competition. Access to other services sectors is liberal and is locked in as a condition for accession to the WTO in 2003. Apart from the temporary exemption of telecommunications services to most-favored nation (MFN) status, other sectors have been open to most modes of supply, with the usual caveat concerning restrictions on the employment of foreigners.<sup>4</sup>

No legal restrictions are in place on foreign capital inflows. The foreign investment regime, governed by the 1994 Law on Foreign Investment, provides for national treatment, MFN, and full repatriation of capital and earnings. The law banning foreigners from owning land

(they can only lease it) is not restrictive, as companies registered by foreigners in Armenia as Armenian business entities have the right to own land. The barriers in the opinion of international businesses relate to the inconsistent application of rules for taxes, customs (especially valuation), and regulation, especially in the area of trade. While these may not be prohibitive for large firms with easy access to high levels of state administration, they create conditions of unfair competition for medium-size businesses and other market entrants and add to uncertainty.

Access to Armenian markets for goods is liberal in terms of official border and behind-the-border arrangements. Tariffs are low not only by CIS standards but also by international standards. Although Armenia's weighted and unweighted average MFN tariff rates are twice as high as those in the EU, they are still well below 5 percent (Table 5.1).

Furthermore, commitments made upon accession to the WTO have infused a considerable degree of stability and predictability into Armenia's foreign trade policy. They have also reduced (but not completely eliminated) the potential for capture of foreign trade decisions by narrow interest groups by providing the government with tools to tame rent-seekers. Armenia's two-band tariff regime, with applied MFN tariff rates at low levels of zero or 10 percent ad valorem, has

TABLE 5.1 AVERAGE APPLIED AND BOND MFN TARIFF RATES  
IN SELECTED COUNTRIES (IN PERCENT)

		<i>Armenia</i>	<i>Kyrgyz Republic</i>	<i>Lithuania</i>	<i>European Union (15)</i>
		2001	2002	2003	2002
Total goods	Simple average (%)	3.3	4.5	1.3	1.5
	Weighted average (%)	2.2	3.2	0.6	1.4
Agricultural goods	Simple average (%)	8.3	7.1	4.7	3.2
	Weighted average (%)	6.6	6.6	4.3	2.9
Industrial goods	Simple average (%)	2.9	4.3	1.0	1.3
	Weighted average (%)	1.1	2.7	0.3	1.3
Bound rate of all goods	Simple average (%)	8.5	7.4	9.2	3.9
	Weighted average (%)	9.6	6.4	9.4	3.0
Binding	Coverage (%)	100.0	99.9	100.0	100.0
Memorandum:					
simple average tariff rate in 2004		3.0	5.2	1.5	1.5

Sources: Based on the UNCTAD TRAINS (<http://www.unctad.org/Templates/Page.asp?intItemID=1907&lang=1>), WTO IDB database ([http://www.wto.org/english/res\\_e/status\\_e/its2005\\_e/its05\\_toc\\_e.htm](http://www.wto.org/english/res_e/status_e/its2005_e/its05_toc_e.htm)), and the IMF trade information database for 2004 (<http://www.imf.org/external/data.htm>).

been locked, thanks to accession to the WTO. Armenia's schedule of MFN "bound" tariff rates has seven ad valorem rates: 0, 4, 5, 6.5, 8, 10, and 15 percent.<sup>5</sup> However, as a condition of accession, Armenia has been required to bind tariffs across all Harmonized System items. In addition, Armenia has committed itself, as a result of direct pressure from members of its WTO working party, to review periodically the specific tariff rates to assure that these do not exceed their equivalents of ad valorem bound tariff rates.<sup>6</sup>

Armenia has made significant commitments toward a liberal trade regime in the context of WTO membership, including commitments under the WTO General Agreement on Trade in Services (GATS). Except for telecommunications, Armenia's bound sectoral commitments are extensive in terms of both coverage and market access across different modes of supply of services. The number of subsectors in which exceptions are placed on a mode of supply (that is, unbound) is very small in Armenia's schedule. Except for settlement and clearing services for financial assets, including securities, derivative products, and other negotiable instruments, there are no exceptions under delivery mode 1 (cross-border). Consumption abroad (mode 2) is subject to no restrictions. The only restriction in market access under mode 3 (commercial presence) is the requirement that suppliers of technical testing and analysis services should be legal entities constituted under Armenian legislation. In contrast to a number of countries—including highly developed economies—that limit a maximum foreign equity stake, there is no such a limit in Armenia.

Given the emphasis in national economic policy on promoting the ICT sector, and given Armenia's specialization in computer services that sets it aside from countries at a similar level of economic development, it is puzzling that Armenia did not join the Information Technology Agreement (ITA) upon accession to the WTO. The ITA, concluded by 29 participants at the Singapore Ministerial Conference in December 1996, provided for participants to completely eliminate duties on ITC products covered by the Agreement by January 1, 2000. The number of WTO members that participate in ITA has risen to 63 states, including China, India, and East Asian countries including Malaysia, Singapore, and Thailand. Participation does not assure knowledge-intensive growth but can help to create the right conditions for such growth.

However, neither commitments under the WTO Agreements nor legal provisions protecting private property rights and enforcing contracts alone have ensured the high contestability of Armenia's domestic markets. First, the capacity of courts remains weak, as they operate slowly in the enforcement of contracts and the mediation of commercial disputes. Furthermore, firms do not trust the ability of courts to

act independently and enforce decisions. Neither do they trust the impartiality of the state administration, regarded by businesses as corrupt. Second, the computerization of customs has to date fallen well short of improving the quality of customs services, with customs procedures yet to achieve the WTO standards of transparency. The lack of the bilateral harmonization of customs practices with Georgia, corruption, and the limited application of ITC further exacerbate transaction costs.

Nontransparent procedures corroborate businesses' complaints about the continuing practice of customs of extracting "irregular" payments from them. Corruption and the imposition of unofficial fees at the border are most frequently reported by the private sector as serious issues. The fact that customs clearance procedures are applied with equal zeal also to exports is suggestive, as, generally, in other countries, customs efforts are largely directed only at imports. For example, on the rail system from Armenia to Georgia, unofficial fees account for approximately 6–13 percent of the total costs of transport (Molnar and Ojala 2003). A typical container shipment by truck from Tbilisi to Rotterdam is subject to unofficial payment costs totaling 7 to 40 percent of the total logistics costs, with customs clearance being the most significant element.

The administration of VAT rebates to exporters is an important factor that deters exports. VAT reimbursements do not occur quickly enough and are underpaid by the government. A recent survey (World Bank 2004a) notes that only 44 percent of surveyed firms entitled to the refund have claimed it.<sup>7</sup> One obvious reason for unclaimed refunds is that for the remaining 56 percent of companies it took, on average, 145 days to receive a VAT refund. Moreover, on average they received 15 percent less than the amount to which they were entitled by the law. In 2005 a significant improvement has occurred in the pace and quantity of refunds.

Moreover, the most anticipated benefits of the computerization of customs services (that is, reducing the release time of consignments and slashing the documentation or bureaucratic burden put on a trader or customs broker) have so far failed to materialize. Traders and customs brokers have limited access to the system. The old practice of bureaucratic delays fueling corruption, combined with a lack of capacity in customs administration, continues.

Other barriers to the high contestability of Armenia's domestic markets stem from the high "hassle" cost of doing business in Armenia discussed earlier. Weaknesses in tax administration, the capacity of the CPEC to enforce competition laws, and the weak judicial system have been responsible for low FDI inflows and for Armenia's limited success in attracting activities outsourced by multinational corporations (except for diamonds).

## REFORMING CUSTOMS RULES

Ideally, the government should extend the same customs rules that it applies to diamond cutting to other sectors of the economy. This would entail reducing the time for customs clearance to one day, accepting the invoice value, and conducting in-house clearance, if needed. While these steps would be a dramatic improvement over the current practice, other transaction cost-raising elements would have to be addressed as well, such as the VAT refund system mentioned previously.

Extending a “diamond-like” regime with an improved VAT refund mechanism to all exports would be difficult. While inputs crossing customs borders are usually subject to tariff rates and indirect taxes if sold domestically, the tariff rate on diamonds is zero and no taxes are levied. By the same token, a domestic firm has no incentive to sell the imported input and will domestically circumvent customs, thereby depriving the budget of customs and other tax revenues. In short, there is no need for duty drawback, temporary admissions, or bonded warehouse schemes, which require considerable capacity on the part of customs administration to be really effective. While computerization—if accompanied by administrative reforms and changes in customs procedures commensurate with the newly acquired technological capacities—may significantly improve this capacity, this might take some time.

Therefore, the suggested reform would be to move gradually and establish a diamond-like regime in terms of administrative efficiency for a selected group of firms. The selected firms would be put on a “white list.” Firms on such a white list would be eligible for special treatment by the customs and VAT administration. Customs would be obliged to complete customs clearance within a very short period; it would also have to observe the provisions of the WTO Agreement on Customs Valuation instead of using reference prices; and it would be obliged to run an effective scheme that provides duty waivers and exemptions from other restrictions on imported inputs for established exporters that import inputs, whether for domestic production or export, or both.<sup>8</sup> The VAT administration would be obliged to rebate the VAT to a white-listed firm on the same day that exports are cleared by customs. For any delays, a firm would be entitled to a refund plus interest.

Which firms, in addition to diamond-cutting firms, should be put on a white list? While the criteria to be used may be subject to further refinement, the general guidelines are easily discernible. First, the process and the criteria should be transparent and open to the public scrutiny of press and nongovernment organizations, such as business associations.

Second, foreign-owned firms publicly traded on the U.S. and EU stock exchanges should be automatically included. Their operations are subject to the highest standards of international scrutiny and they can ill afford to enter into shady business operations. This would take care of participation in the global networks of production and distribution, simply because their major movers are publicly traded, large, multinational corporations.

Third, firms operating in the ICT sector should also be included in the white list as their use of imported inputs is limited and the value added created locally is huge. Their exports are not subject to customs clearing procedures. In fact, they are virtually impossible to monitor. However, in order to claim duty and VAT rebates, they would have to disclose some transactions to the financial authorities. The overall direct benefits to ICT firms of being included in the white list are lower than for exporters of manufactures, although firms of this sector are as vociferous in their criticism of the VAT rebate scheme as are the diamond-cutting firms. Furthermore, this would be a significant step in improving the business climate for a sector critical to Armenia's move to a knowledge-intensive economy.

Fourth, for the remaining firms, one would have to identify one or two criteria related to a record of past dealings with the tax administration. One criterion might involve the number of years in existence; another might take into account the past record of dealing with tax and customs administrations. Both would have to be clearly defined. The general idea would be to reward law-abiding firms. Firms that do meet the criterion of the length of existence but are involved in inward processing (for example, of garments or footwear) might be exempted.

Representatives from government and other relevant business administration would annually or semiannually update the white list. A mechanism to address the grievances of those that have not been included should be designed and implemented. However, if the criteria are precisely defined and transparently implemented, the number of cases handled under this mechanism would be rather limited.

A white list alone would not be sufficient for improving customs efficiency. There are other areas which might be relatively quickly fixed. One quick action would be the establishment of an independent professional association of customs brokers. The association would be empowered to license and scrutinize its members. In order to assure integrity and responsibility, it would operate according to a transparent code of conduct that would be obligatory for all members and it would have an institutional voice in the government bodies responsible for overseeing customs administration.

Another quick action would be to open the customs computer system to customs brokers. Customs-related documents would be brought

in line with what is really required under a computerized system such as the Automated System for Customs Data (ASYCUDA). A further action would be the simplification of customs clearance procedures. Under normal circumstances, the customs clearance of exports serves one major purpose: to assure that the shipment does not contain products banned for exports. Once an exporter produces a certificate of origin issued by the Chamber of Commerce, the shipment should be immediately cleared. Hence, a strict time limit on releasing a shipment should be introduced; if the time limit is exceeded, a shipment should be immediately released.

The above measures are relatively easy to implement. While they require the close attention of policy makers, they consume administrative resources in a very moderate way. Over the long term, they would actually reduce the administrative burden.

### **INTEGRATION IS BURDENED BY EXPENSIVE BACKBONE SERVICES**

The domestic elements of the business climate (that is, regulatory regimes and measures directly affecting entry, conduct, and exit for firms) also influence the external interaction of domestic firms. Elements that are as important for domestic as for external activities include procedures for the simplification and harmonization of international trade; the state of the infrastructure and its management; and the provision of such backbone services as telecommunications, banking, insurance, transportation, and business services. Other elements are customs procedures, related regulatory procedures for border clearance, technical standards regulations, and airport efficiency and effectiveness. These elements shape the ease and speed with which goods and services move across national borders services; therefore, they are crucial to trade in goods. Consequently, improvements in the domestic business climate may produce limited positive economic effects if not accompanied by similar improvements in trade facilitation.

Weaknesses in the provision of backbone services add greatly to the costs for domestic firms to participate in the emerging division of labor based on international outsourcing, just-in-time production, and supply-chain management. Increasingly, sliced value chains, with individual production stages being moved to countries with comparative advantages, have become trademarks of a current global economic landscape. Interaction among "production blocs" of border-spanning production networks is particularly vulnerable to delays in and disruptions between individual stages of the supply chain owing to weaknesses in service links. Hence, the poor quality of backbone services and trade facilitation deters foreign firms from incorporating domestic

firms into their supply chains and also acts as a barrier to other types of trade. In a nutshell, these are the factors responsible for the emergence of trade within global value chains and networks.

The factors responsible for the emergence of a new form of the division of labor driven by the globalization of production appear to be missing in Armenia. Falling transportation and communications costs have created opportunities for the outsourcing, just-in-time production, and supply-chain management that have been altering the competitive landscape of many countries by relocating business activities and providing a new source of entry into international markets. However, high transportation and communications costs as well as high transaction costs of doing business in Armenia are barriers to participation in the division of labor based on production fragmentation.

The limited presence in the global value chain and trade network of garments, and the almost complete absence of Armenian providers for some ICT customer support services, have not been the result of adverse external conditions. These conditions are mostly home made, and thus can be addressed by changes in government policies. While geographic or political constraints are difficult to overcome, contemporary technology combined with a right mix of policies may considerably ease their negative impact. Outsourcing, just-in-time production, and supply-chain management, which are all critical to transferring abroad a slice of a production process, cannot function efficiently if there are delays and disruptions because of weaknesses in the service chain. The weakest link in the service chain in a country may tip the balance against including a firm in the global supply chain. The service chain includes backbone services, namely, telecommunications, transport, financial services (banking, insurance, securities trading), distribution and business services (legal services, accounting, consulting), as well as customs procedures.

Neither politics nor geography has affected Armenia's strong and expanding presence in the diamond value chain. This is the result of inherently low transport costs and friendly government policies that are not extended to other sectors. Potential or actual producers of parts and products for other chains and networks are not in a similarly privileged position. Transportation costs usually account for a large share of total production costs. Few items match diamonds or services' combination of a lightweight and high-value unit. Just-in-time production and supply-chain management are less important in the diamond business, as is the timeliness of the communications links.

For products other than diamonds the distance from major markets clearly matters, as trade costs, including transportation, customs, and communications, may make operations noncompetitive in world markets. But even though trade has expanded more rapidly in areas geo-

graphically closer to the major world markets, trade in more distant regions has also grown, which demonstrates that policies that reduce transaction costs can soften the negative impact of distance. Air and telecommunications links play a crucial role in this reduction.

Wilson, Mann, and Otsuki (2004) identify four indicators of the capacity to facilitate trade. These are port efficiency, the customs environment, the regulatory environment, and the ICT infrastructure. Port efficiency measures the quality of the infrastructure of maritime ports and airports. The customs environment measures the direct customs costs as well as the administrative transparency of customs and border crossings. The regulatory environment measures the country's approach to regulations and their quality. The ICT infrastructure measures the extent to which an economy has the necessary domestic infrastructure (such as telecommunications, transportation, financial intermediaries, and logistics firms) and is using networked information to improve efficiency and to transform activities to enhance economic activity. Since we have discussed regulatory environment and customs practices, and since a private operator runs the airport in Yerevan, we shall focus on ICT infrastructure and transportation services.

### **ICT INFRASTRUCTURE: THE PRIVATE TELEPHONE MONOPOLY**

Rapid technological development in the electronics, computer, and telecommunications industries has eroded the previously inherent natural monopoly characteristics of telecommunications. By the same token, it has weakened somewhat the negative impacts of the government's decision to grant a legal monopoly (originally until 2013) to ArmenTel, the local telecommunications company, owned by the Hellenic Telecommunications Organization. The monopoly also encompasses cellular; the local loop providing land line links to firms and households; and international sources, including, theoretically, Internet services. The only areas that have escaped the monopoly's reach, albeit not completely, are the Voice over Internet protocol (VoIP) and private international satellite communication such as that operated by Lycos, a private foreign company. These developments account for the low volume of officially captured international calls. But satellite communication is not a full substitute for access through land lines, and satellite has nontrivial fixed costs and cannot be connected to the telecommunications network to provide backup and higher utilization. Therefore, while modern technologies offer some ways of circumventing the monopoly reach of ArmenTel, it controls the decisive "last mile" local loop access and has dominated the mobile phone market.

How has ArmenTel's monopoly affected the development of telecommunications in Armenia? One way of addressing this question is to compare the costs and the use of telecommunications services in Armenia to those in other CIS countries. This may not be a very demanding benchmark, as many other CIS countries have equally poor regulatory reform and privatization and some still maintain a state monopoly for service provision. Nevertheless, the general conclusion is that, overall, Armenia's telecommunications services compared with other CIS countries performed poorly over 1998–2002. Despite an increase in 2002 over 2001, in 2003 the international outgoing traffic from Armenia declined significantly more on average than in other CIS countries. The cost of using the Internet in Armenia was 41 percent higher than the average for the CIS. The prices for high-speed connections charged by ArmenTel are around 30 times more than those in countries where telecommunications services are not monopolized. These developments explain why Armenia had a low number of Internet users, well below the CIS average. Moreover, the number of cellular phones per 1,000 people is significantly lower than in neighboring Georgia.

Tables 5.2 and 5.3 compare the telecommunications situation in Armenia with those in Azerbaijan and Georgia.

Tables 5.4 and 5.5 compare benchmarks for telecommunications infrastructure and the Internet in Armenia with selected countries.

The poor quality of the ICT infrastructure is a barrier to the development of the economy and to its shift toward the higher knowledge intensity and enhanced networking that technological change permits

TABLE 5.2 TELECOMMUNICATIONS SECTOR OVERVIEW

	<i>Armenia</i>	<i>Azerbaijan</i>	<i>Georgia</i>
Population, 2003, millions	3.80	8.23	4.89
GDP per capita 2003, PPP, US\$	3,607	3,606	2,569
Telecom revenue, 2002, US\$ millions	70.1	85.8	135.0
Telecom investments, 2002, US\$ millions	22.7	28.7	n.a.
Number of fixed lines, 2003	563,679	941,366	650,500
State ownership share in the incumbent fixed-line operator, September 2004	ArmenTel 10% (90% owned by Greece's OTE)	n.a.	n.a.
Number of mobile subscribers, June 2004	137,530	1,317,560	779,300
Number of mobile operators, June 2004	1	2	3

Sources: World Development Indicators (WDI) (<http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:20398986~menuPK:64133163~pagePK:64133150~piPK:64133175~theSitePK:239419,00.html>), ITU, European Mobile Communications Report (<http://www.mac.doc.gov/ceebic/countryr/Fyrm/MARKET/Macedonia%27s%20Information%20Technology%20Sector.pdf>).

TABLE 5.3 PERCENTAGE OF HOUSEHOLDS WITH ACCESS TO A TELEPHONE

Country		Total	Income quintiles				
			1	2	3	4	5
Armenia (ISLS 2001)	Capital (Yerevan)	83.7	73.6	80.6	78.9	88.4	92.8
	Other urban	64.8	46.8	59.5	67.5	76.8	79.9
	Rural	44.0	34.8	40.4	42.8	48.1	53.3
	Whole country	61.8	50.4	56.4	59.4	68.1	74.5
Azerbaijan (HBS 2001)	Capital (Baku)	63.4	58.4	55.1	62.8	68.5	71.6
	Other urban	44.4	43.2	42.7	40.8	48.2	48.7
	Rural	18.4	18.2	17.3	18.3	17.9	20.1
	Whole country	38.6	38.4	36.9	35.8	38.9	43.1
Georgia (HBS 2001)	Capital (Tbilisi)	71.7	59.1	63.7	70.9	76.9	82.1
	Other urban	47.3	31.8	44.1	49.9	58.6	66.7
	Rural	8.8	5.0	8.2	8.8	10.5	10.8
	Whole country	34.7	25.4	33.2	34.5	37.9	42.5

Source: Integrated Survey of Living Standards (ISLS); Household Budget Survey (HBS).

Note: Comparisons should be made only within countries and not between them, since the surveys were conducted independently and the questions were not identical.

**TABLE 5.4 BASIC TELECOMMUNICATIONS INFRASTRUCTURE BENCHMARKS**

<i>Country</i>	<i>GDP per capita 2003, PPP (US\$)</i>	<i>Households with a television, 2002 (%)</i>	<i>Main lines per 100 inhabitants, 2003</i>	<i>Mobile penetration, August 2004 (%)</i>
Albania	4,571	90	8	32
Armenia	3,607	91	15	4
Azerbaijan	3,606	121	11	17
Bosnia and Herzegovina	6,029	87	24	31
Bulgaria	7,807	93 <sup>a</sup>	38	59
Croatia	11,139	94 <sup>d</sup>	42 <sup>b</sup>	60
Czech Republic	16,448	99	36	100
FYR Macedonia	6,762	82 <sup>d</sup>	27 <sup>b</sup>	40
Georgia	2,569	76	13	17
Greece	19,973	98 <sup>c</sup>	45	96
Hungary	14,572	96 <sup>c</sup>	35	76
Moldova	1,505	—	22	14
Romania	7,222	97	20	40
Serbia and Montenegro	—	92	24	37
Slovak Republic	13,469	100	24	75
Slovenia	19,300	91	41	95
Turkey	6,749	108	27	45

*Sources:* WDI, ITU, European Mobile Communications Report, Paul Budde Communication.

a. Data from 2003; b. data from 2002; c. data from 2001; d. data from 2000; — =not available.

and encourages. The absence of high-quality services and the high costs of existing services affect all sectors of the economy, amounting often to the equivalent of a prohibitive tax on some potential markets. It is impossible to estimate how many transactions have not taken place because of this situation. Neither is it possible to tell how many industrial or service operations would have been transferred to Armenia had there been more efficient telecommunications services. It is, however, indisputable that very high telecommunications costs have severely exacerbated the disadvantage associated with Armenia's geographical location. High-quality ICT infrastructure and services are crucial to the development of a contemporary economy.

TABLE 5.5 INTERNET BENCHMARKS

Country	PCs per 100 inhabitants, 2002	Internet users per 100 inhabitants, 2003	International Internet bandwidth per capita, 2002, bps	Internet hosts per 1000 inhabitants, 2003
Albania	1.2	1	3.9	0.08
Armenia	1.6	4	2.1	0.55
Azerbaijan		4 <sup>a</sup>	0.3	0.07
Bosnia and Herzegovina	n.a.	3 <sup>a</sup>	6.6 <sup>c</sup>	1.89
Bulgaria	5.2	21	10.1	6.66
Croatia	17.4	23	41.2	6.78
Czech Republic	17.7	31	2,189.1	27.44
FYR Macedonia	4.5	5 <sup>a</sup>	24.2	1.73
Georgia	3.2	3		1.01
Greece	8.2	15	222.0	17.05
Hungary	10.8	23	246.3	35.78
Moldova	2.1	8	9.4	3.32
Romania	8.3	18	89.3	2.18
Serbia and Montenegro	2.7	8	0.9 <sup>b</sup>	1.84
Slovak Republic	18.0	26	1,516.0	21.22
Slovenia	30.1	38 <sup>a</sup>	539.6	21.48
Turkey	4.3	8	16.3	5.08

Source: ITU. Online at: <http://www.mac.doc.gov/ceebic/countryr/Fyrm/MARKET/Macedonia%27s%20Information%20Technology%20Sector.pdf>

a. Data from 2002; b. data from 2001; c. data from 2000; bps = bits per second; — = not available.

The ArmenTel monopoly has been reduced and further cellular competition will be allowed in 2009. A new mobile operator has been licensed, although, given the objectives pursued and the process followed, it is unlikely that a competitive regime will emerge. Duopolies can produce outcomes close to monopolies unless competition law is actively applied to prevent tacit collusion. The PSRC has been given enhanced powers in an attempt to countervail the adverse effects of ArmenTel's continuing dominant market position. There is little expectation that Armenia will benefit fully from the rapid fall in costs and the introduction of new services that a fully liberalized market would offer. It is understood that the government regards current policies as the best achievable until the ArmenTel license expires in 2013. It is

crucial that every opportunity be taken to maximize the possibilities for competition given the current policy and agreements.

Clearly, the government faces the difficult issue of minimizing the negative impact of some of the most restrictive provisions of its contract with ArmenTel without endangering the credibility of Armenia's commitment to the sanctity of contracts or facing a considerable fiscal cost. The policy so far has been a combination of a strong commitment to respect the contract while requiring that ArmenTel meets its obligations, together with a declaration that regardless of its outcome, mobile (cellular) and data services sectors will be open to domestic and foreign companies in the future.

In the meantime, the tactic is being followed of increasing the regulatory pressure on ArmenTel by placing telecommunications under the jurisdiction of the PSRC, which deals also with power, water, and natural gas. However, as long as ArmenTel essentially has monopoly rights, the major task would be overseeing a monopoly and trying to use regulatory tools to encourage the utility to expand its output and lower its prices to efficient levels. The management of the license should ensure that all provisions concerning the commitments of ArmenTel are implemented. This task is different from setting the regulatory framework that facilitates entry and protecting the competitive process.

Hence, as long as the monopoly is in place, the best intervention is to ensure that the PSRC is an efficient and effective regulator and enforcer of the modified agreement with ArmenTel. With the current duopoly likely to continue until 2009, an additional option would be for the government to develop and announce **now** its future policy: namely, that all government-imposed economic entry barriers would be removed when the license expires (so that, for example, the electricity distribution company could provide telecommunications services if technically and commercially viable). Furthermore, the available and necessary radio frequency spectrum will be auctioned off well before 2009, so that further mobile operators, to the extent that they consider they would be commercially viable, would be able to enter the market as soon as restrictions are lifted. Private networks (including those using satellite links) could prepare to interconnect and provide services to other customers. The market after 2013 should be regulated only by competition law.

### **AIR TRANSPORT: AN UNTAPPED ASSET**

Despite the importance of land transport, the infrastructure system in Armenia requires modernization, including adequate provisions for ongoing maintenance and management and considerable road reha-

bilitation. In addition, most of its rail track and rolling stock are in need of repair or replacement. Since rail and road links from Georgia to Armenia account for 70 percent of Armenian trade, their quality is of particular importance. They are all in poor condition. The lack of direct sea access, the mismanaged state-owned railway company (Holden and Sahakyan 2004), the high freight rates, and the ongoing blockade of the borders with Azerbaijan and Turkey, all contribute heavily to the high transportation costs faced by importers and exporters, which puts Armenian firms at a competitive disadvantage.

Unless transport costs go down, the trade patterns will remain biased toward goods with high value relative to weight at the expense of the bulky low-cost products of light industry. This may explain why, unlike the situation in other transition economies, Armenia's exports of textiles, apparel, and footwear have been limited.

What can the government do about transportation costs? It is important to ensure good road operation and development in order to lower vehicle operating costs and transport time, and the government may be spending too little by way of public investment in this area (note that the medium term expenditure framework for 2006–8 suggests that funding for state roads is declining as a share of GDP). Placing the state-run railway on a business footing would allow it to compete more effectively with road transport and to maximize its economic value added. The government can influence the performance of infrastructure service providers through changes in incentives and the institutional environment. Investments in infrastructure and strengthening the regulatory structure can reduce transport costs with particularly large potential for reducing costs in air transport and railways. Overall, however, as mentioned earlier, transportation costs, both overland and by air, are well above the levels in other CIS landlocked countries, including those located further away than Armenia from their most important markets, largely in the EU.

The shift away from air transport to land transport indicates that the former has become less competitive. Providers of air cargo services have been unable to retain their clients or to lure new ones with more attractive prices, as freight shipped by air from Yerevan fell between 1997 and 2003 by more than two-thirds (depending on the indicator).<sup>9</sup> The fall has been even more dramatic considering that the value of exports of goods rose 3.3 times over this period. Volumes increased significantly in 2004, back to the level four years earlier. The re-opening of the land corridor through Georgia might have boosted land transport. But had there been more aircraft belly space available, thanks to an increase in the number of passenger flights, lower air cargo rates would have attracted a much larger portion of shipments than was the case. This clearly has not happened, as there was no significant increase in the frequency of flights until 2004. It remains

to be seen whether the resumption of growth in air services continues, is sustained, and translates into better services for cargo shippers (including lower prices).

The fall in the share of the most dynamic worldwide mode of transport—air transport—can be attributed to the fall in the competitiveness of air transport services owing to poor infrastructure and a restrictive aviation policy. The poor infrastructure component has been potentially addressed, thanks to the government's decision to sign a 30-year concession agreement with Argentina-based Corporation America for the management of the Yerevan Zvartnot International Airport in 2003. Careful management of the concession by the government, within a clear policy framework, should result in a more efficient and effective provision of airport services.

The removal of the infrastructure barrier alone will not suffice to make air transport competitive. The appropriate regulatory environment must be in place in order to take advantage of better infrastructure. However, recent government action is not encouraging: an agreement has been signed with the Russian airline Siberia for the establishment of a new airline (Armavia) to take over Armenian international air "rights" on an exclusive basis until 2013 (with a stream of annual payments to the government for these rights). This agreement suggests that the approach to aviation policy has remained restrictive via exclusive and restrictive route rights. Instead of moving to a less restrictive approach that emphasizes the removal of government-imposed entry barriers to air services (as pioneered by Chile and implemented by countries such as Latvia), Armenia has retained the bilateral system of air transport regulations, which is based on a positive list approach that limits the provision of services to those that are explicitly permitted.<sup>10</sup> An existing Armenian airline, the Armenian International Airline, has been forced out of serving the Armenian air markets as a result of the government's agreement with Armavia.

Leaving aside safety and aviation security issues, which need to be addressed in any future scenario, the regulatory philosophy underlying the restrictive approach to bilateral aviation agreements has been to protect the "national" carrier from external competition—Armavia in this case. Governments have understandably been concerned about service continuity and have often considered that only a national carrier will ensure such continuity. Costly regulatory assistance is usually given, as in this case, although the government, unusually by international practices, is receiving explicit annual payments in return for the grant of exclusive rights. Inferior services in terms of costs and quality often result. International experience shows that in a deregulated environment airlines will serve markets: concerns about service continuity have been generally unfounded. Regulatory restrictions impede this process and tend to exclude the most efficient airlines.

The empirical evidence from countries that have deregulated the domestic aviation sector (such as the United States and the EU) is robust: passengers and air freight shippers in both the EU and the United States have experienced a dramatic and continuing decline in airfares. Thanks to the opening of the sector to new entrants, existing carriers have come under strong competitive pressures. These in turn have reduced costs through gains in productivity. The entry of the so-called low-cost carriers (LCCs) has halved airfares and stimulated volume by at least 70 percent in both the EU and the United States. Competition has also been responsible for a faster adaptation and diffusion of new technologies. The combination of liberalization and technological progress has been behind a 3.5 percent average annual decline in real terms in prices of services over 1991–2001.

The costs of bilateral aviation agreements are not just reflected in the higher prices of air transport due to the absence or limited competition. In fact, they also involve the much more important and more difficult-to-estimate costs of forgone opportunities. These costs are potentially large as lower airfares boost tourism, stimulate important flows of ideas and human capital, deepen networks, and create new opportunities for firms to market their products domestically and internationally. Tourists in turn increase the demand for a range of services and goods. The empirical evidence can be supplemented by several examples.

The liberalization of aviation policy, together with investment in the Emirates airline, has contributed to Dubai's impressive economic development, which is driven largely by tourism and services. The result of the relatively liberal policies pursued by the United Arab Emirates since the 1980s is that Dubai is now served by around 100 airlines flying to 145 destinations and Emirates has become a formidable world-class competitor. More important, Dubai it has become a tourist and business center in the Middle East. Last, but not least, one suspects that the probability for a firm to become incorporated in global production and distribution networks increasingly on the basis of just-in-time production is low in the absence of reliable, high-frequency, competitive air transport services.

A second example suggests that airline liberalization has been a contributing factor to economic development in Ireland—often described as a Celtic Tiger because of its spectacular economic growth performance over the last decade or so. It is often overlooked that the measures that created a “virtuous circle” leading to the Irish economic boom included not only public expenditure cutbacks that allowed for tax reductions but also EU-driven airline deregulation that allowed Ryanair to fully develop the LCC business model following the U.S. Southwest Airlines example. Deregulation “facilitated a more than doubling of tourist numbers over the following decade” and contributed significantly to FDI inflows (Barry 2003, p. 909).

For a small landlocked economy aiming to maximize its long-term economic growth rate, the best aviation policy would be along the lines of the Chilean “Open Skies” policy, which would include Armenian carriers having reciprocal rights to compete. Under this arrangement the government policy would be to eliminate government-imposed entry barriers to air transport. This should be the option that Armenia should adopt as quickly as possible, although the agreement of Armavia would probably be required, unless their contract with the government is renegotiated.

Full implementation of such a policy is not likely in the immediate future, as it would take both governments (Armenia and Russia) to agree to liberalize a bilateral agreement. Taking into account the lack of Armavia’s business interests in some routes and interests of other governments to open access for their carriers, Armenia may be able to strike Open Skies agreements with the United States, the United Arab Emirates, and Bahrain, for example. Since all three are potentially important markets, and since the latter two offer relatively close outlets to a wide range of markets, these agreements would be of significant economic importance to Armenia. The reason why the United Arab Emirates and Bahrain might be interested in Open Skies agreements is that both have carriers with well-connected hubs that offer high-frequency connections throughout the Middle East and Asia. Such an agreement would also offer an extra air cargo link to European markets.

The reasons why the United States might accept the offer are twofold: one related to the Armenian diaspora and commercial relations in the United States and the other to the international aviation policy of the United States. The pressure from the diaspora might be reinforced by U.S. carriers interested in flights to Armenia. As for the U.S. aviation policy aspect, such a reciprocal agreement would be natural, as at present, the United States has Open Skies agreements with over 70 countries, including Uzbekistan and, recently, India. The U.S. type of Open Skies agreement typically includes the fifth freedom<sup>11</sup> code-share rights for U.S. carriers extended beyond hubs outside the United States. This would allow a U.S. carrier to add its code to any partner airline (for example, an EU carrier flight into Yerevan).

To date, the EU has displayed little interest in entering into negotiations to achieve the major modifications that Open Skies agreements would entail with small countries with restrictive air service policies. Rather, it has been seeking to extend arrangements like the European Civil Aviation Area to other countries with the Open Sky type of policies (the United States, Singapore, and New Zealand, for example). Within the parameters of this approach, the CIS might be a potential partner but not Armenia alone.

TABLE 5.6 PHASED CIVIL AVIATION REFORM

<i>Time framework</i>	<i>Incumbent carriers</i>	<i>New entrant carriers</i>
April 1, 2006, to April 1, 2007	Up to 3 daily flights	Up to a daily freq.
From April 1, 2007	Unrestricted	Unrestricted

Source: Bank staff.

Under these circumstances, the Open Skies agreement with the EU is currently an unlikely option, and Armenia should instead announce its objective of removing restrictions on carriers and inbound flights, subject to receiving reciprocal rights. If Armenia considers that the protection this would accord Armavia would be insufficient (including taking account of the agreement with Armavia), then depending on the assessment of the agreement with Armavia (or its successor), the government could take a phased approach toward a fully liberal and unrestrictive policy. The steps could be as shown in Table 5.6.

The government could also implement a liberal approach for fifth freedom rights as well as explicitly announcing that it favors a multi-airline policy.

Armenia could gain considerably from Open Skies arrangements among CIS countries modeled on the EU European Civil Aviation Area. But this would take time, as Armenia would have to develop the model and convince other CIS members, perhaps building a coalition with like-minded countries.

A likely increase in the number of flights connecting Yerevan with the Middle East, the United States, and the EU would exert competitive pressure on airlines that service routes to Moscow and other destinations in Russia, particularly as the recent survey of passengers through Yerevan airport has shown that the great bulk of passengers flying to Moscow were actually en route to Europe and the United States.

## SUMMARY AND KEY RECOMMENDATIONS

Armenia enjoys an admirably open trade and investment regime, but firms are insufficiently linked to the international production and distribution chains, and ICT firms have not been able to make good use of international opportunities. Major constraints lie in the lack of transparency and consistency in regulation and the poor customs administration. Customs rules can be reformed to make its administration more rules-based. Policy-induced high costs in telecommunications and in air transport need to be fought, as current structures impose a high “tax” on competitiveness. It is suggested that the

future liberal telecommunications regulatory regime be decided and announced now, and that rapid steps be taken to remove economic restrictions on civil aviation with the aim of developing an Open Skies policy in conjunction with the EU.

- *Customs and VAT*: Establish a “white list” of firms subject to special treatment by Customs and VAT administration, including quick customs clearance; use provisions of the WTO Agreement on Customs Valuation instead of using reference prices; create an effective scheme that provides duty waivers and exemptions from other restrictions on imported inputs; and give rebates of VAT as soon as exports are cleared by customs.
- Extend direct transfer input to all customs houses.
- Bring customs-related documents in line with what is really required under a computerized system of the ASYCUDA type.
- Simplify customs clearance procedures for exports with a strict time limit on releasing a shipment; if the time limit is exceeded, the shipment should be immediately released.
- Support participation in international R&D networks (such as the EU 6th Framework Program).
- Sign the WTO Information Technology Agreement.
- Publish a statement of government civil aviation policy for consultation.
- Introduce new and increased services in 2005–6.
- Pass a new telecommunications law and see that the responsibility for implementation, including that of the ArmenTel license, is passed to PSRC.
- Have a cellular competitor enter service.
- Have the PSRC prepare a regulatory policy statement in 2006 that, among other things, lays out an implementation plan for the entry of a third service provider by 2009.

## NOTES

1. A large number of firms, connected through complex and borderless supply chains made up of high-volume, multicustomer, and multinational specialists at each level, have replaced the vertically integrated firms dominant in the 1980s and early 1990s.

2. The front-end, customer-centric portion of the supply chain includes service providers such as contact centers, order processing, and technical support. At the same level is the order fulfillment hub, which is a combination of a logistics center with order picking and configuration capabilities.

3. The following sources have been used in this section: the World Bank's various country reports, the World Bank Investment Climate Survey, BEEPS and BEEPS II surveys, Economist Intelligence Unit information, the Heritage Foundation's Index of Economic Freedom, and the World Bank's Doing Business Indicators.

4. Armenia, however, has made a commitment "to provide unlimited market access for all basic and value-added telecommunications services subsector initially covered by the monopoly immediately upon suspension or termination of monopoly rights in that subsector on or at anytime prior to the end of the monopoly." See WTO 2002.

5. The simple average bound tariff rate for all products is 8.6 percent, with the average rate of 14.9 percent for agricultural products and 7.7 percent for industrial products (authors' calculation based on Armenia's "Bound" Schedule). Both averages put Armenia in the middle of transition economies. For agricultural products, Albania, the Slovak Republic, and the Czech Republic (prior to the EU accession) have lower rates of 9.4 percent and 10 percent. Estonia's and Latvia's rates are higher at 17.5 and 34.6 percent, correspondingly. For industrial products, Albania, the Czech Republic, the Slovak Republic, Hungary, and Estonia have lower average rates of 6.6, 4.2, 4.2, 6.9, and 7.3 percent, respectively.

6. This is an extra Armenia-specific commitment to observe the provisions of the WTO Agreement.

7. Data show that a significant improvement in timeliness in VAT refunds began to take place in 2005.

8. Their design and implementation would require the attention of policy makers. Some possible mechanisms are a rebate scheme on account, a deferred drawback, or a temporary admissions mechanism.

9. Freight in thousand metric tons stood at 33 percent of its 1997 level in 2003 and in million ton-kilometers at 26 percent.

10. According to this approach, a service can be provided only if it is explicitly permitted.

11. The fifth freedom refers the right of an airline from one country to land in a second country, pick up passengers, and fly to a third country where the passengers then deplane. This would allow, for example, a U.S. airline to stop en route to Armenia or fly beyond Armenia providing services at each stage.



## CHAPTER 6

# Knowledge and Innovation

The creation, dissemination, and use of knowledge, together with the required strengthening of the competition and external integration policies, must lie at the heart of the effort to ramp up technology in production. For the efficient use of knowledge, the four pillars that are widely accepted conditions are the following:

- an economic and institutional regime that provides incentives for the efficient creation, dissemination, and use of existing knowledge
- an educated and skilled population that can create and use knowledge
- a system of research centers, universities, think tanks, consultants, firms, and other organizations that can tap into the growing stock of global knowledge, and assimilate and adapt it to local needs
- a dynamic information infrastructure that can facilitate the effective communication, dissemination, and processing of information

Armenia is distinctive in having the following characteristics:

- A significant annual inflow into the labor force of energetic, motivated individuals who value knowledge and higher education. Armenia's private higher education (although of a predictably low quality) is one of the most vibrant sectors of the economy.
- A large stock of highly educated people, yet with largely obsolete specialized skills. In the former USSR Armenia specialized in

R&D, and all the tribulations of the past 12 years notwithstanding, Armenia still boasts a critical mass of human capital that sustains a culture that values knowledge. However, this stock has been eroded recently owing to emigration, a low level of public spending on education, and delayed reforms in university education.

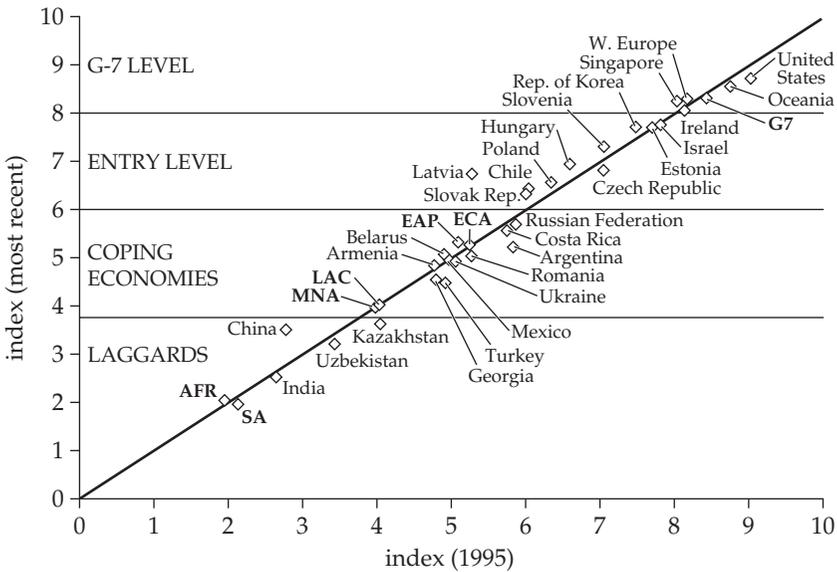
- A large and entrepreneurial diaspora which is as generous in philanthropic contributions to Armenia as (with few exceptions) it is reticent in business initiatives.
- Weak local entrepreneurship. Although there are some successful entrepreneurs (for example, in the software and jewelry sectors), they are not nearly numerous enough to change the economy. Clusters and value chains are not developing. There are of course the usual reasons of a weak investment climate and geographical isolation, but these do not appear to be the main problem. Armenian entrepreneurs and policy makers alike do not appreciate (and hence do not seek to improve) the value of intangibles (brand names, business reputations, marketing and managerial skills, networks, and so forth). This is where a large stock of educated engineers and scientists, with their attendant focus on assets that one can touch, turns to a disadvantage.
- Fragmentation of the policy debate. Traditions of collective action and public-private partnerships are also weak.

The policy challenge lies in building on the strengths of the country and addressing the critical weaknesses so that growth at higher productivity levels can be ensured. Here the major burden falls on the mobilization and recombination of the existing human capital, triggered by an initially modest investment in intangibles, such as mechanisms of knowledge and skill transfer from the diaspora to Armenia. The major contribution that policy analysis can make is to provide a fresh perspective on problems, thereby inviting policy makers to change their mindsets and to identify and initiate knowledge-intensive initiatives.

### **THE KNOWLEDGE ECONOMY IN THE INTERNATIONAL CONTEXT**

The following figures illustrate Armenia's knowledge readiness from the mid-1990s to the early years of this decade. Figure 6.1 demonstrates the relative performance of countries and regions in the Knowledge Economy Index (KEI), a composite index which measures the preparedness of the country for a knowledge-based development framework. The KEI is calculated by computing the average of the

FIGURE 6.1 ARMENIA AND THE WORLD:  
KNOWLEDGE ECONOMY INDEX



Source: KAM, K4D, WBI, World Bank ([www.worldbank.org/kam](http://www.worldbank.org/kam)).

performance scores of a country or region in all four pillars of the Knowledge Economy (KE).

Overall, during the last five to seven years, Armenia improved rather marginally its performance in the KEI. In the knowledge map (Figure 6.1), as defined by countries' performance in the index, Armenia stands within the medium performers group, yet noticeably below the average of the ECA region. Armenia falls further behind OECD and EU members, while the performance gap between Armenia and its selected comparators is significant.<sup>1</sup> In particular the gap with respect to Israel and Ireland is significant. These indicators should signal the sense of urgency for Armenia, which, despite its well-documented potential and impressive economic growth trends, does not seem to be maximizing the benefits from its competencies. Armenia is also falling behind other former socialist economies that have managed to compete better in a rapidly changing knowledge-based environment.

Countries can be divided into four broad classes:

- Very low knowledge endowments—laggards.
- Relatively low endowments—coping economies.

- “Accession club”—entry-level to KE—a class that is characteristic of upper middle-income economies starting to compete on knowledge and innovation, not on low labor costs alone. These are more advanced ECA and Asian countries.
- G-7 levels of knowledge endowments.

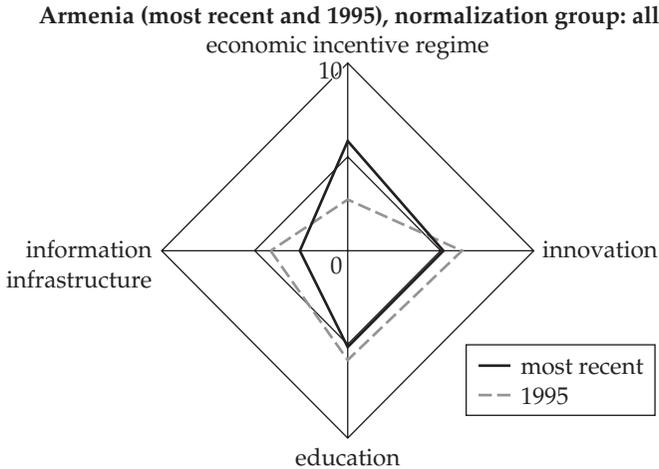
While the criteria distinguishing one class from another are necessarily arbitrary, the messages for Armenia are quite clear:

- On the overall KE score, Armenia is among the coping economies: it is within the same league as Russia, Ukraine, and Costa Rica and within a healthy distance from both laggards and entry-level economies.
- Yet Armenia’s performance across the four KE pillars (economic incentive regime, education, innovation, and ICTs) is unusually unbalanced. On economic and institutional regime Armenia performs very well, on a par with recent EU entrants. In contrast, the ICT pillar is shockingly underdeveloped. Not only is Armenia squarely among laggards (the worst category, occupied by Sub-Saharan Africa, Albania, and the Central Asian republics of the FSU); its relative position has actually worsened significantly since 1995. This is all the more worrisome given its geographical isolation. Because of its landlocked status and unfriendly neighbors it should at least rank in the accession club on ICT.
- On education, Armenia still performs reasonably although lagging behind many Eastern European economies. However, the relatively good human capital is a heritage of Soviet times that has not translated into adequate innovation performance. The innovation pillar remains weak.

Examining performance in the four KE pillars that define the aggregate KEI (Figure 6.2), Armenia performs poorly in the ICT pillar, an area in which it lost significant ground relative to the world. In absolute terms Armenia did improve its ICT indicators (explicitly shown in Figure 6.2) but the world on average—defined by the 121 countries in the Knowledge Assessment Methodology (KAM) sample—made a significantly larger improvement. Armenia’s strongest pillar is its economic and institutional regime (EIR), which was the weakest in the mid-1990s; in this area the country demonstrated significant improvements and remains particularly competitive in the ECA region. In the education pillar, a traditionally strong area for the country, Armenia lost some ground, while in the innovation pillar the country regressed even more.

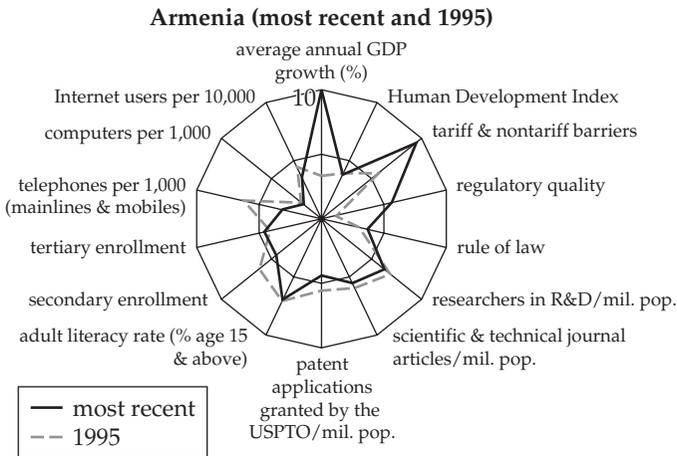
Figure 6.3 illustrates how Armenia performed, over time, in each of the 12 variables that describe the four KE pillars, and therefore

FIGURE 6.2 ARMENIA: PERFORMANCE IN THE FOUR KNOWLEDGE ECONOMY PILLARS, 1995–MOST RECENT



Source: KAM, K4D, WBI, World Bank ([www.worldbank.org/kam](http://www.worldbank.org/kam)).

FIGURE 6.3 ARMENIA KNOWLEDGE ECONOMY INDEX SCORECARD

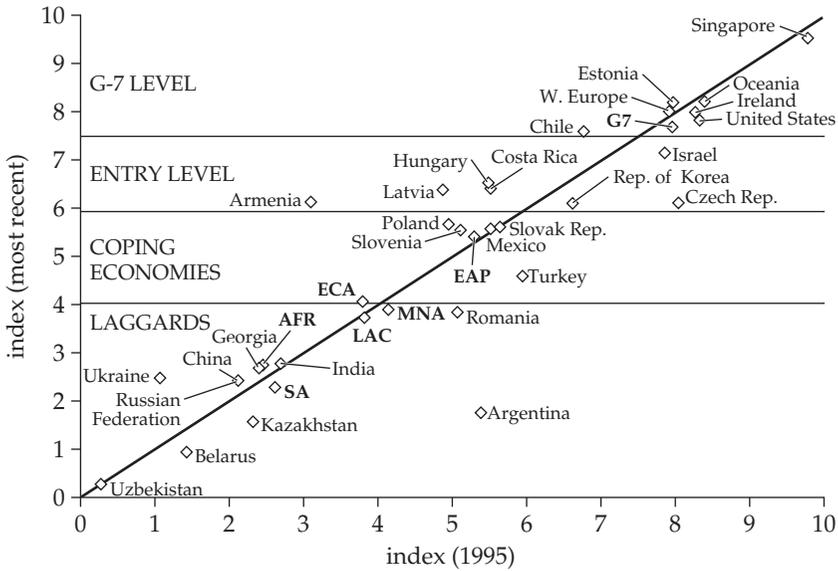


Source: KAM, K4D, WBI, World Bank (<http://www.worldbank.org/kam>).

the aggregate KEI, plus two performance variables (GDP growth and Human Development Index [HDI]).

In the EIR pillar, the country demonstrated the largest improvement in the ECA region, currently performing well above the regional average, behind Latvia and Hungary (Figure 6.4). Armenia signifi-

FIGURE 6.4 ECONOMIC INCENTIVE REGIME:  
ARMENIA AND THE WORLD



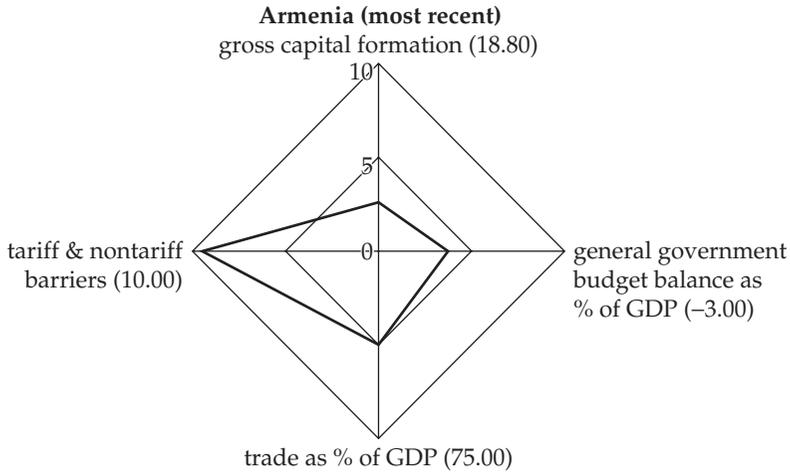
Source: KAM (<http://www.worldbank.org/kam>).

Note: Armenia is an open economy with total trade representing currently 75 percent of GDP, which is still below the average of the ECA region. Armenia's exports of goods and services as a share of GDP—a solid indication of international competitiveness—is significantly lower than all comparator countries and the same income group average. In Armenia in 2002, despite the fact that exports of goods and services had significantly increased since 1995 and accounted for almost 30 percent of GDP, imports accounted for 47 percent of GDP, causing Armenia to carry over a significant trade deficit, much larger than any of its comparator countries.

cantly improved its terms of trade by reducing tariff and nontariff barriers<sup>2</sup> and also managed to improve significantly, relative to the world, its regulatory quality indicators by implementing policies friendly to markets and business. Rule of law indicators did not improve significantly and they are below the regional average levels, but still the country showed better improvement than the average of the KAM country sample, and therefore it demonstrates improvement relative to the world. Armenia is lagging behind all of its selected comparators in this pillar, with the exception of Russia, which is moving particularly slowly toward a modernized institutional phase.

Figures 6.4 and 6.5 show several additional KAM indicators that describe performance in the pillar of economic incentive regime. The scorecard indicates that Armenia is characterized by low levels of gross

FIGURE 6.5 ARMENIA'S SCORECARD IN THE ECONOMIC INCENTIVE REGIME



Source: KAM ([www.worldbank.org/kam](http://www.worldbank.org/kam)).

Note: Data for gross capital formation shown in the figure is the average of the period 1991–2001.

domestic investment, the lowest among its comparators. On average for the years 1995–2002, Armenia spent around 19 percent of GDP in domestic investments—the least share along with Costa Rica—while the closest was Russia, 20 percent; and Latvia and Slovenia topped the list with 25 percent. Armenia on average for 1995–2002 spent a significantly smaller amount in domestic investments than, on average, the groups of low- and middle-income countries.

On governance and institutional quality variables, Armenia performs significantly worse than all other comparators and the average of the region, with the exception of Russia in rule of law and Israel in voice and accountability indicators. In particular, despite a national campaign against corruption, the high incidence of corruption continues to affect business and the attraction of foreign investment. The Heritage Foundation (2004) states in its analysis that “bribery is widespread and is the most common form of corruption, especially in the areas of government procurement, all types of transfers and approvals, and such business-related services as company registration, licensing, and land or space allocation.” The Bleyzer Foundation in a benchmarking analysis of 15 FSU countries on FDI driving conditions notes that Armenia is ranked thirteenth in the corruption level index, whereas in the overall composite index it is ranked sixth, behind Estonia, Latvia, Lithuania, Kazakhstan, and Russia (Bleyzer 2002).<sup>3</sup>

Furthermore, the size of the shadow economy in Armenia, which is equal to 45 percent of GDP, is significantly larger than that in some of its comparator economies and the average for the region (Table 6.1). This reveals the poor institutional capacity and high incidence of corruption in Armenia, combined with the increasing tax burden and social security payments. The size of the shadow economy in Armenia is a prohibitive factor in fiscal revenue generation, which could create a vicious cycle with tax base erosion (resulting in higher taxes), the worsening of fiscal constraints (Economist 2003), and ambiguous effects on private sector development and the quality of products and services. Unless urgent and radical reforms transform the effectiveness of the governance and institutional capacity of the country, Armenia will be facing competitiveness challenges that will be hard to meet.

In education, a pillar in which Armenia has a strong tradition, the country lost some ground relative to the world and remains weak relative to the regional ECA average (Figure 6.6). Enrollment in secondary education has fallen significantly in the post-transition period and remains well below the (ECA) regional average. However, enrollment in tertiary education improved significantly but still remains at very low levels by regional standards.<sup>4</sup> The vast majority of ECA economies, and all selected comparators (with the exception of Costa Rica), outperform Armenia in the KAM variables used to define aggregate performance in the education pillar.

Figure 6.7 isolates Armenia and presents the available set of variables used in the KAM to define performance in the education pillar. It is striking to realize, relative to the large availability and potential of educated human capital in the country, how little Armenia spends on education—less than 3 percent of GDP (2000 data). The significant

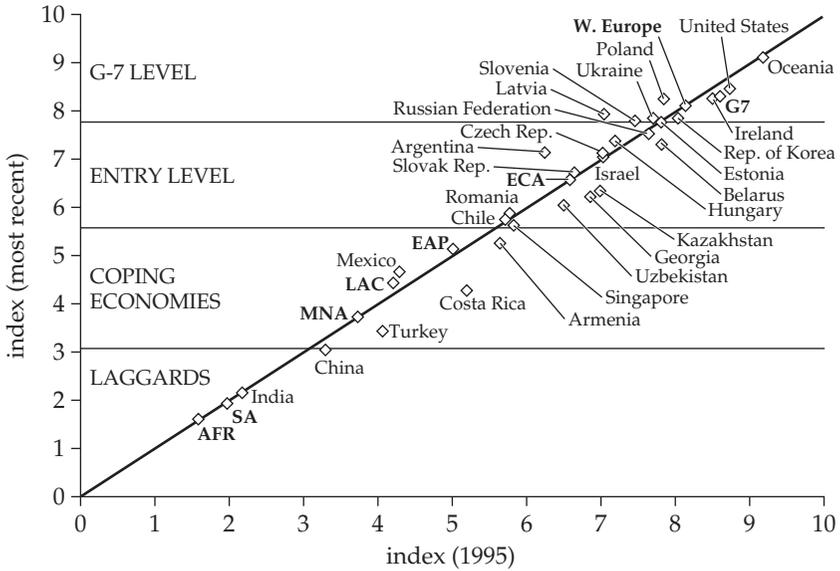
TABLE 6.1 THE SIZE OF THE SHADOW ECONOMY  
(AS PERCENT OF GDP)

<i>Country</i>	<i>1990–93</i>	<i>2000–01</i>
Armenia	40.1	45.3
Estonia	34.3	39.1
Ireland	15.4*	15.7**
Russian Federation	27.8	45.1
Slovenia	22.9	26.7
Average Central and Eastern Europe	23.4	29.2
Average FSU	32.9	44.8
Average of 21 OECD countries	15.7*	16.7**

*Source:* Schneider 2002.

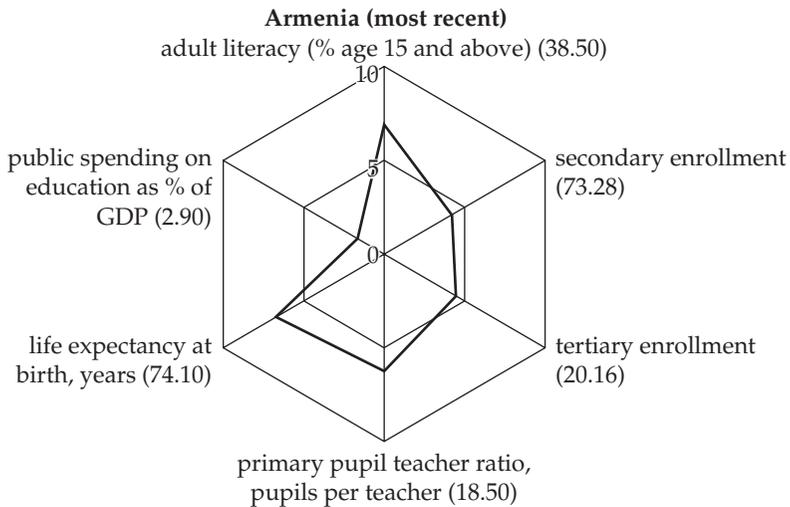
\*1994–5; \*\* 2001–2.

FIGURE 6.6 EDUCATION: ARMENIA AND THE WORLD



Source: KAM (<http://www.worldbank.org/kam>).

FIGURE 6.7 ARMENIA'S SCORECARD ON EDUCATION



Source: KAM ([www.worldbank.org/kam](http://www.worldbank.org/kam)).

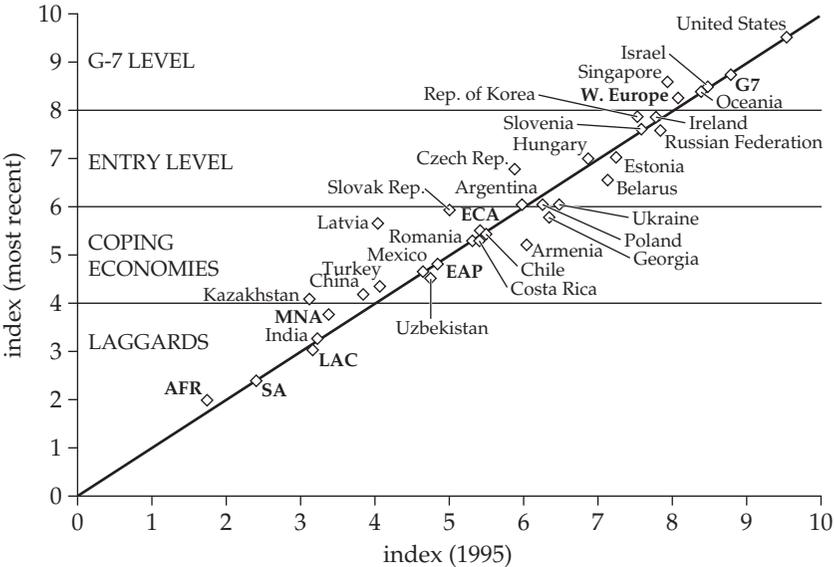
gap in education spending between the ECA regional average (4.6 percent of GDP) and Armenia is particularly alarming.

Based on the KAM variables that define the innovation pillar, which in the mid-1990s was the strongest pillar of the country, Armenia lost significant ground relative to the world, and its performance currently falls below the ECA regional average (Figure 6.8). It is evident that Armenia lost a significant part of its stock of researchers (brain-drain) in the diaspora, while the number of scientific and technical publications has declined over the years. Patent activity is minimal and has remained rather stagnant throughout the years. Although close behind Costa Rica and Chile, Armenia lags behind all selected comparators.

In Figure 6.9, basic KAM indicators using the most recent available data are presented describing the performance of Armenia in the innovation pillar. One of the weakest indicators for Armenia is spending on R&D (0.2 percent of GDP) whereas the average for the lower-middle-income group is close to 0.9 percent (Figure 6.9).

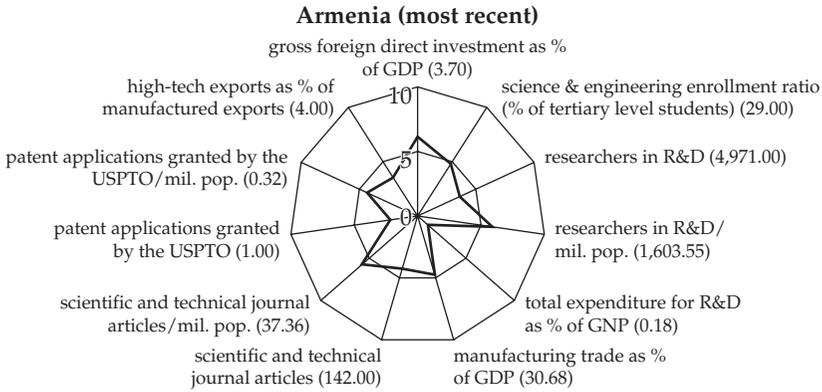
For the ICT pillar, in the variables that describe the availability and penetration ratios of these technologies, Armenia scores dramatically below the world and the ECA regional average, indicating the country's weakness in keeping up with regional and global technology penetration and usage trends (Figure 6.10). ICT is the country's weakest pillar. In absolute terms, however, some improvements in

FIGURE 6.8 INNOVATION: ARMENIA AND THE WORLD



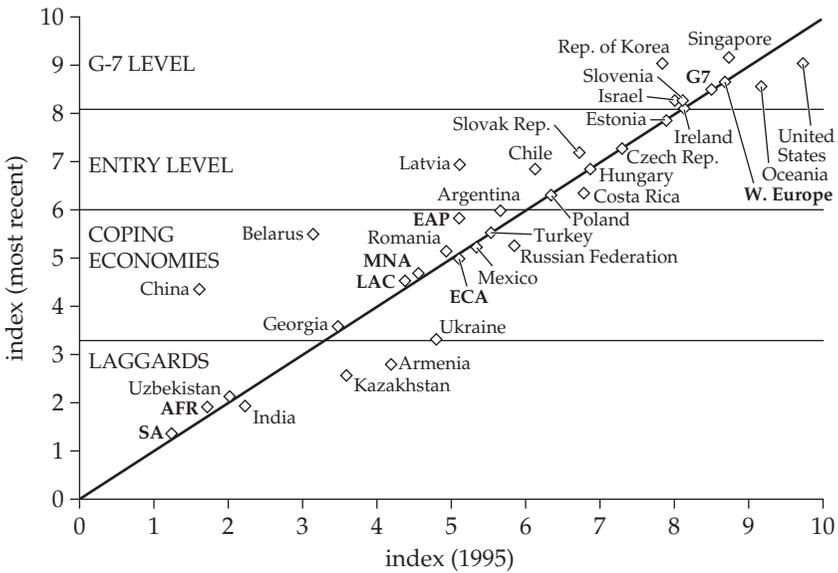
Source: KAM (<http://www.worldbank.org/kam>).

FIGURE 6.9 ARMENIA'S SCORECARD IN INNOVATION



Source: KAM (www.worldbank.org/kam).

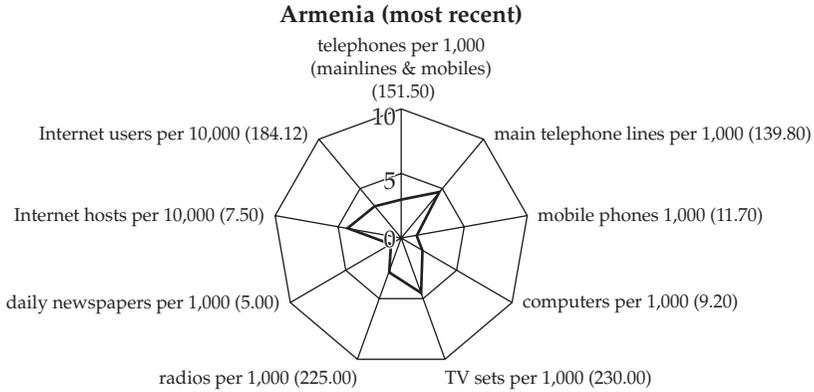
FIGURE 6.10 ICT: ARMENIA AND THE WORLD



Source: KAM (www.worldbank.org/kam).

Internet usage and computer penetration ratios were achieved, but the volume of these improvements was much less significant than those occurring globally. In Armenia the current levels of Internet users per 10,000 people and computers available per 1,000 people are among the lowest in the region and globally. The availability of telephones and

FIGURE 6.11 ARMENIA'S SCORECARD IN ICT VARIABLES



Source: KAM (<http://www.worldbank.org/kam>).

mobile phones per 1,000 people is also very limited—an additional element indicating the profound weaknesses and state of emergency in the telecommunications infrastructure of the country. The gap in performance between Armenia and its selected comparators is tremendous and is apparently widening.

Armenia's lack of growth is paradoxical. There is a high potential of knowledge utilization that shows tantalizing promise (for example, in software and certain enterprises of heavy industry) yet remains largely untapped.

Figure 6.11 shows Armenia's performance relative to the world in ICT variables.

### POLICIES TO STRENGTHEN KNOWLEDGE-BASED COMPETITIVENESS

A pragmatic agenda for change will entail focusing on bottom-up entry points (immediate policy agenda), then scaling them up to assure coordination and concerted action (medium-term policy agenda), and then moving to major reforms (longer-run policy agenda).

Finland, Ireland, and the Republic of Korea are the best-known, best-practice exemplars of concerted action; they have engineered successful transitions to knowledge-based economies. In all of these cases, national economic crises compelled diverse actors to define and implement a new agenda through explicit or implicit national agreements on goals and mechanisms to move forward. The crises also prompted policy makers and private sector leaders to lengthen

the time horizon of the policies adopted. Thus, Nokia—Finland’s first mover toward an innovation-based economy—dramatically increased R&D investments. Finland responded by increasing public R&D and transforming the innovation system to fit business needs. Members of Parliament took courses and went on study tours demonstrating the need for the new agenda. National public innovation organizations played a crucial role by transforming technology into businesses and assuring a critical mass of demonstration cases.

Ireland also exemplifies a successful combination of top-down and bottom-up policies. It made an investment in education and R&D infrastructure in the 1980s, followed by drastic policy changes beginning in 1987. To complement its top-down policies, Ireland instituted pragmatic bottom-up programs, including regional partnerships to mitigate high unemployment and a program to expand national-supplier linkages from FDI. Korea’s powerful and shared national vision—from which impetus a private sector champion emerged—was followed by effective government coordination (see Box 6.1).

Three lessons from the discussion above are relevant for Armenia. First, simple institutional recipes do not exist for concerted action. Armenia will need to devise its own recipe for a KE. Given its great regional diversity, Armenia’s regional and state-level policy initiatives would be a key entry point for a knowledge-based economy. Armenia has already advanced somewhat in that direction.

Second, the experiences of Korea and Finland indicate that even when major crises call for urgent economic transitions, countries must “prepare the bases.” This essential preparatory stage is seen in the initial *Vision Korea Report*. It is seen in Finland’s major effort to facilitate and accelerate business R&D.

Third, although major reform efforts from the top are vital, they may not provide the all-important impetus for transformation. Concerted effort must evolve. Bottom-up experiments in Armenia, some of which are already under way, must mature. These transitional stages then proceed to *concerted efforts* (the Korean knowledge strategy is one example).

Drawing on a diversity of best practices, we suggest that Armenia construct and implement a strategy to move toward knowledge-based competitiveness in three stages:

- *Immediate agenda (2007–08)*: Begin massive awareness-building and initiate pilot/demonstration projects.
- *Medium-term agenda (2008–10)*: Create a springboard for major reforms by assuring major improvements in the investment climate, strengthening stakeholders for reforms, and proceeding with a private sector-led shared vision “Armenia 2025.”

### BOX 6.1 KOREA'S TRANSITION TO A KE: BOTTOM-UP INITIATIVE LEADS TO GOVERNMENT ACTION

In 1998, Korea officially launched a national strategy to move to a knowledge-based economy in the wake of a financial crisis. The initial impetus came from the private sector—the *Maeil Business Newspaper*—which concluded in 1996, even before the crisis, that there was an urgent need for a more coherent vision of the future of the Korean economy. This newspaper launched the “Vision Korea Project” as a national campaign in February of 1997, and developed the first *Vision Korea Report*.

Eventually, the government—the Ministry of Finance and Economy—became the main champion of the KE policy agenda. The Korean Development Institute was a so-called system integrator and coordinated the work of a dozen think tanks. A joint World Bank and OECD report provided a framework, outlining concrete steps for reforms in the various policy domains.

Progress was monitored closely. This was a crucial step in identifying and addressing any inertia or resistance, as for example, with education. Korea's knowledge strategy of April 2000 evolved into a three-year action plan for five main areas: information infrastructure, human resources, knowledge-based industry, science and technology, and the elimination of the digital divide. To implement the action plan, Korea established five working groups involving 19 ministries and 17 research institutes, with the Ministry of Finance and Economy coordinating the implementation. Every quarter, each ministry submits a self-monitoring report to the Ministry of Finance and Economy, which puts out an integrated report detailing progress. The midterm results and adjustments to the plan are sent to the executive director of the National Economic Advisory Council, which reports on the progress of the implementation and gives an appraisal of the three-year action plan to its advisory members.

*Source:* Author's own elaboration.

- *Long-term agenda (2008 onward):* Enact major reforms that would transform and create world-class innovation capacity, education systems, and ICT infrastructure (Table 6.2).

Table 6.2 outlines a medium-term agenda (establishing a springboard for the KE) and a longer-term agenda (creating a world-class KE infrastructure). We view the decade from 1995 to 2003 as a stage of building foundations. Armenia's accession to the WTO in 2003 was an important event signaling that Armenia had a certain macroeconomic and socioeconomic stability and had created the basic institutional

**TABLE 6.2 SEQUENCING OF THE ARMENIA KE POLICY AGENDA**

<i>Stages of economic reform and growth</i>	<i>Major constraints</i>	<i>Drivers of growth</i>	<i>Thrust of government policy</i>	<i>Examples of policy initiatives</i>	<i>Benchmarks</i>
Building foundations 1995–2003	Sustainability of macroeconomic stability and market reforms	Remittances and other transfers from abroad  Infrastructure and services	Assuring macro and social stability  Some initiatives to improve innovation climate	Infrastructure projects  Creation of business council	Signaling event: Accession to WTO (2003)  Other indicators: Investment share in GDP, private investment in GDP (reasonably high)  Level of knowledge-based exports (very low)  Business share in innovation (practically nil)
Establishing a springboard for KE, 2005–8	Dearth of role models and stakeholders for reforms (self-made start-up and spin-off entrepreneurs)	Increasing share of merchandise exports; growing role of services	Assuring a critical mass of stakeholders for reforms through a two pronged strategy:  Top-down: dramatic reduction of administrative barriers to growth  Bottom-up: facilitation of private sector-driven “centers of excellence”	Competitive grant schemes to enhance business innovation  Creation of innovation council	Signaling events: A multinational establishes knowledge-intensive operations in Armenia  Elimination of ArmenTel monopoly  Some skilled emigrants come back and become successful entrepreneurs  Rising share of business R&D and merchandise exports
Major reforms: creating world-class KE infrastructure, 2008–15	Human capital constraint: inadequate stock and flow of technical skills  Inadequate ICT infrastructure	Skill-intensive exports  Robust internal demand	Major overhaul of education, ICT infrastructure, and innovation systems	Wide-scale introduction of income-contingent scheme to finance private higher education	Significant return migration of highly skilled  Robust knowledge-intensive clusters are established

Source: Elaboration by the author.

foundations for a market economy. We argue that the time has come for a new stage of policy: assuring a critical mass of stakeholders for reforms. That, in turn, would imply a two-pronged strategy:

- a top-down approach: a dramatic reduction of the administrative barriers to growth and a dramatic improvement in the investment climate
- a bottom-up approach: the facilitation of private sector-driven “centers of excellence” in innovation, enterprise upgrading, education, and ICT.

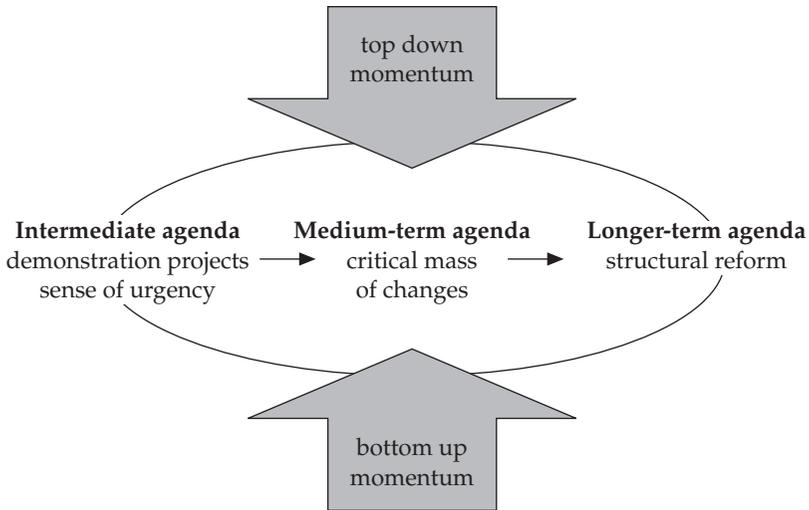
This policy stage should be characterized by more strategic and proactive government policies to improve innovation, the education systems, and the ICT infrastructure. By proactive, we do not mean a sectoral industrial policy of “picking winners.” Rather, the focus should be on functional interventions that are open to all eligible stakeholders and that are designed to accelerate existing policy trends, rather than creating policies from scratch. Examples of policy initiatives in this vein include competitive grant schemes to enhance business innovation (more on this is given below) and the creation of an innovation council to assure linkages among higher education, R&D organizations, and the enterprise sector. Benchmarks and signaling events of the completion of this stage of reform could be as diverse as the following:

- A multinational establishes knowledge-intensive operations in Armenia.
- The ArmenTel monopoly is eliminated.
- Some skilled emigrants come back to Armenia and become successful entrepreneurs.
- This is a rising share of business R&D in the overall R&D budget and of merchandise exports in overall exports.

The achievement of these benchmarks would signal the formation of a critical mass of stakeholders that would allow Armenia to engage in major and quite painful reforms in innovation, in the enterprise upgrading system, and in ICT infrastructure. We will not discuss in detail the long-run agenda for change. What follows focuses on the “what” and “how” of the medium-term agenda (establishing a springboard for a KE).

To summarize, the sequencing of the transition to a knowledge-based economy in Armenia can be conceptualized as focusing on bottom-up entry points (the immediate policy agenda), then scaling them up to ensure coordination and concerted action (the medium-

FIGURE 6.12 VIRTUOUS CIRCLE OF GROWTH AND REFORMS



Source: World Bank staff.

term policy agenda), and then moving to major reforms (the longer-run policy agenda). The art and craft of policy making is about sequencing the various horizons of a policy agenda in a virtuous circle of growth and reforms. A pragmatic agenda to get around the many institutional rigidities that Armenia faces includes the following steps: (i) create the momentum for change by fostering stakeholder awareness; (ii) attain consensus on tackling some of the key obstacles at the national level (to enhance the demand for an institutional change); and (iii) to move ahead with concrete, manageable, bottom-up approaches that can serve as demonstration projects to move the larger agenda (Figure 6.12).

### MEDIUM-TERM AGENDA: ALLEVIATION OF CRITICAL CONSTRAINTS

The arguments about the sequencing of reforms discussed in the previous section have been confirmed by experienced policy observers. For example, Dani Rodrik’s paper (2004) argues that the key to growth is not getting all or most institutions right at once, but rather overcoming the chief bottleneck to raising growth by, say, 2 percentage points a year, and using the proceeds of this improvement to overcome the next bottleneck—and so on. There is a kind of ‘bootstrapping reform’ strategy which provides useful insight into the “how to” of reforms.

As is evident from the analysis in Chapter 1, two major immediate constraints from the perspective of knowledge-based competitiveness are the following:

- an extremely weak and fragmented innovation system, including lack of linkages among the productive sector, the universities, and the research institutes
- the low quality and high prices of ITC infrastructure

From a longer-term perspective, human capital (particularly technical and managerial skills) is a major constraint.

Table 6.3 summarizes the critical constraints from the perspective of the KE, and also the relevant medium-term policy agenda (to be discussed below) for alleviating the constraints.

### **INNOVATION SYSTEM: MAKING INNOVATION RELEVANT FOR BUSINESS**

An innovation system consists of a network of organizations, rules, and procedures that affects how a country acquires, creates, disseminates, and uses knowledge. Key organizations for the creation of knowledge include universities, public and private research centers, and policy think tanks. Private firms are at the center of the innovation system. If the private sector has little demand for knowledge, the innovation system cannot be effective. Effective linkages between R&D and industry linkages are vital to transform knowledge into wealth. Therefore, networking and interactions among the different organizations, firms, and individuals are critically important. The intensity of these networks, as well as the incentives for acquiring, creating, and sharing knowledge, are influenced by the economic incentive regime in general.

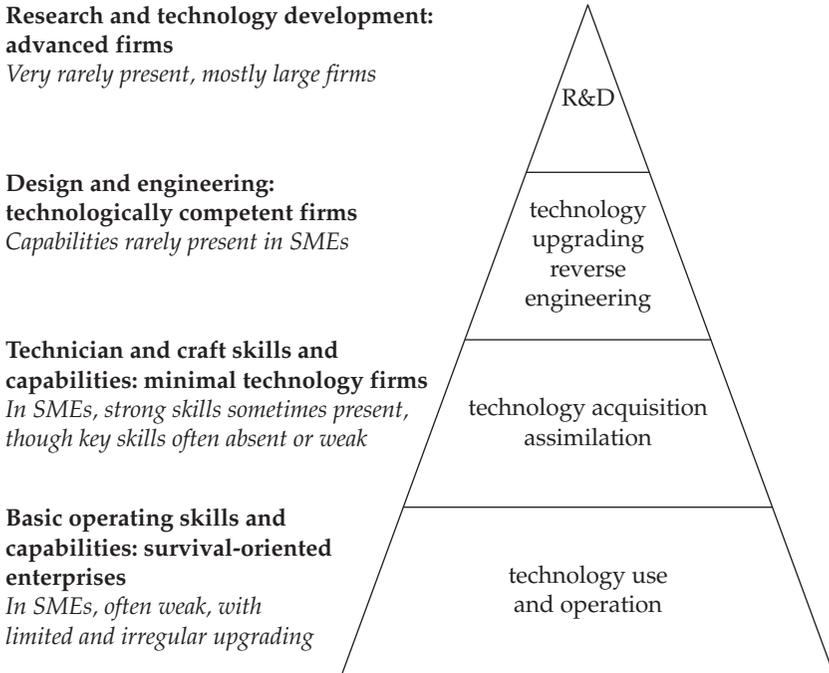
The innovation system framework, as it has been applied to a variety of studies of OECD countries, relies too much on innovation in the sense of the development of radical or incrementally new knowledge. Traditional measurements for an innovation system include indicators of expenditure on R&D, activity in high-technology sectors (biotechnology, ICT), patenting activity (number, intensity), and researchers per 10,000 population. These indicators proxy the ability to generate new knowledge. However, they are not particularly helpful in understanding how a traditional, low-tech manufacturing firm can learn to upgrade its capabilities to compete in a more knowledge-based economy. Rather, these indicators are very often just the top of a pyramid (see Figure 6.13), the bulk of which comprises firms, mostly SMEs, for

**TABLE 6.3 SPECIFIC POLICY INITIATIVES AS ENTRY POINTS TO ADDRESS SYSTEMIC CONSTRAINTS**

<i>System</i>	<i>Main objectives</i>	<i>Specific initiatives</i>	<i>Relevant best practices (discussed in Chapter 3)</i>
<b>Innovation system</b>	Enhance linkages among productive sector, universities, and science organizations	Competitive grant scheme to promote business R&D and training  Seed support to venture capital fund	U.K. Teaching Company Scheme
<b>Education system</b>	Reform curriculum of basic, secondary, and higher education	Technology/design facility on the basis of major university  Distant education project collaboration with diaspora  Establish National Innovation Council to bring together education, R&D organizations, and industry	Competence center models (in design stage in Estonia)
<b>ICT infrastructure</b>	Improve quality of ICT services and reduce their costs	Institutional strengthening of public utility regulator	Liberalization policies in ICT infrastructure in some Central European countries

*Source:* Elaboration by the author.

FIGURE 6.13 THE PYRAMID OF LEARNING CAPABILITIES OF FIRMS



Source: Adapted from Intarakumnerd et al. 2002.

which the major issue is the acquisition of basic skills in marketing, design, engineering, and other operational areas rather than technology upgrading and R&D.

Because of this, the traditional innovation system approach might be applicable to a very limited subset of the economy, such as firms in the export-oriented sectors. It might also be useful for setting long-term goals and objectives, in terms of creating the elements missing in the traditional approach. Table 6.4 flags a range of policy interventions—which should be considered as a menu of options, not all of them immediately relevant for Armenia.

Armenian policy has a narrow view of technological development, which is equated with R&D. The underlying model of technology development describes firms only as the demand side, relative to the supply side that is provided in R&D institutes and universities. Policy considers that the key to reducing the technology gap is not in the technology activities of enterprises themselves but through the expansion of intermediary institutions such as technology centers

TABLE 6.4 MATCHING POLICIES TO CAPABILITIES: A RANGE OF INSTRUMENTS TO SUPPORT INNOVATION

<i>Type of enterprise</i>	<i>Policy objectives</i>	<i>Instruments and interventions</i>
<b>Survival-oriented enterprises</b>	To build basic competitive capabilities by fostering awareness of scope and benefits of innovation	<ul style="list-style-type: none"> <li>■ business advisory and support services—SME and micro-enterprise support agencies</li> <li>■ facilitation of access to finance (including micro-finance)</li> <li>■ management and skills development</li> </ul>
<b>Minimum technology firms</b>	To foster competitiveness by introducing basic innovation skills and encouraging adoption and application of new ideas	<ul style="list-style-type: none"> <li>■ support for business development, diversifying customer base</li> <li>■ product diversification and quality improvement</li> <li>■ management and skills development</li> <li>■ Internet-based information services</li> <li>■ technology awareness and marketing</li> <li>■ support for technology adoption and adaptation projects</li> <li>■ cluster-based approaches to stimulating innovation</li> </ul>
<b>Technologically competent enterprises</b>	To support market development and entry into global value chains by fostering strategic alliances and certain in-house innovation capabilities	<ul style="list-style-type: none"> <li>■ business development, exports market support</li> <li>■ Internet-based information services</li> <li>■ technology transfer support</li> <li>■ incubators and technology parks</li> <li>■ linkages with academic researchers</li> <li>■ laboratory services and metrology services</li> <li>■ consultancy and technical assistance support, such as on commercialization, intellectual property rights, licensing, patenting</li> <li>■ supplier development and linkage promotion programs</li> </ul>
<b>Advanced enterprises</b>	<p>To facilitate moving up global value chains by upgrading in-house innovation capabilities and strategic alliances</p> <p>Diffuse experience of innovation leaders as role models for the rest of the economy</p>	<ul style="list-style-type: none"> <li>■ support for participation in international R&amp;D networks (such as the EU 6<sup>th</sup> Framework Program)</li> <li>■ technology and other innovation-based spin-offs</li> <li>■ university-industry collaboration</li> <li>■ support for commercialization</li> <li>■ development of vibrant venture capital industry</li> <li>■ encourage participation of national innovation leaders in national advisory bodies, technology foresight, and cluster processes</li> </ul>

Source: Elaboration by the author.

and science and technology (S&T) parks. The problem of technology development is reduced to the issue of the commercialization of R&D results.

Treating industry only as demand side is quite misleading because industrial firms not only generate the demand for industrial technology but they account for a very large part of the supply side as well. In fact, most of the technology-generating capabilities are located in the industry (that is, in firms themselves, not in extramural organizations such as S&T parks and R&D institutes). Business enterprises fund between 50 and 60 percent of the general expenditures on research and development (GERD) in North America, the EU, and the Nordic countries, and they perform between 60 and 70 percent of the GERD. Thus, the issue for Armenia is how to increase R&D in the business sector, not outside of it. In addition, using only R&D can be misleading as a large contribution to technology development is made by types of technical change that do not involve formally organized R&D at all.

Innovation surveys from the EU and Central European economies show that the key source of important information for innovation comes from enterprises themselves or from partners in value chains (suppliers, buyers). Infrastructure institutions are actually marginal as a direct source of information for innovation. The importance of non-R&D technology development suggests that it is inappropriate to narrow down innovation policy to just R&D policy and to bridging institutions. In fact, infrastructure institutions are much more important as sources of knowledge and skills carried by people who move among universities, R&D institutes, and firms, or between firms. Information services, training, and standard services as well as problem solving and R&D in all forms of people-centered types of output are the key function of extramural technology institutes. One of the most important roles played by R&D in public technology institutes is to contribute flows of people into the technological activities of industry.

In Armenia, as in many Eastern European and CIS countries, there seems to be a dearth of measures that stimulate firms to undertake their own technology development. Policy is focused much more on measures that support institutions in undertaking S&T activities on behalf of industrial firms. Within the innovation policy, there are no policy measures that support and facilitate actions by firms themselves.

In a nutshell, Armenia should avoid an exclusive focus on supporting technology institutions in a supply-driven approach, with support to extramural institutions rather than to firms. The balance should be corrected between a focus, on the one hand, on directly strengthening the technology development capabilities and activities of firms, and on the other hand, building and strengthening various kinds of tech-

nology development and transfer institutions. Currently, there is not a system that would support firms to advance from technology use and maintenance to technology development and creation.

Mechanisms to support technology transfer institutions (such as S&T parks) are an important component of the policy system. However, a major emphasis in policy development should be on mechanisms that assist and empower firms to make their own investments into technology absorption and development. Within that firm-centered approach to policy, increasing emphasis has to be given to stimulating and facilitating various forms of collective activity involving groups of firms. These groups may be established industry associations, or less formally structured groups organized around value chains, or clusters of firms in related industries.

Among instruments for financing innovation in Armenia, grant-based mechanisms are notably absent. These mechanisms commonly provide grants to firms which undertake particular kinds of technological activity (such as R&D, design, technological or managerial training, engagement of consultants, employment of qualified scientists and engineers, and many others). In most cases, the grants cover a defined proportion of the costs of the specific activity.

### **ICT INFRASTRUCTURE: ASSURING ENTRY OF NEW SERVICE PROVIDERS**

The beginning of this chapter documents a very low level of development for ICT infrastructure. Figure 6.1 shows that Armenia performs just below the average for economies of the FSU, which is hardly satisfactory given Armenia's peculiar geographical position and aspirations to develop a competitive ICT cluster.<sup>5</sup> This is mainly attributable to one single problem: the ArmenTel monopoly, which has been addressed in earlier chapters.

### **FORMATION OF HUMAN CAPITAL: ENHANCING EDUCATION-INDUSTRY LINKAGES**

Many problems in the education sector, especially in the school system, are well understood and are being addressed through existing and planned reforms. This section will focus in more detail on the education-industry linkages.

*Chronic underspending.* Armenian public spending on education is 2.8 percent of GDP, well below the OECD average of 5 percent and the

rate in other transition economies. Private spending is also low (less than 0.5 percent) as is education as a proportion of public spending (11 percent).

*Inefficiency.* A dramatic fall in the school-age population since independence, plus only modest reductions in staffing levels, has resulted in staffing ratios which are low in international terms and, more important, unsustainable in the Armenian context. For example, there are only about 11 pupils for every full-time equivalent teacher. The Medium-Term Expenditure Framework (MTEF) proposes increasing these overall ratios to one teacher for every 16 students.

*Lack of relevance.* There has been little reform of the curriculum, the assessment methods, or the teacher training since independence. The main challenge is the transition from a teacher-centered to a student-centered learning approach. Reforms supported under the EQ&R project will be a major step toward meeting this challenge.

*Equity.* Enrollment in basic education continues to fall, and is now below 85 percent. Low levels of public spending have resulted in increasing levels of informal payments in “free” basic education. In higher education, expansion has been mainly in private institutions and fee-paying places at public institutions. While this has increased access—though still for only 16 percent of the cohort—public spending overwhelmingly favors the rich, since state scholarships are given mainly to those who score highest on the entrance examination.

*Governance and management.* One of the biggest and most difficult challenges Armenia faces is to move away from the top-down system of management, in which the Ministry of Education passes directives that are then uniformly applied to all institutions and in which the flow of information is one way and is used to control rather than empower local actors.

*Tertiary education.* A major stakeholder conference was held in November 2002, organized during the preparation of SAC V. The equity concerns have been mentioned above.

The lack of quality assurance mechanisms (accreditation, inspection, and so forth) means that students and other stakeholders cannot choose better institutions and courses, and good-quality private institutions are undermined by a small number of fly-by-night operators. Investment is low or nonexistent, resulting in poor quality, outdated teaching environments, and an almost complete absence of international level research.

## EDUCATION-INDUSTRY LINKAGES

Historically, Armenia has had a highly educated population, and educational attainment figures have remained remarkably high since independence despite the low levels of spending. However, the skills and knowledge that individuals have acquired have become increasingly obsolete in the labor market. Much of the education would have been fact-based information learned by rote; and, even if the education were more relevant to the labor market, high levels of unemployment, underemployment, and informal employment would have eroded skills and knowledge. Older adults, though they are more likely to be employed, would also have worked for longer periods in state-owned, static industries.

The story of a private company Lycos illustrates the main issues and options for enhancing education industry linkages. Lycos is a fully owned subsidiary of the German-based Lycos Europe. Lycos Armenia is integrated into Lycos Europe's network of competence centers in Gutersloh, Copenhagen, Hamburg, Munich, Paris, and Stockholm for the development of its core services: search, communications, communities, and shopping. Lycos Armenia is in the software development business (Web posting, e-mail, chat room communities, e-commerce) and provides technical support to the Lycos Europe portal. Importantly, the company works closely with two universities in Yerevan and provides grant funding of about US\$500,000 for a two-year bachelor's degree program in Internet computing designed primarily by Lycos staff. Sixty to 70 percent of the lectures are also given by Lycos staff. Throughout the program internships are also offered in the Lycos offices in Armenia and elsewhere in Europe. The top graduates of the program are usually hired by the company.

The fact that a private company establishes its own training programs and, more important, does this in collaboration with major Armenian universities, is promising. This indication of the effective demand of private sector and private sector initiative is a foundation on which a coherent private-sector-led system of lifelong learning can be built. The following options for expanding and accelerating the existing education-industry linkages could be considered:

- Distance learning as a pilot project (Box 6.2). The advantage of this potential distance learning project is that it would bring together the ICT and education dimensions. As Box 6.2 outlines, the Armenian diaspora can become involved in a new and productive way. In addition, as worldwide experience of distance learning indicates, these projects are easily scaled up and expanded when successful.

### BOX 6.2 DISTANCE LEARNING AS A POTENTIAL PILOT PROJECT TO ENHANCE EDUCATION-INDUSTRY LINKAGES

Distance learning could be a low-cost opportunity for Armenia to accelerate the transfer of global knowledge and drastically upgrade the quality of teaching in its universities. For a landlocked, remotely located country, the modern technology could provide the following group of primary benefits:

- Access to high-caliber professors and lecturers, who would initially demonstrate how the core modern curricula should be delivered to students and therefore would greatly contribute to the training and retraining of trainers (local professors). The availability of various professional talent in the diaspora and the existence of an established professional diaspora network would simplify the future mobilization of potential participants and could further reduce project costs (many diaspora members may be ready to supply such lecturing on a pro bono basis). Recent examples from Turkey and Thailand confirm the feasibility of such an approach.
- Online access to modern experimental facilities and academic libraries.
- Economies of scale, including low-cost dissemination/sharing of popular courses among various local universities and training centers.

As with many other collective diaspora initiatives, the distance learning project, especially in the area of engineering, is likely to lead rather quickly to the second generation of (indirect) benefits. As experience from other countries suggests, professionals participating in advanced educational projects abroad tend to be eager to launch new business ventures with their local partners and frequently with their former students. On the parallel track, collective efforts of diaspora activists in the area of university education has the potential to evolve gradually toward more business-oriented projects, undertaken basically by the same group of initial diaspora sponsors, such as those associated with university business incubators.

*Source:* Elaboration by the author.

- Establishment of a Skills Development Fund to encourage enterprise sector training, subject, of course, to a thorough cost-benefit and fiscal priority assessment.

## SUMMARY AND KEY RECOMMENDATIONS

Armenia enjoys various advantages that should lead to future growth that is based on innovation and the skilled use of knowledge-intensive assets: it has a core of well-educated and motivated labor, the incentive regime is in place, and there are international linkages. But local entrepreneurship has been weak, and ICT is handicapped by high telecommunications costs and low R&D spending. In addition to the reform in competition discussed earlier, the government could facilitate private sector-driven centers of excellence in innovation and enterprise upgrading. The government could also pursue reforms in education, infrastructure, telecommunications, and aviation to take explicit account of the need to support ICT and innovation.

- business advisory and support services—SME and micro-enterprise support agencies
- facilitation of access to finance (including micro-finance)
- management and skills development
- Internet-based information services
- support for technology adoption and adaptation projects
- cluster-based approaches to stimulating innovation
- support for participation in international R&D networks (for example, the EU 6th Framework Program)
- encouragement of participation of national innovation leaders in national advisory bodies, technology foresight, and cluster processes

## NOTES

1. In figures like the one presented in Figure 6.1 the reader should note the following points. On the horizontal axis the 1995 KEI scores are plotted. On the vertical axis the KEI scores for the most recent year are plotted. The more advanced KE performers plot in the northeast quadrant of the graph, while the weaker ones plot in the southwest quadrant of the graph. Both the position along the 45-degree line and whether a country plots above or below the line are significant. The countries or regions that are plotted below the line indicate a regression in their performance relative to where they were in 1995. The countries or regions that are marked above the line signify an improvement in their position in the latest period compared to their position in 1995. Those countries that are plotted on the line have maintained their relative position over the two periods. Each country's performance as depicted in the figure is relative to the performance of the total country sample included in the KAM (121 countries).

2. This reflects 2003 data from the Heritage Foundation. Nevertheless, the Heritage Foundation states the following in 2004 Index of Economic Freedom: "In 2001, according to the World Bank, Armenia's weighted average tariff rate was 2.5 percent, up from the 1.9 percent reported in the 2003 Index of Economic Freedom by the Heritage Foundation." The U.S. State Department reports that most imports are free of prohibitions, quotas, or licensing, but businesses complain about "cumbersome procedures [and] bribes solicited by customs officials." Based on new evidence of customs corruption, Armenia's trade policy score is 1 point worse in this year (2004).

3. In this analysis 15 FSU countries are ranked by the following FDI driving elements: liberalization and deregulation of business activities, stability and predictability of the legal environment, corporate and public governance, liberalization of foreign trade and international capital movements, financial sector development, corruption level, political risk, country promotion and image, and targeted investment initiatives.

4. Based on statistical information management and analysis (SIMA) data for the year 2000, Armenia is performing better in tertiary enrollment rates than Albania, Tajikistan, and Turkey.

5. This section relies on the Public-Private Infrastructure Advisory Facility (PPIAF) presentation, "Sector Overview and Review of International Experience, Identification of Bottlenecks and Recommended Roadmap to Develop a Rural Telecommunications Strategy in Armenia" (PPIAF 2004).

## **Part II: Detailed Analysis**



## CHAPTER 7

# Growth Analysis from the Perspective of Employment Generation and Poverty Reduction

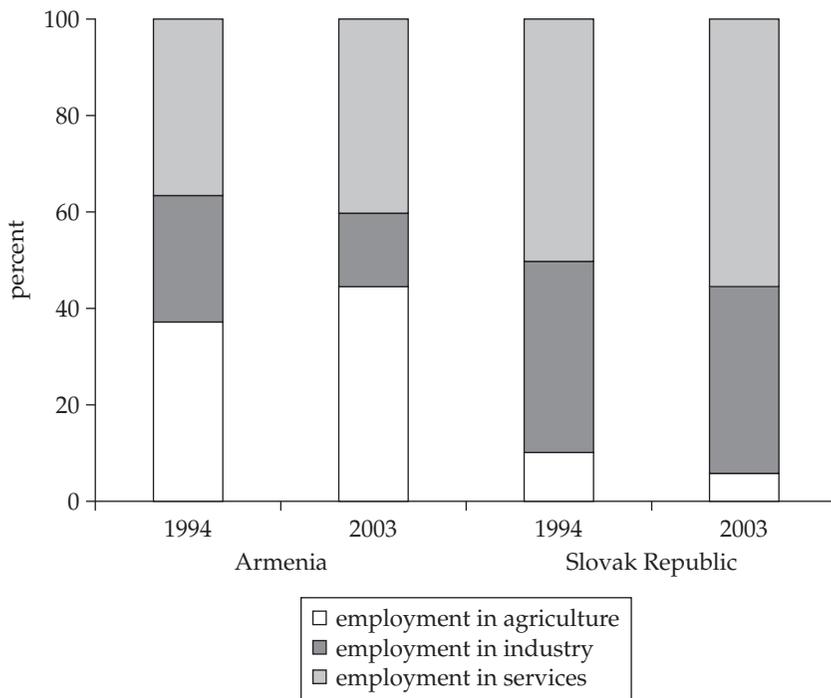
### SUBSECTORAL GROWTH, INVESTMENTS, AND EXPORTS

#### Sectoral Growth

This chapter<sup>1</sup> discusses the economic transformation that is associated with job creation outside of subsistence agriculture and financial deepening—processes that took place in new EU member countries. The transformation has been slow in Armenia, but has started to pick up recently. Agriculture's contribution to GDP in Armenia continues to be high at 25–30 percent and its contribution to employment is more than 45 percent, well above the levels of 4.5 percent and 5 percent in new EU member states. Agriculture is concentrated in low value-added products (dairy, meats, and grains). The services sector, which is concentrated in public administration and trade, generates 35–37 percent of GDP in Armenia, compared to more than 60 percent in new EU member countries (Figure 7.1).

Growth was led by construction and industry (including manufacturing), mainly through power production, food processing, and beverages, and in part by services, through trade and catering (but with services growth being notably slower than in other fast-growing transition economies) and mirrored export and investment performance.

Sectoral contributions to GDP have changed dramatically over the past decade. The most striking feature has been the growth of the services sector and construction at the expense of industry (Table 7.1). Changes in relative prices had a dramatic impact on agriculture (that is, a decline in agriculture terms of trade since the 1998 Russian crisis). Real agricultural prices have been declining until recently, while real prices in services (led by the utility price adjustment) and

FIGURE 7.1 ARMENIA AND THE SLOVAK REPUBLIC,  
EMPLOYMENT BY SECTORS, 1994–2004

Source: WDI.

TABLE 7.1 SOURCES OF GDP GROWTH IN ARMENIA,  
BY SECTOR

<i>Sector</i>	<i>Share in GDP (percent)</i>	<i>Contribution to GDP US\$ million</i>
Agriculture	24.8	531.3
Construction	13.9	298.6
Diamonds	1.9	40.7
Dwellings	3.2	68.2
Industry	7.0	151.1
Manufacturing	11.9	254.8
Services	37.3	800.8
Total	100.0	2,145.5

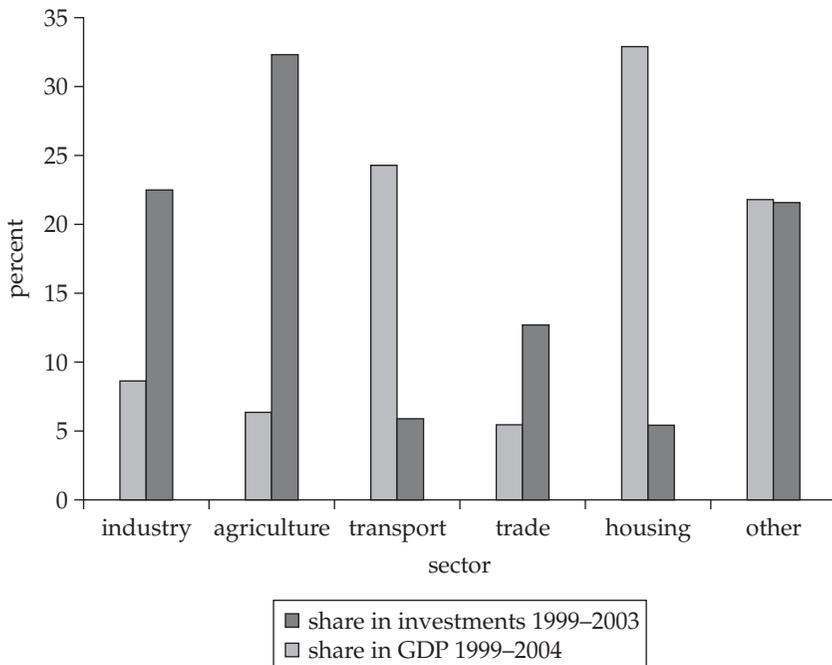
Source: SAM (Chapter 8 of this book).

industrial prices have been increasing consistently. Agriculture, which grew at a slower pace than the rest of the economy during the 1990s, has absorbed a surplus of (unskilled) labor released in the process of economic transformation. The fastest growing sector in the economy—construction—has made a significant contribution to job creation: the share of the labor force employed in construction has risen from 4 to 9 percent over the past five years. Job creation in industry in recent years was mostly concentrated in new private enterprises. Out of 26,500 jobs created in industry during 1999–2003, 22,000 were established in newly created private enterprises.

### Investments

The sectoral composition of investments shaped the sectoral growth pattern. Figure 7.2 presents the structure of investments by sectors with housing representing about 30 percent of total investments during 1999–2003. Infrastructure has also attracted a considerable share of

FIGURE 7.2 SECTORAL SHARES IN GDP AND INVESTMENTS  
(AVERAGE)



Source: WDI.

investment. Several profitable and competitive traditional sectors have attracted private investment during the process of economic transformation (for example, gem cutting, brandy making, electric motors, hotels, high-technology manufacturing, and software services).

A significant source of investment financing has been foreign direct investment (FDI). The major portion of FDI, both in infrastructure (telecommunications through the privatization of the national telecommunications company, ArmenTel) and in industry (privatization of the gas distribution network), was the direct result of large-scale privatization. Two Russian companies, including Gazprom and the energy corporation Itera, and the Greek OTE, are among the main investors in the country. The third largest foreign investor is Canada, with about 11 percent of the total investment, followed by the United States with 10 percent of the total cumulative investment. France, Luxembourg, the United Kingdom, Cyprus, Italy, Belgium, and Switzerland are other large investors in the country.

FDI in the agro-processing sector, especially in beverages, has in several cases stimulated technology transfer and changes in the production pattern. One of the largest privatization deals in this sector involved the sale of the Yerevan Brandy Factory (YBF). The privatization of YBF generated strong linkages between farmers and buyers of agricultural produce. But this example is one of very few and an indication of the barriers that deter stronger private investment, both domestic and foreign, to the sectors with high export and growth, high value-added activities, and therefore high profit potential.

## **Exports**

Further analysis of the investment structure is limited by the lack of detailed and consistent data on a micro level. The analysis of export performance gives a good indication of the sectors that have managed to attract investments.

Armenia's exports have experienced impressive growth since the mid-1990s. In real terms, exports have grown by 13 percent per year since 1995. The share of exports in GDP has steadily grown and in 2003 the share of exports in GDP was 32 percent. Since 1995, Armenia has experienced impressive growth in its volume of trade—a trend only temporarily dampened by the Russia crisis. Table 7.2 shows the sources and sectoral distribution of exports in Armenia as given in 2002.

The composition of exports has registered some encouraging developments, with exports diversifying toward high value-added manufacturing goods and services. However, exports still remain quite concentrated, with precious stones and metals accounting for more

TABLE 7.2 SOURCES OF EXPORTS IN ARMENIA, 2002, BY SECTOR

<i>Sector</i>	<i>Share in total exports (percent)</i>	<i>Contribution to exports (US\$ million)</i>
Diamonds	37.0	258.0
Other	31.2	217.6
Heavy metals & machinery	14.4	100.4
Manufacturing	13.9	97.1
Electricity supply and dist.	1.9	13.4
Agriculture	1.6	11.5
Total	100.0	698.0

*Source:* SAM, 2002 (Chapter 8 of this book).

than 40 percent of total exports. Uncut gems are imported into the country, are cut and sometimes mounted as finished jewelry, and then re-exported to Europe or the United States. Other large exports are food products and machine products. Armenia also demonstrates a high share of services exports. However, a closer look at the composition shows that service exports are sensitive to transportation costs. Armenia's exports tend to be concentrated in the sectors with low or no transport costs (cut diamonds, services, electricity).

The analysis highlights the following features of Armenian trade:

- The integration of Armenia into world trade remains limited and has not seen major improvements outside of the diamond trade.
- Armenian exports have become increasingly concentrated, even compared to other countries with a large share of mineral exports, which makes the exports more volatile and vulnerable to changes in external conditions, such as input arrangements and prices.
- Over the past decade the number of goods in which Armenia has demonstrated a revealed comparative advantage (RCA) has not expanded significantly (Table 7.3).
- Armenia also demonstrates a high share of services exports. However, a closer look at the composition shows that service exports are sensitive to transportation costs. Armenia's exports tend to concentrate in sectors with low or no transport costs (cut diamonds, services, electricity).
- Trade in services may have increased substantially, but trade data will not capture this, owing to transfer pricing by firms and the general bias toward "goods" trade by statistics departments (Figure 7.3).

TABLE 7.3 ARMENIA: REVEALED COMPARATIVE ADVANTAGE, 2003

<i>Revealed comparative advantage</i>	2003
Diamonds, not industrial, not set	75.7
Beverages	16.1
Metalliferous ores and metal scrap	12.0
Electric energy	10.1
Nonferrous metals	6.6
Nonferrous metals	1.5
Fruits and vegetables	1.1
Iron and steel	1.0
Electrical machinery, apparatus	0.1

Source: World Integrated Trade Solution (WITS). <http://wits.worldbank.org>.

Note: The index for country  $i$  good  $j$  is  $RCA_{ij} = (X_{ij} / X_{it}) / (X_{wj} / X_{wt}) * 100$  where  $w =$  world and  $t =$  total for all goods. The RCA index compares the composition of exports of a country with the composition of total world exports. An RCA index higher than 1 indicates that a country has a strong RCA in the export of the product. An RCA index lower than 1 indicates that the country has a comparative disadvantage in that product. An RCA index equal to 1 indicates that the country has neither an advantage nor a disadvantage.

## LINKS BETWEEN GROWTH, EMPLOYMENT, AND POVERTY

### Impact of Growth on Poverty

A strong and almost decade-long rise in national income and, to a lesser extent, a reduction in inequality have been the two factors that have contributed to poverty reduction in Armenia. Since 1994, Armenia has grown at a remarkable average annual rate of over 7 percent and by 2004 its real GDP reached the pre-transition level. In addition to output growth, private foreign transfers—invested mostly in construction—and remittances have played a key role in raising the national income. Both sources of growth in aggregate demand have triggered a high induced household income multiplier<sup>2</sup> and produced strong spillover effects that have benefited multiple households.

The poorest population in Armenia saw the strongest increase in consumption. Estimates based on the Armenia Integrated Living Conditions Survey (ILCS) indicate that *Armenia saw a considerable decline in extreme poverty during 1998–2004*. About 17 percent of the population, or more than half a million people, have moved out of poverty in the past *five years*. About 9 percent of the population, or 0.23 million people, escaped the basic food deprivation. This evidence is consistent with the evolution of inequality for the period—the Gini coefficient

FIGURE 7.3 MATRIX: CLASSIFICATION OF ARMENIAN EXPORTS BY COMPOSITION AND DESTINATION, 2003

SICT	6672	68	11	28	67	89	35	72	05
Export	Diamonds	Nonferrous metals	Beverages	Metal ores & scrap	Iron & steel	Miscellaneous manufacturing	Electric energy	Electrical machinery	Fruit & vegetables
Israel	♦								
Belgium	♦								
Russian Federation		♦	♦	♦		♦		♦	♦
Germany		♦			♦				
Netherlands				♦					
UAE	♦			♦		♦			
United States				♦		♦			♦
United Kingdom		♦		♦					
Switzerland				♦	♦				
Georgia							♦		
Iran		♦		♦			♦		
Ukraine			♦						
Greece		♦							
China		♦		♦					
Turkmenistan								♦	
Thailand	♦								
Canada	♦								
Belarus			♦						

Source: WITS database. <http://wits.worldbank.org>.

Note: SICT: Standard International Trade Classification

decreased from a value of 0.299 in 1998–99 to a value of 0.259 in 2004—and indicates that the growth was accompanied by a compression in the overall structure of consumption distribution.

Growth has been channeled to the households through multiple sources that have increased both factor and nonfactor income. A strong growth in factor income from both labor and capital was accompanied by a stable growth in remittances and a consistent improvement in public transfer programs. In fact, household income from all main sources rose in real terms between 1998–99 and 2004. Factor income remained a dominant source of household income for all quintiles, followed by income from remittances and public transfers. Such a multiplicity of income sources has benefited various types of households and resulted in a broad-based poverty reduction in Armenia.

*Growth in factor income* mirrored growth in output<sup>3</sup> and was based on large productivity gains that were due to structural changes and labor shedding in the process of labor rationalization, and to a lesser extent, to a rise in employment. Survey data point to a 17 percent unemployment rate, which is an estimated 35 percent reduction in the unemployment rate estimated in 1998–99, but it is still the highest unemployment rate registered among the transition countries. In addition, much of the work force is to be found in low-paid subsistence agriculture, trade, the informal economy, and temporary employment. While the demand for additional formal labor grew slowly, productivity gains secured stronger earnings for current workers with stable employment arrangements, with real wages seeing a 50 percent increase between 1998–99 and 2003. The investment contribution to growth was also considerable and the share of capital value added in Armenia's GDP has increased over time. Income from capital has been growing rapidly, benefiting those who owned and/or received the assets at the outset and/or are in the process of economic transformation. Armenia's recent growth has also benefited from large foreign capital transfers invested mostly in the construction sector, which is characterized by a strong income multiplier effect on employment, and therefore on household incomes.

In addition to factor income, both public and private transfers have played an important role in boosting household income in Armenia. *The poor rely heavily on government transfers* (such as pensions, social assistance, and other transfers), with this source representing about 20 percent of household income and the third largest source of income (after labor income and remittances) in the poorest quintiles. Social protection benefits have increased in the past five years in real per capita terms. Benefits have also improved in terms of targeting the poorest, with the family poverty benefit system becoming an effective mechanism for reaching the poor.

### Box 7.1 RECONCILIATION OF NATIONAL ACCOUNTS AND THE HOUSEHOLD SURVEY DATA

The National Accounts succeed in understanding Armenia's underlying production technology, trade position, and final demand structure. However, the use of a "representative" household agent for total demand makes it impossible to determine whether economic growth in Armenia is helping to alleviate poverty. In our study we have scaled total household incomes to meet total factor endowments and total (official) transfers from abroad, from the government, and from investment. For poor households, this leads to a significant divergence from reported income from the 2002 Household Survey.

The most onerous problem when using household data is to reconcile household consumption against household income. Several of the poorer deciles in Armenia report far lower incomes than they report expenditures. Even when government and family transfers are included, expenditure for the poorest decile in Armenia is at least 10 times as large as income.

Indeed, according to the *Statistical Handbook* based upon the 2002 Armenian Household Survey (Table 1, p. 51), 2002 total monthly per capita income was 12,776 drams. Of this, monetary income was 9,781 drams and nonmonetary (that is, own-produced value of consumption) monthly income was 2,995 drams. Annual monetary income, based on the survey, is then 117,372 drams per year ( $12 \times 9,781$ ), or US\$204.83 per year, taken at market exchange rates. This implies that average income is US\$0.56 per day. However, when using the National Accounts, we find that total value added (GDP at producer prices) is US\$2.145 billion. Using 3.1 million as the national population, per capita income is US\$1.90, more than three times as large as income from the Household Survey. During the reconciliation, some of the differences between rural and urban incomes can be attributed entirely to the investment account.

*Source:* SAM (Chapter 8 of this book).

Remittances and other private transfers by far exceed publicly provided resources in Armenia.<sup>4</sup> They accounted for more than 10 percent of GDP during this period and boosted consumption levels, including among the poor, thereby helping to reduce poverty. An increasingly large number of households receive remittances reaching 50 percent of the monetary income of recipient households. Remittances have a direct effect on the recipient households' well-being as well as strong secondary multiplier effects for those who do not receive

remittances directly. External remittances comprise a large share of overall monthly income for households that receive them, which suggests that remittances have significantly improved the well-being of the poorest households and have been critical for keeping these quintiles out of poverty.

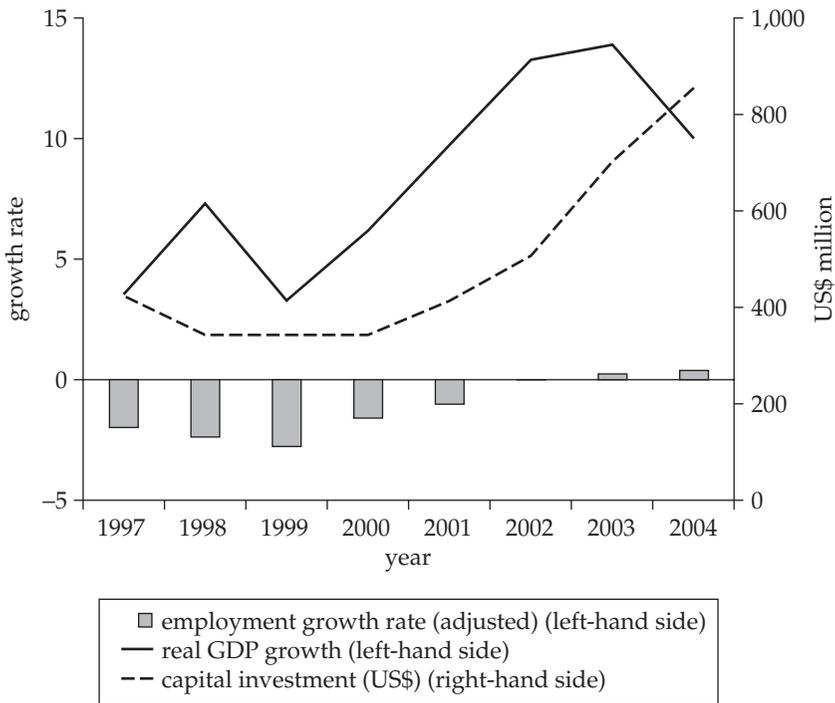
### **Impact of Growth on Employment**

Armenia's labor force comprises about 50 percent of the total population, which is comparable with the situation in other European countries. The situation with employment, however, is much worse in Armenia than in comparator countries. In contrast to the strong growth performance in Armenia, the evolution of aggregate employment during the 1990s was negative. The labor force remains poorly utilized; the labor participation rate is low and unemployment is rampant (over 19 percent). The formal employment level is low and the main source of employment growth until recently was through the expansion of self-employment and low value-added agriculture and trade. High emigration has been negatively affecting the domestic supply<sup>5</sup> of young and skilled labor, combined with slow growth on the demand side especially with slow growth in skilled jobs. Data on wages by professions suggest that the strongest increase was recorded in skilled labor, but, as mentioned above, the number of skilled job positions created was limited. The upswing has been shared by a range of professions, including unskilled and semiskilled labor.

An economy's long-term growth is driven by the evolution of its underlying supply factors of production and physical and human capital, and by the development of total factor productivity. In Armenia, the positive output trend has not translated into employment growth, and formal employment is currently below that reported in the early 1990s (Figure 7.4). Total factor productivity growth seems to be capturing most of the growth pattern, reflecting efficiency gains stimulated by structural changes over the mid-1990s and early 2000s.

As with other transition countries, the surge in unemployment in Armenia was anticipated given the massive economic and geographic reallocation of labor during the transformation. This phenomenon, called "jobless growth," is not specific to Armenia but is typical of most transition economies, where initial growth is mostly based on large productivity gains due to structural changes and labor shedding in the process of labor rationalization and more efficient utilization of labor resources, rather than through an increased use of the labor force. In the process of a country's search for new equilibrium, the destruction of unproductive jobs is accompanied by the creation of new and more productive jobs. However, job losses usually exceed job gains, leading to a net fall in employment.

FIGURE 7.4 REAL GROWTH AND FACTORS OF PRODUCTION, 1997–2004



Source: Armenian Department of Statistics.

According to the household surveys, which are based on self-reporting, unemployment overall was 29 percent in 2002, down only 2 percentage points from 2001, with most of the decline being in Yerevan, where unemployment fell by 7 percentage points between 2001 and 2002. The persistence of high unemployment and underemployment even after more than a decade of economic growth may reflect some underlying structural problems.

The pace at which the Armenian economy will be moving toward its new equilibrium, and the pattern it will assume, will depend on a variety of factors. We focus our analysis on a few of these factors which are relevant to our analysis (for example, the issues related to the flexibility of labor markets are deliberately omitted as they are being examined in the paper on labor markets).

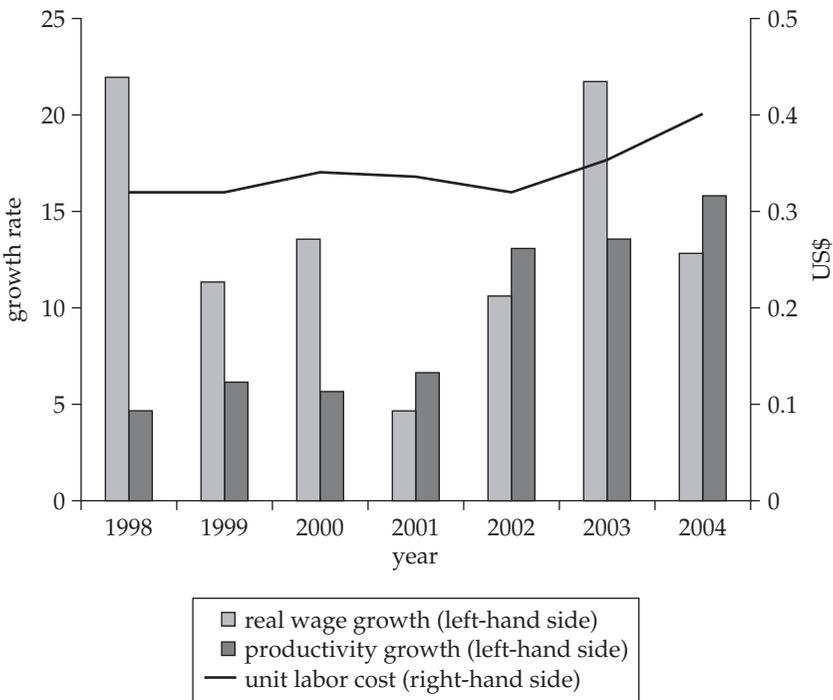
Strong labor productivity growth and an increase in the unit labor cost of current workers have crowded out the short-term potential for new employment. In general, growth in labor productivity, if associated with slower growth in real wages, reduces unit labor costs and

creates room for new employment. In Armenia, rapid growth in labor productivity was accompanied by an increase in hourly compensation above the productivity growth level.

Armenia started from a low level of productivity but exhibited one of the fastest productivity growth rates among the comparator countries. Labor productivity in Armenia grew continuously over the last decade, and this growth accelerated during the early 2000s (Figure 7.5). During this period Armenia realized much of the “catch up” potential which arose following the economic transformation.

As a result of this rapid productivity growth, the productivity gap between Armenia and industrialized countries has narrowed; however it remains substantial and accentuates the importance of sustaining recent growth rates. The high growth rate of labor productivity was mainly due to Armenia’s comparative advantage of an educated and skilled workforce and the country’s strong tradition of having highly skilled craftsmen.

FIGURE 7.5 REAL WAGE GROWTH AND PRODUCTIVITY GROWTH, UNIT LABOR COST (US\$), 1998–2004

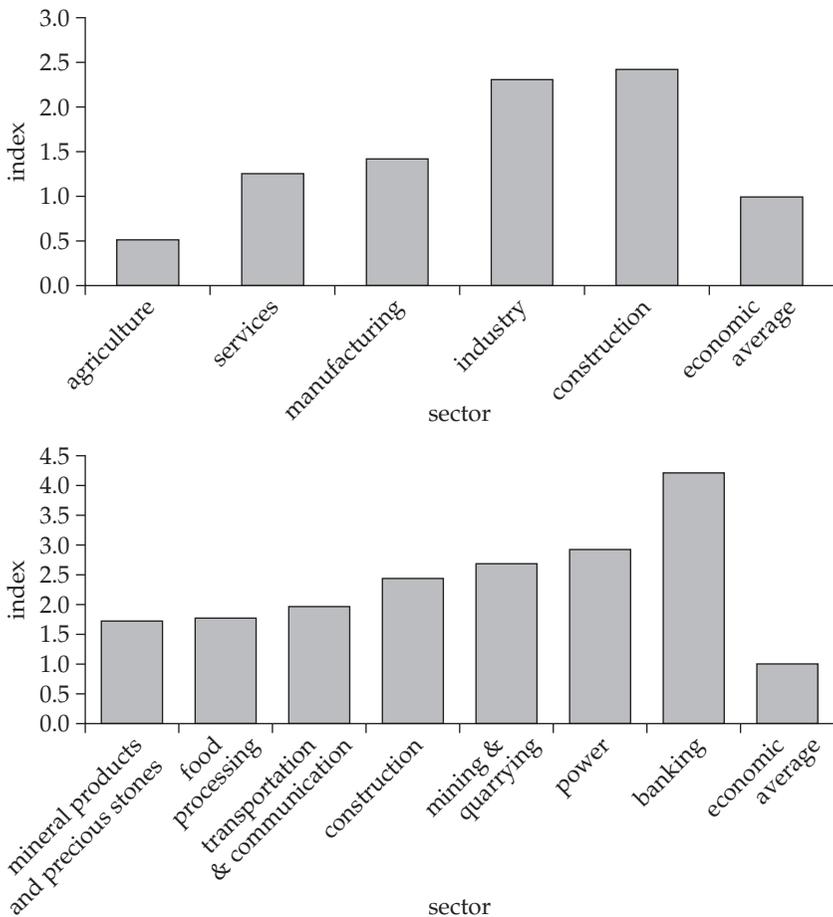


Source: Armenian Department of Statistics.

Labor productivity growth in Armenia was outperformed by the increase in labor compensation. The unit labor cost (ULC) (influenced by diverse factors such as hourly compensation, productivity, and the exchange rate) gradually increased to about 46 percent of the U.S. ULC level (about 44 percent of the euro-area level) from as low as less than 3 percent in the early 1990s, and secured solid earnings for current workers.<sup>6</sup> However, the benefits of recent economic growth have not generated higher employment and the increase in the labor cost has partly contributed to jobless growth (Figure 7.6).

Figure 7.6 illustrates the mismatch between the rapidly expanding sectors and labor productivity. The contrast between the rapidly growing sectors and formal employment indicates that the majority

FIGURE 7.6 LABOR PRODUCTIVITY BY SECTOR



Source: Armenian Department of Statistics.

of the labor force has benefited only modestly from rapid economic expansion.

**Growth in Armenia has been concentrated in non-tradables and few tradable sub-sectors.** Contrary to the industrialization pattern of the East Asian Tigers (like the Republic of Korea and Taiwan, China) with highly diversified export structures, recent growth in Armenia has been characterized by a mix of export-orientation toward capital intensive goods (such as scrap metal), commodities with low transportation costs (such as diamonds), and exports with a high price/volume ratio (such as brandy), accompanied by import substitution of more labor-intensive commodities (such as subsistence agriculture).

The export bias toward capital-intensive goods is explained by the high costs of exporting goods (and services) from Armenia and therefore the concentration of exports around services/commodities with a high ratio of price to volume. This particularly high cost structure is a combination of common “transition economy” factors and Armenia’s specific factors:

- In Armenia, as in any other transition economy, new jobs created differ in their salient characteristics from old jobs that were destroyed, and employment growth relies on business start-ups. The number of new businesses and new jobs created is directly associated with the profit margins generated by the new firms, while the costs of the new firms are generally high owing to initial investment and working capital needs, marketing, skills mismatch, high risks, and uncertainties (see subsequent chapters for detailed analyses). At the same time, new firms are confronted by severe resource constraints. Savings are low, financial intermediation is expensive, stock markets are underdeveloped, and insurance services are virtually nonexistent.
- These high costs are inflated by additional charges related to corruption, which is also common in other transition economies but to varying degrees (other chapters in this report will try to benchmark Armenia relative to other transition economies). The high cost of doing business in Armenia and the high transaction costs push businesses into the informal economy, reduce investment opportunities, and prevent Armenia’s participation in the global division of labor based on production fragmentation and direct impact on the number of jobs created.
- In addition to the above, Armenia faces the challenge of a small domestic market and market isolation. This makes the country dependent on exports and at the same time makes exports expensive because of high transportation costs.

- And finally, the high costs of backbone services (such as air fares and telecommunications), higher, in fact, than in the countries that do not face structural problems in market access, exacerbate the cost of doing business to levels not affordable for an average start-up with a modest profit margin.

As a result, only exports that have very low transportation costs (such as diamonds and electricity exports to neighboring countries) or exports with a high price/volume ratio (such as brandy)—in other words, capital-intensive industries—have proved to be profitable in Armenia and have attracted investment. On the other hand, labor-intensive commodities such as light manufacturing, which requires bulk exports, have been developing much more slowly.

In addition to the above, the sectors that had the opportunity to reduce costs by capitalizing on the existing export markets through a brand name (for example, brandy in Russia) or an established chain of production (such as precious stones refinement) have continued to follow the high cost of doing business. Another arrangement that allowed new businesses to operate was becoming informal and operating underground.

### Growth Spillover Channels

Armenia's growth has recently benefited from an increase in remittances and capital transfers, similar to the resource boom type of growth, where sources of growth rest on concentrated and volatile internal sources of demand financed from external transfers. Sources of growth rely heavily on both consumption driven by remittances and private transfers<sup>7</sup> (discussed earlier in the chapter), and on investment, mainly in construction, which relies heavily on foreign capital transfers.

In general, the high share of value added in production leads to a greater contribution of that particular activity to GDP and growth. A strong reliance on intermediate inputs leads to low value added in production and is associated with low value added multipliers. Typically, sectors with high value added and intersectoral linkage multipliers would have a higher growth impact, but the gains from a large multiplier depend on the sector's size. Armenia's economy, especially its industrial sector's reliance on intermediate inputs, is quite high. Despite low savings rates and low effective taxes, which represent other leakages from output, the total value added as a share of total production is about 50 percent. The share of value added in industry is just 30 percent and the share of manufacturing only 16 percent; and the GDP multipliers of these sectors are lower than the

economy average (close to 1 as compared to about 1.4 on average in the economy). Machinery and jewelry cutting have the lowest share of value added in production, which implies that these industries are comprised mostly of intermediate inputs. In contrast, the share of value added is quite high in construction, agriculture (crops, vegetables, and fruits), and services (utilities and banking), which implies large value-added multipliers (above 1.5) for these three sectors and the much stronger impact of these sectors on GDP growth than industry and manufacturing. Growth in these sectors is more likely to contribute to higher personal income for Armenians. Relatively, these sectors demonstrate high household multipliers.

Over time, the share of capital value added in Armenia's GDP has increased, and although this has led to high overall incomes, it has had a relatively narrow impact on poverty reduction, as the earners of profits in a capital-biased, value-added economy depend on how these profits are distributed. Some industries, such as cellular telecommunications, mining, or utilities may exhibit a high degree of value added in production, but since those industries are capital intensive, their contribution to personal income will depend on who collects the capital rents. For example, a foreign-owned mine may capture significant rents, but most of this income could be sent off-shore.

Intersectoral linkage multipliers (Box 7.2) are highest in some services sectors, particularly in real estate, banking, and insurance. The intersectoral linkage multipliers are particularly low in some manufacturing sectors, such as light manufacturing and machinery and equipment that rely on imported inputs (the share of imports in absorption has recently increased to 45 percent). The mismatch between the level of GDP and intersectoral linkage multipliers and the share of the sector in value added indirectly point toward distortions in resource allocation, suggesting that there may be a disincentive for firms to invest in potentially highly profitable activities.

While the largest intersectoral linkage multipliers in agriculture are in high value-added crops such as fruits and vegetables, the share of these sectors in Armenia's GDP is lower than the share of those with much lower multipliers. This suggests that some sectors with high growth potential have a much lower impact on growth than they potentially could have if they were to develop significantly in the future. Capitalizing on such high multiplier sectors would require finding ways of channeling investments into such sectors through a set of policy actions, including eliminating price distortions. To strengthen the backward and forward linkages from agriculture to agro-processing and manufacturing, the authorities should develop a strategy that enhances the efficient use of Armenia's agricultural base, including through improved access to markets and an increase in productivity.

### BOX 7.2 LINKAGES IN THE MODEL BASED ON THE SOCIAL ACCOUNTING MATRIX

The model based on the social accounting matrix (SAM) provides insights about the input and output relationships between goods and services markets, as well as the interlinkages between the demand for labor and capital in the process of production. This is made possible by analyzing a set of comparable direct and indirect intersectoral linkage multipliers in the context of the relative importance of each economic activity.

Multipliers in the SAM-based model reflect how much a unit-increase in the demand and production of a commodity affects the demand for more commodities. The multiplier effect entails a higher demand for activities leading to higher wage incomes and profits (that is, higher household incomes), which create the demand for domestic or imported commodities.

Direct multipliers:

- *Value-added multipliers*—show how much a unit-increase in the demand for a commodity directly affects the demand/production of the same commodity.
- *Intersectoral linkage multipliers*—illustrate how much a unit-increase in the demand for a commodity increases the demand/supply of commodities produced by other activities.

Indirect multipliers:

- *Induced household income multipliers*—show how much a unit-increase in the demand for a commodity affects household income.
- *Employment multipliers*—show how many jobs are ultimately created directly or indirectly as a consequence of a unit-increase (1 million dram) in the demand for a commodity.

The level of multipliers reflects the level of value added in production. Strong reliance on intermediate inputs leads to low value added (to labor and capital) and, hence, small multipliers. This could be the result of large leakages from an economy, due to a large proportion of imported inputs, taxes, and savings. Strong linkages entail direct and indirect spillovers of subsectoral growth on growth in other sectors, employment generation, and income distribution.

Source: SAM (Chapter 8 of this book).

Remittances represent a considerable source of household income (US\$207 million approximately)<sup>8</sup> and are one of the main sources of foreign exchange for the country. An increasingly large number of households receive remittances in Armenia. Within these households, remittances tend to account for around 50 percent of their monetary income. The overwhelming part of remittances is spent on current consumption and only a small percentage is used for investment. Remittances have a direct effect on the recipient households' well-being as well as strong secondary multiplier effects. We have used the social accounting matrix to simulate the multiplier impact of remittances on the national economy.

*Impact on employment and household incomes by sector.* Construction—the fastest growing sector in Armenia—has had a strong impact on employment as well as on household incomes (see Table 7.4 for the employment and income multipliers as derived from an SAM constructed for Armenia). Direct short-term spillover effects associated with the construction sector are strong, as is illustrated by large multipliers and validated by the high share of the construction sector in the total economy's value-added and low-import content.

The construction sector is strong in generating jobs, but the permanence of such jobs will depend on continued activity. The prospect of Millennium Challenge Account funding is, therefore, encouraging for employment. But, equally, a possible decline in construction would depress the direct demand for multiple economic activities. The spillovers from these would be strong. The decline in incomes would result from a reduction in incomes generated in the construction sector, as well as indirectly from other sectors. Suppressed household incomes would, in turn, depress the demand for commodities and services produced domestically. This would produce multiplier effects and exacerbate the effect of the original shock.

There are a number of subsectors in agriculture, services, and manufacturing that are relatively stable and could potentially produce stronger spillover effects and contribute significantly to growth, sustainable employment, and poverty reduction (the value-added share in production is high, and direct and indirect multipliers are quite significant). However, their ability to attract investments seems to be distorted. Their relatively low size and high export share in total production indicate that they may react strongly (may easily generate double-digit growth and significant exports) when the constraints to growth are eased and/or incentives are provided. Capitalizing on such activities will be critical for increasing growth sustainability, diversifying the sources of exports, and creating better-paid jobs.

Growth potential and the spillover effect of a number of activities that have not been growing rapidly are high in the sectors with the following characteristics:

- A high value-added share in production, particularly in some agriculture subsectors (above 60 percent) but also in services (banking and insurance and real estate). The share of value added is quite high in construction, agriculture (crops, vegetables, and fruits), and services (utilities and banking), which implies large value added multipliers (above 1.5) for these three sectors and a much stronger impact of these sectors on GDP growth than industry and manufacturing. Growth in these sectors is more likely to contribute to higher personal income for Armenians. Related to these characteristics, these sectors demonstrate high household multipliers.
- High intersectoral linkage multipliers such as banking and insurance and real estate.
- The large share of exports in total production for processing sectors and, at the same time, weak export performance of these activities indicate that: (i) the potential of these sectors is underutilized and (ii) growth potential in these sectors can most likely be realized through export.

The recent strong export expansion has had a limited impact on poverty reduction. Exports are concentrated in diamonds (37 percent of total exports, or US\$ 258 million in 2002). The sector's contribution to the economy's value added is just 2 percent as the sector relies heavily on diamond imports (Table 7.5). This is an enclave activity with modest spillover effects for growth. In terms of employment, the sector does not create many jobs, but the jobs created are high-quality ones and are critical for the economy. In addition to diamond processing, export diversification in other semiskilled and skilled labor and higher value-added activities would generate stronger spillover effects and would translate into job creation and overall poverty reduction.

The results of the simulations show that further diversification of the economy is critical for reducing the vulnerability of growth to external shocks and maintaining a reasonable growth momentum in the medium to long terms. As earlier sections of this chapter indicated, the economy has a small nondiamond production/export basket. With the exception of a few traditional commodities and power, this basket does not reveal a comparative advantage in any particular commodity. However, it does suggest a natural comparative advantage through its linkages to the country's agricultural base and other economic resources as well as skilled human capital. The challenge for policy makers is to provide the general policy and institutional underpinnings for faster development of formal private sector activities, which (i) tap into the higher-value elements of this basket that can create high-wage employment, and (ii) capitalize on the external demand by meeting the scale and quality requirements.

TABLE 7.4 DIRECT AND INDIRECT MULTIPLIERS

<i>Sector</i>	<i>Share in GDP</i>	<i>VA/output</i>	<i>Own multiplier</i>	<i>Linkage with other sectors</i>	<i>Induced HH income multipliers</i>	<i>Labor multiplier</i>	<i>Capital and land multiplier</i>
1 grn: Wheat, potatoes, and legumes	4.6	63.5	1.1	4.9	1.6	0.8	0.8
2 vfr: Vegetables and fruits, including grapes and dried fruits	5.4	87.1	1.1	5.6	1.9	0.9	1.0
3 vol: Vegetable oils and fats	0.0	6.0	1.0	3.2	0.9	0.4	0.5
4 ocr: Crops not elsewhere classified	3.8	78.7	1.1	5.5	1.8	0.8	1.0
5 mil: Dairy products, including eggs and milk	7.8	49.1	1.4	5.0	1.6	0.8	0.8
6 omt: Beef, pork, mutton, and poultry meat	3.1	42.0	1.1	5.1	1.6	0.8	0.8
7 enr: Energy—oil and natural gas	0.0	0.0	1.0	0.0	0.0	0.0	0.0
8 min: Mining and quarrying	1.8	59.8	1.2	5.4	1.7	0.7	1.0
9 fod: Food processing and beverages	7.4	36.7	1.4	4.6	1.5	0.8	0.7
10 tbc: Tobacco products	0.6	17.0	1.1	3.2	0.9	0.4	0.5
11 lmf: Light manufacturing and textiles	0.2	10.1	1.2	2.8	0.8	0.4	0.4
12 crp: Chemicals, rubbers, and plastics	0.5	19.6	1.1	3.5	1.0	0.5	0.5
13 mnm: Mineral products and precious stones	1.9	15.1	1.0	2.9	0.8	0.4	0.4
14 mtl: Metals and metal products	2.0	39.7	1.1	4.5	1.4	0.7	0.7
15 mch: Machinery equipment and motor vehicles and precision optical equipment	0.3	6.5	1.1	2.3	0.6	0.3	0.3
16 omf: Other manufacturing	0.8	29.3	1.1	3.5	1.0	0.5	0.6
17 utl: Electricity, gas, and water supply	5.2	73.5	1.3	5.4	1.8	0.7	1.1
18 ele: Electricity supply and distribution	4.8	62.6	1.2	4.5	1.5	0.7	0.8
19 con: Construction	13.9	57.6	1.1	4.7	1.5	0.7	0.9
20 trn: Transport and communications	7.1	58.9	1.2	5.0	1.6	0.8	0.8

TABLE 7.4 (CONTINUED)

<i>Sector</i>	<i>Share in GDP</i>	<i>VA/output</i>	<i>Own multiplier</i>	<i>Linkage with other sectors</i>	<i>Induced HH income multipliers</i>	<i>Labor multiplier</i>	<i>Capital and land multiplier</i>
21 trd: Retail and wholesale trade and public catering	13.5	64.5	1.3	5.0	1.7	0.7	1.0
22 bnk: Banking, lending, and insurance	1.7	69.1	1.1	5.6	1.8	1.0	0.8
23 gov: Governance, defense, and public procurements	9.2	54.5	1.2	5.2	1.7	1.0	0.7
24 osr: Other services not elsewhere classified	1.1	25.2	1.1	4.2	1.2	0.5	0.7
25 dwe: Housing and dwellings	3.2	73.6	1.1	5.9	1.9	0.5	1.4
Total	100.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<b>Total agriculture</b>	24.8	58.4	1.1	4.9	1.6	0.7	0.8
<b>Total manufacturing</b>	11.9	29.0	1.1	3.5	1.0	0.5	0.5
<b>Total industry</b>	8.9	15.9	1.1	3.4	1.1	0.5	0.6
<b>Total construction</b>	13.9	65.7	1.1	4.7	1.5	0.7	0.9
<b>Total services</b>	40.5	55.5	1.2	5.1	1.6	0.7	0.9
<b>Total</b>	100.0	49.5	n.a.	n.a.	n.a.	n.a.	n.a.

Source: SAM, 2002 (Chapter 8 of this book).

Note: Here, share of VA in output means that for every dram of production only x percent is value added. So, while production or output from an activity can be very large, the value added can be very small because of the high share of intermediate, especially imported, inputs.

TABLE 7.5 ARMENIAN ECONOMY, SECTORAL STRUCTURE DEPICTED BY SAM

<i>Sector</i>	<i>Share in GDP</i>	<i>VA/Output</i>	<i>Share in exports</i>	<i>Share in nondiamond exports</i>
grn: Wheat, potatoes, and legumes	4.6	63.5	0.0	0.1
vfr: Vegetables and fruits, including grapes and dried fruits	5.4	87.1	0.8	1.3
vol: Vegetable oils and fats	0.0	6.0	0.0	0.0
ocr: Crops not elsewhere classified	3.8	78.7	0.7	1.1
mil: Dairy products, including eggs and milk	7.8	49.1	0.1	0.1
omt: Beef, pork, mutton, and poultry meat	3.1	42.0	0.0	0.0
enr: Energy—oil and natural gas	0.0	0.0	0.0	0.0
min: Mining and quarrying	1.8	59.8	5.5	8.8
fod: Food processing and beverages	7.4	36.7	7.3	11.6
tbc: Tobacco products	0.6	17.0	0.5	0.8
lmf: Light manufacturing and textiles	0.2	10.1	4.2	6.6
crp: Chemicals, rubbers, and plastics	0.5	19.6	1.2	1.9
mnm: Mineral products and precious stones	1.9	15.1	37.0	
mtl: Metals and metal products	2.0	39.7	6.4	10.1
mch: Machinery equipment and motor vehicles and precision optical equipment	0.3	6.5	8.0	12.7
omf: Other manufacturing	0.8	29.3	0.7	1.1
utl: Electricity, gas, and water supply	5.2	73.5	0.0	0.0
ele: Electricity supply and distribution	4.8	62.6	1.9	3.0

TABLE 7.5 (CONTINUED)

<i>Sector</i>	<i>Share in GDP</i>	<i>VA/Output</i>	<i>Share in exports</i>	<i>Share in nondiamond exports</i>
con: Construction	13.9	57.6	0.9	1.4
trn: Transport and communications	7.1	58.9	12.6	19.9
trd: Retail and wholesale trade and public catering	13.5	64.5	0.0	0.0
bnk: Banking, lending, and insurance	1.7	69.1	1.0	1.5
gov: Governance, defense, and public procurements	9.2	54.5	1.1	1.7
osr: Other services not elsewhere classified	1.1	25.2	10.1	16.1
dwe: Housing and dwellings	3.2	73.6	0.0	0.0
<b>Total</b>	<b>100.0</b>	<b>n.a.</b>	<b>100.0</b>	<b>63.0</b>
<b>Total agriculture</b>	24.8	58.4	1.6	2.6
<b>Total manufacturing</b>	11.9	29.0	28.3	44.9
<b>Total industry</b>	8.9	15.9	42.5	8.8
<b>Total construction</b>	13.9	65.7	0.9	1.4
<b>Total services</b>	40.5	55.5	26.7	42.3
<b>Total</b>	100.0	49.5	100.0	100.0

Source: SAM (Chapter 8 of this book).

Note: Here, share of VA in output means that for every 1 dram of production only x percent is value added. So while production or output from an activity can be very large, the value added can be very small because of the high share of intermediate, especially imported, inputs.

The impact of growth on formal job creation was limited, as the sectors that have experienced strong growth in Armenia have not been labor-intensive (Table 7.6). On the contrary, agriculture, which has been growing more slowly than the rest of the economy, has absorbed surplus labor released in the process of economic transformation. The government—the most labor-intensive activity in Armenia—has been negatively affected by fiscal adjustment. Other labor-intensive sectors (such as banking and light manufacturing) have been growing slowly. The main reason for the unfavorable progress in the light manufacturing sector is related to high transportation costs, such as aviation. The construction sector, which has been a leading growth sector, has provided quite a few employment opportunities. However, the sustainability of these jobs depends on the sustainability of the source of its financing, which is volatile. Diamond cutting, which is a sector with good jobs, is capital-intensive but the contribution of labor value added in the sector is not. The effective reallocation of jobs released as a result of the termination of large construction projects depends on the ability of the economy to provide alternative opportunities outside of the construction sector in case of demand contraction. The causes of the centering of growth on sectors that are not labor-intensive are explored in Chapter 11 of this book.

*The mismatch between rapidly expanding sectors and labor productivity.* The contrast between the rapidly growing sectors and formal employment indicates that the majority of the labor force has benefited only modestly from rapid economic expansion.

Armenia has shown some signs of export diversification, but a number of sectors with high growth potential remain idle. The mismatch between the level of GDP and intersectoral linkage multipliers and the share of the sector in value added indirectly point toward the distortions in resource allocation, suggesting that there may be a disin-

TABLE 7.6 SOURCES OF EMPLOYMENT IN ARMENIA:  
DISTRIBUTION BY SECTOR, 2002

<i>Activity</i>	<i>Share in total employment (percent)</i>	<i>Contribution to employment US\$ thousands</i>
Agriculture	49.5	548
Construction	4.8	53
Industry	1.6	18
Diamonds	1.4	15
Manufacturing	10.6	117
Services	32.1	355
Total	100.0	1,106

*Source:* SAM, 2002 (Chapter 8 of this book).

centive for the firms to invest in potentially highly profitable activities. Earlier sections have noted that despite the apparent diversification of the nongold export basket, very few—mostly primary—exports reveal a comparative advantage and even fewer export items show signs of emerging competitiveness in regional markets (the dairy industry and heavy manufacturing are two examples). The present export basket, however, reflects strong backward linkages to the country's natural resource endowments and agricultural base and other economic resources, as well as skilled human capital. As reflected in the presence of supply chains in several sectors, there are also clear forward linkages, especially with respect to agro-processing and light manufacturing, although these linkages are weak, particularly toward the upper end of the supply chain. A diversified export basket that takes advantage of the presence of these supply chains will not only facilitate the production and export of raw materials from agriculture and industry, but will also facilitate higher value-added processed and manufactured products from the same supply chains (such as canned vegetables and fruit juices).

*High value-added agricultural products.* The trade data analysis suggests that crops such as vegetables and fruits, which presently have a relatively high share of GDP but a miniscule share of nondiamond exports, have significant growth potential—evident from their high value-added shares in total production (over 80 percent)—and export potential. The existing forward linkages of these commodities to agro-processing suggest that if their supply is sufficiently expanded, they can generate even higher value in the form of processed food. To strengthen the backward and forward linkages from agriculture to agro-processing and manufacturing, the authorities should develop a strategy that enhances the efficient use of Armenia's agricultural base, including through improved access to markets.

*Manufacturing (particularly textiles, chemical production, machinery and equipment, and motor vehicle production) can aid export diversification.* The large share of exports in total production in the processing sectors, together with the observed weak export performance of these activities, indicate that (i) the potential of these sectors is underutilized, and (ii) growth potential in these sectors can most likely be realized through export. High transportation costs and domestic barriers to the development of the higher end of these supply chains are the main obstacles to the expansion of these subsectors (for more details, see Part II, Chapters 9–11). Their relatively low size and high export share in total production indicate that they may react strongly (easily generating double digit growth and significant exports) when the constraints to growth (such as policy-induced high business transactions costs or aviation and telecommunications costs) are eased. Capitalizing on such activities will be critical for increasing growth

sustainability, diversifying sources of exports, and creating better paid jobs. The main distortion for a stronger interest in high value-added activities with large export potential is transportation costs. Armenia has experienced a sharp drop in its trade transported by air in recent years, despite its landlocked nature and its subjection to a blockade by Turkey and Azerbaijan. The cost of air cargo in Armenia is much higher than that in other landlocked countries such as Kazakhstan, the Kyrgyz Republic, or Mongolia, or the semi-landlocked Turkmenistan. Such high costs have caused a relative shift toward road transport (despite poor infrastructure) and even railways. Liberalizing air transport by expanding the participation of several carriers could greatly enhance export competitiveness in Armenia.

Finally, a number of subsectors in services such as banking and insurance, ITC, and tourism present cases where the potential has not been fully exploited. In addition, these sectors demonstrate high intersectoral linkage multipliers, which suggests that these sectors potentially produce stronger spillover effects and contribute more to growth, sustainable employment, and poverty reduction (the value-added share in production is high and direct and indirect multipliers are quite significant). However, their ability to attract investments seems to be distorted. A key barrier, especially for the services sector, is the lack of competition and the high prices of telecommunications. The telecommunications infrastructure in Armenia is currently one of the least developed in the CIS, despite being one of the first in the CIS to privatize. The 15-year monopoly granted to the single private investor since the privatization of ArmenTel in 1997 to the Greek operator OTE, coupled with the government's ineffective regulation of the operator, has led to severe underinvestments and has stifled growth even in mobile phones, where the penetration ratio in Armenia is one-tenth that of its neighbors. The extremely high cost and poor quality of telecommunication services has handicapped the country in production and exports.

## **ANALYZING EXTERNAL SHOCKS AND SOURCES OF VULNERABILITY IN ARMENIA: SAM-BASED SIMULATIONS OF ALTERNATIVE SCENARIOS**

### **Assumptions and Scenarios**

As discussed in the previous sections, Armenia has demonstrated a strong growth performance in the last several years. The generation of baseline growth does not seem to be a constraint for Armenia. The challenges that Armenia faces seem to be (i) how to ensure growth

sustainability, and (ii) how to enhance a growth pattern that secures job creation and rising household incomes.

Based on these considerations and taking into account the previous analysis of the growth pattern, we have decided to focus our simulations on the following issues:

- Construction is the leading, yet unstable, growth sector that strongly relies on a highly volatile source of financing—capital transfers. Direct short-term spillover effects associated with the construction sector (illustrated by large multipliers and validated by the high share of the construction sector in the total economy's value added) are strong. The sector may not be generating long-term sustainable employment, nor may it be a future source of growth, but the first-round effects on growth and employment seem to be large. A negative shock in the sector could therefore trigger a decline in growth, a reduction in employment, and an increase in poverty. The sector is not a viable source of growth unless accompanied by growth in export-oriented, high value-added activities that generate future sources of income through a demand for skilled jobs. An economy cannot grow by simply continuing to build houses and infrastructure financed by uncertain external flows, unless it ensures that the demand for the new houses and infrastructure is strong and the returns on investment are generated.
- Exports are quite volatile, with diamonds representing the most important source of revenue from exports (37 percent of total exports, or US\$258 million in 2002). Diamonds are susceptible to price fluctuations as well as conditions in inputs markets and are therefore vulnerable to external shocks; the sector's share in GDP, however, is only 2 percent. Although the sector is also an important source of foreign exchange, it is an enclave activity with modest spillover effects for growth in terms of employment. The sector does not create many jobs and the jobs created are highly skilled. In this regard, export diversification toward high value-added activities should be pursued to reduce export concentration and export reliance on this highly volatile source of foreign exchange and to safeguard the economy from the negative impact of external shocks.
- As was mentioned above, remittances are an important source of household incomes (about US\$207 million). Remittances are, however, an unreliable source of income, and are perhaps unproductive if they are channeled toward consumption alone, as may be occurring in Armenia. While this is an unsustainable source of growth, as it is consumption-based and does not

generate long-lasting income and jobs, its first-round effects are large. Therefore, the negative shock associated with the reduction of remittances may have a devastating effect on the economy and on household incomes. There is a need to build an incentive mechanism to channel a portion of these remittances into savings that can be invested in sectors with future growth potential.

### **Simulation Results**

The results of the simulations of a negative shock on cut-diamond production are provided below. We have assumed a 50 percent decline in diamond exports (that is, about US\$135 million). The effects of this export decline on growth, employment, and poverty are relatively moderate due to the enclave character of the diamond activity (the sector's contribution to GDP is about 2 percent) and its strong reliance on unprocessed diamond imports. The diamond sector's linkages with the rest of the economy are not as strong as they would appear, judged by the large share of diamonds in exports.

The effect of a comparable shock on construction would be much stronger, as the sector has large multipliers and a relatively low import share. The impact is also stronger on employment. This has an important implication for growth impetus in Armenia, which currently relies strongly on construction. This is a sector fueled by investments—the most volatile component of the aggregate demand. In 2004, as a result of the termination of the Lyndsey project, with the associated US\$100 million in injections into the economy, the construction contribution to GDP declined substantially and many people employed in the sector were laid off. A decline in construction would depress the direct demand for multiple economic activities, with strong spillovers to the rest of the economy. There would be a decline in incomes resulting from lowered income in the construction sector as well as, indirectly, in other sectors. Suppressed household incomes would, in turn, lower the demand for commodities and services produced domestically and, through multiplier effects, would exacerbate the effect of the original shock.

The third simulation was conducted to see the effect of a comparable shock to remittances. The associated negative effect on GDP was stronger than in the diamond export shock case but weaker than in the construction case owing to smaller value added multipliers. However, this shock had the strongest impact on household incomes (–11 percent).

Based on our analysis, we would argue that construction is a good but volatile source of growth and, in order to cushion the economy against its sudden decline, the economic development policy should

enhance more stable sources of growth and employment in the services and manufacturing sectors. The manufacturing sector has lower multiplier effects in the short run but provides sustainable employment with a strong potential for future income generation.

We have simulated a case when the sectors with high export potential are given incentives, or when certain barriers to trade are eliminated (for example, transportation costs are reduced). The results of the simulations show that this scenario has a strong positive effect on growth, household incomes, and job creation.<sup>9</sup> This positive effect on employment is even stronger when we take into consideration that jobs that are created are sustainable and well paid (Table 7.7).

### *Future Growth Prospects and Desirable Growth Patterns with Stronger Spillover Effects*

The intersectoral linkages and transmission mechanism, which in recent years enabled strong economic growth to penetrate down to households through higher incomes, are likely to prevail in the medium term. Stronger growth in export-oriented sectors, driven by a shift toward higher value-added production, would clearly bring higher overall GDP growth in the medium term. Such a shift would also be instrumental in preparing the economy to face the difficult challenge of maintaining modest growth rates should any of the shocks described above materialize.

For purely illustrative purposes we have also demonstrated the result of a 10 percent shock to agriculture output through higher productivity. However, higher productivity may be commensurate with lower prices, especially if the agricultural goods cannot be exported. In September 2004, there was a good melon crop and all of the farmers had excess melons. As there is only so much demand for melons on the domestic market, many of the melons were left to rot, since no one would buy them, even at near-zero prices. Unfortunately, watermelons are low-value per pound, so the melon growers are not able to sell them internationally. This underscores the importance of linkages of agriculture to agro-processing, which may boost productivity and create additional demand.

### *Model Simulations: Sustainable Growth and Job Creation, Using Export Diversification*

The results of the simulations show that further diversification of the Armenian economy is critical to reduce growth vulnerability to external shocks and maintain a reasonable growth momentum in the medium to long terms. As earlier sections of this chapter have indicated, the Armenian economy presently has a relatively small

TABLE 7.7 TABLES GENERATED USING THE 2002 SAM-BASED MODEL FOR ARMENIA

<i>Shock</i>	<i>Effect on GDP, US\$ &amp; percent change</i>	<i>Effect on labor income, US\$ &amp; percent change</i>		<i>Effect on jobs numbers &amp; percent change</i>		<i>Effect on household income, US\$ &amp; percent change</i>
		<i>Skilled</i>	<i>Unskilled</i>	<i>Skilled</i>	<i>Unskilled</i>	
<b>I. Negative shocks</b>						
Diamonds (-50% = US \$135 m)	-109.5 (-5.1%)	-8.6 (-3.7%)	-44.8 (-5.5%)	-5,500 (-3.8%)	-52,700 (-5.5%)	-109.5 (-4.4%)
Construction (-30% = US\$135 m)	-204 (-9.5%)	-13 (-5.7%)	-76 (-9.3%)	-8,300 (-5.8%)	-89,500 (-9.3%)	-204 (-8.3%)
Remittances (-5.5% = US\$135 m)	-139.2 (-6.5%)	-10.1 (-4.4%)	-64.1 (-6.6%)	-6,400 (-4.4%)	-63,600 (-6.6%)	-275 (-11.1%)

Source: SAM (Chapter 8 of this book).  
m = million.

nondiamond production/export basket. With the exception of a few traditional commodities and power, this basket does not reveal a comparative advantage in any particular commodity. However, it does suggest a natural comparative advantage through its linkages to the country's agricultural base and other economic resources as well as skilled human capital.

## CONCLUSIONS

The single most important factor explaining the recent poverty decline in Armenia was high growth combined with declining inequality. The principal sources of growth, household income, and foreign exchange in Armenia (that is, construction, remittances, and concentrated exports), are quite concentrated, although there are clearly some elements of economic and export diversification. Trade and export-oriented growth beyond diamond processing should become a leading strategy of the development model pursued by the government. While domestic savings need to continue to grow, FDI as well as portfolio investment as opposed to private transfers should become more important drivers of economic growth. More generally, the country should open up to benefits from intensified international flows of information and technology (Box 7.2) and the promotion of concepts of good governance and business management. In this context, efforts to develop a policy framework for shared growth beyond the construction sector, which is a major beneficiary of current investment inflows, needs immediate attention. Armenia's manufacturing and services sectors should also benefit more from investments and the associated intensified international flows of information and technology. Some generic recommendations are

A discussion of the future agenda is contained in other sections of the documents.

TABLE 7.8 SIMULATION ASSUMING EXPORT DIVERSIFICATION

	<i>Magnitude of shock effected through policy reforms</i>	<i>Effect on GDP, US\$ &amp; percent change</i>	<i>Effect on labor income, US\$ &amp; percent change</i>		<i>Effect on jobs numbers &amp; percent change</i>		<i>Effect on household income, US\$ &amp; percent change</i>
			<i>Skilled</i>	<i>Unskilled</i>	<i>Skilled</i>	<i>Unskilled</i>	
<b>Total shock to economy based on the strategy of export diversification</b>	US\$135 m	158.4 (7.4%)	12.5 (5.5%)	63.0 (7.7%)	7,800 (5.4%)	74,100 (7.7%)	158.4 (6.4%)
Vegetables and fruits, including grapes and dried fruits	(9% = US\$2.8 m)						
Crops not elsewhere classified	(10% = US\$2.5 m)						
Food processing and beverages	(13% = US\$2.5 m)						
Light manufacturing and textiles	(50% = US\$27 m)						
Metals and metal products	(26% = US\$22 m)						
Machinery equipment, motor vehicles, and precision optical equipment	(34% = US\$28 m)						
Banking, lending, and insurance	(12% = US\$3 m)						
Other services not elsewhere classified	(41% = US\$35 m)						

Source: SAM (Chapter 8 of this book).

m = million.

**TABLE 7.9 AN ALTERNATE APPROACH THAT DOES NOT RELY ON EXPORT GROWTH**

A 10 percent positive shock in agriculture versus a 10 percent positive shock in manufacturing and industry (excluding minerals and mining)

<i>Inward-looking policies that promote all nonmineral sectors equally</i>	<i>Effect on GDP, US\$ &amp; percent change</i>	<i>Effect on labor income, US\$ &amp; percent change</i>		<i>Effect on jobs, numbers &amp; percent change</i>		<i>Effect on household income, US\$ &amp; percent change</i>
		<i>Skilled</i>	<i>Unskilled</i>	<i>Skilled</i>	<i>Unskilled</i>	
Agriculture (10% = US\$91 m)	151.3 (7.1%)	7.2 (3.2%)	65.2 (7.9%)	4.6 (3.2%)	76.6 (8.0%)	151.3 (6.1%)
Manufacturing & industry (10% = US\$241 m)	359.9 (16.8%)	38.6 (16.9%)	135.8 (16.6%)	24.5 (16.9%)	159.7 (16.6%)	359.9 (14.6%)

Source: SAM (Chapter 8 of this book).

m = million.

**Box 7.3 INFORMATION AND COMMUNICATIONS  
TECHNOLOGY SECTOR**

The ITC industry could play a leading role in Armenia's economic development. It is a versatile technology and there are no areas of products or services where ITC cannot be applied and benefits obtained. ITC also has multiplier effects on other economic activities. Given the regional constraints to the country's trade, the significance of ITC development, especially e-commerce applications, cannot be overemphasized. Armenia's ITC industry development program is based on its comparatively large supply of qualified ITC professionals, the relatively short durations of ITC projects, relatively low capital requirements, low wage rates, and benefits in terms of high value-added products. In the former Soviet Union, Armenia was one of the main scientific centers of the country, with special focus on the ITC industry. There were about 40 R&D companies active in the field, the biggest of which, Yerevan R&D Institute of Mathematical Machines, had about 10,000 employees and was producing both hardware (mainframes, computers mostly for Soviet military industry needs) and the corresponding software (operating systems, applications). Despite the country's economic and physical hardships experienced since its independence in 1991, the ITC industry has survived and has even developed. Since 1997, the ITC industry has been advancing at an accelerated pace in all three of its subsectors: (i) hardware; (ii) software; and (iii) media for collection, storage, processing, transmission, and presentation of information. More than 200 companies, including about 20 American and European companies, are currently operating in the ITC sector in Armenia employing local specialists.

Because job opportunities are limited, a large number of programmers are unemployed or work as computer maintenance specialists or operators, rather than for software firms. However, software development has become so popular in Armenia that many mathematicians and physicists are changing their specialties to become software professionals. Armenia has approximately 6,000–7,000 specialists in the field, with 300 graduating every year from the Engineering University and the State University's applied mathematics faculty. The biggest software company in Armenia is HPL Armenia, a subsidiary of Silicon Valley-based HPL Inc., which employs about 150 programmers. Software exports alone amounted to an estimated US\$20 million in 2000. In support of ITC development, the government declared the ITC industry as one of the priorities for Armenia's economic development by a decree adopted in December 2000. The concept of ITC industry development was endorsed by the government in April 2001, while the sector development program is currently under preparation.

*Source:* "National Human Development Report, Armenia," UNDP, 2001.

## NOTES

1. Prepared by Ekaterine Vashakmadze, Economist, World Bank.
2. This multiplier reflects how much a unit increase in the demand for a commodity affects household income.
3. It is difficult to accurately assess the distribution of factor income among wage income, mixed income, and income from capital, as the Armenian statistical data on wages include only the official wage bill, which clearly underestimates the real level of the wage bill. (See also the discussion in Box 7.1.)
4. There have been two large waves of Armenian emigration: at the beginning of the twentieth century and after the collapse of the Soviet Union. This reflects the present structure of the Armenian diaspora, which comprises the two types of internationally recognized migrants. The first type is recent emigrants who are relatively young, have immediate families in Armenia, and support their families' incomes from abroad. This source of funds mostly finances consumption and is relatively stable at least over the future 20 to 30 years; from the pure accounting point of view this source is reflected as net transfers and net income from abroad. The second type of emigrant is the earlier emigrants, people whose families left about 100 years ago, and who are investing money in their country of origin if they see investment opportunities there.
5. It is estimated that at least some 20,000 people leave the country every year, mostly for economic reasons.
6. The higher the value added by labor is, the greater is the remuneration to labor and the stronger the poverty impact of an activity, if its share in all activities is large. At the same time, sectors with high employment multipliers have the potential to absorb a lot of employment, but the earnings from those jobs depend on the *quality* of jobs in the sector. The growth pattern is decisive in creating higher-wage jobs versus expanding the number of low-paid jobs. In general, low value-added agricultural activities and trade create the greatest amount of employment if one counts only the number of jobs generated per 1 million drams. However, there is a trade-off between the number of jobs and the quality of new jobs created. In contrast, the financial sector generates fewer jobs per million drams, but the quality of these jobs is superior and therefore provides sustainable sources of income and long-term security, moving more people out of poverty versus temporary employment and a reduction in transient poverty. That said, the creation of quality jobs may be constrained by the supply of skilled labor.
7. Remittances from the Armenian diaspora are a very important source of financing, signaling strong investment interest and business opportunities abroad and pointing to the potential for exploiting these opportunities back home. This source should be counted as a tremendous asset in terms of integration into global markets. This source of funds primarily finances investment, reacts to the macro environment and investment climate, and may be

highly volatile; from an accounting point of view, these are capital inflows which are debt-creating or returns-creating.

8. Unofficial remittances may be two to three times larger than official estimates.

9. The effect of the shocks on household income and GDP is identical in absolute value.

## ANNEX 7.1.

## Disaggregated Effect of Shocks on GDP (by sector), Armenia SAM

TABLE 7A.1.1 EFFECT OF A (-50%) SHOCK ON DIAMONDS

	<i>Base</i>	<i>Impact</i>	<i>Change</i>	<i>Share in GDP (%)</i>	
	<i>GDP</i>	<i>on GDP</i>	<i>in GDP</i>	<i>Old shares</i>	<i>New shares</i>
	<i>(US\$ million)</i>	<i>(US\$ million)</i>	<i>(%)</i>		
<b>Total agriculture</b>	531.3	-24.7	-4.7	24.8	24.9
<b>Total manufacturing</b>	254.8	-12.0	-4.7	11.9	11.9
<b>Total industry</b>	191.8	-27.7	-14.5	8.9	8.1
<b>Total construction</b>	298.6	-3.2	-1.1	13.9	14.5
<b>Total services</b>	869.0	-41.9	-4.8	40.5	40.6
<b>Total</b>	<b>2145.5</b>	<b>-109.5</b>	<b>-5.1</b>	<b>100.0</b>	<b>100.0</b>

Source: Armenia SAM.

TABLE 7A.1.2 EFFECT OF A (-30%) SHOCK ON CONSTRUCTION

	<i>Base</i>	<i>Impact</i>	<i>Change</i>	<i>Share in GDP (%)</i>	
	<i>GDP</i>	<i>on GDP</i>	<i>in GDP</i>	<i>Old shares</i>	<i>New shares</i>
	<i>(US\$ million)</i>	<i>(US\$ million)</i>	<i>(%)</i>		
<b>Total agriculture</b>	531.3	-40.6	-7.6	24.8	25.3
<b>Total manufacturing</b>	254.8	-16.9	-6.6	11.9	12.3
<b>Total industry</b>	191.8	-9.8	-5.1	8.9	9.4
<b>Total construction</b>	298.6	-87.8	-29.4	13.9	10.9
<b>Total services</b>	869.0	-49.0	-5.6	40.5	42.2
<b>Total</b>	<b>2,145.5</b>	<b>-204.1</b>	<b>-9.5</b>	<b>100.0</b>	<b>100.0</b>

Source: Armenia SAM.

TABLE 7A.1.3 EFFECT OF A (-5.5%) SHOCK ON REMITTANCES

	Base GDP (US\$ million)	Impact on GDP (US\$ million)	Change in GDP (%)	Share in GDP (%)	
				Old shares	New shares
<b>Total agriculture</b>	531.3	-51.5	-9.7	24.8	23.9
<b>Total manufacturing</b>	254.8	-18.6	-7.3	11.9	11.8
<b>Total industry</b>	191.8	-11.6	-6.1	8.9	9.0
<b>Total construction</b>	298.6	-2.3	-0.8	13.9	14.8
<b>Total services</b>	869.0	-55.1	-6.3	40.5	40.6
<b>Total</b>	<b>2,145.5</b>	<b>-139.2</b>	<b>-6.5</b>	<b>100.0</b>	<b>100.0</b>

Source: Armenia SAM.

### EXPORT DIVERSIFICATION INTO MANUFACTURING AND HIGH-VALUE NONTRADABLES

TABLE 7A.1.4 EFFECT OF A (+US\$135 MILLION) COMBINED  
SHOCK BASED ON RELATIVE EXPORT SHARES

	Base GDP (US\$ million)	Impact on GDP (US\$ million)	Change in GDP (%)	Share in GDP (%)	
				Old shares	New shares
<b>Total agriculture</b>	531.3	47.0	8.8	24.8	25.1
<b>Total manufacturing</b>	254.8	38.7	15.2	11.9	12.7
<b>Total industry</b>	191.8	10.6	5.5	8.9	8.8
<b>Total construction</b>	298.6	4.3	1.4	13.9	13.1
<b>Total services</b>	869.0	57.8	6.7	40.5	40.2
<b>Total</b>	<b>2,145.5</b>	<b>158.4</b>	<b>7.4</b>	<b>100.0</b>	<b>100.0</b>

Source: Armenia SAM.

### AGRICULTURE VERSUS MANUFACTURING AND INDUSTRY, EXCEPT MINERALS AND MINING

TABLE 7A.1.5 EFFECT OF A (+10% = US\$91 MILLION) POSITIVE  
SHOCK IN AGRICULTURE

	Base GDP (US\$ million)	Impact on GDP (US\$ million)	Change in GDP (%)	Share in GDP (%)	
				Old shares	New shares
<b>Total agriculture</b>	531.3	95.6	18.0	24.8	27.3
<b>Total manufacturing</b>	254.8	12.0	4.7	11.9	11.6
<b>Total industry</b>	191.8	7.3	3.8	8.9	8.7
<b>Total construction</b>	298.6	2.1	0.7	13.9	13.1
<b>Total services</b>	869.0	34.4	4.0	40.5	39.3
<b>Total</b>	<b>2,145.5</b>	<b>151.3</b>	<b>7.1</b>	<b>100.0</b>	<b>100.0</b>

Source: Armenia SAM.

TABLE 7A.1.6 EFFECT OF A (+10% = US\$241 MILLION) POSITIVE SHOCK IN MANUFACTURING AND INDUSTRY, EXCEPT MINERALS AND MINING

	<i>Base</i>	<i>Impact</i>	<i>Change</i>	<i>Share in GDP (%)</i>	
	<i>GDP</i>	<i>on GDP</i>	<i>in GDP</i>	<i>Old shares</i>	<i>New shares</i>
	<i>(US\$ million)</i>	<i>(US\$ million)</i>	<i>(%)</i>		
<b>Total agriculture</b>	531.3	85.6	16.1	24.8	24.6
<b>Total manufacturing</b>	254.8	58.1	22.8	11.9	12.5
<b>Total industry</b>	191.8	31.4	16.4	8.9	8.9
<b>Total construction</b>	298.6	5.6	1.9	13.9	12.1
<b>Total services</b>	869.0	179.2	20.6	40.5	41.8
<b>Total</b>	<b>2,145.5</b>	<b>359.9</b>	<b>16.8</b>	<b>100.0</b>	<b>100.0</b>

Source: Armenia SAM.

## ANNEX 7.2

### Methodology Used in the Paper

This paper depicts the Armenian subsectoral economic structure by analyzing a newly constructed 2002 Social Accounting Matrix (SAM) (see Light, Vashakmadze, and Khachatryan 2005). The results of this paper are derived from simulations based on a multiplier analysis of the SAM. The objective of our analysis was threefold: (i) to examine the vulnerabilities of the present growth pattern; (ii) to understand the channels through which growth penetrates to the labor market through employment creation and household incomes; (iii) to identify possible constraints to higher and more shared growth, which will generate sustainable jobs and lead to more effective poverty reduction.

While approaching this task we have asked ourselves the following questions: (i) What are the sources of Armenia's current growth? What are their implications for jobs and household incomes? What does the structure of the Armenian economy imply in terms of subsector growth; (ii) How sustainable are these sources and what are the implied vulnerabilities of the current growth pattern? (iii) Are the sectors that have managed to attract investment indeed the ones with high future growth potential? (iv) What is the effect of growth on future productive assets: is the current growth pattern creating productive assets or mainly consuming foreign inflows with a lesser impact on future sustainable growth? Answering these questions will help us to understand what is needed to achieve a sustainable and balanced growth with strong spillover effects, especially on employment generation and the well being of low-income households. We have applied a step-by-step approach that includes the following:

- We have conducted an economic analysis that depicts a disaggregated picture of the Armenian economy by constructing and analyzing different information sources, including the SAM, and by revealing the interrelationships between sectors as they grow.
- We have conducted a multiplier analysis that considers the economic impact of growth across different sectors and analyzes the linkages between growth, employment, and poverty.
- Based on preliminary findings, we have formed certain hypotheses that we have tested through a set of simulations.

For this study we have developed and applied an SAM-based supply-side model. The model is practical but has certain limitations; it assumes fixed prices, which is plausible in the short term for a country with highly unutilized capacity, like Armenia. The 25 sector SAM for Armenia (Light and Rutherford 2004) provides a good initial base for such an analysis. The model has been elaborated by incorporating the information on households, employment, and current account balance. The 2002 SAM for Armenia is the first attempt to systematically combine data from disparate Armenian agencies in order to create a balanced, representative framework for economic analysis. It is also the first time that the Armenian survey of household consumption has been integrated together with the Armenian National Accounts. By providing a bridge between these two fundamental data sources, the SAM provides a basis for the comparison of data sources and a sound methodology for checking the consistency of the national and household accounts.

## ANNEX 7.3

# Summary Notes on Labor Statistics in Armenia

### SOURCES OF DATA

There are several NSS publications on labor statistics in Armenia:

1. **Monthly reports of “Socio-Economic Situation in Armenia”** are the main sources of the current situation on labor statistics, and sections of “Labor Market Indicators” generally comprise monthly data and monthly accumulative data on the following:
  - nominal wages and salaries per worker
  - number of economically active population by sectors
  - number of employed persons
  - unemployment rate
2. Data from monthly publications are used by NSS to prepare the annual *Statistical Yearbook of Armenia*. The yearbook is the main source of finalized and summarized labor statistics in Armenia. The sections on “Employment” and “Living Standards of Population and Social Sphere” contain the following average annual data:
  - labor resources
  - number of economically active population by sectors
  - number of economically nonactive population
  - number of employed persons
  - number of unemployed persons
  - registered unemployment rate
  - unemployment benefits and average monthly data on the same
  - nominal wages and salaries per worker

The data published in the *Statistical Yearbook of Armenia* are final and have priority in case of differences compared with the data on the “Socio-Economic Situation in Armenia.”

3. However, the results of 2001 Census of Armenia (Armenia 2003c) may be considered a more comprehensive and detailed statistical source for labor statistics in Armenia, though the census was undertaken only for a certain period of time. Along with some other valuable statistical data, the 2001 census results contain the following more useful information on “Economically Active De Jure Population” by the following categories:

- rural and urban
- occupation and employment status
- sex and age
- educational attainment
- type of economic activity

All the indicators since 2002 represented in the section on “Employment” in the *Statistical Yearbook of Armenia* (excluding the officially registered unemployed) were based on data recalculated by the results of the 2001 census.

4. Other labor surveys conducted by NSS are useful. **The “Labor Force Sample Survey in the Urban Settlements in Armenia”** (August–September 2001) was aimed at deriving statistical information on issues concerning sex and age, specialty composition, employment structure of the economically active population of the urban settlements in Armenia, factors influencing the latter, unemployment, underemployment, and the labor market in general. In this analytical publication outputs of the survey were summarized and general conclusions were drawn. Meanwhile, to have a complete picture, the derived indicators were compared with the official macroeconomic indicators on employment for Armenia.

## CONCLUSION

The officially registered unemployment rates are calculated according to the Armenian law “About Employment.” According to this law, the unemployed are considered persons 16 years and older who meet these conditions:

- do not have work
- have applied to the Employment State Service of Armenia to receive work and have at least one year’s work experience/practice

Except for the officially registered unemployment rate, the labor force survey and the census are allowing the real unemployment level to be estimated. As a basis for the labor force survey and census, the International Labor Organization (ILO) recommendations on the definition of unemployment were taken.

According to this definition, during the reference period the unemployed are considered to be all persons who satisfy all three of the following criteria:

- do not have work or a profitable job
- are actively seeking work at the Employment State Service (as well as independently)
- are ready to start working immediately

TABLE 7A.3.1 SELECTED LABOR INDICATOR DEFINITIONS

<i>Source of definition</i>	<i>Total labor force</i>	<i>Employment</i>	<i>Unemployment</i>
Statistical Yearbook 2004	Economically active population includes all employed and unemployed population who develop labor markets (related to labor force demand for production of commodities and services).	Number of persons employed includes those persons who work at institutions and all organizations of all types, including those employed at small organizations, public organizations, peasant farms, and also those engaged in entrepreneurial activity, and self-employed persons.	Officially registered unemployed are able-bodied citizens of working age who are resident in the territory of the Republic and who in the period under review do not have work (profitable activity), seek a job with the aid of employment territorial centers, and who are ready to begin work immediately or during the period defined by legislation.
Labor Force Survey	Economically active population is the sum of employed and unemployed persons who form the labor force demand in the labor market.	Persons were employed, did some paid work, or had some profitable employment during the observation week, even if it lasted for an hour.	Persons were unemployed, did not have a job during the observation week, looked for a job, and were ready immediately to take up work.

(continued on next page)

TABLE 7A.3.1 (CONTINUED)

<i>Source of definition</i>	<i>Total labor force</i>	<i>Employment</i>	<i>Unemployment</i>
2001 Census	The economically active population (labor force) comprises those individuals 15 years or older who are either employed or unemployed (according to the ILO definition) during the reference period.	<p>The employed population must satisfy one of the following two categories:</p> <ol style="list-style-type: none"> <li>1. Paid employment               <ol style="list-style-type: none"> <li>a. Those who performed work for wage or salary, in cash or kind</li> <li>b. Those that have a job but were temporarily not at work during the reference period, but had a formal attachment to their job</li> </ol> </li> <li>2. Self-employment               <ol style="list-style-type: none"> <li>a. Those who performed work for profit or family gain, in cash or kind</li> <li>b. Those that have their own enterprise but were not working during the reference period for some specific reason</li> </ol> </li> </ol> <p>According to current ILO recommendations, work means at least one hour of work performed during the reference period.</p>	<p>The unemployed comprise all those persons 15 years or older who during the reference period satisfy all three of the following criteria:</p> <ol style="list-style-type: none"> <li>a. Without work; in other words, not in paid or self-employment as defined in the employed population</li> <li>b. Currently available for work; in other words, available for paid or self-employment, during the nearest two-week period</li> <li>c. Seeking work; in other words, took specific steps in a recent period to find paid or self-employment</li> </ol> <p>Also considered unemployed are those individuals who stated they that were not looking for a job due to one of the following reasons:</p> <ol style="list-style-type: none"> <li>a. Have applied for a job and will be starting it in near future</li> <li>b. Have applied for a job and are waiting for the answer</li> </ol>

## CHAPTER 8

# A Social Accounting Matrix for Armenia

### INTRODUCTION

This chapter<sup>1</sup> provides documentation related to the 2002 Armenian SAM. Development of this SAM is necessary to identify the potential linkages between economic growth and poverty alleviation and for basic economic analysis of Armenian tax and trade policies. The credibility of these studies depends upon an accurate and complete depiction of Armenia's economy. The 2002 SAM for Armenia is the first attempt to systematically combine data from disparate Armenian agencies in order to create a balanced, representative framework for economic analysis. It is also the first time the Armenian survey of household consumption has been integrated with the Armenian National Accounts. By providing a bridge between these two fundamental data sources, the SAM provides a basis for comparison of data sources and a sound methodology to check the consistency of the national and household accounts.

The development phase was influenced by the particular uses for the SAM. Some of these uses are itemized here:

- **Economic analysis.** A disaggregated picture of the economy is made possible by combining the national data with industry-level data. This disaggregation reveals the interrelationships among sectors as they grow.
- **Economic growth and the incidence of poverty.** By connecting poor and rich households to different factors of production, different consumption bundles, and different transfer patterns, the household SAM provides the basis to determine what linkages exist between Armenian economic growth, employment, and the alleviation of poverty.

- **Multiplier analysis.** The inclusion of an input-output (IO) matrix into the social accounts means that we can invert this matrix and generate economic output “multipliers.” This is often a straightforward way to consider the economic impact of growth across different sectors.<sup>2</sup>
- **Policy and impact analysis.** This SAM provides the basis for a standardized computable general equilibrium (CGE) model of the Armenian economy. CGE models are the most common tool for tax and trade policy analysis. The underlying data describe the industries and individuals that pay taxes in Armenia and also describe who is consuming imports and who is producing exports.
- **Data improvement.** A well-documented “benchmark” dataset can be used as a starting point for further data development. We hope this SAM will be used as a benchmark to measure the quality of new data sources.
- **Data integration.** The official data produced by various Armenian ministries and departments, such as the NSS, Ministry of Finance, customs authorities, and the tax authorities, should be “consistency checked” with other divisions’ output. Although perfect coordination is not possible, we hope this SAM will permit each organization to compare their own data with the outputs that would be applied by combining data from other sources.

With these needs in mind, we developed three SAMs to represent Armenia’s economy; each one reveals a different level of detail. The macro SAM represents the most aggregated national accounts. The cells from this matrix replicate the basic national accounting identities, such as GDP, national income, and the current/capital accounts.

The micro SAM disaggregates total national production into 25 separate industries. Each industry has a distinct production technology that includes intermediate inputs from other industries and uses different combinations of production factors. This matrix decomposes aggregate value added into four distinct factors: skilled labor, unskilled labor, capital rents, and land rents. Total direct and indirect taxes are distinguished using the major Armenian tax streams: value-added taxes, income taxes, profits taxes, excise taxes, import tariffs, and payroll (social security) taxes. The international accounts are decomposed by sector, so that imports, exports, domestic supply, and total aggregate supply are known for each of the 25 industries. The micro SAM combines all of these components into a single, balanced matrix.

Finally, the household (HH) SAM projects income and expenditure profiles from a single representative agent onto 20 income deciles. Ten rural and 10 urban households are categorized by income; then each household's factor income, expenditure patterns, and transfers are mapped onto the 25 industries and four factor types.

Although we believe these social accounts represent the best available data for Armenia at this point, there is room for improvement. Closer collaboration with the NSS could yield a more accurate depiction of total sectoral output. By the same measure, closer collaboration with the NSS household survey division might yield more accurate factor incomes for each income decile. Accurate factor share information is critical in order to identify the effect of industrial growth upon wages and capital rents. Finally, an Armenian-based IO table would be an improvement because it would dispel suspicions that the core nature of Armenian production is not correctly captured.

We hope the current dataset will lower the cost of further data development and lead to a universally accepted set of national accounts for the country. This documentation should facilitate further improvements, especially because a detailed description of the building process has been included in the Annex.

The remainder of this documentation is arranged as follows. Section 2 presents three depictions of the Armenian social accounts. Section 3 briefly describes past and future applications of the Armenian accounts for economic analysis. Section 4 concludes and offers potential avenues for further improvements. A lengthy and detailed Annex documents the SAM building process; Annex subsections "Matrix Balancing" and "The Build Distribution" detail the algebraic mechanics and files needed to build the SAM from scratch.

### **THREE SOCIAL ACCOUNTS MATRICES**

In this section we present the Armenian accounts using three separate matrices, each with an increasing level of detail. The macro SAM contains only aggregate national accounts values; the micro SAM adds sectoral detail by disaggregating production, consumption, and trade to 25 goods and industries. Finally, the household SAM adds further detail by disaggregating the single consumer into 20 separate households using data from the 2002 Armenian Household Survey of income and consumption. All of the social accounts are based upon a set of input tables. These input tables are based upon published government statistics, analytical reports, and judgments from local experts and staff.

### The Aggregate macro SAM

We have chosen a specific split of accounts to reveal sufficient detail for calculating the output both from expenditure and the revenue side for constructing the macro SAM. Furthermore, we have made an effort to preserve the mandatory data entries fully comparable with the System of National Accounts. We have included the following major accounts in the macro SAM: productive sector, commodity markets, factors of production, two institutions (governance and the rest of the economy), the savings/investment account, and the “rest of the world” account.

By using the column totals provided in two of the input tables, Annex Tables 8A.1.2 and 8A.1.3, we can produce most of an aggregate SAM. Several national indicator statistics from the NSS can be found in the macro SAM below. For example, GDP at producers’ prices is equal to total value added, or US\$2,145.5 million. The macro SAM is reproduced here as Table 8.1.

TABLE 8.1 AGGREGATE SOCIAL ACCOUNTS FOR ARMENIA,  
2002 (US\$ MILLIONS)

		<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>
		<i>ACT</i>	<i>COM</i>	<i>VA</i>	<i>RA</i>	<i>GOV</i>	<i>ROW</i>	<i>I/S</i>	<i>Total</i>
1	ACT	—	4,337.6	—	—	—	—	—	4,337.6
2	COM	1,962.1	—	—	2,033	237	698	514.8	5,444.9
3	VA	2,145.5	—	—	—	—	—	—	2,145.5
4	RA	—	—	2,145.5	—	117.7	206.7	—	2,469.9
5	GOV	230	—	—	72	—	54.7	—	356.7
6	ROW	—	1,107.3	—	—	—	—	—	1,107.3
7	I/S	—	—	—	364.9	2.0	148	—	514.9
8	Total	4,337.6	5,444.9	2,145.5	2,469.9	356.7	1,107.4	514.8	—

Key:

ACT *Activities* account, total production

COM *Commodities* account, aggregate demand, and supply of goods

VA *Value-added* account

RA *Representative-agent* account

GOV *Government* account

ROW *Foreign* account.

I/S *Investment and savings* account

Source: Authors’ calculations.

Note: — = not available.

These figures should be easy to recognize. Reading by ROW/COLUMN, we see that total value-added (RA/VA) equals US\$2,145 million. This figure is identical to the column sum for VA0 from Annex Table 8A.1.2. Total imports, found in the ROW/COM cell, are also equal to the column total under M0, US\$1,107. At some point, however, adjustments were impossible to avoid. For example total intermediate demand, ID0, is slightly larger in the macro SAM than it is in input Annex Table 8A.1.2, (US\$1,962 versus US\$1,924). Other cells can be checked in a similar way.

Table 8.2 compares the macro SAM from Table 8.1 to officially published statistics from the NSS. There is a clear linkage between the macro SAM and the Armenian System of National Accounts. The macro SAM cells are presented in column three of Table 8.2, and the corresponding National Accounts spreadsheet cell is presented in column four.

**TABLE 8.2 REPLICATION OF SELECTED NATIONAL ACCOUNTS MEASURES BY THE MACRO SAM**

<i>Account</i>	<i>Value (US\$ millions)</i>	<i>Macro SAM</i>	<i>SNA spreadsheet cell</i>
GDP (producer prices)	2,146	A3	SNA (An7)
Net indirect taxes	230	A5	SNA (An4)
GDP at (market prices)	2,376	A3+A5	SNA (An3)
Total absorption	2,786	D2+E2+G2	SNA (An28)
GNP	2,464	A3+A5+F4+118.7	SNA (An60)
GNI (disposable)	2,638	A3+A5+F4-F5	SNA (An61)
GDS	105	A8-A2-D2-E2	SNA (An50)
GNS	367	D7+E7	SNA (An53)
GDI	515	G2	SNA (An36)
Direct taxes	73	D5	GFS (AN11)
Total net current transfer	173	F5+118.7	SNA (An49)
Imports of goods and services	1,107	B6	SNA (An26)
Exports of goods and services	698	F1	SNA (An25)
Current account balance	148	F7	BOP (AN36)

*Source:* Authors' calculations.

*Note:* The macro SAM cell coordinates are used to calculate each macroeconomic statistic. These values can be compared with the corresponding National Accounts spreadsheet cells.

SNA: System of National Accounts.

### The micro SAM

Construction of a complete SAM is done by disaggregating each cell contained in the aggregate (macro) SAM. Using more detailed tables for industrial supply (for example, see Table 8A.1.2), we can produce disaggregated statistics for production, industrial demand, value-added, final demand, and trade. The dimensions of the micro SAM for Armenia are listed in Table 8.3.

The following paragraphs describe how the micro SAM accounts are organized.

*Activities/Commodities.* We used official NSS statistics to compute participation for major sectors, but some sectors that were provided needed further disaggregation from outside data sources. For example, the NSS official statistics use “industry” to describe all manufacturing sectors. We used output shares taken from an IMF Country Report for Armenia to further disaggregate this super-sector into six subsectors.

Given total output for each sector, we then use a surrogate IO table as a starting point to describe each industry’s production technology. For most sectors, we assert that the production technology is similar, agricultural industries are typically labor-intensive in low-income countries, and manufacturing industries are typically capital-intensive.<sup>3</sup>

Some sectors are clearly unique to Armenia and required manual adjustment. For example, Armenia’s “cut jewelry” sector accounts for one-third of total imports and exports. This sector uses only one inter-

TABLE 8.3 STRUCTURE OF THE DISAGGREGATED (MICRO) SAM FOR ARMENIA, 2002

<i>Name of account</i>	<i>Number of accounts</i>	<i>Description</i>
Activities/commodities	25	Industries are described in Table 8.4
Factors of production	4	Skilled labor, unskilled labor, capital, and land
Tax streams	6	VAT, excise, labor tax, profits tax, payroll tax, and import tariffs
Government	1	Central government
Households	1	One single, representative agent
Trading partners	1	ROW trading partner
Margins	n.a.	Trade and distribution (TRD) margins, collected as a production activity and used as an intermediate input
Savings-investment	3	Private, government, and foreign

Source: Authors’ calculations.

mediate input, uncut gems. The remainder of the value accrues to labor and capital, so the IO matrix was corrected to reflect Armenia's special circumstances in the jewelry industry. In other cases, aggregate intermediate demand was larger than total supply. Adjustments to the IO matrix were required in these cases as well. A full description of the SAM-balancing process is included in the Annex.

*Tax Streams.* Upon request, the Armenian Ministry of Finance has supplied figures for tax collections across tributary streams for each of the 25 commodities. Each of the six taxes is presented individually in the SAM, but where they appear in the matrix depends on whether they are classified as *direct* or *indirect* taxes. Total tax collections in our treatment are about 20 percent smaller than total government revenues for 2002. Collections are smaller in this dataset because we chose to omit some of the revenues from special taxes, fees, and other miscellaneous incomes that are not consistent year to year.

*Government.* All government activity, local and national, is presented using a single government agent, and a single government production technology. Government income comes mostly from tax collections and from transfers. Revenues are spent primarily to purchase the "government good," which is produced using intermediate materials, labor, capital, and land. The government also transfers funds to households and contributes to savings.

*Households.* The micro SAM includes a single representative agent (RA). The RA earns income by selling production factors, and the RA consumes goods as final demand. Total factor earnings by the RA in this matrix sums to US\$2,145 million, which equals gross domestic product, taken at producer prices. Other income comes from government transfers and remittances from abroad, which are placed in the ROW account.

*Sector Descriptions.* Table 8.4 presents 25 industrial sectors with labels and descriptions. These sectors reflect our best notion of Armenia's strategic and important industries. While some of the sectors in the social accounting matrix have been disaggregated from the Armenian national statistics, others are a combination of less-important sectors that were included on separate lines in the NSS accounts. Table 8.4 presents a detailed description of each sector, and a mapping between the NSS output statistics and the sectors in Table 8.4 can be found in the Annex.

### **Armenia 2002: A Snapshot**

The micro SAM depicts the Armenian economy at a fairly disaggregated level and helps us to understand the implications of its present structure in terms of subsectoral growth. Table 8.5 displays Armenia's production and trade statistics for 2002. The largest single output sectors were construction, trade, and processed foods. Other large

TABLE 8.4 DETAILED SECTOR DESCRIPTIONS FOR EACH INDUSTRY IN THE 2002 ARMENIAN MICRO SAM

<i>Symbol</i>	<i>Description</i>
GRN	<i>Grains, potatoes, and legumes.</i> Taken from the 2002 agriculture dataset (available in the Armenia SAM distribution). This sector combines wheat, potatoes, and leguminous plants.
VFR	<i>Vegetables and fruits, including grapes.</i> Includes vegetables, dried fruit (without grapes) and the grapes account.
VOL	<i>Vegetable oils.</i> Directly from 2002 agriculture accounts.
OCR	<i>Other crops.</i> Crops that are not classified elsewhere in the social accounts.
MIL	<i>Milk and milk products.</i> Dairy products including raw or processed milk, eggs, and related products
OMT	<i>Other meats.</i> Includes the beef, pork, mutton, goat, and poultry categories from the 2002 agriculture dataset.
ENR	<i>Energy.</i> Oil and natural gas. This sector is not produced in Armenia—it is a pure import.
MIN	<i>Mining and quarrying.</i> This sector comes from two sources. The first source is the National Accounts (Macro Data.xls) sector “Geology.” The second portion comes from the IMF Statistical Annex, page 7, Table 4: Structure of Industrial Production (1996–2001). The portion for “Mining and Quarrying” is taken from the “industry” sector of the National Accounts.
FOD	<i>Processed food and beverages.</i> Includes all processed foods, alcoholic, and nonalcoholic beverages. This is one of the largest consumption sectors in Armenia.
TBC	<i>Tobacco and tobacco products.</i>
CRP	<i>Chemicals, rubber, and plastic.</i> This sector was apportioned from the industry macro-sector in the 2002 NSS official output statistics. Oil and natural gas refining or processing is included in this sector.
OMF	<i>Other manufacturing.</i> Manufacturing industries not elsewhere classified.
LMF	<i>Light manufacturing and textiles.</i> Includes textiles, dressing, and dyeing of fur.
MNM	<i>Minerals and precious stones.</i> This sector mainly captures the jewelry-cutting business in Armenia. The single largest import and export good in Armenia is jewels. Uncut jewels enter the country and finished jewelry is exported. Shares are taken from Table 4 of the IMF Statistical Annex. This datasheet is available as part of the Armenia SAM distribution (see Annex for details).
MTL	<i>Metals and metal products.</i> Basic metals and fabricated metals, taken directly from the IMF Statistical Annex. Represents 8 percent of industrial output.

(continued)

TABLE 8.4 (CONTINUED)

<i>Symbol</i>	<i>Description</i>
MCH	<i>Machinery and equipment.</i> Combines machinery, equipment, and motor vehicles with optical, medical, and other precision devices, IMF Statistical Annex, Table 4. Combined share is 3.8 Percent.
UTL	<i>Gas, water, and trash utilities.</i> This sector appears twice: once in the industrial section from the IMF Statistical Annex, then again as a separate account in the official NSS accounts. We combine these two accounts for the total. The totals are the "utility sector" from the macro report and "electricity, gas, and water" from the IMF Statistical Annex, Table 4.
ELE	<i>Electricity production and distribution.</i> Captures nuclear electricity production and the distribution of power across the Armenian electricity grid.
CON	<i>Construction.</i> Taken directly from the official NSS National Accounts.
TRN	<i>Transportation and communications.</i> Includes public transportation activity, postal communication, and fixed-line and wireless telecommunications.
TRD	<i>Trade and distribution activities.</i> Wholesale and retail trade plus commerce combines two macro lines: Retail trade and catering plus general commerce.
BNK	<i>Banking and finance.</i> Combines two lines from the 2002 National Accounts: insurance and lending.
GOV	<i>Government, defense, and public procurement.</i> This represents government activities within the economy. Taken from the macro data spreadsheet, and also compared with general statistics regarding the government sector. This sector also includes "social spending," including four lines from the national accounts: health & sport, education, culture, and science.
DWE	<i>Dwellings and housing.</i> One line from the national accounts: housing.

activities include the public sector (GOV), cut gems, transportation services, and electricity output. Food is probably more important to the Armenian economy than it appears in this table. If we combined the four largest food industries (processed foods (FOD), dairy (MIL), meats (OMT) and grains (GRN)), then consumable food would be the largest single industry in Armenia. Total combined output for these four industries accounts for 25.1 percent of total production.

Table 8.5 also displays exports (X0), imports (M0), and total domestic supply (A0) for each sector. Import and export volume is dominated by a single sector: uncut and cut gems (MNM). This sector alone

TABLE 8.5 ARMENIAN PRODUCTION STATISTICS BY SECTOR, 2002  
(US\$ MILLION)

<i>Sector</i>	<i>Y0</i>	<i>Y0(%)</i>	<i>D0</i>	<i>X0</i>	<i>M0</i>	<i>A0</i>
Construction	518.3	11.9	512.1	6.2	2.9	515.0
Retail & wholesale trade & catering	447.2	10.3	447.2	0.0	0.0	447.2
Food processing & beverages	430.7	9.9	379.6	51.1	46.7	426.3
Governance, defense, & public spending	362.5	8.4	354.8	7.7	7.8	362.6
Dairy products, eggs, & milk	342.6	7.9	342.1	0.5	6.8	348.9
Mineral products & precious stones	269.3	6.2	11.3	258.0	206.3	217.5
Transport & communication	259.9	6.0	172.2	87.7	24.0	196.2
Electricity supply & distribution	163.2	3.8	149.8	13.4	5.6	155.5
Beef, pork, mutton, & poultry meat	159.0	3.7	158.9	0.1	23.1	182.0
Wheat, potatoes, & legumes	155.5	3.6	155.2	0.3	50.7	206.0
Electricity, gas, & water supply	152.0	3.5	152.0	0.0	0.0	152.0
Vegetables, grapes, dried fruits	132.5	3.1	126.9	5.6	24.0	150.9
Metals & metal products	109.9	2.5	65.3	44.7	55.3	120.6
Crops not elsewhere classified	103.1	2.4	98.1	5.0	19.9	118.0
Services not elsewhere classified	93.7	2.2	23.1	70.6	60.5	83.6
Housing & dwellings	92.6	2.1	92.6	0.0	0.0	92.6
Machinery, vehicles, precision equipment	88.7	2.0	33.0	55.7	186.4	219.5
Tobacco products	80.9	1.9	77.3	3.6	30.0	107.3
Energy (oil & natural gas)	75.7	1.7	75.7	0.0	156.5	232.2
Mining & quarrying	65.9	1.5	27.2	38.7	1.1	28.4
Other manufacturing	61.2	1.4	56.1	5.0	52.1	108.3
Chemicals, rubbers, & plastics	53.0	1.2	44.7	8.3	81.7	126.4
Light manufacturing & textiles	52.6	1.2	23.5	29.1	40.1	63.7
Banking lending & insurance	51.6	1.2	44.9	6.7	11.3	56.2
Vegetable oils & fats	15.8	0.4	15.8	0.0	14.3	30.1

Source: Authors' calculations and NSS statistics.

Key:

Y0: Aggregate production value

Y0 (%): Production share of total output

D0: Supply to domestic market

X0: Supply to export markets

M0: Import value (cif)

A0: Armington supply (D0 + M0)

represents about one-quarter of the total trade volume for Armenia. Uncut gems are imported into the country, they are then cut and sometimes mounted as finished jewelry, then re-exported to Europe or the United States. Transportation, services, and machine products are the other large exports for Armenia.

TABLE 8.6 VALUE ADDED IN PRODUCTION FOR ARMENIA, 2002  
(US\$ MILLION)

<i>Sector</i>	VA0	VA0(%)	VA/Y	L/VA	K/VA
Construction	298.6	13.9	57.6	40.7	59.3
Retail & wholesale trade & catering	288.6	13.5	64.5	30.2	69.8
Governance, defense, & public spending	197.7	9.2	54.5	86.1	13.9
Dairy products, eggs, & milk	168.2	7.8	49.1	55.4	44.6
Food processing & beverages	158.1	7.4	36.7	64.0	36.0
Transport & communications	153.1	7.1	58.9	57.0	43.0
Vegetables, grapes, dried fruits	115.4	5.4	87.1	48.7	51.3
Electricity, gas, & water supply	111.6	5.2	73.5	29.3	70.7
Electricity supply & distribution	102.1	4.8	62.6	48.7	51.3
Wheat, potatoes, & legumes	98.7	4.6	63.5	51.0	49.0
Crops not elsewhere classified	81.1	3.8	78.7	42.5	57.5
Housing & dwellings	68.2	3.2	73.6	0.0	100.0
Beef, pork, mutton, & poultry meat	66.9	3.1	42.0	53.0	47.0
Metals & metal products	43.6	2.0	39.7	67.9	32.1
Mineral products & precious stones	40.7	1.9	15.1	60.3	39.7
Mining & quarrying	39.4	1.8	59.8	38.6	61.4
Banking lending & insurance	35.7	1.7	69.1	68.0	32.0
Services not elsewhere classified	23.6	1.1	25.2	28.3	71.7
Other manufacturing	17.9	0.8	29.3	40.4	59.6
Tobacco products	13.7	0.6	17.0	50.4	49.6
Chemicals, rubbers, & plastics	10.4	0.5	19.6	52.2	47.8
Machinery, vehicles, precision equipment	5.8	0.3	6.5	56.8	43.2
Light manufacturing & textiles	5.3	0.2	10.1	66.2	33.8
Vegetable oils & fats	1.0	0.0	6.0	71.2	28.8
TOTAL	2145.5	100.0	0.0	0.0	0.0

*Source:* Authors' calculations and NSS statistics.

*Key:*

VA0: Total value added (US\$ million)

VA0 (%): Value added as a share of total VA0

VA/Y: Value added share of total output

L/VA: Labor share of value added

K/VA: Capital share of value added

If we reorganize these statistics according to *value added*, a different story emerges. Table 8.6 contains a breakdown of factors and value added in production for each sector.

The government is the most labor-intensive activity in Armenia, where labor represents 86.1 percent of total value added. Other labor-intensive industries are banking (BNK), light manufacturing (LMF), and jewelry cutting (MNM). Column three (VA/Y), displays the intensity of value added in production. Machinery, tobacco, and jewelry

cutting have the lowest share of value added in production, which implies that those industries are comprised mostly of intermediate inputs. Crops, vegetables and fruits, banking, and utilities have a relatively higher share of value added in the production process—growth in these sectors is more likely to contribute to higher personal income for Armenians. Some industries, such as cellular telecommunications, mining, or utilities may exhibit a high degree of value added in production ( $VA/Y$  may be large), but since these industries are capital-intensive, their contribution to personal income will depend upon who collects the capital rents. For example, a foreign-owned mine may capture significant rents, but most of this income could be forwarded offshore.

### *Taxes*

Like all former CIS countries, Armenia is faced with challenges related to tax collection and public finance. Despite relatively high statutory tax rates, tax evasion and multilevel corruption are significant impediments to collection. The result is a relatively weak public tax system. Table 8.7 presents Armenia's major tax streams and breaks down tax collections by sector.

Value-added taxes contribute most to the public coffers: about US\$158 million was collected from the VAT in 2002. The statutory VAT rate is 20 percent, and more than one-half of these revenues are collected at the Armenian border. Excise taxes on motor fuel, tobacco, and beverages collected US\$56 million in 2002, labor and social security taxes accounted for approximately US\$50 million, the profits tax (denoted here by TK) contributed US\$22.8 million, and import tariffs amounted to approximately US\$15.2 million. These main tax streams represented US\$302 million in 2002.<sup>4</sup> According to the 2004 Aide-Mémoire on Armenia, we know that 2002 tax revenues were closer to US\$385 million. The collections here represent only the major tax streams, excluding several fees and additional royalties collected by the central and local governments.

### *Consumption*

Household demand, government demand, and intermediate demand can help to identify how price changes, such as inflation, can have an impact on households or producers. Table 8.8 displays the total commodity supply for Armenia ( $A0 = D0 + M0$ ) and each component of demand for these goods.

TABLE 8.7 TAX PAYMENTS BY SECTOR IN ARMENIA, 2002  
(US\$ MILLION)

Sector	Total REVS	%	VAT	Tax instruments			
				TM	TL	TXS	TK
Energy (oil & natural gas)	75.0	24.8	49.3	0.0	0.0	25.7	0.0
Food processing & beverages	32.9	10.9	16.1	2.7	3.7	9.1	1.2
Tobacco products	30.5	10.1	5.8	1.4	0.4	22.0	0.9
Machinery, vehicles, precision equipment	18.8	6.2	14.9	3.2	0.4	0.0	0.3
Other manufacturing	17.3	5.7	11.7	0.8	2.9	0.0	1.8
Retail & wholesale trade & catering	14.9	4.9	7.4	0.0	6.2	0.0	1.3
Governance, defense, & public spending	13.7	4.5	0.0	0.0	13.7	0.0	0.0
Electricity gas & water supply	12.8	4.2	4.2	0.0	2.5	0.0	6.2
Transport & communications	11.4	3.8	3.7	0.0	5.0	0.0	2.8
Chemicals, rubbers, & plastics	11.1	3.7	10.0	0.5	0.4	0.0	0.3
Wheat, potatoes, & legumes	8.7	2.9	8.7	0.0	0.0	0.0	0.0
Beef, pork, mutton, & poultry meat	7.6	2.5	3.9	1.8	0.4	0.0	1.6
Construction	7.5	2.5	2.1	0.0	3.3	0.0	2.1
Light manufacturing & textiles	6.4	2.1	4.3	1.3	0.4	0.0	0.4
Mineral products & precious stones	5.9	2.0	3.9	1.1	0.4	0.0	0.5
Vegetable oils & fats	5.1	1.7	3.5	1.6	0.0	0.0	0.0
Mining & quarrying	5.0	1.7	2.2	0.0	0.4	0.0	2.4
Housing & dwellings	5.0	1.6	0.0	0.0	4.6	0.0	0.4
Metals & metal products	4.6	1.5	3.2	0.0	1.2	0.0	0.1
Banking, lending, & insurance	3.9	1.3	0.0	0.0	3.3	0.0	0.5
Crops not elsewhere classified	2.4	0.8	1.9	0.5	0.0	0.0	0.0
Diary products, eggs, & milk	2.2	0.7	1.3	0.3	0.4	0.0	0.1
TOTAL	302.8	100.0	157.9	15.2	50.0	56.8	22.8

Source: Authors' calculations and Ministry of Finance statistics.

Key:

REVS: Total tax revenues for sector

#: Share of aggregate tax revenues

VAT: Value-added tax revenues—all sources

TM: Import tariffs

TL: Labor taxes

TXS: Excise taxes

TK: Profits taxes

TABLE 8.8 TOTAL COMMODITY SUPPLY AND COMPONENT DEMAND BY CONSUMER, 2002 (US\$ MILLION)

<i>Sector</i>	<i>Supply A0</i>	<i>C0</i>	<i>C0(%)</i>	<i>Demand</i>		
				<i>G0</i>	<i>ID0</i>	<i>I0</i>
Food processing & beverages	426.4	275.0	13.5	0.0	151.4	0.0
Dairy products, eggs, & milk	349.0	231.3	11.4	0.0	117.7	0.0
Retail & wholesale trade & catering	377.3	226.4	11.1	0.0	150.9	0.0
Energy (oil & natural gas)	232.3	131.3	6.5	0.0	101.0	0.0
Vegetables, grapes, dried fruits	150.8	109.8	5.4	0.0	41.0	0.0
Beef, pork, mutton, & poultry meat	182.1	103.3	5.1	0.0	78.8	0.0
Tobacco products	107.4	102.7	5.0	0.0	4.8	0.0
Electricity, gas, & water supply	152.0	97.5	4.8	0.0	54.5	0.0
Construction	631.6	83.9	4.1	0.0	136.3	411.4
Transport & communication	196.2	79.2	3.9	0.8	116.2	0.0
Wheat, potatoes, & legumes	205.5	75.9	3.7	0.0	129.6	0.0
Governance, defense, & public spending	316.6	73.1	3.6	230.1	13.4	0.0
Mineral products & precious stones	217.7	68.0	3.3	0.0	149.6	0.0
Electricity supply & distribution	155.4	63.0	3.1	0.0	92.5	0.0
Housing & dwellings	92.6	48.2	2.4	0.0	44.4	0.0
Banking, lending, & insurance	56.3	39.0	1.9	0.0	17.2	0.0
Other manufacturing	108.2	38.5	1.9	0.0	63.7	6.0
Crops not elsewhere classified	118.0	38.1	1.9	0.0	79.9	0.0
Machinery, vehicles, precision equipment	218.7	37.5	1.8	0.0	97.9	83.3
Light manufacturing & textiles	63.7	29.2	1.4	0.0	34.5	0.0
Metals & metal products	120.6	26.5	1.3	0.0	86.7	7.4
Chemicals, rubbers, & plastics	126.5	23.9	1.2	3.2	99.4	0.0
Vegetable oils & fats	30.1	17.9	0.9	0.0	12.2	0.0
Mining & quarrying	28.3	8.8	0.4	0.0	19.6	0.0
Services not elsewhere classified	83.5	4.9	0.2	3.0	68.9	6.8
TOTAL	4,747	2,033	100	237	0	515

*Source:* Authors' calculations and NSS statistics.

*Key:*

A0: Armington aggregate supply (D0 + M0)

C0: Final demand by households

C0(%): Budget share of household consumption by sector.

G0: Government demand for commodities

ID0: Intermediate-inputs (firm) demand

I0: Investment demand

Table 8.8 is ranked according to final demand (C0). We see that processed foods, dairy products, trade margins, and fossil fuels are the largest components in final demand by households. Beyond these staples, the second-tier demand commodities are vegetables, meats, tobacco products, and basic utilities.

### The Household SAM

The national accounts go far to explain Armenia's underlying production technology, trade position, and final demand structure. However, the use of a "representative" household agent for total demand makes it impossible to determine whether economic growth in Armenia helps to alleviate poverty.

To determine the *distribution* of income and expenditure as the economy grows, we further disaggregate the SAM to distinguish household types. In the HH SAM, we disaggregate a single household agent into 20 individual households, each distinguished by income (by deciles) and location (rural or urban). This sort of disaggregation is made possible by using data from the annual "Survey of Living Conditions"—a survey of incomes and expenditures compiled by the NSS.

Figure 8.1 shows how total sectoral expenditures are disaggregated into household-level expenditures by good. Total final demand is broken down into rural and urban household spending, but the total demand still equals aggregate final demand. To do this, the  $25 \times 1$  vector of expenditure shares, shown in the top panel of Figure 8.1, is expanded into a  $25 \times 20$  matrix of expenditure shares by commodity and household.

Likewise, aggregate value added is allocated to each household according to income decile and location. This  $4 \times 1$  vector is disaggregated into a  $4 \times 20$  matrix of factor allocations. The column sums equal each household's total factor endowments and each row total equals national factor supply. The combination of row and column totals equals total value added, or GDP at producer prices. We see that this figure equals US\$2,145, which is identical to value added in the macro SAM discussed early in this chapter, as well as the factor incomes from the above section on the micro SAM.

The disaggregation does not come without difficulty. The most onerous problem when using household data is to reconcile household consumption against household income. Several of the poorer deciles in Armenia report far lower income than they report expenditures. Even when government and family transfers are included, expenditure for the poorest decile in Armenia is at least 10 times

FIGURE 8.1 EXPANSION FROM A SINGLE RA TO MULTIPLE HOUSEHOLDS

expenditure shares: RA to 20 households (25×1 to 25×20)																																				
<table style="border-collapse: collapse; width: 100%;"> <tr><td style="text-align: center;">RA</td></tr> <tr><td>GRN 75.9</td></tr> <tr><td>VFR 109.8</td></tr> <tr><td style="text-align: center;">⋮</td></tr> <tr><td>DWE 48.2</td></tr> </table>	RA	GRN 75.9	VFR 109.8	⋮	DWE 48.2	→	<table style="border-collapse: collapse; width: 100%;"> <tr><td style="text-align: center;">U1</td><td style="text-align: center;">U2</td><td style="text-align: center;">...</td><td style="text-align: center;">R1</td><td style="text-align: center;">R10</td></tr> <tr><td>GRN</td><td><math>C_{U1}^{grn}</math></td><td>...</td><td>...</td><td><math>C_{R1}^{grn}</math></td><td><math>C_{R10}^{grn}</math></td></tr> <tr><td>VFR</td><td>...</td><td>...</td><td>...</td><td>...</td><td>...</td></tr> <tr><td style="text-align: center;">⋮</td><td>...</td><td>...</td><td>...</td><td>...</td><td>...</td></tr> <tr><td>DWE</td><td><math>C_{U1}^{dwe}</math></td><td>...</td><td>...</td><td><math>C_{R1}^{dwe}</math></td><td><math>C_{R10}^{dwe}</math></td></tr> </table>	U1	U2	...	R1	R10	GRN	$C_{U1}^{grn}$	...	...	$C_{R1}^{grn}$	$C_{R10}^{grn}$	VFR	...	...	...	...	...	⋮	...	...	...	...	...	DWE	$C_{U1}^{dwe}$	...	...	$C_{R1}^{dwe}$	$C_{R10}^{dwe}$
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GOV 117.7																																				
U1	U2	...	R1	R10																																
LAB	2.8	8.5	...	...	110.8																															
SKL	0.1	1.1	...	...	27.8																															
⋮	...	...	...	...	...																															
GOV	5.5	5.9	...	...	3.7																															

Source: Author.

Note: Each household has a unique expenditure and income pattern, as depicted here.

as large as income. As Deaton (2003) notes, this difference can be attributed to several factors. Because aggregate household income and spending must also be coordinated within the national accounts, we chose to use income *shares* and expenditure *shares* to distinguish households, then scale household totals to meet expenditures from the Living Standards Survey, and also meet aggregate final demand and factor endowments from the SAM. Table 8.9 displays income sources for each household, and Table 8.10 displays 2002 expenditures for each household.

Figures from the “Total” row of Table 8.9 should be familiar by now, as they are identical to total factor incomes from the micro SAM. Total household incomes were scaled to meet total factor endowments and total (official) transfers from abroad, from the government, and investment. For poor households, this leads to a significant divergence from reported income from the 2002 Household Survey. Deaton (2003) notes that this is not an anomaly only in Armenia; on page 8 he states:

Income measured in the survey is on average larger than consumption measured in the surveys, but is in most cases less than national accounts consumption, and much less than GDP. Survey income is less than 60 percent of GDP on average.”

Indeed, according to the *Statistical Handbook* (Armenia 2003b) based upon the 2002 Armenian Household Survey (Table 1, p. 51), 2002 total monthly per capita income was 12,776 drams. Of this, monetary income was 9,781 drams and nonmonetary (that is, own-produced value of consumption) monthly income was 2,995 drams. Annual monetary income, based upon the survey, is then  $(12 \times 9,781)$ —117,372 drams per year, or US\$204.83 per year, taken at market exchange rates. This implies that average income is US\$0.56 per day. However, when

TABLE 8.9 HOUSEHOLD INCOME BY FACTOR, 2002  
(US\$ MILLION)

Deciles	SKL	LAB	CAP	LND	GOV	ROW	INV	TOTAL	Y/K	\$/DAY
Rural households										
R1	0.0	2.5	5.1	0.6	6.0	0.0	0.0	14.2	91.3	0.3
R2	0.8	8.2	14.6	2.1	5.1	0.1	0.0	30.8	198.6	0.5
R3	2.0	12.8	21.8	3.4	5.7	0.1	0.0	45.7	294.8	0.8
R4	4.4	21.4	23.6	3.4	6.5	0.4	7.6	67.2	433.8	1.2
R5	8.4	31.3	25.4	3.7	5.6	0.9	9.6	85.0	548.5	1.5
R6	9.7	44.7	28.5	4.3	6.2	0.9	12.0	106.3	686.0	1.9
R7	12.0	52.7	39.2	6.0	4.3	2.7	14.9	131.9	850.9	2.3
R8	14.9	65.3	51.3	7.8	4.4	5.8	19.0	168.5	1087.3	3.0
R9	17.8	78.7	76.8	11.2	4.5	18.3	26.4	233.6	1507.3	4.1
R10	27.8	110.8	205.6	30.7	3.7	62.5	56.1	497.3	3208.5	8.8
Urban households										
U1	0.0	2.8	4.9	0.9	5.5	0.0	0.0	14.2	91.3	0.3
U2	1.1	8.5	12.3	2.9	5.9	0.1	0.0	30.8	198.6	0.5
U3	2.8	13.2	18.1	4.5	7.0	0.1	0.0	45.7	294.8	0.8
U4	5.8	19.7	21.1	4.7	7.9	0.5	11.4	71.0	458.2	1.3
U5	10.4	27.2	24.0	5.1	7.3	1.4	14.4	89.8	579.5	1.6
U6	12.3	38.0	28.6	5.9	8.1	1.4	18.0	112.3	724.7	2.0
U7	15.4	45.2	38.3	8.3	6.0	3.9	22.3	139.3	898.9	2.5
U8	19.1	56.0	49.3	10.7	6.1	8.2	28.5	178.1	1148.7	3.1
U9	23.0	69.3	69.9	15.2	6.4	23.5	39.6	246.8	1592.4	4.4
U10	41.1	109.6	167.8	41.2	5.5	76.0	84.2	525.4	3389.6	9.3
TOTAL	228.7	817.9	926.2	172.7	117.7	206.7	364.1	2834.0		

Source: Authors' calculations, based upon *Social Snapshot* report by NSS (Armenia 2003b).

Key:

Figures are in millions of U.S. dollars, unless noted.

R1 ... R10: Rural deciles

U1 ... U10: Urban deciles

SKL Skilled labor

LAB Unskilled labor

CAP Capital rents

LND Land rents

GOV Government transfers

ROW Foreign remittances

INV Savings demand

Y/K Per-capita income

\$/DAY Per-capita income per day

TABLE 8.10 FINAL DEMAND DISAGGREGATED BY HOUSEHOLD TYPE AND COMMODIT, 2002 (US\$ MILLION)

		TOTAL	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	U1	U2	U3	U4	U5	U6	U7	U8	U9	U10
TRD	Retail & wholesale trade & catering	311.4	1.9	4.7	7.0	8.2	9.3	13.2	15.2	18.4	25.6	58.4	1.7	3.8	4.0	7.8	9.1	7.9	14.0	18.6	21.9	<b>60.5</b>
FOD	Food processing & beverages	274.9	2.2	6.1	7.9	9.3	11.1	11.6	18.1	16.4	25.3	55.6	1.1	3.2	3.5	6.5	7.0	6.7	10.5	14.5	16.1	42.1
MIL	Dairy products, eggs, & milk	231.2	1.0	2.7	4.8	7.2	8.5	9.6	15.7	12.9	21.3	38.7	1.0	2.7	3.0	5.4	6.8	6.3	10.0	13.3	18.1	42.4
ENR	Energy (oil & natural gas)	131.3	0.6	1.8	1.9	2.3	3.2	5.1	4.4	6.0	11.1	26.8	0.7	1.7	2.3	3.3	4.7	4.0	5.9	7.3	10.7	27.6
VFR	Vegetables, grapes, dried fruits	109.8	0.5	1.4	1.9	2.5	2.7	5.8	4.4	4.4	7.0	24.4	0.5	1.5	1.8	3.2	3.8	3.4	4.9	6.9	10.4	18.5
OMT	Beef, pork, mutton, & poultry meat	103.2	0.5	1.2	1.9	2.5	2.2	3.9	4.1	5.7	7.8	16.1	0.6	1.3	1.8	2.4	3.3	3.3	5.1	7.1	9.6	22.6
TBC	Tobacco products	102.6	0.6	1.5	1.7	2.4	2.7	4.8	4.5	5.3	8.3	16.8	0.6	1.4	1.8	2.4	3.3	3.4	5.6	5.9	9.6	20.0
UTL	Electricity, gas, & water supply	97.5	0.6	1.5	2.2	2.6	3.0	4.1	4.8	6.2	8.2	17.3	0.6	1.3	1.8	2.4	2.9	3.1	4.4	5.8	6.8	17.9
TRN	Transport & communications	79.1	0.3	1.2	1.2	1.7	2.1	2.6	2.2	2.3	6.9	15.8	0.5	0.8	1.3	2.7	2.3	2.3	3.8	4.9	7.9	16.3
GRN	Wheat, potatoes, & legumes	75.9	0.5	1.4	2.1	2.3	3.1	3.8	3.4	3.7	8.1	14.1	0.4	1.2	1.5	2.1	2.5	2.5	3.8	4.5	5.2	9.9
GOV	Governance, defense, & public spending	73.1	1.5	1.1	1.6	1.4	1.8	0.0	3.1	5.1	7.7	22.0	0.7	0.6	2.1	0.0	0.0	1.1	5.1	3.4	14.8	0.0
MNM	Mineral products & precious stones	68.0	1.5	0.0	0.0	0.0	4.3	0.0	0.0	8.7	6.7	0.0	3.3	4.8	13.5	0.0	1.3	16.2	0.9	0.0	0.0	6.9
ELE	Electricity supply & distribution	62.9	0.4	1.0	1.4	1.7	2.0	2.7	3.1	4.1	5.3	11.1	0.4	0.9	1.2	1.6	1.9	2.1	2.8	3.8	4.4	11.4

TABLE 8.10 (CONTINUED)

		TOTAL	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	U1	U2	U3	U4	U5	U6	U7	U8	U9	U10
DWE	Housing & dwellings	0.3	0.7	1.1	1.3	1.5	2.0	2.4	3.1	4.1	8.4	0.3	0.7	0.9	1.2	1.4	1.6	2.2	2.9	3.3	—	8.7
BNK	Banking, lending, & insurance	38.9	0.3	0.6	0.9	1.0	1.2	1.7	1.9	2.5	3.3	6.8	0.3	0.5	0.8	1.0	1.2	1.3	1.7	2.3	2.7	7.0
OMF	Other manufacturing	38.5	0.2	0.5	0.6	0.8	1.0	1.3	1.8	2.6	3.7	8.6	0.2	0.5	0.6	0.9	0.9	1.1	1.9	1.7	3.0	6.6
OCR	Crops not elsewhere classified	38.1	0.1	0.1	0.6	0.8	0.9	0.2	2.9	0.7	0.0	6.5	0.3	0.6	0.7	0.8	1.4	2.1	2.3	1.9	5.4	9.8
MCH	Machinery, vehicles, precision equipment	37.4	0.2	0.1	3.0	0.1	0.1	3.3	0.4	11.7	2.0	1.4	0.1	0.6	0.1	0.2	0.4	0.6	2.2	6.7	0.7	3.7
LMF	Light manufacturing & textiles	29.2	0.1	0.4	0.5	0.8	0.6	1.1	1.1	1.7	2.8	6.4	0.2	0.5	0.5	0.7	0.8	0.9	1.3	1.6	1.7	5.6
MTL	Metals & metal products	26.5	0.1	0.4	0.5	0.6	0.7	0.9	1.1	1.6	3.1	6.4	0.1	0.4	0.6	0.4	0.5	0.8	0.8	1.5	2.5	3.6
CRP	Chemicals, rubbers, & plastics	23.9	0.3	1.0	1.1	0.0	0.3	0.0	1.6	0.3	3.8	4.8	0.2	0.5	0.3	0.6	2.2	1.3	0.6	0.0	5.0	0.0
VOL	Vegetable oils & fats	17.9	0.1	0.4	0.4	0.5	0.7	0.9	0.6	1.0	1.8	4.2	0.1	0.3	0.4	0.5	0.6	0.6	0.8	0.8	1.0	2.1
MIN	Mining & quarrying	8.7	0.1	0.1	0.2	0.3	0.3	0.4	1.0	0.7	0.5	2.7	0.0	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.5	0.8
OSR	Services not elsewhere classified	4.8	0.0	0.1	0.0	0.2	0.1	0.2	0.2	0.4	0.3	0.3	0.0	0.0	0.0	0.1	0.2	0.3	0.2	0.3	0.3	1.4
TOTAL		2,033.0	13.9	30.0	44.5	50.3	63.3	79.0	98.1	125.4	174.4	373.5	13.9	30.0	44.5	46.5	58.6	73.2	90.8	116.1	161.5	345.4

Source: Authors' calculations based upon *Social Snapshot* (Armenia 2003b) and other NSS publications.

Note: — = not available.

using the National Accounts, we find that total value added (GDP at producer prices) is US\$2.145 billion. Using 3.1 million as the national population, per capita income is US\$1.90, more than three times as large as income from the Household Survey.

As an initial pass, we used rural/urban shares that are approximately equal. Some of the differences between rural and urban incomes can be attributed entirely to the investment account. The 2002 Household Survey includes an indicator for both rural and urban settlements. A straightforward improvement to this household dataset would be to replicate the urban-rural income and expenditure patterns more accurately.

Table 8.10 presents household consumption patterns for each commodity. The household expenditure survey uses a “diary” for households to fill out, which contains a detailed list of food goods for purchase. For durable goods and nonrecurring expenses, a basic questionnaire is provided. We used a mapping procedure to connect each of the goods in the survey with the commodities in our SAM. Correctly classifying the survey goods was difficult, but a more problematic issue arose when some types of goods were not covered in the survey.

## **SAM-BASED APPLICATIONS**

Several studies are now possible using the multiple-household SAM. The most important research goal of this task is to identify where linkages exist between economic growth, employment, and poverty. The next three subsections present a brief outline for future SAM-based applications.

### **Economic Growth and Poverty Alleviation**

The important advantage of a SAM-based model is that it provides useful insights into the interrelationships that exist between goods and services markets, as well as the interlinkages between the demand for labor and capital in the process of production.

Using the household SAM, which reflects how much a unit-increase in the demand and production of a commodity affects the demand for inputs, we can detect the vulnerabilities in the present economic growth pattern and estimate what the input requirements are to achieve sustainable and balanced growth. A detailed analysis will be presented in the separate paper on SAM-based applications.

We can also calculate the economic growth patterns that affect mostly the consumption in the lowest-income deciles. As an example, consider benchmark consumption for the rural decile number four

(R4). Decile four is the group that is most likely to make the transition away from poverty because they currently stand at or near the poverty line. Average per capita income for this decile is slightly less than US\$1 per day, at US\$340.70 per year.

As we can see in Table 8.11 almost 60 percent of all expenditures are allocated to processed foods, dairy, meats, vegetables, and utilities. This includes 16.3 percent of expenditures which represent the retail markups paid as part of retail consumption (TRD). We can now compare household expenditure for R4 against the World Bank's poverty line for Armenia. For 2002, the overall poverty line, in value terms, was 12,261 drams per month, and the food-value poverty line was 7,516 drams.<sup>5</sup> When translated to dollar values at market exchange rates, we get US\$258 per year for overall poverty or US\$159 per year for food-value poverty. If we add the top four food categories in consumption (FOD, MIL, OMT, and VFR), average annual purchases of these goods equals US\$154, just US\$4 less than the poverty line (see Figure 8.2).

A straightforward strategy is to target policies that are most effective for the lowest income deciles. These policies must either raise income or lower the real cost of consumption. For example, if the

TABLE 8.11 CONSUMPTION AND INCOME FOR RURAL HOUSEHOLD DECILE NO. 4

<i>Sector</i>	<i>R4(%)</i>	<i>R4(\$)</i>	<i>Family(4)</i>		<i>R4(%)</i>	<i>R4(\$)</i>	<i>Family(4)</i>
FOD	18.5	60.1	240.6	SKL	8.2	28.1	112.4
TRD	16.3	52.8	211.1	LAB	40.6	138.2	552.8
MIL	14.3	46.3	185.4	CAP	44.7	152.2	608.9
UTL	5.1	16.6	66.2	LND	6.5	22.2	88.9
OMT	4.9	15.9	63.7				
VFR	4.9	15.9	63.7				
TBC	4.7	15.4	61.6				
ENR	4.6	14.8	59.3				
GRN	4.5	14.7	58.7				
TRN	3.4	11.0	44.0				
ELE	3.3	10.7	42.8				
OTHERS	15.4	50.0	199.9				
<b>TOTAL</b>	100	324.2	1,297	<b>TOTAL</b>	100	340.7	1,363

Source: Authors' calculations.

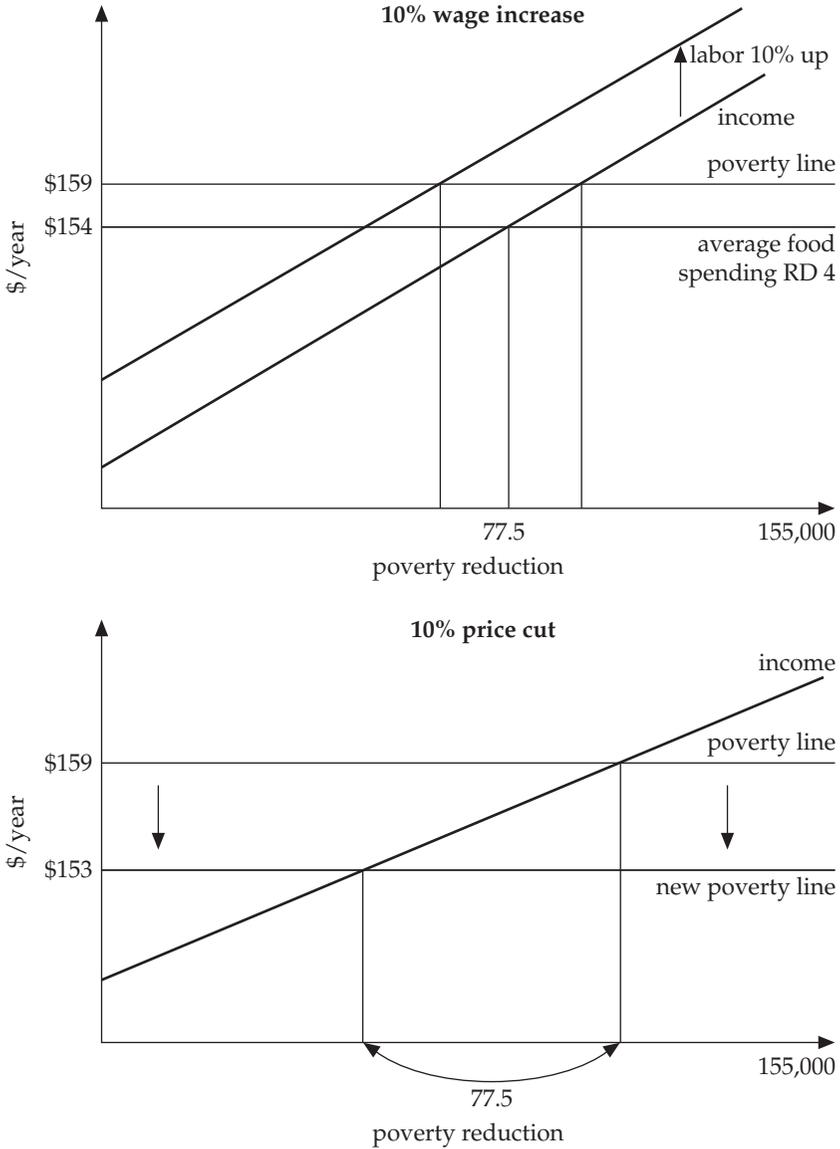
Key:

R4(%): Share of consumption or income as a percentage of total.

R4(\$): Annual dollar value of income or consumption in *per capita* terms.

Family(4): Annual dollar value of income or consumption for a family with four members.

FIGURE 8.2 IMPACT OF INCREASED WAGES OR LOWER FOOD PRICES ON POVERTY FOR RURAL DECILE NO. 4



Source: Authors' calculations.

return to unskilled labor (LAB) increased by 10 percent, then the average individual in R4 would earn an additional US\$13.82, and the average household would earn an additional US\$55.28. Holding all other prices constant, and assuming preferences are homothetic, the average per capita food bill would rise by US\$5.91 (about 45 percent of the total increase in wages). Of the approximately 155,000 households in R4, this wage increase would pull 5,000 to 10,000 Armenian residents out of poverty.

We get a similar result when the price of FOD is reduced by 10 percent. Given R4's baseline spending of US\$60.1 on FOD, the reduction, other things being equal, is equal to US\$6.01 of additional income. In both cases, the average change in income is about US\$6.00 per year. All else being equal, we know that households will be better off in the first scenario, when income rises. The wage increase acts as a pure income effect, whereas the food price cut involves both an income effect and a substitution effect. Although the household can reallocate the savings under the price-cut scenario, the welfare gain is smaller because consumers will be faced with a different bundle of prices.

Using this simple methodology, it would be possible to compute the feasible set of income and price changes, for all sectors and factors, which would achieve a given level of poverty reduction. This sort of analysis is not possible without a fully balanced, multiple-household SAM.

### **Distribution of Tax Incidence**

Using the Armenian SAM, we can now evaluate the relative burden of taxation across household types. We can also consider how best to use Armenia's taxation and transfers system to alleviate poverty. The government collects taxes and spends the funds on public projects and on transfers to poor segments of the population. The net impact of tax reform upon households depends upon the following factors:

- production cost effects for firms, and the resulting impact upon employment and wages for key industries
- income and expenditure patterns of each household group
- transfer payments, as government revenues rise or fall

These distributive impacts can now be determined using a CGE model. The model determines factor prices and commodity prices after a discrete shift in taxation. The resulting household income and consumption profiles can be determined as part of this equilibrium. This approach is often useful, because it captures all of the effects at the same time. For example, a government policy to increase transfers

to the poor may be ill advised if the additional funds are generated through a new tax on food items. The net effect may be increased transfers, but also higher food bills. The distortionary effect of new taxes then adds to the welfare burden, for all residents.

### **Trade Liberalization and Poverty**

A third application of the Armenian SAM is to consider the effect of further trade liberalization in Armenia, and international trade's potential role for poverty reduction.

Even though Armenia currently supports an open trade regime, where statutory tariff rates are 10 percent for most goods, the country remains highly isolated. This isolation comes from a closed border with two neighboring countries: Turkey and Azerbaijan. As the government considers the benefits and costs of a potentially open border with Turkey, our dataset will be helpful in quantifying the net price effects for many staple goods, as well as the corresponding impact upon wages and employment for some of the more important production sectors.

## **CONCLUSION AND DIRECTIONS FOR FUTURE IMPROVEMENT**

Our goal is to raise the level of policy debate in Armenia by providing a consistent, well-documented dataset that describes key production industries, household groups, international accounts, tax, and spending streams. We understand that this dataset is preliminary, but we believe that policy decisions are better informed by a roughly parameterized model, based upon the Armenian SAM, than upon the uncalibrated logic of economic theory.

The dataset presents three views of the economy. The first is a top-level overview, which we call the macro SAM because it can be used to derive most of Armenia's macroeconomic indicators. The second is a mid-level view called micro SAM, which will serve as the workhorse dataset for most analysis projects. This dataset describes the interrelations among industries, the government, domestic households, and foreigners. Finally, we have developed a household SAM that can be used to identify the *distributive* effects of public policy. In many cases, a multiple-household model can be overly cumbersome for analysis, especially for tasks with a short timeframe. But there is no substitute for a multiple-household model to consider how government and nongovernmental policies are likely to affect the poor. In fact, for detailed poverty analysis, a much higher degree of granularity in the household accounts would be needed. We hope that future users

of this dataset endeavor to increase the consistency of the Household Survey data, and improve the corresponding household accounts in the Armenian SAM. We leave the reader with a short list of near-term data improvements. These improvements were chosen both because they will potentially improve the data quality for this SAM, and because they are relatively easy to carry out.

### *Data Improvement*

We expect this document to be used for policy or academic purposes, so we invite the reader to use the Armenian SAM and to make improvements. Naturally, these improvements will only become beneficial if the reader intends to share and document any changes made to the dataset. Some near-term potential for data improvements are itemized below.

- **Sectoral detail.** This dataset distinguishes 25 production and consumption sectors. Our choice of industries had to be made at an early date, and it therefore missed some potentially important industries, either from a supply or a demand viewpoint. A useful and relatively painless improvement is to reorganize the sectoral aggregation in order to focus upon the most important sectors for a particular study. For example, if the SAM is used for a trade-policy study, identify the key import and export industries. Or, if the study is directed at poverty analysis, expand upon those goods most important for the lower-income deciles, which are mainly food, housing, and utilities.
- **Multiple trading partners.** We do not distinguish regional trading partners. The single existing partner (ROW) could be disaggregated into five or six distinctive trading regions.
- **Household income and spending patterns.** Additional analysis of household spending and income patterns will greatly improve the HH component of the Armenian SAM, without requiring any readjustment of other SAM submatrices. In the Annex we have included our mapping between goods in the Household Survey and the sectors defined in the SAM. A more careful remapping of these goods could help create a closer fit and a clear count of Armenia's poor population. A separate improvement is to account for Armenia's very rich population. We believe that this tiny segment of the population (perhaps 1 percent), could account for more than 20 percent of the country's spending and more than 50 percent of the country's income. Without an assessment of this population segment, we will always find a yawning gap between household income and GDP.

- **Production statistics.** Although output for some sectors is carefully measured (electricity production is an example), other sectors report output that clearly conflicts with other national accounts, such as imports and exports. Additional clarification of what the NSS reports, and whether pertinent information is missing, would help to identify those industries that are truly important to Armenia's economic growth.

## ANNEX 8.1

# Social Accounts Construction—A Manual

This Annex contains a detailed description of the SAM development process. The process begins with construction of several *input* data tables of industrial production, consumption, trade, and taxation. These input tables are combined and compared against some standard accounting identities. Where large discrepancies arise, basic judgment is combined with matrix-balancing techniques to impose a balanced set of accounts that resembles Armenia's economy. The resulting industrial data are then merged with data from the Household Survey into a single, balanced SAM for industries as well as households. First we discuss some challenges we encountered; then we elaborate on the actual process of building the SAM in subsequent sections of the Annex.

### SAM BALANCING AND MISSING DATA

Development of a balanced SAM typically requires adjustments that reconcile disparities within existing data, but Armenia is the first case where at least one part is wholly missing. To complete the social accounts, we used a surrogate input-output (IO) table from another country (Poland). Of course, the new IO table did not fit perfectly with aggregate output values for Armenia. We found, however, that the production technology for most sectors is similar across developing countries. A few sectors, such as jewel cutting for Armenia, are unique and require special consideration. When balancing a SAM, we attempt to utilize as much information as possible and adjust the data by weighting credible and accurate sources most heavily. Data elements that are less credible are adjusted more intensively than

others. Two techniques for SAM-balancing seem to be popular: RAS and maximum entropy (ME).<sup>6</sup> We believe that the choice of balancing minimand (such as ME or least squares) is not as important as the choice of *which data elements* are being adjusted and why.

Our experience has been that the study results are more sensitive to the policy variables, rather than IO coefficients. For example, results from a tax policy study are more biased by errors in the tax rate than by an equal percentage error in the IO coefficients. Therefore, when we balanced the 2002 Armenian SAM, the tax rates were held fixed, while the IO coefficients and other data were adjusted according to traditional Bayesian priors.

### **A Structured Build Approach**

In the process of developing the 2002 Armenian social accounts, we tried to design a “structured build process” for developing countries where some data are missing. We hope that the process developed here can be refined and applied to new countries rapidly and cost-effectively.

The approach requires access to the Global Trade Analysis Project (GTAP) database,<sup>7</sup> competence with the General Algebraic Modeling System (GAMS) programming system,<sup>8</sup> and with Microsoft Excel. The process does not eliminate the need for local and international expertise and judgment, but it can help to speed up the difficult task of SAM deployment. The approach first requires basic data collection from the host country, to be presented as a set of *input tables*. These tables are then combined, and if necessary, augmented with surrogate data to generate the SAM for the target economy. This process is described in detail earlier in this chapter.

### **DATA COMPILATION**

Only a limited number of data tables are required to generate SAMs. We now present these input tables and describe how they are combined and adjusted as the dataset is built. We emphasize that these input tables should be straightforward to construct by local experts, and that they are probably best left to these experts because they require an intimate understanding of the local economy and local accounting practices. Data acquisition and organization can be the most time-intensive portion of the process. In the Armenian case, it took several months to construct the input tables, and only a few weeks to combine the tables into a consistent SAM.

## INPUT DATA

The required input data are listed below. The data were collected, reviewed several times, and then placed into Excel (XLS) worksheets. We present an enumerated list of the required inputs:

1. Sectoral output ( $Y_0$ ), value-added ( $VA_0$ ), and intermediate demand ( $ID_0$ ). This is basic data that should be supplied by the country for each sector or commodity in the SAM. This input table was provided as a spreadsheet. It has been replicated here as Table 8A.1.2.
2. Sectoral imports ( $M_0$ ) and exports ( $X_0$ ). International trade statistics are almost always available at the highest level of disaggregation, and the trade data will usually need to be aggregated to match the sectoral structure in the SAM. Aggregating trade *values* is simple, but aggregating the corresponding *tariff rates* is more difficult. For this SAM, we used a trade-weighted average of import tariffs. The tariff was weighted by the relative share of each sub-sector during the aggregation. Bach and Martin (2001) show that the trade-weighted average tariffs will under-estimate the true tariff-equivalent in a CGE model. They do not, however, develop a useful alternative measure for the applied CGE modeler. Thus, the trade values are included together with other sectoral data into Input Table #1. The tariff values are included separately, in Table 8A.1.3.
3. Collected taxes. Collections, by sector of each type of tax in the economy. At a minimum, this would include import duties, labor taxes, payroll taxes, value-added taxes, and excise taxes. Various intermediate taxes, production levies, and corporate taxes may be available. Most importantly, these taxes should be supplied by sector as well as tax stream. This is also provided in spreadsheet format, but has been included in this report as Table 8A.1.3.
4. Intermediate input coefficients. Armenia does not have an IO table, so the IO coefficients were constructed using representative values taken from the GTAP database. Poland was used for the surrogate data. Despite the Armenian conventional wisdom, we have found in a previous study that tax-policy results are not highly sensitive to IO coefficients, and that another (similar) country's production technology could be used.
5. Value-added shares. Like the IO coefficients, these values were only partially available for Armenia. We utilized local data where possible, then filled in the gaps using the GTAP database.

6. Consumption shares. Government expenditures are almost always available, but they are listed by functionary stream, not by production sector. Investment demand by firms, households, and the government also lacked specific sectoral detail. Household demand can be computed as the residual demand after government, investment, and exports, but it is useful to consider final demand shares from different economies as a comparison.
7. Macroeconomic and financial totals. Net public and private investment, borrowing, net trade positions, international remittances, and other financial transactions are not crucial when constructing a CGE model, but *accountants* and *politicians* tend to focus upon these figures. Therefore, it is best to include them in the aggregate SAM for completeness. In our case, the financial transactions and institutional transfers are found in the Macro SAM presented as Table 8.1.

This Annex includes five input tables for the SAM, plus two additional tables required to construct the multiple-household SAM. Input tables #1 to #4 are presented in this section of the Annex. Input Table #5, the macro SAM, is listed at the beginning of the report, as Input Table 8.1. Input tables #6 and #7 are also printed in the main body of the chapter. They are Tables 8.9 and 8.10, respectively. These tables are also included in the distribution archive as Excel spreadsheets.

The data-flow process is depicted using a flow chart in Figure 8A.1. This chart shows how each of the data tables is used to generate either the micro or HH SAM.

## ECONOMIC VARIABLES AND THEIR CONSTRUCTION

Since the SAM will be used as the basis for economic research, we may as well begin considering the data using economic terminology. Identifying these data in economic terms will help to streamline the data-automation process later.

During the build process, these variables are assigned to each account in the input data, then combined to build the SAM. The construction process in which these variables are used is described next.

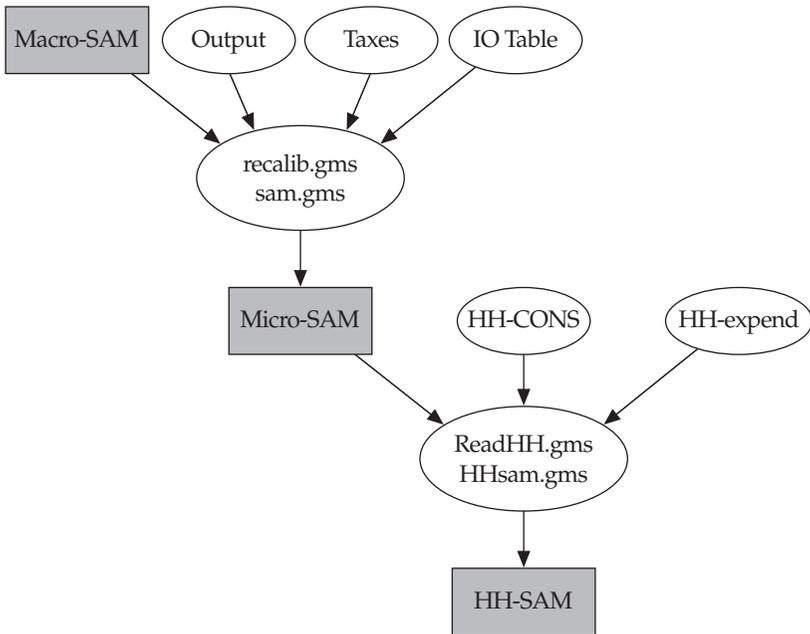
## ACCOUNTING IDENTITIES

In order for the overall SAM to be balanced, we must impose a basic set of accounting identities. These identities must hold across all of the input tables *before* construction of the SAM. It is the responsibility of the local expert to ensure that the input tables conform to the accounting identities presented in this section.

TABLE 8A.1.1 INPUT TABLES REQUIRED FOR THE STRUCTURED APPROACH TO SAM DEVELOPMENT

Table	Description
Table #1	Sectoral production and trade values for Armenia (Table 2A.1.2)
Table #2	Collected taxes by sector and tax stream (Table 2A.1.3)
Table #3	Surrogate IO table for Armenia (Poland) (Table 2A.1.4)
Table #4	Sectoral value-added and consumption shares (Table 2A.1.5)
Table #5	Aggregate social accounts for Armenia (Table 2.1)
<b>Additional household tables</b>	
Table #6	Expenditures for each household and each commodity (Table 8.10)
Table #7	Incomes for each household, by factor and transfer type (Table 8.9)

FIGURE 8A.1 SIMPLIFIED STRUCTURE OF SAM DEVELOPMENT PROCESS



Source: Author.

Note: Three social accounting matrices are generated in this process: macro-SAM, micro-SAM, and HH-SAM. The input data enters at one of two points in the process, either before or after the micro-SAM is built. Four main GAMS (.gms) programs are used to combine the data in each table and accommodate the various discrepancies between each data source.

TABLE 8A.1.2 INPUT TABLE #1: SECTORAL PRODUCTION AND  
TRADE VALUES FOR ARMENIA, 2002 (US\$ MILLION)

<i>Sector</i>	<i>Y0</i>	<i>VA0</i>	<i>ID0</i>	<i>M0</i>	<i>X0</i>	<i>D0</i>
GRN	156	103	53	51	0	156
VFR	144	126	18	24	6	138
VOL	1	1	1	18	0	1
OCR	102	84	18	20	5	97
MIL	346	168	178	7	1	346
OMT	155	67	88	23	0	155
MIN	58	39	19	1	42	16
ENR	0	0	0	165	0	0
FOD	406	158	248	47	51	355
TBC	48	14	34	30	4	44
LMF	42	5	37	42	30	13
MNM	268	41	228	214	259	9
CRP	35	10	25	85	8	27
MTL	104	43	61	56	45	59
MCH	64	6	58	164	56	7
OMF	42	18	25	49	5	37
ELE	170	108	62	6	13	157
UTL	146	109	37	0	0	146
CON	516	298	218	3	6	510
TRN	247	144	103	24	82	165
TRD	432	266	166	0	0	432
DWE	91	66	25	0	0	91
BNK	49	36	13	11	7	42
OSR	85	24	61	61	71	14
GOV	362	211	150	8	8	354
TOTAL	4,070	2,145	1,924	1,107	699	3,371

*Source:* Author's calculations based upon NSS statistics.

Y0: Total production for Armenian sectors

VA0: Total value-added in production by sector

ID0: Total intermediate demand by sector

M0: CIF import value by sector

X0: FOB export value by sector

D0: Armenian production that is sold to the domestic market: by definition,

$$D^0 = Y^0 - X^0$$

Descriptions for each sector listed in this table can be found in Table 8.4.

TABLE 8A.1.3 INPUT TABLE #2: 2002 COLLECTED TAXES  
BY SECTOR AND TAX STREAM

Sector	VAT collections (US\$ million)				Other tax collections (US\$ million)					
	VATP	VATS	VATM	VATD	TXS	TM	TL	TK	TSS	
ENR	0	0	22.11	31.75	28.07	0	0	0	0	81.9
OMF	6.84	0	2.11	3.86	0	0.88	1.23	2.46	2.67	17.4
FOD	0	0	8.42	9.12	1	2.98	1.58	1.58	3.44	33.7
TBC	3.33	0	2.81	0.18	24.04	1.58	0.18	1.23	0.38	33.3
MCH	0	0	14.74	1.58	0	3.51	0.18	0.35	0.38	20.4
TRD	3.33	2.81	0	1.93	0	0	2.63	1.75	5.73	12.5
CRP	0	0	9.30	1.58	0	0.53	0.18	0.35	0.38	11.9
TRN	1.58	0.53	0	1.93	0	0	2.11	3.68	4.59	9.8
GRN	0	0	9.47	0	0	0	0	0	0	9.5
OMT	0	0	4.21	0	0	1.93	0.18	2.11	0.38	8.4
UTL	0.70	0	0	3.86	0	1.05	8.25	0	2.29	13.9
LMF	0	0	3.86	0.88	0	1.40	0.18	0.53	0.38	6.8
CON	0	0	0	2.28	0	0	1.40	2.81	3.06	6.5
MNM	0	0	2.81	1.40	0	1.23	0.18	0.70	0.38	6.3
MIN	0	0	0.18	2.28	0	0	0.18	3.16	0.38	5.8
GOV	0	0	0	0	0	0	5.79	0	12.61	5.8
VOL	0	0	3.86	0	0	1.75	0	0	0	5.6
MTL	0	0	1.58	1.93	0	0	0.53	0.18	1.15	4.2
OCR	0	0	2.11	0	0	0.53	0	0	0	2.6
DWE	0	0	0	0	0	0	1.93	0.53	4.20	2.5
MIL	0	0	1.40	0	0	0.35	0.18	0.18	0.38	2.1
BNK	0	0	0	0	0	0	1.40	0.70	3.06	2.1
VFR	0	0	1.05	0	0	0.35	0	0	0	1.4
SOC	0	0.53	0	0	0	0	0.88	0	1.91	1.4
TOTAL	16	4	90	65	62	17	22	31	48	353.6

Source: Authors' calculations based upon Ministry of Finance statistics.

Definitions:

Presumptive (VATP): VAT revenues collected via the presumptive tax legislation

Simplified (VATS): VAT revenues collected via the simplified tax legislation

Customs (VATM): VAT revenues collected at the Armenian border by customs authorities

Domestic (VATD): VAT revenues collected via the traditional VAT system

Tariffs (TM): Tariff revenues collected at the Armenian border

Income (TL): Income tax revenues from individuals filing and from paycheck withholdings

Profits (TK): Corporate profits tax revenues

Payroll (TSS): Social security and other earmarked taxes applied to labor income

TABLE 8A.1.4 INPUT TABLE #3: PRODUCTION TECHNOLOGY STRUCTURE FOR ARMENIA (%)

Sector	OCR	OMT	VOL	MIL	CRP	ELE	OMF	TRD	DWE	GRN	VFR	ENR	MIN	FOD	TBC	LMF	MNM	MTL	MCH	UTL	CON	TRN	BNK	GOV	OSR		
OCR	30.4	19.8	2.9	17.6	0.1	—	7.2	0.7	—	0.9	3.2	—	—	8.9	14.9	0.4	—	0.1	0.0	—	0.0	—	—	0.3	0.0		
OMT	6.1	1.8	18.5	2.0	—	—	—	0.7	—	10.5	3.3	—	0.3	19.7	0.7	0.0	—	—	—	—	—	—	—	—	0.4	—	
VOL	—	7.0	50.0	4.4	0.1	—	—	0.4	—	—	0.4	—	—	2.5	0.6	0.0	—	—	—	—	—	—	—	—	0.2	0.0	
MIL	3.0	7.7	0.6	29.4	0.1	—	—	2.7	—	5.7	1.6	—	—	0.3	0.3	0.1	—	—	0.0	—	—	—	—	—	—	3.4	0.2
CRP	6.0	4.6	7.4	8.0	45.6	0.6	6.8	8.1	—	27.5	13.3	9.6	1.5	4.3	3.5	12.4	14.6	9.8	9.8	1.5	6.5	5.2	0.5	4.5	3.5		
ELE	1.3	2.2	0.8	2.1	4.6	37.1	2.5	0.9	—	2.5	3.3	—	10.8	1.0	0.7	1.8	5.9	6.9	1.4	5.7	0.3	0.9	1.5	—	5.4		
OMF	14.1	1.6	2.4	4.7	6.9	2.4	41.0	6.2	—	8.3	23.0	4.4	1.6	2.9	5.6	1.9	5.4	4.9	1.6	0.9	6.0	7.2	6.4	4.7	8.0		
TRD	4.6	2.4	1.2	2.3	4.0	1.1	3.0	29.1	—	4.2	5.3	5.8	2.0	2.0	2.7	2.0	4.4	2.1	5.5	2.4	7.3	13.3	24.3	16.7	10.4		
DWE	—	—	—	—	—	—	—	0.0	—	—	—	—	—	—	—	—	—	—	—	—	0.0	0.0	—	—	0.0	0.0	
GRN	0.0	29.8	0.1	6.1	—	—	—	0.7	—	15.5	0.0	—	—	6.3	8.0	0.0	—	—	—	—	—	—	—	—	0.5	—	
VFR	—	0.1	0.5	0.2	0.1	—	—	2.2	—	—	7.7	—	—	7.4	0.8	0.0	—	—	—	—	—	—	—	—	0.9	—	
ENR	2.0	0.2	—	0.0	3.6	51.7	18.1	—	—	—	9.8	—	—	1.6	0.4	0.3	0.5	6.5	3.2	0.2	15.0	0.2	—	—	0.4	0.7	
MIN	0.4	—	0.3	0.1	0.5	—	0.1	0.1	—	0.6	1.5	1.1	68.3	0.0	—	0.1	2.2	15.0	0.0	—	1.3	0.1	—	—	0.3	0.6	
FOD	0.6	12.0	5.6	5.0	0.4	—	0.1	7.1	—	—	—	—	—	34.4	23.6	1.5	—	—	—	—	—	0.1	0.3	3.5	0.7		
TBC	0.1	—	0.3	0.1	0.1	—	—	0.8	—	—	—	—	—	0.3	20.0	—	—	—	—	—	—	—	0.1	0.4	0.4	0.7	
LMF	1.4	0.6	0.3	1.9	4.6	—	3.3	4.2	—	0.1	2.3	3.1	—	0.5	1.6	64.5	2.4	0.5	0.9	0.1	1.0	1.4	0.1	4.9	1.4		
MNM	3.8	0.2	0.0	0.4	1.0	—	1.0	0.9	—	1.2	3.4	1.1	0.8	0.5	1.9	0.4	26.0	2.4	0.8	1.0	20.0	0.6	0.1	1.3	3.5		
MTL	6.5	1.1	0.3	2.2	1.8	0.2	4.0	5.9	—	1.2	4.3	15.7	1.2	0.5	1.1	0.5	6.2	40.3	16.8	6.3	11.8	2.0	—	—	1.0	2.0	
MCH	9.4	3.4	5.0	4.9	2.1	2.3	2.4	7.1	—	10.2	2.8	34.5	4.2	2.0	2.2	1.7	8.1	5.8	53.2	2.0	10.5	18.2	2.4	6.5	6.9		
UTL	0.3	0.1	0.0	0.1	0.2	0.1	0.1	0.2	—	0.2	1.5	0.4	0.1	0.2	0.1	0.2	0.2	0.2	0.2	57.1	0.1	0.1	0.3	0.7	1.1		
CON	1.3	0.8	0.1	0.7	2.6	0.9	-0.5	1.5	100	2.4	1.0	7.3	0.7	0.3	0.6	0.4	1.7	1.2	0.7	2.8	21.6	1.7	—	—	20.2	5.4	
TRN	4.8	1.7	1.3	2.4	5.8	1.7	4.3	8.6	—	3.1	4.0	4.8	5.6	2.8	2.7	2.2	8.1	2.9	2.7	1.7	5.2	38.7	11.0	8.1	6.1		
BNK	0.8	0.4	0.8	1.3	1.1	0.4	1.9	1.2	—	1.0	1.4	—	0.2	1.2	2.9	3.5	2.4	1.2	1.6	0.4	0.6	1.1	34.5	1.8	0.6		
GOV	0.4	0.6	—	0.7	0.7	0.1	0.2	1.1	—	0.2	0.7	1.3	—	0.2	0.4	0.5	0.3	0.1	0.4	1.0	0.3	0.6	3.4	6.7	1.3		
OSR	2.7	1.7	1.4	3.1	13.7	1.5	3.4	9.5	—	4.6	6.2	10.9	1.1	1.6	4.7	5.4	5.8	3.5	3.9	2.1	7.2	8.7	14.8	12.7	41.5		
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		

Source: Authors' calculations based upon GTAP dataset.

Note: This table displays the production technology for a surrogate country (Poland) that constitutes the starting point for Armenia's assumed production technology. The final IO shares differ substantially for some sectors (such as the cut-jewels sector) based upon local knowledge. Other changes are required in order to satisfy the basic accounting identities listed below.

— Not available.

TABLE 8A.1.5 INPUT TABLE #4: VALUE ADDED AND CONSUMPTION SHARES (%)

<i>Sector</i>	<i>LAB</i>	<i>SKL</i>	<i>CAP</i>	<i>LND</i>	<i>Total</i>	<i>C</i>	<i>G</i>	<i>I</i>	<i>Total</i>
OCR	43.2	1.5	28.1	27.1	100	100	0.0	0.0	100
OMT	52.3	0.7	11.9	35.1	100	100	0.0	0.0	100
VOL	61.6	10.4	19.4	8.6	100	100	0.0	0.0	100
MIL	52.8	2.6	21.3	23.3	100	100	0.0	0.0	100
CRP	41.3	10.6	48.1	0.0	100	80.9	19.1	0.0	100
ELE	32.4	13.6	54.0	0.0	100	100	0.0	0.0	100
OMF	34.8	5.2	60.0	0.0	100	82.5	0.0	17.5	100
TRD	20.8	3.4	75.8	0.0	100	100	0.0	0.0	100
DWE	0.0	0.0	100	0.0	100	0.0	0.0	0.0	0.0
CGD	0.0	0.0	100	0.0	100	0.0	0.0	0.0	0.0
GRN	52.2	0.8	12.0	35.0	100	100	0.0	0.0	100
VFR	52.2	0.8	12.0	35.0	100	100	0.0	0.0	100
ENR	51.3	3.7	4.4	40.6	100	100	0.0	0.0	100
MIN	33.6	4.9	47.9	13.5	100	0.0	0.0	0.0	0.0
FOD	54.0	9.9	35.1	1.0	100	100	0.0	0.0	100
TBC	44.0	6.4	49.6	0.0	100	100	0.0	0.0	100
LMF	57.8	8.4	33.8	0.0	100	100	0.0	0.0	100
MNM	52.0	8.3	39.7	0.0	100	100	0.0	0.0	100
MTL	58.4	9.5	32.1	0.0	100	28.8	0.0	71.2	100
MCH	45.0	11.9	43.2	0.0	100	31.8	0.0	68.2	100
UTL	21.3	8.7	70.0	0.0	100	100	0.0	0.0	100
CON	35.4	5.5	59.2	0.0	100	14.5	0.0	85.5	100
TRN	44.4	9.9	45.7	0.0	100	98.3	1.7	0.0	100
BNK	36.1	32.0	32.0	0.0	100	100	0.0	0.0	100
GOV	33.6	53.4	13.0	0.0	100	15.8	84.2	0.0	100
OSR	15.0	13.3	71.7	0.0	100	73.8	11.5	14.7	100

*Source:* Authors' calculations from NSS and GTAP database.

*Notes:*

LAB: Unskilled labor

SKL: Skilled labor

CAP: Capital

LND: Land rents

C: Final demand by households

G: Government demand

I: Investment demand

TABLE 8A.1.6 SYMBOL TABLE

<i>Symbol</i>	<i>Description</i>	<i>File location</i>
$Y_i$	Total output supply. Source: NSS National Accounts, subtables from the IMF Statistical Annex (2002), and the Agriculture subtable.	Armenia.xls
$X_i, M_i$	Imports and exports of goods and services. Provided for 2002 by the customs authorities and the NSS. Each traded good was mapped onto the model sectors.	Armenia.xls
$D_i$	Domestic supply. This is an imputed parameter that depends upon the values for $Y_i$ and $X_i$ .	n.a.
$A_i$	Armington aggregate supply. $A_i$ represents the total supply for a good in Armenia. It is a computed parameter, which combines $D_i$ and $M_i$ , net of import and value-added levies applied at the border and domestically. Although this value is not incorporated directly into the SAM, it is a common input for CGE models.	n.a.
$ID_{ji}$	Intermediate demand. Aggregate values for intermediate demand are provided in the National Accounts data. But individual input coefficients are taken from a surrogate IO table. This IO table is reproduced for the reader in Table 2A.4.	Armenia.xls; GTAP database
$L_i, K_i$	Labor and capital demand for production in sector $i$ . Total value added is provided in the National Accounts, but the share of labor, capital, land, and indirect taxes is not provided by the NSS. These values are based upon the surrogate IO tables from the GTAP database. The capital intensity can be an important determinant of labor/capital returns and should be reviewed more carefully by experts in Armenia.	Armenia.xls; GTAP database

TABLE 8A.1.6 (CONTINUED)

<i>Symbol</i>	<i>Description</i>	<i>File location</i>
$\Omega_{fi}$	Factor endowments. Factor endowments for labor, capital, and land are computed from total demand by firms and government. Total sales of labor and capital are then allocated to households based upon the 2002 household consumption and income survey. A data discrepancy exists between official wage statistics and the official value added statistics. Although total value added is reported to be more than US\$2,100 million, officially reported wages are only (approximately) US\$600 million, which implies that labor's share in value added is less than 30 percent of total value added. The typical labor share in value added is closer to 70 percent.	n.a.
$G_i$	Government demand for good $i$ . These values are based upon the GTAP surrogate dataset, but can be reconciled also by reports by the Armenian Ministry of Finance.	GTAP database
$INV_i$	Investment demand for good $i$ . Taken from the surrogate dataset from GTAP.	World Bank LDB; Armenia.xls
$FD_i$	Final demand for good $i$ . Computed as a residual based upon total supply and total demand. Total final demand should be compared with the surrogate data, as well as with Armenian household surveys. This task is forthcoming in a future study.	World Bank LDB; Armenia.xls
$t_i$	Direct and indirect taxes. Tax rates are computed as the ratio of collections to tax base. For example, applied import tariffs for good $i$ equal duties for good $i$ , divided by imports for good $i$ : $t_i^M = \frac{TM0_i}{M0_i}$ .	Armenia.xls

*Note:* Each symbol is listed together with a brief description and file location.

n.a. Not applicable.

The accounting behind any SAM reflects the basic economics of producer competition, market equilibrium, and resource exhaustion. For producers, the output (sales) value must be at least as large as the combined input cost; and when the sales value exceeds input costs, this excess is often attributed to undocumented or unreported costs, such as the return to capital or depreciation. The supply of goods must be sufficient to satisfy total demand. Total supply for a commodity is reported as the column total, and demand for a commodity is reported in the corresponding row total. A difference in these totals indicates a market imbalance. Finally, households in the economy earn money either by selling factors or through government and foreign transfers. The government collects revenue by levying taxes. Each agent's income must be sufficient to cover the purchases for that year. If there is an imbalance, this value is attributed to either savings or borrowing. In all three situations, the data are considered to have been the result of optimizing economic agents.

These basic conditions are understood more clearly if we present a handful of accounting identities related to individual SAM accounts. First, we take the set  $I$  to represent individual production sectors in the model and the corresponding output commodity.<sup>9</sup> For example,  $I$  is the set {GRN, MIN, FOD, etc...}. We define the following conditions for producer profits and market equilibrium:<sup>10</sup>

The total sales value must equal the total cost of production:

$$Y_i = \sum_j ID_{ji} + L_i + K_i + T_i \quad (8A.1.1)$$

Total output or sales for good  $i$  ( $Y_i$ ), at producer prices, must be large enough to cover the cost of production. This includes the purchase of intermediate inputs ( $ID_{ji}$ ), value added ( $L_i$ ,  $K_i$ ), and taxes ( $T_i$ ).

Total supply must equal demand for all commodity markets:

$$Y_i + M_i \geq \sum_j ID_{ij} + G_i + FD_i + INV_i + X_i \quad (8A.1.2)$$

where total supply in this framework equals total output ( $Y_i$ ) plus imports ( $M_i$ ) and demand comprise intermediate demand by firms ( $ID_{ij}$ ), government demand ( $G_i$ ), final consumer demand ( $FD_i$ ), investment demand ( $INV_i$ ), and demand by the rest of the world ( $X_i$ ).

The same condition holds for factor markets. Supply of labor and capital must be sufficient to satisfy producer demand:

$$\sum_h \omega_h^L \geq \sum_i D_i^L \quad (8A.1.3)$$

$$\sum_h \omega_h^K \geq \sum_i D_i^K \quad (8A.1.4)$$

where  $\omega_h^L$  is each household ( $h$ )'s endowment (or supply) of labor, and  $\omega_h^K$  is each household's capital endowment, and  $D_i^L$  is the demand for labor by sector  $i$ . So, total factor supply equals factor demand.

## **DATA MAPPING**

An inevitable, and unenviable, task is to map various sector types between each other. A mapping that aggregates many sectors onto a single sector is fairly easy. Values are added together and relabeled. A mapping that disaggregates a single sector into many smaller sectors is much more difficult. Additional information must be uncovered from a separate source in order to generate a useful disaggregation. This disaggregation problem was encountered with the Armenia data when mapping the industry megasector into several smaller industrial units. We used output shares within production to identify each subsector's production, but the relative share of intermediate inputs, labor inputs, and capital inputs were not available, so each subsector uses an equivalent split between intermediate inputs and value added. Of course, we know these are different. The sector mappings between the NSS National Accounts, GTAP, and the 2002 Armenian Household Survey are described in this section.

### **Soviet Accounts to National Accounts**

As of 2004, the NSS has been preparing to develop a system of national accounts based on the United Nations' International Standard Industrial Classification (ISIC). Unfortunately, the 2002 statistics still rely upon the old Soviet-style system of accounts. In the old-style accounts, industry is listed as a single activity, which comprises one-third of total GDP. At the same time, small and meaningless sectors are included, like geology, which represents less than 1 percent of GDP, and has no clear corresponding economic sector.

Table 8A.1.8 presents a mapping that we chose between the NSS GDP accounts and the sectors which are believed to be representative of Armenia's economy. Where possible, the percentage breakdown is shown next to the sector abbreviation. We aggregate and disaggregate the data in both directions. Industrial activity is disaggregated into several smaller activities, while health, education, and science are combined into a single sector, GOV. This mapping is available electronically as part of the Armenian SAM distribution. The spreadsheet is named mapping.xls.

### **GTAP Database to Armenian Industries**

In order to use the GTAP surrogate IO data together with the Armenian NSS data and outside data, we are required to map GTAP codes onto each 2002 Armenian SAM sector. Table 8A.1.7 presents this mapping. The left-hand column contains the three-letter Armenian code, the center

column is the GTAP Version 5 code, and the right-hand column is a short description of the GTAP sector being aggregated. The interested reader can further identify GTAP's sectoral classification, and a mapping between GTAP and the ISIC (International Standard Industrial Classification) accounts, on the GTAP Web site (<http://www.gtap.org/>).

**TABLE 8A.1.7 MAPPING GTAP V5 SECTORS ONTO 2002 ARMENIAN SAM SECTORS**

<i>Armenian SAM</i>	<i>GTAP</i>	<i>GTAP description</i>
GRN	PDR	Paddy rice
	WHT	Wheat
	GRO	Cereal grains nec
VFR	V_F	Vegetables, fruit, nuts
VOL	OSD	Oil seeds
	VOL	Vegetable oils and fats
OCR	CB	Sugar cane, sugar beet
	PFB	Plant-based fibers
	OCR	Crops nec
	FRS	Forestry
	SGR	Sugar
OMT	CTL	Bo horses
	OAP	Animal products nec
MIL	RMK	Raw milk
	MIL	Dairy products
FOD	FSH	Fishing
	CMT	Bo meat products
	OMT	Meat products
	PCR	Processed rice
	OFD	Food products nec
TBC	B_T	Beverages and tobacco products
ENR	COL	Coal
	OIL	Oil
	GAS	Gas
	OMN	Minerals nec
LMF	WOL	Wool, silk-worm cocoons
	TEX	Textiles
	WAP	Wearing apparel
	LEA	Leather products
	OMF	LUM
PPP		Paper products, publishing
P_C		Petroleum, coal products
OMF		Manufactures nec
CRP	CRP	Chemical, rubber, plastic products
MNM	NMM	Mineral products nec
MTL	I_S	Ferrous metals
	NFM	Metals nec
	FMP	Metal products

**TABLE 8A.1.7 (CONTINUED)**

<i>Armenian SAM</i>	<i>GTAP</i>	<i>GTAP description</i>
MCH	MVH	Motor vehicles and parts
	OTN	Transport equipment nec
	ELE	Electronic equipment
	OME	Machinery and equipment nec
ELE	ELY	Electricity
UTL	GDT	Gas manufacture, distribution
	WTR	Water
CON	CNS	Construction
TRD	TRD	Trade
TRN	OTP	Transport nec
	WTP	Water transport
	ATP	Air transport
	CMN	Communications
BNK	OFI	Financial services nec
	ISR	Insurance
OSR	OBS	Business services nec
	ROS	Recreational and other services
GOV	OSG	Public administration, defense, education, health
DWE	DWE	Ownership of dwellings

*Source:* Armenia SAM.

### **SURVEY CONSUMPTION CATEGORIES TO NATIONAL ACCOUNTS INDUSTRIES AND FACTORS**

Similar to the industrial and income classifications, we mapped household consumption categories from the 2002 Armenian Household Survey onto the 2002 Armenian SAM sectors. There are 480 consumption categories distinguished in the Household Survey—most of the food items. Table 8A.1.9 presents an excerpt of this mapping.

### **MATRIX BALANCING**

In order to finish with a balanced set of national accounts, several balancing routines were applied to the data at various points in the construction process. This subsection describes where the balancing was applied and why.

#### **Manual Approach**

Our first approach is to review the input data and consider why certain accounts do not balance. As we review each account discrepancy,

we often find that the largest imbalances are caused by errors in data translation or errors in data mapping. When the data are translated properly, or are mapped more tightly to the true meaning of the economic activity, many of the larger errors do not require mechanical adjustments.

This has been the case for some accounts in Armenia. For example, this country has traditionally been a major center for cut diamonds. Uncut and cut gems are the single largest import and export items for Armenia. Two issues arose while generating the national accounts for precious gems. First, the national accounts were inconsistent. Total exports were US\$259 million, and imports were US\$214 million; but the NSS also reported that domestic production was only US\$9 million, when the accounting identity implies that it is at least US\$45 million. The second issue comes from the surrogate IO table. The precious stones sector is aggregated together with other mining and minerals in the GTAP database, which is the source of the IO table. Thus, the production shares for this sector did not reflect the fact that in Armenia more than 90 percent of intermediate demand is own-use (uncut gems). The IO table was manually adjusted to reflect expert opinion related to the jewelry industry there. Other accounts were adjusted using the least-squares methodology.

The main point of this exposition is to demonstrate that “SAM balancing” cannot be a completely automatic process. As described in Round (2003, p. 174),

... Data reconciliation methods were not as arbitrary as it might at first seem. There were essentially three steps involved in the judgement approach. First, the initial data were set alongside each other in the accounting framework to take initial stock of the problem. Secondly, a qualitative judgement was taken on the relative reliability of the alternative estimates, relying on expert local advice. Thirdly, after choosing the most reliable estimates, further scaling and adjustments were made manually to achieve consistency

The same three steps are taken here, except that the third step can now be achieved using a computer.

### **Mechanical Approach**

After some work using the manual approach, the remaining loose ends (and there are plenty) are balanced using a least-squares approach. Most of the new imbalances arise as we disaggregate intermediate demand ( $ID^0_{ij}$ ), final demand ( $C^0_j$ ), government demand ( $g^0_j$ ), and

factor incomes ( $VA^0_{Fj}$ ). After disaggregation from the macro SAM, we face the problem that some (if not all) of the basic accounting identities above no longer hold, as they did for the aggregate SAM.

In the least-squares approach,  $ID^0_{ij}$ ,  $C^0_j$ , and  $D^0_j$  are adjusted in order to satisfy the producer competition (zero profits) and market equilibrium (supply-demand) equations. Later in the build process, we enforce the income-expenditure identities for each household decile. We describe the first problem, balancing supply and demand, first.

The market-balance problem is defined in the recalibration routine as follows:

$$\min \sum_{i,j} (ID_{i,j} - ID^0_{i,j})^2 + \frac{1}{2} \sum_i (D_i - D^0_i)^2 + \frac{1}{10} \sum_i (C_i - C^0_i) \quad (8A.1.5)$$

such that

$$M^0_i + D_i = \sum_j ID_{i,j} + C_i + G^0_i + I^0_i \quad (8A.1.6)$$

$$D_i + X^0_i = \sum_j ID_{j,i} + \sum_l L^0_{l,i} + \sum_k K^0_{k,i} + t^0_i$$

This minimization problem chooses values for  $ID$ ,  $D$ , and  $C$  with zero-profit and market-balance conditions as constraints. We have applied different weights to each choice variable. The choice of weights in the objective function is somewhat arbitrary. In this problem, consumption and domestic supply are weighted less heavily, so that changes in these values do not penalize the objective function as much as changes to  $ID$ .

In `sam.gms`, another least-squares rebalancing problem is solved. Instead of squaring the absolute difference between input variables, in `sam.gms` we chose to square the percentage difference between input variables. For example, government consumption is adjusted according to this penalty function:

$$\sum_i \left[ \frac{G_i}{G^0_i} - 1 \right]^2 \quad (8A.1.7)$$

The SAM-balancing problem in `sam.gms` includes all of the social accounts, including taxes, international trade and savings, and government collections and expenditures. Remaining imbalances in any account are corrected here.

Finally, the household income and expenditures are fit to macro data, also by using a mechanical balancing approach. In the GAMS program file, `readhh.gms`, we separately fit income to aggregate factor income and transfers, and we fit expenditures to total net-domestic supply. In each case, we adjust the percentage difference between the final variables and the target values.<sup>11</sup>

TABLE 8A.1.8 MAPPING OF ARMENIAN OUTPUT STATISTICS TO SAM SECTORS

<i>Armenian sector</i>	<i>Total production (Y0) (million dram)</i>	<i>SAM sectors (%)</i>
Industry	611,879	FOD (35.7) TBC (3.1) CRP (2.3) MNM (9.2) MCH (1.2) OMF (1.3) MIN (9.8) UTL (24.4)
Agriculture	522,634	GRN (18.7) VFR (23) VOL (0.2) OCR (15.4) MIL (30.6) OMT (12.2)
Forestry	942	OCR (100)
Construction	297,088	CON (100)
Transport & communication	142,670	TRN (100)
Retail trade & catering	233,889	TRD (100)
Public procurements	8,576	GOV (100)
Spare parts	1,526	TRD (100)
Information & tech. srvcs	1,288	OSR (100)
Real estate transactions	4,914	OSR (100)
General commerce	5,295	TRD (100)
Geology	417	MIN (100)
Other branches	3,300	OSR (100)
Housing	52,471	DWE (100)
Utility sector	84,605	UTL ELE
Health, sport	68,277	GOV (100)
Education	52,541	GOV (100)
Culture	9,630	OSR (100)
Science	6,988	GOV (100)
Lending	26,748	BNK (100)
Insurance	1,485	BNK (100)
Governance and defense	71,791	GOV (100)
NGOs	10,645	GOV (100)
Financial intermediaries	0.0	(Not Included)

*Source:* Armenia SAM.

*Note:* This mapping is available as an Excel spreadsheet, included as part of the distribution archive: mapping.xls. Industrial shares were apportioned based on IMF statistics. A full listing of the IMF industrial shares is available in the program distribution: Armenia SAM.

Agriculture shares were apportioned according to the Armenian national accounts, provided by the NSS, and relisted in the SAM distribution file as: Armenia agriculture 2002.xls.

TABLE 8A.1.9 MAPPING GTAP V5 SECTORS ONTO 2002  
ARMENIAN SAM SECTORS (CONTINUED)

<i>SAM code</i>	<i>Survey code</i>	<i>Survey description</i>
MIL	10408	Cheese of cow milk (chanack, lory, other)
MIL	10409	Homemade cheese, cow milk
MIL	10410	Gruyere and Dutch cheeses
MIL	10411	Cream cheese
MIL	10412	Ice cream
MIL	10499	Other milk products
MIL	10501	Eggs
MIL	10502	Dry eggs
MIL	10601	Butter
MIL	10602	Melted butter
MIL	10603	Margarine
VOL	10604	Sunflower oil
VOL	10605	Olive oil
VOL	10606	Other vegetable oils
VOL	10699	All sorts of oil and animal fat
VFR	10701	Apples
...		
CRP	20502	Laundry detergent
CRP	20503	Laundry whitening
CRP	20504	Other laundry goods
CRP	20599	Other cleaning materials
OMF	20601	Linoleum
OMF	20602	Pile
OMF	20603	Wallpaper
OMF	20605	Basin
OMF	20606	Toilet
CON	20607	Cement
OMF	20609	Oil-based paint

Source: Armenian Living Standards Measurement Survey (LSMS).

## THE BUILD DISTRIBUTION

The main text describes the SAM development process, but the actual *program files* used to generate the dataset can appear completely different. This section of the Annex steps the reader through the program files and describes how they are combined to build a complete SAM. The SAM is based solely upon the input data files provided by the local experts. There are places in the process, however, that require manual adjustment techniques. These manual adjustments are difficult to avoid, and they are different for each country. For this reason, it is unlikely that readers will be able simply to drop in new input files and

mappings for their own country and expect a reasonable, balanced SAM to materialize. This distribution offers a structured approach to the thought process while constructing the SAM, but it is not a substitute for careful consideration of a given country's economy.

First we list the contents of the distribution file: Armenia SAM.zip:<sup>12</sup>

```

|   run.bat
|
+--build
|   |   aggr.gms
|   |   Armenia.xls
|   |   buildsam.gms
|   |   extract.zip
|   |   recalib.gms
|   |   setup.bat
|   |   shares.gms
|   |   soedata.gms
|   |   tables.gms
|   |
|   \--data
|       arm25.map
|       gtap001.set
|       POL.GDX
|
+--sam
|   Armenia_hh_2002.xls
|   hhsam.gms
|   printxls.gms
|   readhh.gms
|   sam.gms
|
\--SourceData
2002_GDP_NSS.xls
Armenia_agriculture_2002.xls
Export Import data in 2002 Revised.xls
IMF-Statistical-Annex(Industry Shares).pdf

```

There are three directories: build, sam, and sourceData. Most of the data management is handled in the build directory, where setup.bat directs the aggregation, mapping, and combination of each of the four input tables. The data is recalibrated using recalib.gms, the main program in the build directory. Most of the remaining GAMS programs

are optional; they produce descriptive tables based upon the pre- and post-calibrated data. A subdirectory, *data*, contains the IO table for Poland and the mapping between GTAP and our 25-sector SAM. Finally, *extract.zip* contains the necessary files to extract an IO table from the GTAP database. The extraction process requires the entire GTAP database, a 3MB file (*gtap001.zip*).

The programs in the SAM directory write out the micro-SAM and then generate the household SAM. *sam.gms* is handed data from the build process, re-checks the calibration, then writes the micro-SAM to a comma-delimited file. Then the household dataset, *Armenia hh 2002.xls*, is read by *readhh.gms* and combined with the national accounts by *hhsam.gms*. *printxls.gms* is the program that “flattens” the social accounts into a single, two-dimensional matrix.

Finally, a minimal *SourceData* directory is included. This directory contains spreadsheets that were used to build Input Tables #1 and #2, output, value added, trade, and taxation, for each sector.

The most important file is *run.bat*, the command file. If everything is correctly in place, this file builds and writes the entire social accounting matrix from scratch. The contents of this file are shown here:

```

cd build
call setup pol
cd ..\sam
call gams sam
call gams printxls -dataset=ekasam
call gams readhh
call gams hhsam rem workbook:
: call e:\gams211\xlwrite msam.csv sam.csv
hhsam.csv Armenia_2002_SAM.xls
if '%1'=='cleanup' goto cleanup
cd ..
goto end

:cleanup
del *.lst
del *.gdx
del msam.txt
del *.csv
cd ..
goto end

:end

```

First, we enter the build directory and call the `setup.bat` subcommand file, indicating that we wish to use POL for the surrogate IO table. This extracts Poland's production structure from the GTAP database<sup>13</sup> and computes intermediate demand shares, value-added shares, and final consumption shares. The program `recalib.gms` combines the source output and tax data together with the surrogate data to generate most of the micro social accounts. These data are returned in a GAMS data container labeled `sam2002.gdx`.

## NOTES

1. This chapter was prepared by Miles K. Light, University of Colorado, and by Ekaterine Vashakmadze and Artsvi Khatchatryan, both at the World Bank.

2. While the model has limitations in many aspects, its simplicity offers certain advantages: (i) its underlying assumptions of fixed prices and fixed technology in an economy with ample underutilized capacity like Armenia are reasonable at present; (ii) the model can be applied for understanding the nature of the backward and forward linkages in the economy; (iii) the simplicity of the model permits both easy tracking of information gaps and easy transfer to the relevant counterparts for technical capacity building. At the same time, at this stage in the data development process, we advise cautious use of input-output analysis, since the IO table we currently use is an adjusted surrogate table.

3. Interestingly, the labor/capital intensity is reversed for high-income countries. In the United States, for example, agriculture is a capital-intensive industry and chemical manufacturing is labor-intensive, due to high R&D costs.

4. Note that US\$302 million equals the ROW-SUM along the GOV accounts in the macro SAM, minus the transfers from ROW.

5. Figures are taken from Armenia (2003c), p. 116, Table 4.

6. See, for example, Robinson et al. (2001).

7. <http://www.gtap.agecon.purdue.edu/>.

8. <http://www.gams.com/>.

9. In this treatment, each producing sector provides only one output good.

10. Table 8A.1.6 contains descriptions for each symbol.

11. The *target values* are the original household income and expenditure figures based upon the 2002 Armenian Household Survey.

12. This archive is freely available to interested readers. It can be downloaded from the Armenia Project Web site, located here: <http://www.mileslight.com/armenia/>.

13. This distribution does not include the full GTAP dataset. Instead, we have extracted these data and placed them into the GAMS data container, pol25.gdx.



## CHAPTER 9

# Taxation and Economic Efficiency in Armenia

### INTRODUCTION

While Armenian economic growth has been robust for the past few years, tax revenue collections have fallen short of expectations.<sup>1</sup> Tax revenue as a fraction of GDP has fallen steadily, particularly through reductions in the collection of direct taxes. In total, tax revenues have fallen by more than 2.5 percent of GDP, with 1 percent due to reductions in personal income tax collections and 1.25 percent due to reductions in receipts from the profits tax.

While early stages in transition and development may be led by the private sector, sustained development and reductions in poverty require public sector resources. Health, education, and public infrastructure are all essential for sustainable development, and the provision of these goods and services demands an efficient and reliable tax system.

There are several recent studies of the Armenian tax system that have evaluated the prospects for tax reform from legal and structural viewpoints.<sup>2</sup> The present paper reports results from a CGE model that has been formulated to explore, from a quantitative perspective, the economic consequences of different types of tax reforms in Armenia. We use the model to consider the marginal cost of funds from direct and indirect tax instruments, and we also present a set of scenarios for increasing tax revenue by between 0.5 and 2 percent of GDP.

Data discrepancies and omissions make Armenian tax policy analysis difficult. Presently, there does not exist a “post-Soviet” IO table or any comprehensive source of economic data for Armenia. In the absence of a consistent set of national economic statistics, our model is based on information from a variety of sources. Sectoral value added, aggregate output shares, trade statistics, and components of final

demand are based on data from the NSS. Input-output coefficients in our model are based on recent IO tables from 1997 for Hungary and Poland.

We use two alternative sources of these coefficients in order to evaluate the robustness of our result. Our findings indicate that the results are not overly sensitive to the choice of production technology. The results are much more sensitive to benchmark tax rates and the elasticities of substitution that characterize trade-offs between formal and informal goods and services.

Despite the data limitations inherent in this study, we still believe that policy decisions can be better informed by a roughly parameterized model than by the uncalibrated logic of economic theory. For example, the model can be used to assess how collections in tax revenue from one tax instrument are affected by changes in other tax rates. These types of assessments are particularly important in view of the high and growing level of informal activity.

With some effort on the part of statistical authorities, the input data for our model can be substantially improved; thus we regard the present set of results as preliminary. The general lessons the model is now providing are, however, highly informative. The standard “first-best” rules for taxation (low rates, broad base), which apply in many competitive economies, may be inappropriate in a second-best setting. Armenia clearly represents a second-best economic environment, as is evidenced by the low collection rates of its principal taxes. Revenues from income and profits taxes are reduced by underreporting of both labor and capital income.<sup>3</sup> VAT revenues appear to have a somewhat higher rate of compliance, but as of 2002 the relative efficiency of VAT collections is about half that of developed countries.

The NSS includes an estimate of *informal economic activity* as part of the officially tabulated GDP. According to this estimate, one-third of the US\$2.9 billion Armenian GDP is produced within the informal sector. Labor and capital income from this sector are omitted from the tax base, and tax collections based on payments within the informal sector are low. Additionally, factor earnings from informal firms can more easily evade VAT and profits taxes, or a portion of them.

Several international teams, including the IMF, United States Agency for International Development (USAID), and the World Bank, have assessed the Armenian tax system and made recommendations for tax reform. Although the foci of these analyses all differ, there are some common themes that arise in these studies:

- The tax revenues in Armenia are low relative to developed countries, and they are low even compared to most CIS countries. The IMF Fiscal Affairs Department reported 2004 tax income to be

17.7 percent of GDP (IMF 2004). Most alarming is the precipitous fall in tax collections between 1999 and 2003, during which time revenues fell from 20 percent to 17.2 percent of GDP. Most of this decline resulted from the fall in rates of collection for income and profits taxes.

- Official tax policy in Armenia has conformed to IMF recommendations. The VAT has only two rates (20 percent and 0 percent), personal income taxes have only three rates (0 percent, 10 percent, and 20 percent), and, where import tariffs exist, the rate is a uniform 10 percent.
- Tax collection and administration are reported to be weakly enforced. Despite a clear and simple tax code, collections are low. This could imply either weak administration or some forms of corruption, or both.
- The tax system is perceived to be unfair. Residents in Yerevan do not believe that tax revenues are used for public goods and services. Small taxpayers believe that the rich individuals do not pay their share, while wealthy taxpayers complain that tax auditors are unpredictable and punitive.<sup>4</sup>

As is apparent from a cursory study, the issues that surround tax policy in Armenia are wide ranging. Our analysis of these issues, however, focuses solely on economic welfare and the aggregate burden of tax collection. We implement a CGE model with which to assess the factors that determine how tax revenues respond to changes in tax rates.<sup>5</sup> The study is macroeconomic in nature and does not consider individual firms, organizations, or any legal interpretation of the tax code. Our model is based on a dual economy in which there coexist formal and informal firms and markets. Firms operating in both the formal and informal sectors are assumed to maximize profits. Prices of goods and factors adjust so that supply equals demand in all markets.

Informal activity in our model is calibrated to information regarding the level of informality in different sectors. In our central cases we adjust sectoral shares of informal activity to target the NSS estimate that 30 percent of the aggregate Armenian economy is represented by informal activities. Informal production in the model is able to evade taxes for profits wages, and value added.

Our analysis demonstrates that rising levels of evasion produce a corresponding increase in the marginal cost of public funds. This implies that the cost-benefit test for publicly funded health, education, and infrastructure investments becomes increasingly more stringent as informality increases. In the present economy, an additional dollar of public expenditure costs between US\$1.30 and US\$1.60. When

we account for the long-run response of investment and capital stock to the perverse incentives introduced by the informal sector and the tax system, the marginal cost of funds might easily introduce a 100 percent premium on public expenditure. In view of the crucial role in economic development played by public expenditures and investments, there are potential dire consequences for the long-term health of the Armenian economy if the trend toward increasing levels of informal activity cannot be reversed.

Faced with the high efficiency costs of raising revenue, there are limited possibilities for raising significant revenue from any of the tax bases. In the short term, efficiency costs are smaller because capital is fixed and unable to escape, yet raising tax revenue remains costly due to the ability of firms and consumers to substitute untaxed, informal products for formal goods that are subject to tax.

In the long-term model, we find that tax policy has costly impacts on capital accumulation and economic growth. The existing profits, income, and value-added taxes all tend to discriminate against investment in formal sectors, and the long-run perspective underscores the need for avoiding further discouragement of investment in these areas.

We find that the long-run efficiency cost of taxes on agricultural products is low because existing profits and income taxes tend to discriminate against formal activities in manufacturing and industry. These taxes lead to underinvestment in industry, an effect that is partially offset by a tax on agricultural income. As has been pointed out elsewhere, taxes on agricultural activity face administrative difficulties because most farmers are small-holders. These farmers would be exempt from income and profits taxes in any case, if revenues and income are low.

The marginal cost of public funds from any of the direct and indirect tax instruments are increased when a substantial fraction of the tax base is able to avoid payments, or when individuals are more willing to substitute informal goods and services for formal goods and services. These results provide strong support for tax policies that underscore the need to reduce tax evasion and informal activities organized primarily as a means of evading tax payments.

The remainder of this chapter is organized as follows. The next section presents the model formulation. The third section presents some stylized facts regarding the economic structure of Armenia as represented in our dataset. The fourth section compares the relative efficiency among each tax stream and goes on to consider some tax proposals presented by the IMF in 2004. A detailed review of how the results are affected by the use of surrogate data sources for production technology is discussed in the fifth section. The last section provides conclusions.

## A GENERAL EQUILIBRIUM MODEL FOR ARMENIA

Our model represents Armenia as a small open economy with two types of economic activity: *formal activities*, which are subject to tax, and *informal activities*, which are untaxed. The model portrays an Arrow-Debreu economy with constant returns-to-scale and perfect competition across all modes of production. As a small, open economy, Armenia faces fixed relative prices for imports and exports. Producers maximize profits taking prices as given, and consumers maximize utility subject to a budget constraint that depends upon the value of their endowments, transfers from the government, and remittances from abroad. These assumptions imply that no producer earns above-normal profits and that consumers cannot increase consumption of all goods simultaneously. These are the basic economic concepts of economic scarcity and competition.

Following Mathiesen (1985), we formulate and solve the model as a complementarity problem with three types of equilibrium conditions: market clearance, zero profit, and income balance. Production technology and consumer preferences are characterized using the nested, constant-elasticity of substitution (CES) functional form. The model accommodates analysis of both the static and steady-state welfare effects through alternative representations of the capital stock.

The numerical equations are based on data derived from the 2002 Armenian National Accounts together with reports provided by the IMF, USAID, GTAP, and the World Bank. The present version of the model distinguishes 25 industries, the government, and a single, representative consumer. In each industry, in the reference equilibrium a given share of production is produced informally.<sup>6</sup>

### Economic Flows

The relationship between different sectors and consumers in the model is shown in Figure 9.1. Various aspects of the economy are depicted here, with the exception of taxes subsequently.

Production in sector  $i$  ( $Y_i$ ) combines four primary factors: capital ( $K$ ), skilled labor ( $L_S$ ), unskilled labor ( $L_U$ ), and land ( $N$ ). Intermediate inputs are added to produce outputs for the domestic ( $D_i$ ) and export ( $E_i$ ) markets. An "Armington composite good" ( $A$ ) is a combination of domestic goods ( $D$ ) and imports ( $M$ ). Armington aggregate goods are the basic consumption commodity. They are consumed by industry as an intermediate input and they are also goods for final consumption ( $C$ ), government consumption ( $G$ ), and or investment ( $I$ ). Consumers are endowed with factors of production ( $L_S, L_U, K, N$ ), which are sold to industry ( $Y$ ). They are also the final consumers, who use income

from factor sales to purchase Armington goods (C via A), to invest (I), or to create government services (G).

For sectors,  $Y_i$ , appearing in Figure 9.1 there are two associated activities: formal production ( $Y_i^F$ ) and informal production ( $Y_i^I$ ). The formal sector is subject to various taxes (VAT, profits, payroll, and income taxes), whereas the informal sector pays only those taxes collected at the border (import tariffs). These activities produce goods that are consumed in final and intermediate demand. A schematic for the formal/informal consumption activity is presented in Figure 9.2.

### Algebraic Formulation

Our model is based on CES functions. CES functions are widely applied because they are globally regular and can be defined by their zeroth, first, and second order properties. This means that the location (price and quantity), slope (marginal rate of substitution), and curvature (or convexity) completely characterize a CES production or consumption function. This permits a simplified representation of production technology and consumer preferences.

Using this general approach, the supply side of the Armenian model is as shown in Figure 9.1. We use  $\sigma$  to denote the elasticity of substitution for production inputs and  $\eta$  to denote the elasticity of transformation for outputs.<sup>7</sup> In the model, any choice for elasticities in each sector can be applied in order to reflect local expertise related to particular sectors.

### Production Functions

#### Production Inputs

Goods are produced according to a nested Leontief-Cobb Douglas technology. Intermediate inputs and aggregate value added enter at the top level:

$$Y_i = \min \left[ \min_j \left( \frac{x_{ji}}{a_{ji}} \right), \frac{v_i}{b_i}, \frac{m_i^Y}{a_i^M} \right]. \quad (9.1)$$

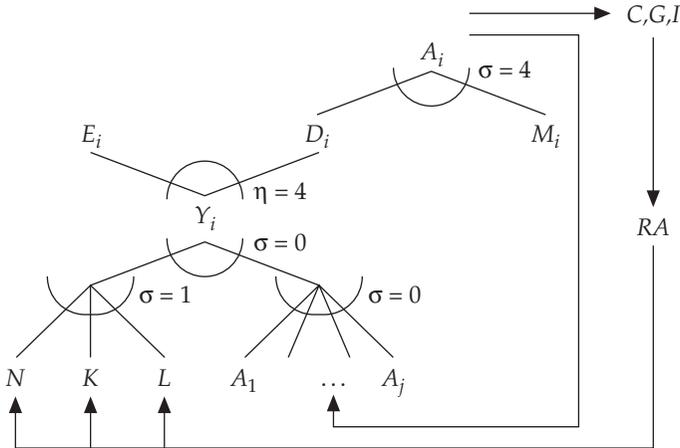
In this expression,  $x_{ji}$  represents intermediate inputs of good  $j$  from the domestic market and represents specialized imports for re-export in sector  $i$ .<sup>8</sup>

Value added represents a Cobb-Douglas aggregation of unskilled labor ( $L_U$ ), skilled labor ( $L_S$ ), capital ( $K$ ), and land ( $N$ ):<sup>9</sup>

$$v_i = L_{U_i}^{\alpha_U} L_{S_i}^{\alpha_S} K_i^\beta N_i^\gamma, \quad (9.2)$$

in which constant returns to scale imply that  $\alpha_F + \alpha_I + \beta + \gamma = 1$ .

FIGURE 9.1 ARMENIAN PRODUCTION STRUCTURE FOR FORMAL AND INFORMAL ACTIVITIES



Source: Authors.

Symbol Description:

- Y Goods production
- D Production sent to the domestic market
- A Armington aggregate good—this activity combines domestic production with imports to produce an *Armington aggregate good* for intermediate use or final demand.
- E Production which is exported
- M Imports
- L Labor inputs—labor is either skilled or unskilled
- K Capital input
- N Land inputs
- I Fixed investment demand. Combines goods from A to produce an investment good.
- G Government demand. Tax revenues purchase goods from A to produce the government good.
- C Final consumption demand. Final demand by households. Households sell labor and capital endowments to pay for final consumption.
- $\sigma$  Elasticity of substitution for inputs.
- $\eta$  Elasticity of transformation for outputs.
- RA Representative agent.

Note: Imports for re-export in the mineral products and precious stones sector have been omitted from this diagram.

### Production Outputs

Each production sector  $Y$  produces two types of commodities: domestic goods  $D_i$  and goods for export  $E_i$ . These goods are assumed to be imperfect substitutes, and they have a constant elasticity of transformation. An algebraic formulation of this transformation function is written

$$Y_i = g(D_i E_i) = \left[ \alpha_i^D D_i^{1+1/\eta} \right]^{1/(1+1/\eta)}, \quad (9.3)$$

where  $\alpha_i^D$  is the benchmark value share of domestic sales in total output for sector  $i$ , and  $\eta$  corresponds to the model input  $\text{etrdx}$ .

### *Imports*

The model adopts an Armington representation of the import demand. Armington goods,  $A_i$ , are produced by combining domestic goods with imports from the same sector. These goods are treated as imperfect substitutes (for example, autos from Russia versus autos from Japan), with an Armington elasticity,  $\sigma_{DM}$ , describing the degree to which these substitute in intermediate and final demand:

$$A_i = \left( \alpha_i^M M_i^{1-1/\sigma_{DM}} + (1 - \alpha_i^M) D_i^{1-1/\sigma_{DM}} \right)^{1/(1-1/\sigma_{DM})}. \quad (9.4)$$

Some confusion can arise trying to distinguish between production,  $Y_i$ , output ( $D_i$ ,  $E_i$ ) and the consumption good ( $A_i$ ). The Armington aggregate good,  $A_i$ , combines domestic output,  $D_i$ , with imports,  $M_i$ .  $A_i$  is the good used as an intermediate input and also for final demand.

### *Trade Balance*

The shadow value of foreign exchange,  $\rho$ , adjusts to clear the market for foreign exchange, a good which is “produced” with exports and consumed by imports:

$$\sum_i \bar{p}_i^E E_i + B = \sum_i \bar{p}_i^M (M_i + a_i^M Y_i). \quad (9.5)$$

Holding all else equal, rising import demand will increase  $\rho$ , which reflects increased demand for external currency. The exogenous parameter  $B$  denotes a current account balance. Because this is a small, open economy, import and export prices ( $\bar{p}_i^E$ ,  $\bar{p}_i^M$ ) are fixed exogenously.

## **Consumption, Investment, and Government**

### *Final Consumption*

A single representative agent ( $RA$ ) is endowed with primary factors of production: capital, labor, and resources. The  $RA$  demands final goods for consumption. Investment and government output also demand final goods, but the level is exogenously specified, while private demand is endogenously determined by utility maximizing behavior. The  $RA$  utility function is Cobb-Douglass as shown below:

$$U(A_i) = \prod_i A_i^{\alpha_i}, \quad \sum_i \alpha_i = 1. \quad (9.6)$$

The RA maximizes utility subject to a budget constraint:

$$\begin{aligned} & \max_{A_i} U(A_i) \\ & \text{s.t.} \quad \sum_i p_i A_i \leq p_K K + p_L L + p_N N + trn - I + B \end{aligned} \quad (9.7)$$

In this problem, the RA maximizes the utility function subject to a budget constraint. The Armenian budget constraint is equal to the total value of factor endowments ( $K, L, N$ ), plus any transfers from the government, minus the cost of investment, plus the net current account balance. The current account balance for Armenia reflects substantial cash remittances from abroad, amounting to US\$175 million, a substantial sum in comparison with US\$683 in goods and services exports.

### *Investment*

In the static formulation, investment demand is held constant at base-year levels. Investments are aggregated into a single, national investment pool, then distributed among production and government sectors according to base-year accounts. Investment funds come from households and government. The level of investment can be altered in the steady-state formulation, as is discussed in the next section, "Armenia's Economic Structure."

### *Government*

Government purchases of goods and services are supported with tax revenue, capital earnings, and net foreign exchange transfers. The model tax system and total tax revenues are described in the next section, "Armenia's Economic Structure."

### **Steady-State Capital**

A major drawback of tax policy analysis in a static model is that the capital stock is fixed and unresponsive to tax-induced changes in the net rate of return. Logically, the level of investment depends upon depreciation, interest rates, and the rate of return to capital stock. Static CGE models fail to address the changes to investment and capital stock associated with changes in the tax code. We address these issues by including a *steady-state* model formulation. The steady-state model allows capital and investment to change in response to tax policy in a way that is consistent with a long-run analysis. The long-run equilibrium condition links the cost of capital with the return to capital:

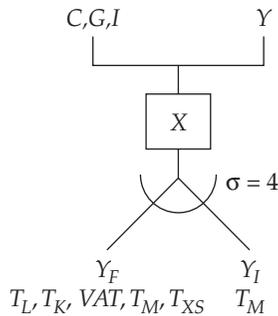
$$p_{inv} = r_K \quad (9.8)$$

This equilibrium condition in the steady-state model is associated with an equilibrating variable,  $\kappa$ , which represents the level of the capital stock. When the return to capital rises relative to the price of investment,  $\kappa$  increases to scale up investment and reflect this arbitrage condition. Thus, in the steady-state equilibrium,  $\kappa$  adjusts investment so that the cost of capital is consistent with the return to capital. This condition is equivalent to assuming “Tobin’s  $q$ ” is calibrated to unity in the reference equilibrium and returns to that value in the long run.

### Informal Market Activities

We treat *informal* products as close but imperfect substitutes for formal goods. Consumers and firms thus distinguish between formal and informal products, and choose between these goods on the basis of relative prices. Figure 9.2 shows how formally and informally produced goods are combined to produce a good “ $X$ ” that is consumed across all types of demand: final demand by consumers, investment, the government, and intermediate demand by firms.  $\sigma_x$  denotes the elasticity of substitution between each good type. In an economy where underground goods or services are qualitatively similar to formal products, or where informal activities are commonplace, there would be a high value of  $\sigma_x$ . As will be shown below, as the value of  $\sigma_x$  increases, so too does the cost of public funds.

FIGURE 9.2 DEMAND FOR FORMAL AND INFORMAL GOODS



Source: Author.

Note: Formally produced goods are subject to all official taxes, while informally produced goods prices incorporate only import tariffs. Goods from each type of production are imperfect substitutes in final and intermediate demand. Final demand and intermediate demand within each sector has a different share of informally produced goods.

### Tax Structure

Production inputs are subject to five major types of taxes. Final consumption is taxed at rate  $vat_i$ . Labor income in the formal economy is taxed at rate  $t_F$ , and social security taxes are also imposed as a tax on labor income in the formal economy, applied at rate  $t_{pyrl}$ . The total tax rate on labor in the formal sector is then  $t_L = t_F + t_{pyrl}$ .

Capital earnings in the formal economy are taxed at rate  $t_K$ , imports pay tariffs at rate  $t_m$ , and land rents are taxed like capital returns, where a national rate for profits taxes is applied. Differences in VAT, import, or formal/informal tax rates across sectors lead to efficiency costs that are captured in the model.

An important segment of the tributary system is the invoice-rebate feature available for the VAT. Under this system, value-added taxes paid for intermediate inputs can be reclaimed by the firm. In theory, the rebate eliminates the tax distortion between intermediate inputs. This distinction is less clear in practice, because the paperwork required for collection is complicated and repayments are unpredictable. According to a 2004 survey of Armenian companies, both of these difficulties exist.

The tax-inclusive cost of production for formally-produced goods is then

$$C_i = \sum_j p_j x_{ji} + p_L(1+t_L)L + (1+t_K)(rkK_i + r_iN_i) + \rho \bar{p}_i^M a_i^m. \quad (9.9)$$

Tax-inclusive revenue value for  $Y$  is denoted as  $R_i$ :

$$R_i = p_i^D D_i + \rho \bar{p}_i^X X. \quad (9.10)$$

In equilibrium, the tax-inclusive cost of production equals output value across all sectors ( $R_i = C_i$ ), and this represents the zero-profit equilibrium condition.

Import tariffs and value added taxes are included in the Armington commodity's unit cost function for formally produced goods:

$$p_i = (1 + vat_i) \left[ \alpha_i^M \left( \frac{p_i^M (1 + t_i^M)}{\bar{p}_i^M} \right)^{1-\sigma} + \left( \frac{p_i^D}{\bar{p}_i^D} \right)^{1-\sigma} \right]^{1/(1-\sigma)}. \quad (9.11)$$

The benchmark tax rate applied on formal labor inputs ( $t_L$ ) is based on direct tax payment by households in the SAM and gross payments to formal labor. The benchmark tax rate applied to private capital ( $t_K$ ) is based on the direct tax payments by private firms and the gross payments to capital in all nongovernment sectors.

There is perfect arbitrage in factor markets, so there is a wedge between the marginal product of labor, capital, and land in the formal and informal economies. One important aspect of the efficiency cost of taxation therefore corresponds to this difference in productivity. Any policy that leads to an increase in informal activity therefore exacerbates this inefficiency.

## ARMENIA'S ECONOMIC STRUCTURE

Our base-year statistics come from a variety of sources. We target the model to match official figures provided by the NSS. Although our figures do not match NSS figures to the exact dram or dollar, our benchmark represents a more consistent accounting framework than is provided by the NSS. By combining information from disparate (official) sources, and by adjusting the data to match up with the equilibrium conditions, we have been able to uncover several inconsistencies in the Armenian national accounts.

The Armenian GDP in 2002 was 1.36 trillion Armenian drams. This is equal to US\$2.3 billion at a market exchange rate of 573 drams per dollar. According to the CIA's *World Factbook* for 2003,<sup>10</sup> Armenia's GDP was US\$12.13 billion in 2002, on a purchasing power parity basis. The official population, according to a 2001 Armenian census, is 3.0 million, so that annual GDP per capita in 2002 was US\$766 at market exchange rates.

Our model represents the economy through 25 sectors of production, trade, and consumption. The sectoral aggregation was tailored to highlight the most important industries and goods in the country (subject to the availability of data). IO coefficients for the model are drawn from the 1997 IO table for Hungary, which is part of the GTAP5.4 database (Hertel 1997).<sup>11</sup> Table 9.1 describes the sectors that are in our model, and Table 9.2 ranks these sectors by output.<sup>12</sup>

Since 1997, Armenia has enjoyed strong economic growth: over the period 2000–03, the economy grew at an annual rate of 12 percent, and inflation has remained low. Most SMEs are privatized, and the antiquated energy system inherited from the Soviet era has been modernized. The country's nuclear power station, Metsamor, produces sufficient electricity, so that Armenia is now a net electricity exporter. Armenia still depends upon imported oil and natural gas, all of which comes from Iran as a result of the conflict with the energy-rich neighboring state of Azerbaijan. Armenia maintains a large trade deficit which has been offset by remittances, international aid, and FDI. Economic ties with Russia remain close, especially in the energy sector.

TABLE 9.1 ECONOMIC SECTORS IN THE ARMENIAN MODEL

<i>Code</i>	<i>Description</i>	<i>Y<sub>0</sub> (US\$ million)</i>
<b>Agriculture</b>		
GRN	Wheat, potatoes, legumes	170.7
VFR	Vegetables, fruits, grapes	209.3
VOL	Vegetable oils and fats	1.4
MIL	Dairy products	279.2
OMT	Beef, pork, poultry	110.9
OCR	Other crops	140.1
<b>Industry</b>		
ENR	Energy: oil and natural gas	0
MIN	Mining and quarrying	95.0
FOD	Food processing & beverages	381.0
TBC	Tobacco products	33.1
LMF	Light manufacturing and textiles	65.7
MTL	Metals and metal products	121.2
CRP	Chemicals, rubbers, and plastics	105.2
MNM	Mineral products and precious stones	311.7
MCH	Equipment, motor vehicles, and optical	119.9
OMF	Other manufacturing	77.6
UTL	Electricity, gas, and water supply	146.5
<b>Services and other</b>		
CON	Construction	519.8
TRD	Retail & wholesale trade, catering	434.8
GOV	Governance, defense, and public expenditures	364.8
TRN	Transport and communications	248.9
OSR	Other services	221.2
DWE	Housing and dwellings	91.6
BNK	Banking, lending, and insurance	87.0

*Source:* Totals from NSS. Individual sectors: authors' calculations. See Annex for data details.

Y<sub>0</sub> Base-year (2001) sectoral output (US\$ million)

In 2002, the single largest industry was construction. Growth in this sector was driven mostly by charitable donations from the American-Armenian diaspora, such as the Lyndsey foundation. Food and agriculture represent almost 45 percent of the country's output. The remaining industry reflects the country's legacy from the Soviet era where metal-cutting machine tools, forging machines, electric motors, instruments, tires, chemicals, gem cutting, and brandy-making were the major tradable goods and services. Most heavy industries have

TABLE 9.2 BASE-YEAR PRODUCTION AND TRADE STATISTICS  
BY SECTOR FOR ARMENIA, 2002 (US\$ MILLION)

<i>Code</i>	<i>Description</i>	<i>Y<sup>0</sup></i>	<i>VA</i>	<i>D<sup>0</sup></i>	<i>E<sup>0</sup></i>	<i>M<sup>0</sup></i>
CON	Construction	519.8	297.4	513.6	6.2	2.9
TRD	Retail & wholesale trade, catering	434.8	264.8	434.8	0.0	0.0
FOD	Food processing & beverages	381.0	156.9	329.8	51.2	44.0
GOV	Governance, defense, and public expenditures	364.8	208.8	285.8	79.0	68.5
MNM	Mineral products and precious stones	311.7	40.4	52.5	259.2	212.3
MIL	Dairy products	279.2	169.9	278.7	0.5	6.6
TRN	Transport and communications	248.9	140.3	166.9	82.0	141.1
OSR	Other services	221.2	213.6	211.3	9.9	0.8
VFR	Vegetables, fruits, grapes	209.3	127.6	203.7	5.6	24.0
GRN	Wheat, potatoes, legumes	170.7	104.1	170.4	0.3	50.8
UTL	Electricity, gas, and water supply	146.5	101.1	140.8	5.7	13.4
OCR	Other crops	140.1	85.4	135.1	5.0	19.5
MTL	Metals and metal products	121.2	59.8	76.4	44.8	55.7
MCH	Equipment, motor vehicles, and optical	119.9	46.3	63.6	56.3	160.3
OMT	Beef, pork, poultry	110.9	65.5	110.8	0.1	21.4
CRP	Chemicals, rubbers, and plastics	105.3	90.5	96.9	8.4	84.6
MIN	Mining and quarrying	95.0	37.4	52.9	42.1	22.9
DWE	Housing and dwellings	91.6	0.0	91.6	0.0	0.0
BNK	Banking, lending, and insurance	87.0	71.8	80.3	6.7	11.3
OMF	Other manufacturing	77.6	49.4	72.5	5.1	47.8
LMF	Light manufacturing and textiles	65.7	22.6	36.1	29.6	40.7
TBC	Tobacco products	33.1	12.7	29.5	3.6	28.6
VOL	Vegetable oils and fats	1.4	0.9	1.4	0.0	16.8
ENR	Oil & natural gas	0.0	0.0	0.0	0.0	151.4
	Total	4,336.6	2,367.0	3,635.3	701.3	1,225.4

Source: Authors' calculations based upon total supply provided by the NSS (2002).

Key:

- $Y^0$  Base-year output
- $VA$  Base-year value added
- $D^0$  Base-year supply to domestic market
- $E^0$  Base-year exports (FOB)
- $M^0$  Base-year imports (CIF, net tariff)

declined precipitously since 1990. Some of these activities have been replaced by high-technology manufacturing and software services. These sectors are still small, however, and they must compete in a global market for business and ITC services.

International trade statistics are presented in Tables 9.3 and 9.4. Armenia's open trade policy has been hampered by the closure of its borders with Turkey and Azerbaijan. All trade is shipped from the north through Georgia or from the south via Iran. Personal imports of goods make up an unknown but potentially significant portion of total imports.

In value terms, the largest import and export is jewelry, gems, and cut stones (model sector MNM). The gem-cutting industry adds value and reexports the gems at a higher price. The key import sectors for final consumption are oil and gasoline, food and food products, and manufactures such as automobiles, machinery, and computers.

Armenian exports are limited to processed gems and jewelry, precision instruments, tourism and related transportation, and some gold, precious stones, and minerals.<sup>13</sup> Sectoral value added, ranked according to labor intensity, is shown in Table 9.5.

### **The Informal Economy**

A portion of the officially reported economic statistics in Armenia comes from a survey of the informal economy. This portion of economic activity is not reported to the government, but represents a certain amount of economic production and consumption. Traditionally, informal economic activity is small-plot farming and marketing. Other examples are certain domestic services and street markets. The NSS estimates that in 1999 the informal economy represented 26 percent of total economic activity. The estimate for 2002 is said to have risen to 30 percent, but the official statistics are not yet available.

In order to identify the nature and size of these activities, the NSS conducts a survey of 9,000 individuals. The questions they ask, or how they tabulate the value of output based upon the survey was not provided. Table 9.6 shows the share of informal activity and employment as estimated by the NSS for 1999. We use these data to calibrate levels of informal activity at the sectoral level, contingent on the assumed informal share of aggregate GDP.

We include the estimates from Table 9.6 in our model to identify the portion of production in each sector that escapes taxation. This portion of the economy is legally obligated to pay taxes, but does not. Presumptive and simplified taxes have been introduced in part to capture economic activity from the informal market, but the collections from these tax instruments are low and we have therefore omitted these taxes from the database and model.

TABLE 9.3 BENCHMARK IMPORT STATISTICS FOR ARMENIA, 2002

<i>Code</i>	<i>Description</i>	<i>M0 (US\$ million)</i>	<i>M0 (%)</i>	<i>% M</i>	<i>% VA</i>
MNM	Mineral products and precious stones	212.3	17.3	79.8	13.0
MCH	Equipment, motor vehicles, and optical	160.3	13.1	70.5	38.6
ENR	Oil & natural gas	151.4	12.4	100.0	0.0
TRN	Transport and communications	141.1	11.5	45.8	56.4
CRP	Chemicals, rubbers, and plastics	84.6	6.9	46.5	86.0
GOV	Governance, defense, and public expenditures	68.5	5.6	19.3	57.2
MTL	Metals and metal products	55.7	4.5	42.2	49.4
GRN	Wheat, potatoes, legumes	50.8	4.1	23.0	61.0
OMF	Other manufacturing	47.8	3.9	39.5	63.7
FOD	Food processing & beverages	44.0	3.6	11.7	41.2
LMF	Light manufacturing and textiles	40.7	3.3	52.1	34.4
TBC	Tobacco products	28.6	2.3	48.0	38.3
VFR	Vegetables, fruits, grapes	24.0	2.0	10.6	61.0
MIN	Mining and quarrying	22.9	1.9	30.2	39.3
OMT	Beef, pork, poultry	21.4	1.7	16.0	59.1
OCR	Other crops	19.5	1.6	12.6	61.0
VOL	Vegetable oils and fats	16.8	1.4	84.8	61.0
UTL	Electricity, gas, and water supply	13.4	1.1	8.7	69.0
BNK	Banking, lending, and insurance	11.3	0.9	12.4	82.5
MIL	Dairy products	6.6	0.5	2.3	60.9
CON	Construction	2.9	0.2	0.6	57.2
OSR	Other services	0.8	0.1	0.4	96.6
TRD	Retail & wholesale trade, catering	0.0	0.0	0.0	60.9
TOTAL		1,225.4	100.0	0.0	0.0

*Source:* Aggregate values supplied by Armenian customs. Sectoral disaggregations are authors' calculations based upon shares from the NSS.

*Key:*

*M0* Base-year imports (US\$ million)

*M0 (%)* Base-year imports as % of total imports

*% M* Base-year imports as % of domestic sales

*% VA* Base-year imports as a percent of sectoral value added

TABLE 9.4 EXPORT STATISTICS FOR ARMENIA, 2002

<i>Code</i>	<i>Description</i>	<i>X0 (US\$ million)</i>	<i>X0 (%)</i>	<i>% X</i>	<i>% VA</i>
MNM	Mineral products and precious stones	259.2	37.0	83.2	13.0
TRN	Transport and communications	82.0	11.7	32.9	56.4
GOV	Governance, defense, and public expenditures	79.0	11.3	21.7	57.2
MCH	Equipment, motor vehicles, and optical	56.3	8.0	47.0	38.6
FOD	Food processing & beverages	51.2	7.3	13.4	41.2
MTL	Metals and metal products	44.8	6.4	37.0	49.4
MIN	Mining and quarrying	42.1	6.0	44.3	39.3
LMF	Light manufacturing and textiles	29.6	4.2	45.1	34.4
OSR	Other services	9.9	1.4	4.5	96.6
CRP	Chemicals, rubbers, and plastics	8.4	1.2	7.9	86.0
BNK	Banking, lending, and insurance	6.7	1.0	7.7	82.5
CON	Construction	6.2	0.9	1.2	57.2
UTL	Electricity, gas, and water supply	5.7	0.8	3.9	69.0
VFR	Vegetables, fruits, grapes	5.6	0.8	2.7	61.0
OMF	Other manufacturing	5.1	0.7	6.6	63.7
OCR	Other crops	5.0	0.7	3.6	61.0
TBC	Tobacco products	3.6	0.5	10.9	38.3
MIL	Dairy products	0.5	0.1	0.2	60.9
GRN	Wheat, potatoes, legumes	0.3	0.0	0.2	61.0
OMT	Beef, pork, poultry	0.1	0.0	0.1	59.1
VOL	Vegetable oils and fats	0.0	0.0	0.0	61.0
TRD	Retail & wholesale trade, catering	0.0	0.0	0.0	60.9
TOTAL		701.3	1.0	0.0	0.0

*Source:* NSS (2001) (reconciled by authors).

*Key:*

*X0* Base-year exports (US\$ million)

*X0 (%)* Base-year exports as % of total exports

*% X* Base-year exports as % of domestic production

*% VA* Base-year exports (FOB) as percentage of sectoral value added

TABLE 9.5 SECTORAL VALUE ADDED, RANKED  
BY LABOR INTENSITY

<i>Code</i>	<i>Description</i>	<i>VA</i> <i>(US\$ million)</i>	<i>LAB</i> <i>(%)</i>	<i>LND</i> <i>(%)</i>	<i>SKL</i> <i>(%)</i>	<i>CAP</i> <i>(%)</i>
MIN	Mining and quarrying	37.4	72.2	0.0	9.4	18.4
LMF	Light manufacturing and textiles	22.6	60.1	0.0	8.7	31.2
OMT	Beef, pork, poultry	65.5	53.7	33.9	0.7	11.6
OCR	Other crops	85.4	52.7	23.4	1.8	22.1
MTL	Metals and metal products	59.8	52.6	0.0	8.6	38.8
GRN	Wheat, potatoes, legumes	104.1	52.3	35.0	0.7	12.0
VFR	Vegetables, fruits, grapes	127.6	52.2	35.0	0.8	11.9
FOD	Food processing & beverages	156.9	51.2	0.0	9.4	39.4
MIL	Dairy products	169.9	48.0	13.4	3.3	35.3
OMF	Other manufacturing	49.4	46.0	0.0	6.9	47.0
MNM	Mineral products and precious stones	40.4	42.8	0.0	6.7	50.4
TRD	Retail & wholesale trade, catering	264.8	42.5	0.0	7.0	50.5
VOL	Vegetable oils and fats	0.9	40.6	18.3	2.8	38.3
TBC	Tobacco products	12.7	40.0	0.0	5.6	54.4
CON	Construction	297.4	37.0	0.0	5.7	57.3
UTL	Electricity, gas, and water supply	101.1	34.4	0.0	14.3	51.3
MCH	Equipment, motor vehicles, and optical	46.3	32.6	0.0	8.6	58.8
CRP	Chemicals, rubbers, and plastics	90.5	32.1	0.0	8.2	59.6
TRN	Transport and communications	140.3	30.2	0.0	9.6	60.2
GOV	Governance, defense, and public expenditures	208.8	25.0	0.0	39.8	35.1
BNK	Banking, lending, and insurance	71.8	22.0	0.0	19.5	58.5
OSR	Other services	213.6	12.4	0.0	11.0	76.6
TOTAL		2,367.0	0.0	0.0	0.0	0.0

*Source:* Base shares from GTAP database. Some sectors were adjusted to reflect Armenia country-office staff calculations.

*Key:*

- VA* Sectoral value added at factor cost (US\$ million)
- LAB* Unskilled labor share of sectoral value added (%)
- LND* Land share of sectoral value added (%)
- SKL* Skilled labor share of sectoral value added (%)
- CAP* Capital share of sectoral value added (%)

TABLE 9.6 ESTIMATED LEVEL OF UNDERGROUND AND INFORMAL ACTIVITY

	<i>Percentage</i>	<i>Corresponding sectors in model</i>
Industry	28.7	MIN,FOD,TBC,LMF, CRP, MNM,MTL,MCH,OMF
Construction	46.1	CON
Transport and communications	21.1	TRN
Trade	75.5	TRD
Agriculture	21.0	GRN,V F,VOL,OCR,MIL,OMT
Other branches	27.1	ENR,UTL,BNK,GOV,OSR,DWE
GDP at market prices	28.9	

Source: NSS (1999).

### Tax Revenue

Table 9.7 shows that total government collections in 2002 were 242.3 billion drams (US\$422.8 million). Value-added taxes were the largest revenue source, contributing 39.2 percent of total tax revenues (US\$165.8 million). Excise taxes were 14.6 percent of total taxes, and payroll contributions to social security totaled 15.7 percent of revenue. These tax bases are followed distantly by enterprise taxes, income taxes, and other taxes.

Table 9.7 shows tax collections for the major levies in Armenia during 2002, and Table 9.8 further disaggregates these collections by production sector.

Armenia's statutory tax code is straightforward. There exists a single VAT rate of 20 percent, a single tariff rate of 10 percent, and a single low-profit tax (20 percent). Income taxes are 10 percent for 80,000 drams per month (US\$139), or 20 percent if income is above 80,000 drams. Excise rates are higher, but they are only applied to tobacco products, alcoholic beverages, and petroleum.

Tax collections are more complicated, but we can review the trend in collections briefly. Profits tax collections have declined precipitously since 1999, as have income tax collections. Collections from profits taxes fell by 50 percent between 1999 and 2003, from 2.2 percent of GDP to 1.1 percent. Similarly, personal income taxes fell from 1.9 percent to 1.0 percent over the same period. The combined loss is 2.0 percent of GDP (US\$58 million if considered in 2002). The trend is strange in light of the very strong economic growth over the same period, during which time GDP increased by approximately 30 percent. No other tax streams have risen to compensate for this loss, and total government revenues have declined as a proportion of GDP.

TABLE 9.7 ARMENIAN TAX COLLECTIONS, 2002 (BY SOURCE)

<i>Tax stream</i>	<i>Billion drams</i>	<i>US\$ million</i>	<i>Percent</i>
Value-added tax	95.0	165.8	39.2
Excise tax	35.3	62.6	14.6
Profits tax	17.4	30.3	7.2
Personal income tax	12.5	21.8	5.2
Payroll taxes	37.9	66.1	15.7
Import duties	9.8	17.1	4.0
Main streams:	207.9	363.3	85.9
Other taxes (omitted from the model)			
Stamp taxes	14.3	24.9	5.8
Environment and property	5.4	9.4	3.7
Presumptive tax	6.4	11.2	2.6
Simplified tax	3.7	6.5	1.5
Other streams	29.8	52.0	13.6
Total	237.7	415.7	99.5

*Source:* Table II.1, IMF Aide-Mémoire (2004).

## ILLUSTRATIVE SIMULATIONS

Table 9.9 presents welfare-cost estimates of raising funds from four major revenue streams. The experiments on which these calculations are based consider inframarginal changes in rates; hence we label these estimates the “Average Cost of Funds” (ACF). The ACF measures the efficiency cost of raising an additional US\$20 million from each of the primary tax streams.

The ACF values provide a very useful input to the public policy debate, specifically related to the cost-benefit calculus of public expenditures. When the ACF equals 1.4, this means that US\$1 of public funds costs the representative consumer US\$1.4. As the ACF increases, the requisite benefit through which a public project can be justified increases, and one would expect that as the ACF exceeds 1.5, fewer public expenditures are justifiable than is the case when the ACF equals 1.2.

Another consideration is the shadow economy and its role in tax revenue leakage. For some of the major taxes, it is reported that non-compliance is as high as 50 percent. The tax leakage in the shadow economy is parameterized by both the benchmark share ( $\theta$ , shown in Table 9.10) and  $\sigma$ , the elasticity of substitution between legal goods and black-market (informal) goods of the same variety.  $\theta$  is the economy-wide share of production occurring underground. Our default assumptions are  $\theta = 30$  percent and  $\sigma = 4$ . The average tax leakage, and the consequent average cost of funds, rises as each parameter

TABLE 9.8 BENCHMARK TAX COLLECTIONS, 2002  
BY PRODUCTION SECTOR (US\$ MILLIONS, 2001)

<i>Description</i>	<i>Y0</i>	<i>VAT</i>	<i>TK</i>	<i>TSS</i>	<i>TXS</i>	<i>TL</i>	<i>TM</i>	<i>Total</i>
Oil & natural gas	0	53.9	0.0	0.0	28.1	0.0	0.0	81.9
Food processing & beverages	381	17.5	1.6	3	10.0	1.6	3.0	37.1
Tobacco products	33	6.3	1.2	0	24.0	0.2	1.6	33.7
Equipment, motor vehicles, and optical	120	16.3	0.4	0	0.0	0.2	3.5	20.7
Other manufacturing	78	12.8	2.5	3	0.0	1.2	0.9	20.0
Governance, defense, and public expenditures	365	0.0	0.0	13	0.0	5.8	0.0	18.4
Retail & wholesale trade, catering	435	8.1	1.8	6	0.0	2.6	0.0	18.2
Electricity, gas, and water supply	147	4.6	8.2	2	0.0	1.1	0.0	16.2
Transport and communications	249	4.0	3.7	5	0.0	2.1	0.0	14.4
Chemicals, rubbers, and plastics	105	10.9	0.4	0	0.0	0.2	0.5	12.3
Construction	520	2.3	2.8	3	0.0	1.4	0.0	9.5
Wheat, potatoes, legumes	171	9.5	0.0	0.0	0.0	0.0	0.0	9.5
Beef, pork, poultry	111	4.2	2.1	0	0.0	0.2	1.9	8.8
Light manufacturing and textiles	66	4.7	0.5	0	0.0	0.2	1.4	7.2
Mineral products and precious stones	312	4.2	0.7	0	0.0	0.2	1.2	6.7
Housing and dwellings	92	0.0	0.5	4	0.0	1.9	0.0	6.7
Mining and quarrying	95	2.5	3.2	0	0.0	0.2	0.0	6.2
Vegetable oils and fats	1	3.9	0.0	0.0	0.0	0.0	1.8	5.6
Metals and metal products	121	3.5	0.2	1	0.0	0.5	0.0	5.4
Banking lending and insurance	87	0.0	0.7	3	0.0	1.4	0.0	5.2
Other crops	140	2.1	0.0	0.0	0.0	0.0	0.5	2.6
Diary products	279	1.4	0.2	0	0.0	0.2	0.4	2.5
Vegetables, fruits, grapes	209	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	221	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>TOTAL</b>		172.6	30.5	46	62.1	21.1	16.7	348.8

*Source:* Official statistics from the Ministry of Finance, provided at the authors' request.

*Note:* Excise taxes (TXS) have been changed. Collections reported in this table (Table 9.8) were taken from Table II.1, IMF Aide-Memoire (2004).

*Key:*

- Y0:* Sectoral output
- VAT:* Value-added tax revenue
- TK:* Profits tax revenue
- TSS:* Payroll tax (social security) revenue
- TXS:* Excise tax revenue
- TL:* Wage (income) tax revenue
- TM:* Tariff revenue
- TOTAL:* Total tax revenues of the indicated sector

TABLE 9.9 COST OF RAISING 0.5% GDP (US\$15 MILLION)  
IN TAX REVENUES: A COMPARISON OF TAX BASES

<i>Short-run</i>	<i>R</i>	$\Delta R\%$	$\Delta t\%$	<i>ACF-SR</i>	<i>ACF-LR</i>	$\Delta \kappa$
WAGE	19.1	78	118	1.3	1.6	0
PAYROLL	41.7	36	54	1.3	1.6	0
PROFITS	27.9	54	71	1.3	5.2	-4
TARIFF	16.7	90	129	1.4	2.5	-1
EXCISE	62.1	24	29	1.2	1.2	0
VAT	172.6	9	11	1.2	1.8	-1

Source: Authors' calculations.

Key:

<i>R</i>	2002 base revenue (US\$ million)
$\Delta R$	Revenue required as percentage of the original tax base
$\Delta t$	Required percentage increase in tax rate
<i>ACF-SR</i>	Average cost of funds in the short run ( $=-\Delta EV / \Delta G$ )
<i>ACF-LR</i>	Average cost of funds after allowing sufficient time for capital stocks ( $\kappa$ ) to adjust
$\Delta \kappa$	Percentage change in Armenia's aggregate capital stock as a result of additional taxes

risers. The *marginal cost of funds* increases more rapidly than the average and is most sensitive to  $\sigma$ .

Table 9.9 shows some of the "central" tax estimates by tax stream. The tax stream called WAGE denotes taxes upon labor income, typically deducted from worker paychecks on a monthly basis. The PAYROLL tax stream represents additional payments for social security and pensions. The PROFITS tax is collections for firm profits, modeled as a tax on the return to capital.

In all of the scenarios, the ACF is compared to raise an additional half percent of GDP, equal to US\$15 million. In the short run, when capital and investment are fixed, labor and payroll taxes have the highest cost of funds, especially for high  $\sigma$  or  $\theta$ . Armenia has seen  $\theta$  increase for these two tributary systems over the past four years. Personal income taxes declined by 45 percent between 1999 and 2003, from 1.9 percent of GDP to 1.0 percent. A similar (less dramatic) trend can be seen for payroll collections (3.2 percent to 2.8 percent), and profits taxes (2.2 percent to 1.1 percent). This trend can be interpreted as a broad increase of  $\theta$  and/or  $\sigma$ . The ACF when  $\theta$  is high (40 percent of the economy) is 1.53 and 1.42 for labor-based taxes. Capital-based taxes have a lower ACF of 1.24. Conversely, consumption-based taxes such as the VAT and excise taxes have a much lower ACF when  $\theta$  is large. ACF estimates in the last column of Table 9.10 for TARIFF, EXCISE, and VAT are 1.19, 1.14, and 1.30, respectively.

TABLE 9.10 INDICES OF INFORMALITY AND THE AVERAGE COST OF FUNDS

Timeframe	$\sigma = 4$			$\theta = 0.3$			$\sigma = 8$
	$\theta = 0.2$	$\theta = 0.3$	$\theta = 0.4$	$\sigma = 2$	$\sigma = 4$	$\sigma = 8$	$\theta = 0.4$
<i>Short run</i>							
Income tax	1.24	1.29	1.36	1.24	1.29	1.40	1.58
Payroll tax	1.24	1.29	1.36	1.24	1.29	1.40	1.58
Profits tax	1.26	1.29	1.35	1.24	1.29	1.42	1.58
Import tariff	1.35	1.38	1.42	1.34	1.38	1.47	1.57
Excise tax	1.14	1.16	1.18	1.13	1.16	1.25	1.30
Value added tax	1.15	1.17	1.21	1.15	1.17	1.22	1.28
<i>Long run (steady state)</i>							
Income tax	1.53	1.59	1.70	1.55	1.59	1.69	1.91
Payroll tax	1.53	1.59	1.70	1.55	1.59	1.69	1.91
Profits tax	5.03	5.17	5.44	4.89	5.17	5.87	6.83
Import tariff	2.41	2.46	2.54	2.38	2.46	2.66	2.88
Excise tax	1.15	1.18	1.20	1.15	1.18	1.25	1.31
Value added tax	1.76	1.80	1.87	1.77	1.80	1.87	1.99

Source: Armenian general equilibrium model calculations.

Key:

$\sigma$ : A measure of the acceptance of *acceptance* of informal goods in place of formal goods. This elasticity reflects willingness of consumer and producers to substitute formal and informal goods and services.

$\theta$ : Base year economy-wide share of informal activity, a measure of the *extent* of informality within the economy.

When the shadow economy ( $\theta$ ) is small, capital (profits) taxes represent an attractive revenue source, with a low ACF. This all changes in the long run. In the steady-state equilibrium we calibrate the model to an assumed equalization of the cost of capital and the rate of return. To the extent that increases in taxes directly or indirectly depress the rate of return to capital or increase the cost of capital replacement, the long-run impact of tax increases will be to reduce the level of the capital stock. This neoclassical growth mechanism can substantially increase the average cost of funds, as indicated by comparing the short- and long-run results in Table 9.10.

### IMF Tax Reform Packages

A tax reform typically involves the combined adjustment of a number of tax rates and several tax bases. Indeed, a crucial role that can be played by a general equilibrium model is to evaluate the combined

effect of the simultaneous adjustment of several tax instruments. This more complex approach to tax reform is required when political feasibility becomes an important component in tax policy.

We have constructed model-based representations of several possible reform packages as is indicated in Table 9.11. These scenarios are (loosely) based upon the recommendations made in the 2004 Aide-Mémoire, as prepared by the IMF Fiscal Affairs Department. Including the agriculture sector in the tax base is considered in AGR5 and AGR. TM5 and UNIF5 present two tariff reforms. UNIF5 removes within-sector exemptions, setting the tariff rate to 5 percent for all sectors in which tariffs are currently applied while retaining trade preferences with other CIS countries. TM5 is a more profound reform that applies

TABLE 9.11 REVENUE AND WELFARE IMPACTS  
OF SELECTED TAX REFORMS

Timeframe	Total revenue		Change in revenue					ACF
	Benchmark	Scenario	Direct	Indirect	NET	% GDP	EV (US\$)	
<i>Short run</i>								
AGR5	172.6	178.9	6.27	-0.05	6.22	0.2	-6.4	1.03
AGR	219.7	236.1	16.39	0.25	16.64	0.6	-17.1	1.03
UNIF5	16.7	24.2	7.57	-0.22	7.35	0.3	-7.0	0.95
TM5	16.7	49.0	32.30	-0.32	31.98	1.2	-29.8	0.93
TXS10	62.1	67.9	5.76	-0.37	5.39	0.2	-6.1	1.13
TXS	62.1	75.8	13.73	-0.39	13.33	0.5	-13.7	1.03
<i>Long run (steady state)</i>								
AGR5	172.6	178.9	6.27	-0.05	6.22	0.2	-6.7	1.07
AGR	219.7	238.4	18.77	1.48	20.25	0.7	-15.2	0.75
UNIF5	16.7	24.2	7.58	-0.26	7.33	0.3	-15.1	2.07
TM5	16.7	49.2	32.50	0.59	33.10	1.2	-46.7	1.41
TXS10	62.1	68.5	6.39	2.21	8.60	0.3	-6.2	0.72
TXS	62.1	76.5	14.43	2.19	16.62	0.6	-14.1	0.85

Source: Armenian CGE model calculations.

Key:

- AGR5 Apply a 5% value-added tax on all agricultural sectors
- AGR Apply a 5% tax on value added, profits, and wages in the formal agricultural sector
- UNIF5 Move to a uniform tariff of 5%, retaining exemptions for imports from free-trade partners
- TM5 Apply a uniform 5% tariff on all imports
- TXS10 Increase excise tax rates by 10% from current levels
- TXS Increase excise taxes by 10% on the current base and tax domestic tobacco

a uniform levy equal to 5 percent on imports from all trading partners. A target value of 5 percent was used for the ad valorem rate because about 50 percent of Armenian imports come from free trade partners such as Russia. Five percent represents half of the standard 10 percent rate.

As discussed, capital- and tariff-based taxes are most efficient in short time frames, but in the long run, high tariffs are detrimental to economic growth and they encourage smuggling and higher underground activity—and the ACF for import tariffs consequently increases.

Among the tax policy reforms presented here, we conclude that there are several directions in which the tax system might be improved. The elimination of preferences for agriculture in the tax system strengthens revenues over the long term and does not discourage economic growth. As indicated in Table 9.11, revenues raised through tariffs are efficient in the short run, with ACF values of: 0.95 (UNIF5) and 0.93 (TM5). The ACF for moving to a uniform tariff is less than 1 because the tariff-reform package increases efficiency as well as revenues. Import tariffs are less attractive in the long run, where the ACF is 2.07 and 1.42, respectively. Conversely, the AGR scenario, where agricultural activity is included into all streams of the tax system (VAT, profits, and income), has a relatively low short-run ACF of 1.03, and a long-run ACF of 0.75.

The long-run efficiency cost of taxes on agricultural products is low because of existing profits and income taxes, which tend to discriminate against formal activities in manufacturing and industry. These taxes lead to underinvestment in industry, an effect that is partially offset by a tax on agricultural income. In the long run, by including agriculture in the tax stream like other sectors, we collect revenues, but also increase the overall efficiency of the tax system. It is pointed out in the IMF Aide-Mémoire that taxes on agricultural activity are difficult to administer, since most farmers are smallholders. These farmers would be exempt from income and profits taxes in any case, if revenues and income are low. Large agricultural firms, however, currently enjoy preferential treatment as a side effect of well-intentioned tax breaks for small farmers.

## SENSITIVITY ANALYSIS

In a typical CGE sensitivity analysis, results are compared across a range of elasticity values. In the present application, however, the level of uncertainty is heightened by the construction of the base-year IO table. In order to develop a better understanding of the degree of uncertainty introduced through the data construction, we have

repeated the calculations reported above using source data from the Hungarian IO coefficients in place of the Polish coefficients. We find that our model results are remarkably robust in this dimension. The structure of the IO matrix turns out to be a *third-order* determinant of model results, as can be seen in the ACF-SR and ACF-LR columns in Table 9.12.

Least-squares methods are used to construct the benchmark database for the model. When IO coefficients are drawn from different sources, this leads to slight differences in the benchmark value shares, as suggested by comparing the *R* and  $\Delta t$  columns in Table 9.12. Our calibration procedure holds tax revenue and sector GDP more or less consistent, but it returns somewhat different benchmark tax rates. The new benchmark tax rates remain very close to the originals, producing a negligible change to the short-run and long-run cost of funds estimates.

TABLE 9.12 SENSITIVITY ANALYSIS FOR THE COST OF RAISING 0.5% OF GDP

	<i>R</i>	$\Delta R$	$\Delta t$	<i>ACF-SR</i>	<i>ACF-LR</i>	$\Delta \kappa$
<i>Hungarian IO coefficients</i>						
WAGE	19.1	78	118	1.3	1.6	0
PAYROLL	41.7	36	54	1.3	1.6	0
PROFITS	27.9	54	71	1.3	5.2	-4
TARIFF	16.7	90	129	1.4	2.5	-1
EXCISE	62.1	24	29	1.2	1.2	0
VAT	172.6	9	11	1.2	1.8	-1
<i>Polish IO coefficients</i>						
WAGE	19.1	78	131	1.3	1.6	0
PAYROLL	41.7	36	60	1.3	1.6	0
PROFITS	28.1	53	77	1.3	5.5	-5
TARIFF	16.7	90	150	1.5	2.8	-2
EXCISE	62.1	24	31	1.2	1.5	0
VAT	172.6	9	11	1.2	2.1	-1

Source: Authors' calculations.

Key:

<i>R</i>	2002 base revenue (US\$ million)
$\Delta R$	Revenue required as percentage of the original tax base
$\Delta t$	Required percentage increase in tax rate
<i>ACF-SR</i>	Average cost of funds in the short run ( $= -\Delta EV / \Delta G$ )
<i>ACF-LR</i>	Average cost of funds after allowing sufficient time for capital stocks ( $\kappa$ ) to adjust.
$\Delta \kappa$	Percentage change in Armenia's aggregate capital stock as a result of additional taxes

## CONCLUSIONS

This paper has demonstrated the feasibility of a quantitative analysis of tax policy issues in Armenia, despite the unavailability of current IO statistics. In the presence of missing IO statistics, policy decisions are still better informed by a roughly parameterized model than by the uncalibrated logic of economic theory.

The cost of public funds in Armenia, measured as the ratio of lost consumption per additional dollar of public revenue, ranges from 1.3 to over 5, depending on the tax base and the model horizon. In the short run, the cost of public funds lies between 1.3 and 2 US\$ per additional dollar of funding.

Our analysis highlights the efficiency cost of informal activity. The marginal costs of public funds from any of the direct and indirect tax instruments are increased when a substantial fraction of the tax base is able to avoid payments, or when individuals are more willing to substitute informal goods and services for formal goods and services. These results provide strong support for tax policies that underscore the need to reduce tax evasion and informal activities organized primarily as a means of evading tax payments.

Our model-based analysis emphasizes the important impact of tax policy on capital accumulation and economic growth. The existing profits, income, and value-added taxes all tend to discriminate against investment in formal sectors, and the long-run perspective underscores the need for avoiding further discouragement of investment in these areas.

We have shown that certain “first-best” rules for taxation (low rates, broad base), which apply in many competitive economies, may be misleading in Armenia’s second-best environment.

## ANNEX 9.1

# SECTORAL CLASSIFICATIONS

The Armenian CGE model has 25 sectors. This aggregation has been chosen because it offers a reasonable characterization of the Armenian economy given data available from the Armenian Ministry of Finance and NSS, along with an ad hoc set of reports provided by various international organizations.

Some aspects of the current national accounts are notable. The first is that 10 years after separating from the Soviet Union and undertaking market reforms, the NSS remains loyal to the original socialist accounting system.

In this system, several superfluous accounts that comprise less than 0.5 percent of GDP are distinguished, whereas several more important categories of economic activity such as manufacturing and food processing are ignored. These shortcomings are rectified to a certain extent by leveraging evidence from IMF country reports, auxiliary data, and outside accounts, such as the GTAP database.

This annex is designed to be comprehensive so that the interested reader can recreate, append, or improve our Armenian dataset, although the NSS intends to switch accounting methods to the International Standard Industrial Classification (ISIC).

## SECTORAL MAPPING

Some of the sectors in our accounts have been disaggregated from the Armenian national statistics. Other sectors reflect aggregations of inconsequential sectors from the accounts. A detailed description of each sector is included here. The tables used to compute total output for these sectors are provided at the end of this annex.

- GRN *Grains and legumes*. This sector comes from the NSS agriculture accounts dataset for 2002 (see Figure 9A.1.1), combining wheat, potatoes, and leguminous plants.
- VFR *Vegetables and fruits, including grapes*. This sector includes vegetables, fruit, and grapes.
- VOL *Vegetable oils*. This sector is taken directly from 2002 agriculture accounts.
- SGR *Sugar*. This sector is taken directly from 2002 agriculture accounts.
- MIL *Milk and milk products*. This sector comprises eggs and milk (without butter).
- OMT *Other meats*. This sector includes the beef, pork, mutton, goat, and poultry categories from the 2002 agriculture dataset.
- MIN *Mining and quarrying*. This sector comes from the national accounts' (Macro Data.xls) "Geology" sector. It is also based on the IMF Statistical Annex (IMF 2002), page 7, Table 4: Structure of Industrial Production (1996–2001). The portion for "Mining and Quarrying" is taken from the "industry" sector of the national accounts.
- FOD, TBC, CRP, OMF Each of these sectors is disaggregated directly from the industry macro-sector via Table 4 from the IMF Statistical Annex (IMF 2002). The shares listed for year 2001 are used.
- LMF *Light manufacturing and textiles*. This sector includes textiles, dressing, and dyeing of fur.
- MNM *Minerals and mining goods*. This sector mainly represents the gem-cutting business in Armenia. The single largest import and export good in Armenia is gems. Uncut gems enter the country and finished jewelry is exported. Shares are taken from Table 4 of the statistical annex. See Figure 9A.1.2 in this annex.
- MTL *Basic metals and fabricated metals*. This sector is taken directly from the IMF Statistical Annex (IMF 2002). It represents 8 percent of industrial output.
- MCH *Manufacturing*. This sector combines machinery, equipment, and motor vehicles with optical, medical, and other precision devices. The combined share of these activities in GDP is 3.8 percent.
- TRD *Wholesale and retail trade and commerce*. This sector combines macro lines for retail trade and catering with general commerce.
- BNK *Banking and insurance*. This combines two lines from the 2002 national accounts.
- ENR *Energy* This sector accounts for natural gas and oil. Energy imports are used to calculate total domestic supply.

- *UTL Gas, water, and electricity.* This sector appears twice; first in the industrial section of the IMF report, then again as a separate account in the official NSS accounts. We combine these two accounts for the total. The totals are the “utility sector” from the macro report and “electricity, gas, and water” from IMF (2002), Table 4.
- *GOV Government, defense, and public procurement.* This sector represents government activities within the economy. It is based on the macro data spreadsheet and also is compared with general statistics regarding the government sector. This sector also includes “social spending,” including four lines from the national accounts: health and sport, education, culture, and science.
- *DWE Dwellings and housing.* This sector is based on the housing entry in the national accounts.
- *CON Construction.* This sector is taken directly from the official NSS National Accounts (see Figure 9A.1.3 in this annex).
- *OSR Other services.* This sector captures the sectors real estate, culture, and information technology.
- *CGD Savings good.* This good represents net savings and capital investment for the country. The sector consumes mostly durable goods and construction.

## ACCOUNTING IDENTITIES

The economic model for Armenia represents an Arrow-Debreu equilibrium. This means that firms are assumed to maximize profits and face competition, households maximize utility, and markets for goods are balanced (supply equals demand). These basic conditions require a handful of accounting identities to hold. These identities are discussed in this section.

First, we take the set  $I$  to represent sectors in the model {GRN, MIN, FOD, etc. . .}. Then we have the following conditions:

The total sales value must equal the total cost of production:

$$Y_i = \sum_j ID_{ji} + L_i + K_i + T_i = C_i . \quad (9A.1.1)$$

Total output or sales for good  $i$  ( $Y_i$ ), at producer prices, must be large enough to cover the cost of production ( $C_i$ ). This includes the purchase of intermediate inputs ( $ID_{ji}$ ), value added ( $L_i, K_i$ ), and taxes ( $T_i$ ).

Supply must equal demand for all markets:

$$A_i \geq \sum_j ID_{ij} + G_i + FD_i + INV , \quad (9A.1.2)$$

where

$$A_i = D_i + M_i. \quad (9A.1.3)$$

Total supply is represented by the “Armington Composite Good” ( $A_i$ ), which combines domestic production ( $D_i$ ) with imported goods ( $M_i$ ). Domestic endowments of value added ( $\Omega_{fi}$ ) can also be included in this condition, where  $\Omega_{fi}$  represents the aggregated endowments of labor ( $L_i$ ) and capital ( $K_i$ ).

Domestic supply is either consumed or exported:

$$Y_i = D_i + X_i. \quad (9A.1.4)$$

Total production for a given good ( $Y_i$ ) is either sold to the domestic market, or it is exported. The *export share* represents the value of exports divided by total output  $x_i/y_i$ . These basic conditions are sufficient to identify or compute most of the national accounts for Armenia.

The origin of each variable appearing in the equilibrium benchmark identities is listed in Table 9A.1.1.

## INPUT-OUTPUT DATA

When the total production, value added, and intermediate demand values are calculated from the national accounts data, we then decompose the intermediate demand structure using our surrogate IO table. We follow a similar procedure to compute the capital/labor shares in value added. The current implementation distinguishes four factors: *skilled labor*, *unskilled labor*, *capital*, and *land*. Each factor’s share in production is presented in the main text of this chapter. We include the dollar payments to those factors below, in the IO table. We also include payments made by producers to various tax authorities. Although the employer does not distinguish tax payments from labor costs (they are still factor payments), we know that the labor costs will change when tax rates are altered, so they are distinguished here.

## External Data Sources

In this section, we include tables from the data sources mentioned above. Each table represents an Excel (XLS) worksheet. These data are available upon request, but they are also printed in this section for convenience.

Different accounts data are stored as a set of spreadsheets and archived on the Armenia project Web site. These files have been posted to <http://milesight.com/armenia/>. A password may be necessary to access this site. Please contact the authors if necessary.

TABLE 9A.1.1 ORIGIN OF EACH VARIABLE

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$Y_i$	<i>Total supply.</i> This parameter is given by the NSS National Accounts data, the subtables from the IMF Statistical Annex (2002), and the Agriculture subtable.
$X_i, M_i$	<i>Imports and exports of goods and services.</i> Provided for 2002 by the customs authorities and the NSS. Each traded good was mapped onto the model sectors.
$D_i$	<i>Domestic supply.</i> Computed parameter based on the values for $Y_i$ and $X_i$ .
$A_i$	<i>Armington aggregate supply.</i> $A_i$ represents the total supply for a good in Armenia. It is a computed parameter, which combines $D_i$ and $M_i$ , net of import, and value-added levies applied at the border and domestically.
$ID_{ji}$	<i>Intermediate demand.</i> Aggregate values for intermediate demand are provided in the national accounts data (Figure 9.5). But individual input coefficients are taken from a surrogate IO table for Hungary. This IO table is reproduced for the reader in Tables 9.1 and 9.2.
$L_i, K_i$	<i>Labor and capital demand for production in sector i.</i> Total value added is provided in the national accounts, but the share of labor, capital, land, and indirect taxes is not provided by the NSS. These values are based upon the surrogate IO tables from the GTAP database. The capital intensity can be an important determinant of labor/capital returns, and should be reviewed more carefully by experts in Armenia.
$\Omega_{ji}$	<i>Factor endowments.</i> Factor endowments for labor, capital, and land are computed from total demand by firms and government. Total sales of labor and capital are allocated to households. A data discrepancy exists between the official wage statistics, provided by the NSS, and the official value-added statistics. Although total value added is reported to be more than US\$2,100 million, officially reported wages are only (approximately) US\$600 million, which implies that labor's share in value added is less than 30 percent of total value added.
$G_i$	<i>Government demand for good i.</i> These values are based upon the GTAP surrogate dataset, but can also be reconciled by reports by the Armenian Ministry of Finance.
$INV_i$	<i>Investment demand for good i.</i> Taken from the surrogate dataset from GTAP.
$FD_i$	<i>Final demand for good i.</i> Computed as a residual based upon total supply and total demand. Total final demand should be compared with the surrogate data, as well as with Armenian household surveys. This task is forthcoming in a future study.

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TABLE 9A.1.2 EXTERNAL DATA SOURCES

<i>File</i>	<i>Description</i>
armdata.xls	Macroeconomic production statistics for import into GAMS. This spreadsheet was taken from Macro Data.xls. The spreadsheet reports <i>value added</i> only, not the total production value. Nevertheless, the shares from this sheet for year 2002 are used to calculate the share of total production in Armenia.
arm ag 2002.xls	Contains major agricultural sectors, including production, imports, exports, and final demand. This is a very useful spreadsheet. The agricultural information from this sheet is used in the model.
Stat. Annex 2001	IMF macroeconomic statistics for Armenia for 2001 (IMF 2002). Several tables are used from this report, including industrial production (p. 7) and the statutory tax code (pp. 52–57).

TABLE 9A.1.3 PRODUCTION TECHNOLOGY STRUCTURE FOR ARMENIA (US\$ MILLION)

<i>Sector</i>	<i>GRN</i>	<i>VFR</i>	<i>VOL</i>	<i>OCR</i>	<i>MIL</i>	<i>OMT</i>	<i>MIN</i>	<i>FOD</i>	<i>TBC</i>	<i>LMF</i>	<i>CRP</i>	<i>MNM</i>	<i>MTL</i>	<i>MCH</i>	<i>OMF</i>	<i>UTL</i>	<i>CON</i>	<i>TRN</i>	<i>TRD</i>	<i>BNK</i>	<i>GOV</i>	<i>OSR</i>	<i>DWE</i>
GRN	24.35	0.01	0.00	0.16	5.50	6.93	0.00	11.82	1.21	0.03	0.01	0.56	0.02	0.01	0.02	0.00	0.43	0.03	1.02	0.00	0.39	0.01	0.00
VFR	0.00	23.61	0.00	0.10	3.98	1.53	0.20	15.94	0.88	0.06	0.06	1.07	0.13	0.05	0.15	0.00	0.91	0.13	2.89	0.05	0.75	0.05	0.00
VOL	0.60	1.04	0.31	0.49	1.48	1.75	0.00	8.82	0.03	0.10	0.01	0.09	0.01	0.00	0.03	0.00	0.05	0.00	0.27	0.00	0.16	0.00	0.00
OCR	0.30	0.89	0.01	25.35	3.49	2.20	0.34	6.78	2.66	1.73	0.03	0.41	0.05	0.04	0.28	0.01	1.18	0.15	0.94	0.00	0.25	0.01	0.00
MIL	0.48	0.42	0.00	0.30	43.59	1.05	0.31	0.56	0.24	0.08	0.03	1.18	0.12	0.04	0.04	0.02	1.16	0.13	2.91	0.05	2.74	0.05	0.00
OMT	0.19	0.00	0.11	0.18	9.14	8.85	0.00	65.46	0.12	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.84	0.00	0.34	0.01	0.00
ENR	0.02	0.27	0.00	0.05	0.42	0.05	1.03	0.94	0.15	0.06	0.52	16.58	1.32	0.01	7.87	7.95	0.17	0.03	0.00	0.00	1.77	0.06	0.00
MIN	0.00	0.06	0.00	0.00	0.00	0.00	0.78	0.05	0.01	0.02	0.39	5.43	0.45	0.01	0.03	0.44	0.84	0.08	0.03	0.00	0.19	0.01	0.00
FOD	2.57	7.44	0.02	2.71	11.00	10.64	0.31	36.34	1.37	0.45	0.08	0.71	0.21	0.07	0.14	0.01	0.45	0.21	3.03	0.00	5.35	0.06	0.00
TBC	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.29	1.90	0.01	0.02	0.00	0.00	0.00	0.02	0.00	0.00	0.07	0.26	0.00	0.59	0.07	0.00
LMF	0.53	0.82	0.00	0.73	0.79	0.08	0.59	6.33	0.62	11.96	0.45	9.22	0.40	1.07	4.17	0.07	4.68	1.30	3.57	0.33	6.37	0.22	0.00
CRP	11.03	13.04	0.02	5.23	6.37	2.30	5.12	12.07	1.46	3.57	5.96	34.55	5.50	3.62	1.63	3.99	10.05	8.92	4.29	0.11	13.17	0.23	0.00
MNM	0.85	0.99	0.00	0.50	0.53	0.24	0.83	0.91	0.58	0.24	0.18	27.77	1.67	1.00	0.12	0.13	39.45	0.39	0.97	0.01	1.19	0.25	0.00
MTL	2.29	2.55	0.00	1.28	1.63	0.63	5.69	4.05	0.72	0.67	0.50	24.64	30.04	9.30	0.46	0.48	24.33	2.04	2.99	0.20	2.21	0.24	0.00
MCH	4.30	3.90	0.01	2.53	3.36	1.21	9.25	5.99	0.82	1.24	0.65	16.83	3.71	43.61	0.51	1.73	16.59	9.78	7.19	2.04	11.59	0.35	0.00
OMF	2.49	3.52	0.01	1.50	2.27	0.50	1.69	6.08	1.36	12.10	1.63	19.89	0.69	1.64	5.16	5.01	7.15	9.78	9.31	0.54	12.76	0.43	0.00
UTL	1.29	2.24	0.00	1.63	2.20	0.70	12.36	4.79	0.45	0.99	0.83	22.66	3.44	0.64	0.36	13.07	1.27	2.83	1.74	0.25	8.11	0.33	0.00
CON	0.00	0.17	0.00	0.06	0.16	0.00	0.38	0.27	0.07	0.00	0.05	1.10	0.16	0.13	0.01	0.23	3.03	3.09	2.05	0.44	0.58	0.33	0.00
TRN	2.25	3.00	0.01	2.41	1.83	0.57	3.75	6.51	0.78	2.28	0.67	18.31	3.55	2.23	0.86	1.34	38.42	16.97	40.88	2.08	15.09	0.68	0.00
TRD	8.71	12.51	0.02	5.85	6.96	3.11	3.84	13.20	1.16	2.90	0.71	19.34	4.88	3.48	1.29	0.46	27.25	14.94	18.60	1.74	18.20	0.91	0.00
BNK	1.75	2.10	0.00	0.96	1.09	0.31	1.28	2.61	0.55	0.51	0.30	4.98	0.71	0.72	0.22	0.61	5.10	3.50	8.48	0.90	2.53	0.15	24.70

TABLE 9A.1.3 (CONTINUED)

<i>Sector</i>	<i>GRN</i>	<i>VFR</i>	<i>VOL</i>	<i>OCR</i>	<i>MIL</i>	<i>OMT</i>	<i>MIN</i>	<i>FOD</i>	<i>TBC</i>	<i>LMF</i>	<i>CRP</i>	<i>MNM</i>	<i>MTL</i>	<i>MCH</i>	<i>OMF</i>	<i>UTL</i>	<i>CON</i>	<i>TRN</i>	<i>TRD</i>	<i>BNK</i>	<i>GOV</i>	<i>OSR</i>	<i>DWE</i>
GOV	1.11	1.30	0.00	0.91	1.33	0.45	2.73	2.32	0.34	0.66	0.25	13.34	1.22	1.02	0.32	0.29	8.59	3.95	10.03	1.06	12.26	0.58	0.00
OSR	1.49	1.75	0.00	1.57	1.78	0.19	4.62	8.90	1.72	2.69	0.91	31.80	2.38	4.36	1.08	1.36	26.64	27.42	43.39	3.42	33.79	2.55	0.00
DWE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.02	0.00	0.02	0.00	0.00
Skilled labor	0.76	1.01	0.02	1.51	5.69	0.46	2.95	14.20	0.71	1.96	7.46	2.72	5.16	3.99	3.44	14.42	16.96	13.45	18.59	14.00	83.20	23.48	0.00
Unskilled labor	54.45	66.65	0.35	43.67	81.54	35.21	22.52	77.65	5.06	13.58	29.05	17.30	31.44	15.11	22.77	34.78	110.19	42.34	112.46	15.80	52.30	26.48	0.00
Land	36.45	44.73	0.16	21.93	22.76	22.22	5.31	5.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Capital	12.49	15.24	0.33	18.33	59.55	7.17	5.60	56.50	6.42	6.68	53.59	19.96	22.07	26.84	20.64	49.01	167.26	80.07	128.05	38.90	60.50	163.60	66.90
Capital tax	0.00	0.00	0.00	0.00	0.17	2.05	2.94	1.47	1.14	0.50	0.35	0.69	0.17	0.35	2.13	7.79	2.73	3.34	1.65	0.65	0.00	0.00	0.00
VAT rebate	-3.03	0.00	-0.07	-1.03	-0.81	-1.63	-6.96	-25.49	-2.84	-5.68	-0.83	0.00	-2.92	-7.43	-2.95	-1.45	-1.65	-1.57	-7.43	0.00	0.00	0.00	0.00
Labor tax	0.00	0.00	0.00	0.00	0.18	0.18	0.18	1.58	0.18	0.18	0.18	0.18	0.53	0.18	1.23	1.05	1.40	2.11	2.63	1.40	5.79	0.00	0.00
Payroll tax	0.00	0.00	0.00	0.00	0.38	0.38	0.38	3.44	0.38	0.38	0.38	0.38	1.15	0.38	2.67	2.29	3.06	4.59	5.73	3.06	12.61	0.00	0.00
Output	167.7	209.3	1.3	139.0	278.4	109.3	88.0	355.5	30.2	60.0	104.4	311.7	118.3	112.5	74.7	145.1	518.2	247.3	427.4	87.0	364.8	221.2	91.6

*Source:* Authors' calculations based on Armenia SAM.

*Note:* This table displays the zero profit accounting for each production sector. The table includes intermediate inputs, factor inputs, and tax payments by producers.

FIGURE 9A.1.1 ARMENIAN AGRICULTURAL ACCOUNTS FOR 2002

	Average retail prices AMD/kg	Stocks beginning of year	Production	Import	Gross supply	Food consumption	Animal feed	Losses	Seed	Export	Other use	Stocks end of year	Use	Satisfaction rate %	min. U.S. \$		
															Consumption per capita		
															kg/ year	gram/ day	kilo-calorie/ day
Wheat	95.4	9.0	47.4	57.9	114.2	75.5	13.4	1.7	6.0	0.3	0.0	17.3	114.2	45.2	151.2	414.2	1325.6
Potato	154.3	20.5	100.7	0.5	121.7	32.5	19.2	7.3	32.8	0.0	0.0	29.9	121.7	99.5	40.2	110.1	82.5
Vegetables	80.0	3.1	77.5	1.0	81.6	66.2	1.6	3.5	0.4	3.1	0.0	6.7	81.6	102.8	158.1	433.2	130.0
Fruit (without grapes)	250.0	2.6	36.0	4.1	42.7	34.8	0.0	3.4	0.0	2.0	0.0	2.4	42.7	94.6	26.6	72.9	109.4
Leguminous plants	475.0	0.7	2.9	3.3	6.9	5.7	0.0	0.3	0.2	0.0	0.0	0.7	6.9	46.7	2.3	6.3	18.2
Vegetable oil	574.0	1.1	1.2	12.4	14.7	13.4	0.0	0.2	0.0	0.0	0.0	1.1	14.7	8.8	4.5	12.2	80.7
Sugar	257.9	1.4	0.0	30.8	32.2	30.4	0.0	0.5	0.0	0.0	0.0	1.3	32.2	0.0	22.5	61.6	237.8
Eggs	718.5	0.4	33.0	0.1	33.5	29.2	0.0	1.8	1.1	1.0	0.0	0.4	33.5	102.7	7.8	21.3	11.3
Milk (without butter)	250.1	20.0	213.5	4.6	238.2	189.5	21.4	9.5	0.0	0.3	0.0	17.4	238.2	98.0	144.7	396.4	158.5
Beef	1111.7	1.6	57.4	17.1	76.0	73.3	0.0	1.0	0.0	0.2	0.0	1.6	76.0	77.3	12.6	34.5	62.1
Pork	1197.1	0.4	21.5	7.9	29.9	28.8	0.0	0.4	0.0	0.0	0.0	0.6	29.9	73.1	4.6	12.6	26.4
Mutton & goat	999.5	0.2	10.3	0.0	10.5	10.1	0.0	0.2	0.0	0.0	0.0	0.2	10.5	100.0	1.9	5.3	8.5
Poultry meat	1146.7	0.8	8.8	25.6	35.2	34.2	0.0	0.2	0.0	0.0	0.0	0.8	35.2	25.6	5.7	15.6	16.7
Grape	387.0	1.5	70.2	2.4	74.1	68.5	0.0	3.4	0.0	0.4	0.0	1.8	74.1	97.2	33.8	92.6	4.2
<b>Total</b>		<b>63.1</b>	<b>680.4</b>	<b>167.7</b>	<b>911.3</b>	<b>692.2</b>	<b>55.6</b>	<b>33.3</b>	<b>40.5</b>	<b>7.5</b>	<b>0.0</b>	<b>82.2</b>	<b>911.3</b>				<b>2272.0</b>

average ex. rate 1 US\$ = 573.35 AMD

Note: These accounts were used to compute production values for agricultural sectors in the current Armenia dataset.

FIGURE 9A.1.2 INDUSTRIAL PRODUCTION SHARES ACCORDING TO THE NATIONAL STATISTICAL SERVICE

Total industry	100.0	100.0	100.0	100.0	100.0	100.0
Mining and quarrying	3.6	3.5	3.9	3.9	5.3	6.6
Manufacturing	74.4	69.6	62.6	64.1	64.5	64.8
Food processing and beverages	44.1	45.6	40.7	39.1	36.6	35.6
Tobacco products	0.1	0.9	2.2	3.9	3.8	2.8
Textiles, dressing, and dyeing of fur	1.7	1.5	1.7	1.3	1.3	1.4
Chemical, chem. products, rubber, plastics	4.2	3.3	2.8	2.9	3.4	3.0
Other nonmetallic mineral products	3.1	3.9	3.8	3.3	2.4	2.7
Basic metals and fabricated metal	2.3	1.5	2.6	3.6	6.6	8.0
Machinery, equipment, and motor vehicles	8.0	4.7	3.1	1.9	2.5	3.1
Medical, precision, optical instruments	1.0	1.1	0.8	0.3	0.4	0.7
Jewelry and related articles	9.3	6.0	4.0	6.3	5.7	5.4
Other	0.6	1.3	0.9	1.4	1.8	2.1
Electricity, gas, and water supply	21.9	26.9	33.5	32.0	30.2	28.6

Source: Armenian authorities, National Statistical Service.

Note: Taken from IMF (2002).

FIGURE 9A.1.3 OFFICIAL ARMENIAN NATIONAL PRODUCTION STATISTICS FOR 2002

Current prices	2002		
	VA	IDO	YD
	millions of drams		
Industry	256,925	354,955	611,879
Agriculture	318,773	203,861	522,634
Forestry	713	229	942
Construction	172,238	124,850	297,088
Transport and communication	83,640	59,031	142,670
Retail trade and public catering	144,051	89,838	233,889
Public procurements	5,703	2,873	8,576
Sear-parts	1,016	510	1,526
Information-technological provision	959	330	1,288
Real estate transactions	3,987	927	4,914
General commerce	3,538	1,758	5,295
Geology	279	137	417
Other branches	2,200	1,099	3,300
Housing	38,331	14,140	52,471
Utility sector	63,270	21,334	84,605
Health, sport	32,418	35,860	68,277
Education	43,296	9,245	52,541
Culture	6,532	3,098	9,630
Science	4,856	2,132	6,988
Lending	19,470	7,278	26,748
Insurance	1,223	261	1,485
Governance and defense	35,833	35,958	71,791
NGOs	6,283	4,362	10,645
Financial intermediaries	-14,937	14,937	0
<b>Total by branches, in main prices</b>	<b>1,230,597</b>	<b>989,003</b>	<b>2,219,600</b>
Net taxes on production and import minus subsidies	131,875		
Taxes	140,145		
Subsidies	8,271		
<b>Gross domestic product at market price</b>	<b>1,362,472</b>		

Source: NSS.

## NOTES

1. This paper was prepared by Miles K. Light, University of Colorado, and Thomas F. Rutherford, Ann Arbor, MI.

2. These studies include the "Tax White Paper," a survey on business opinions produced by the Armenian Chamber of Commerce, 2004, Chamber of Commerce and the IMF Aide-Mémoire (2004).

3. Four of the largest firms in the country reported losses for two straight years, despite GDP growth of 15 percent.

4. See the "Tax White Paper," a survey on business opinions produced by the Armenian Chamber of Commerce in 2004.

5. We do not deal with the distributional consequences of tax reform in the present analysis, although the extension of the present analysis to account for the impact of taxes on poverty would be quite interesting and surely important.

6. Our definition of the "informal market" in this analysis includes those economic activities that do not pay taxes. Part of this group is small farmers and businesses that do not have the capacity to calculate and pay their taxes; another part is those individuals or corporate entities who are explicitly evading government taxes by not reporting their activities. The latter represents illegal economic activities that do not generate taxable transactions.

7. The values for  $\sigma$  and  $\eta$  in the central scenarios are shown in Figure 3.1

8. The greatest sectoral imports in the base-year data are for sector MNM (mineral products and precious stones), in which total imports equal US\$230 million. The MNM sector also generates the largest level of exports, equal to US\$269 million. We characterize imports in this sector as specialized intermediate inputs to the production sector through technology parameter  $a_i^M$  rather than as part of final demand. For all other sectors  $a_i^M = 0$ .

9. The numerical model permits the more general CES functional form for value-added based on model input  $esubkl$ . When this input is unity, value-added aggregates are Cobb-Douglas as shown here.

10. <https://www.cia.gov/cia/publications/factbook/index.html>.

11. The Global Trade and Analysis Project (GTAP) develops a consistent and balanced trade database that includes 57 production sectors and 55 regions. For more information about the GTAP database, see <http://www.gtap.org>.

12. A more detailed description of the sectoral classification is included in the first section of Annex 9.1.

13. While there exists a perception among Armenians that software is a major export industry, this claim is not supported by data from the NSS. The NSS reports that computer-related services account for less than 1 percent of GDP. The statistic is believed to be low because most multinational corporations that purchase IT services in Armenia account for the business as

a cost center for the corporation. Lycos is one example. The company hired 60 programmers in 2004 at an average monthly salary of US\$600. According to informal sources, computer and information service exports were US\$9.9 million in 2002. We have not yet been able to introduce this sector in our database and model for lack of official statistics.

## CHAPTER 10

# Strengthening Competition

### INTRODUCTION

The Armenian economy has registered sustained, rapid growth over the past decade, especially in the last few years.<sup>1</sup> In 2003, GDP increased by 14 percent in real terms after having increased by 12.9 percent in 2002. Economic growth continued at 10.1 percent in 2004, with agriculture, construction, and services leading the growth; and at 13 percent per annum in 2005 and 2006. This growth performance is one of best in the world. The government has committed itself to economic reform and the economy is gradually being transformed. It has made private sector development the main pillar of its growth strategy and has been working to improve the business environment by reducing regulations, improving the bankruptcy law, improving customs administration, strengthening the banking system, and reducing the capacity of officials to hamper businesses. In this process, the government has received substantial support from donors. Nevertheless, per capita GDP remains low. Although extreme poverty and poverty have fallen strongly over recent years, there are still large numbers of poor in Armenia, especially in the rural areas and urban centers outside the capital, Yerevan. Unemployment statistics still show a large number of unemployed, although the informal sector, which currently is about half as large as official GDP, probably has absorbed a substantial number of those who are recorded as being out of work.

Although the growth performance of the economy has been strong, the government is anxious to ensure that it is sustainable. In this regard there is concern that the lack of competition within Armenia could threaten the long-term sustainability of growth and that it has been a contributing factor to the apparent failure of the recent economic expansion to benefit more of the population.

The aim of this chapter is to arrive at a preliminary judgment on the importance of competition for the development of the Armenian

economy. The chapter examines the scope of anticompetitive behavior, the sectors that are the most affected, the relevant work that has been undertaken regarding these issues, the policy options that are available to deal with the problems, and the additional work that is needed. The discussion touches on the political economy issues related to areas of the economy in which competition is lacking and suggests policy options for the government.

The chapter is organized as follows. We look at three main areas in which competition issues are important in Armenia. In the first section, we discuss briefly those sectors that are traditionally regulated and where there are natural monopolies or where competition is inherently limited, such as utilities, telecommunications, and transportation. In the second section we look at sectors of the economy that in Armenia are generally viewed as being controlled by a small number of incumbents who either singly or in cartels dominate the distribution of particular products. These include gasoline, wheat, cut flowers, and sugar. We also discuss some of the methods that appear to be used to maintain market dominance and make suggestions for dealing with this situation. In the third section, we look at barriers to entry into economic activities more generally. The higher the entry barriers, the less likely growth will trickle down to the population and the greater the long-run constraint on growth. The final section of the paper provides some conclusions and policy implications.

## **ARMENIAN BUSINESS COMPETITIVENESS INDICATORS**

Competitiveness indicators aim to distinguish the strengths and weaknesses of the economy and thereby identify actions to improve competition. The most notable institutions that produce international competitiveness rankings are the World Bank, the World Economic Forum (WEF), and the International Institute for Management Development. Although these research organizations include a significant number of countries in their competitiveness assessments, currently none offers a sector-specific country analysis<sup>2</sup> that would be useful for this study.

For Armenia, we used the following indicators to assess the competitive environment (see Tables 10.1–10.4):<sup>3</sup>

- Business formation
- Entry-exit turnover
- Gross value added (GVA)<sup>4</sup>
- Employment
- Average earnings

TABLE 10.1 BUSINESS FORMATION INDICATORS, 2001–04

Sector	Number of registered entities				Number of deregistered entities				Number of registrations as a proportion of the total number of registrations at the start of the year			
	2001	2002	2003	2004	2001	2002	2003	2004	2001	2002	2003	2004
Agriculture, forestry, and fishery	121	119	97	61	38	31	33	51	4.9	4.7	3.7	2.3
Industry (including mining)	632	443	371	252	139	141	146	203	7.7	5.1	4.1	2.7
Electricity, gas, and water supply	15	18	21	23	3	11	1	13	6.2	7.5	8.5	8.6
Construction	178	147	162	144	14	28	51	105	7.6	5.9	6.2	5.3
Wholesale and retail trade	915	742	621	432	333	351	362	541	4.1	3.2	2.7	1.8
Transportation and communications	189	180	124	96	31	18	31	52	13.8	11.8	7.3	5.4
Financial services	23	13	15	17	4	4	1	6	13.4	6.8	7.5	7.9
Real estate, renting, and commercial activity	256	214	152	118	55	42	51	76	10.6	8.2	5.5	4.1
Education	58	35	33	28	16	6	20	17	11.4	6.4	5.7	4.7
Health	62	89	53	37	70	56	24	132	7.1	10.3	5.9	4.0
Social and other services	325	204	147	113	41	49	49	97	10.5	6.0	4.2	3.1

Source: NSS.

TABLE 10.2 EMPLOYMENT INDICATORS, 2001–04 (%)

<i>Sector</i>	2001	2002	2003	2004
Agriculture, forestry, and fishery	18.7	22.3	24.7	28.9
Industry (including mining)	12.3	9.7	11.1	10.3
Electricity, gas, and water supply	5.1	3.5	3.2	3.8
Construction	3.9	5.3	6.2	8.9
Wholesale and retail trade	12.5	14.1	17.4	12.6
Transportation and communications	5.1	5.5	5	4.7
Financial services	0.7	0.7	0.4	0.4
Real estate, renting, and commercial activity	1.4	0.4	1	2
Education	16.4	15.5	13.6	10.4
Health	6.8	6.5	4.2	5.5
Social and other services	5.2	5.5	5.1	5.3

*Source:* NSS.

TABLE 10.3 AVERAGE EARNINGS INDICATORS, 2001–04

	2001	2002	2003	2004
Agriculture, forestry, and fishery	3.0	3.1	4.1	5.6
Industry (including mining)	7.1	7.1	10.5	11.7
Electricity, gas, and water supply	11.2	11.4	12.5	14.7
Construction	8.1	7.8	9.7	11.8
Wholesale and retail trade	2.1	3.7	3.2	3.9
Transportation and communications	8.4	8.7	10.5	11.0
Financial services	15.0	18.9	24.9	29.0
Real estate, renting, and commercial activity	5.5	6.5	8.0	9.5
Education	2.6	2.6	3.5	4.6
Health	2.6	2.3	2.7	3.9
Social and other services	4.9	4.6	5.8	6.6

*Source:* NSS.

For 2001, we used the above **indicators** to compare selected sectors and develop Figure 10.1.

Another important element to consider in assessing competitiveness is the exchange rate in comparison with Armenia's major trading partners (Table 10.5).

Tables 10.1–10.5 illustrate the following:<sup>5</sup>

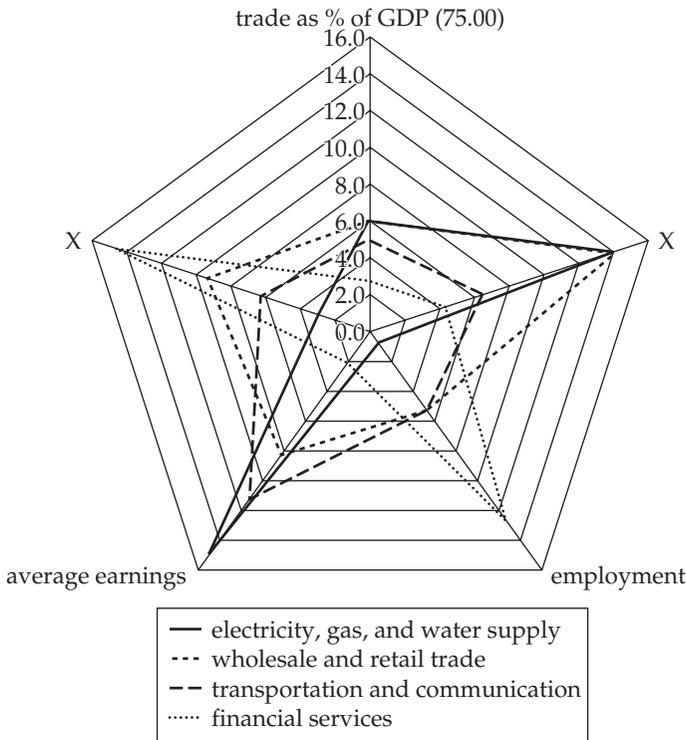
- The number of new businesses registered per year declined between 2001 and 2004 in virtually all sectors (Table 10.1). At first glance this seems surprising, as the economy has been growing rapidly and reform has been proceeding. However, further consideration reveals that it is plausible that business formation

TABLE 10.4 GROSS VALUE ADDED INDICATORS, 2000–01  
(% OF THE TOTAL VALUE ADDED)

	2000	2001
Agriculture, forestry, and fishery	16.56	17.93
Industry (including mining)	32.67	31.50
Electricity, gas, and water supply	6.81	6.33
Construction	13.85	12.43
Wholesale and retail trade	13.00	14.71
Transportation and communications	9.45	9.39
Financial services	2.87	3.04
Real estate, renting, and commercial activity	0.40	0.45
Education	2.28	2.44
Health	0.43	0.38
Social and other services	1.68	1.39

Source: NSS.

FIGURE 10.1 BUSINESS COMPETITIVENESS INDICATORS FOR SELECTED SECTORS



Source: World Bank Doing Business Indicators (<http://www.doingbusiness.org>).

TABLE 10.5 FOREIGN EXCHANGE RATE COMPARISONS,  
2001–04 (INDEX)

	2000	2001	2002	2003	2004
REER	108.7	105.5	96.2	86.8	90.8
REER-Russia	168.9	159.7	152.2	147.5	144
REER-United States	92.3	91.1	90.6	90.2	90
REER-Euro Area	116.2	117.1	118.6	118.8	117.6
REER-Iran	61.5	59.6	58.2	56.8	55.1

Source: IMF, *International Financial Statistics* (<http://ifs.apdi.net/imf/>).

is slowing down. First, Armenia is emerging from many years during which the economy was centrally directed. There must be limited capacity among potential entrepreneurs to estimate realistic opportunities and to determine whether a market is saturated, what opportunities exist, and the extent of the competition. As experience is acquired, judgment will improve. Second, later sections of this chapter point out that the benefits of formality, in the sense of access to the financial system or accessibility of the legal system to contract and resolve disputes, is still very limited. Until reform improves these incentives, many entrepreneurs will prefer to operate informally.

- Entry into the wholesale and retail trade sector faces various constraints.<sup>6</sup> High levels of employment but low average earnings characterize this sector. These features, coupled with high levels of GVA, indicate that the sector's anticompetitive practices are harmful to total welfare.
- Although high entry levels characterize the financial services sector—the entry-exit turnover and business formation indicators are high—its GVA figures illustrate that general activity is suppressed and the sector remains underdeveloped in terms of participating in the development of the Armenian economy.
- The high entry levels in the transportation and communications sector are explained by the large number of retail service providers in the telecommunications sector and the recent increase in the number of lines in public transportation. Importantly, the procedure for granting ownership rights for specific lines remains anticompetitive. The increased number of different sector-specific services provided in the country also explains the high entry figures (for example, freight).
- The electricity, gas, and water supply sector has moderate entry, GVA, and employment levels. Although there are issues still to be resolved, the sector's restructuring practice is one of the success stories in Armenia.

## COMPETITION POLICY IN ARMENIA

This section looks briefly at some of the issues related to sectors that are traditionally regulated in most economies, including telecommunications, power, water, natural gas, transport, and airports. In Armenia, telecommunications regulation was brought under the jurisdiction of the Public Service Regulatory Commission (PSRC) in 2006 by legislative change. The PSRC also regulates power, water, and natural gas.

Other sectors are regulated differently. The General Department of Civil Aviation regulates air traffic. Yerevan Airport is operated under a concessional agreement by a foreign company. A concessional agreement was an important step in creating favorable initial conditions for successful air transportation regulation. The Ministry of Transport regulates transportation. The railway company is still state owned, and unfavorable practices have been reported in this sector (see below). In addition, the Commission for the Protection of Economic Competition (CPEC) has authority regarding actions by companies in these sectors that are deemed harmful to the consumer. This authority has not yet been exercised, although the CPEC is adamant that it could exercise this authority in the future.

The PSRC has been the recipient of substantial support from donors, both to provide technical assistance to upgrade skills and to improve its operating infrastructure. As a result, the capacity of the PSRC to regulate the industries under its jurisdiction has improved.

### Competition Law in Armenia

A full analysis of the Competition Law is beyond the scope of this chapter. Furthermore, there are many aspects of competition in Armenia that, although relevant, are outside the ambit of the law. Nevertheless, some observations on certain features of the law and its application in Armenia are pertinent.

Competition law is a relatively recent innovation in Armenia. The law establishing the State CPEC was passed in 2000 and the CPEC itself began prosecuting cases in 2001. Some key aspects of the law include the following:

- The law prohibits collusion among enterprises, although it fails to distinguish between vertical and horizontal collusion. Generally, economists view horizontal collusion as potentially much more damaging to consumers. Vertical agreements can also present problems, but the circumstances under which this occurs need investigation and analysis. Potential problems could arise in Armenia because the CPEC's technical capacity for this analysis is limited.

- Article 4 of the law prohibits anticompetitive practices between loosely connected groups, although the criteria for determining such behavior are loosely set out and would require intensive investigation, involving several different levels of complexity.
- Article 6 of the law indicates that a firm may be considered to have a dominant position in the market if it is not exposed to substantial competition, or if it commands a market share of more than one-third of total sales.
- The law forbids the abuse of dominant market power. In Armenia, the CPEC maintains a list of firms with such power and supposedly tracks them to ensure that their behavior does not involve abuse. Most of the cases brought by the CPEC have involved firms that are in this list. Cases have been prosecuted under Article 7 of the law, which applies to the abuse of a dominant market position. The Foreign Investment Advisory Service (FIAS) has criticized this approach on the grounds that the CPEC appears to consider that any firm in the list is automatically suspect—which essentially means any large company. Once a firm is on the list of dominant firms, scrutiny intensifies and transactions costs for the firm rise sharply.
- The CPEC has brought a number of cases of “unjustified pricing” based on a methodology involving comparisons between the selling prices of the company and general price indices. Such action makes little analytical sense, in that there is no allowance for shifts in relative prices, and it implicitly assumes that profits should not differ among products, companies, and sectors.
- Article 8 of the law defines market concentration and control through mergers and acquisitions and revolves around a market share of 35 percent or more. Combined with Article 10 of the law, which prohibits concentration unless it fosters competition, Article 8 is used to justify action against such companies.
- Article 9 requires that firms with substantial market power must be registered as being dominant.

Implementation of the law presents a number of problems. The weak institutional framework in Armenia appears to result in some cases (especially in the areas outlined in later sections of this discussion) not being prosecuted, whereas other cases appear to show an excessive targeting of some firms. As in many other areas of private sector issues in Armenia, the law itself is not the primary problem. The existing legislation, while inadequate in some areas, could be used to prosecute uncompetitive behavior. Rather, problems lie in the application of the law, the protection that some groups appear to have, and the generally weak private sector business environment that limits opportunities for new entrants. These issues are explored at greater length below.

## Telecommunications

After independence, Armenia inherited a relatively extensive but low-quality telecommunications network. The design of the network was not commercially driven, which led to misallocated lines and low call volumes. These elements, combined with politically driven low local tariffs and in spite of high international call rates, resulted in low revenues per line. The outcome was outdated equipment, poor network quality, and a slow digitalization rate due to chronic underinvestment in the sector.

During the early stages of restructuring, the government added substantially to the problems of the telecommunications sector by awarding a long-term monopoly (granted until 2013) to ArmenTel, the local telecommunications company, owned by the Hellenic Telecommunications Organization (OTE), a Greek company. The process of privatization was poorly handled, was not transparent, and occurred without an adequate regulatory framework.

In November 2004, the government issued a new license to ArmenTel (after a longstanding dispute and renegotiations)<sup>7</sup>, signed a new Settlement Agreement with OTE/ArmenTel, and issued a second Global System for Mobile Communications (GSM) license with immediate effect, thereby partially liberalizing the market. The settlement agreement provides for a third GSM license to be issued on January 1, 2009. In addition, ArmenTel was deprived of its monopoly over Internet use in Armenia. At the same time, the government granted the company a monopoly for telephony based on the Voice over Internet Protocol (VoIP).

The award of the second telecommunications license was not consistent with international good practice, given that only one candidate, K-Telecom (the operator in Karabakh using GSM technologies that is associated with Karabakh Telecom) was considered. The government perceived the issuance of this license as a “case of exceptional importance” for Armenia’s national security and provided Karabakh with international access to all telecommunications services.

It is socially desirable to have an entrant in a competitive market for the following reasons:

- Entrants often offer a differentiated service not offered by incumbents.
- Entrants often provide existing services at a lower cost.
- Entrants often force the incumbent to produce services more efficiently.

It is generally agreed (see Laffont and Tirole 2000) that an intelligent interconnection policy is the key to the harmonious development

of competition in the telecommunications industry. The offering of mobile services by ArmenTel and K-Telecom will give rise to two-way termination access charges. The government should therefore implement interconnection charges and policies to facilitate competition, induce efficient network use, and encourage investment along with cost minimization. To ensure this end, the PSRC needs continued donor assistance to enhance its regulatory capabilities in the telecommunications sector.

### *Regulatory Challenge*

On the basis of the terms and conditions of both parties' licenses and the 2004 ArmenTel Settlement Agreement, it is unlikely that the current market configuration will change significantly and allow new entrants, at least not until 2009.<sup>8</sup> In the early stages of partial market liberalization, however, embryonic competition if left to itself generally favors the incumbent. Clearly, in the Armenian telecommunications sector, competition is asymmetric: ArmenTel and K-Telecom compete for subscribers, but the former already has 205,000 mobile phone subscribers.

Unfortunately, there have been few contributions (even theoretical) to the study of asymmetric competition, mainly owing to the complications that arise by assuming that access charges should not be set reciprocally (see Cave, Majumar, and Vogelsgang 2002). The policy implications of the findings vary with the assumed underlying economic environment.

### *Demand-Side Asymmetry and Nonreciprocal Termination Charges*

Demand-side asymmetry and nonreciprocal termination charges closely resemble Armenia's current situation in the telecommunications sector. With the new law and its expectations regarding the regulation of the retail level, the implications may need to be modified; however, they are case sensitive and will require additional research. These implications include the following:

- Large differences in access charges (where the well-established firm is paid the higher access charge) act to reduce competition for subscribers.
- Two existing firms may differ over the setting of termination charges, and regulation is generally needed to resolve disputes.
- Generally, sector profits will increase with the increased difference in termination charges, but the gains to firms from this increase

change depending on the firm. This situation can lead to collusion between firms, with side payments from one firm to another.

- The market share of the networks affects total welfare. The magnitude of the effect depends on demand elasticity. In contrast to service providers, the increased access charges lower consumer welfare, which necessitates balanced access pricing policy in Armenia's telecommunications sector.

The high cost of telecommunications in Armenia is particularly severe given that the country is isolated from Europe and the United States: there is an acute need for low communications costs in small, remote economies. It is critical, therefore, that the government and the PSRC deal with this situation appropriately and proactively.

### Utilities

The electricity sector has been substantially restructured over the past few years. First of all, the distribution system has been privatized—an effort that appears to have been very successful. Whereas prior to privatization, inefficiencies, and large arrears strained the system to the breaking point, arrears have now been eliminated, electricity bills are collected on time, and the system is functioning reliably. This is one of the success stories of Armenian privatization.

The power generation sector consists of five large generators, one of which is nuclear, two of which are thermal, and two of which are hydroelectric. One of the hydro generators and one of the thermal generators are run by Russia, which acquired the generators from the Armenian government in a debt-for-equity swap. Russians also run the nuclear station under a management contract. In addition to the large generators, there are a substantial number of small private hydro producers who supply the grid, which is compelled to purchase any power that they produce.

The PSRC also regulates the natural gas distribution sector. Many of the same issues appear to apply to this sector and there is no indication that it was being run ineffectively. The Russian-Armenian joint-stock company "ArmRusGasProd" has invested intensively in developing a gas distribution network in the country.

The CPEC regulates the producers<sup>9</sup> on a rate-of-return basis. Although it is possible to quibble over the efficiency of rate-of-return regulation, a brief review has indicated that it appears to be carried out competently, although a more in-depth study would be needed to confirm this. The challenge will be to move economic regulation generally onto more efficient, credible, multiyear, price-cap regulation.

## Railways

More than a decade of economic transition in Armenia is a lively illustration of forgone development opportunities owing to the transportation blockade. Transportation is essential to promote sustained economic growth and prosperity, given companies' need to obtain inputs for production and deliver goods to the market. Armenia has suffered severely in this regard, not only because of the blockade by Turkey and Azerbaijan but also because productivity in the transport sector, particularly in railways, has been low. The evidence suggests that the operation of Armenia's state-owned railway is politically motivated at the expense of operational efficiency and social welfare.

There have been reports of nontransparent and opportunistic price setting by the Armenian railway company. For example, during rate negotiations that the Ministry of Transportation and Communication was undertaking with the Gold Mining Company, the state-owned railway company attempted to extract very high profits through its dominant position in the sector by proposing high rates for transporting ore. The Gold Mining Company needed to connect its mining facilities (situated in the northeastern part of the country) with its melting facilities (located in the southwestern part of the country), and other means of transportation were economically inefficient. The mining company was in a weak position that the railway company was exploiting. Hence, the railway industry and the state-owned railway company in particular need to be restructured so as to contribute to sustained economic growth. The government of Armenia has decided to concession the railway and has selected the vertically integrated concession option. It will undertake the concession through a transparent and competitive international tender. A government decree dated September 16, 2006, appointed an Intersectorial Commission to present specific recommendations on implementation of the concessioning. A number of important issues related to the railway law, the concession design, and the oversight regime must be resolved to successfully concession the railway. The next section provides concepts to guide the process and ensure restructuring and regulation efficiency.

### *Restructuring*

When considering rail transportation restructuring, Armenia needs to analyze the industry more generally within the context of its technological and organizational features as well as evaluating the recent performance in detail. Five generic options for the vertical restructuring of railway are considered in the literature (see Kessides and Willig 1995). The competitive access option presented below has the

potential to bring more competition, market-based decision making, and innovation into the railway industry.<sup>10</sup> Competitive access is characterized by the existence of an integrated operator<sup>11</sup> required to make rail facilities, such as tracks and stations, available to other operators on a fair and equal basis through the trading of, for example, circulation rights. The potential for the implementation of the competitive access option in Armenia is favorable for a number of reasons.

**Active Intermodal Competition** The passenger transportation data provided in Table 10.6 illustrate the small share of the railway sector, which is mainly due to the enormous growth of motorization, to Armenia's landlocked geographic location coupled with its bad relations with neighboring countries, and to the poor condition of the existing railway facilities (such as stations and passenger wagons).

In freight, the expanding competitive trucking sector has gained the largest percentage of the transportation market. The figures on internal freight volumes (see Table 10.7) illustrate the existing competitive pressures on the rail sector.

This phenomenon is explained in terms of the following:

- Geographic size and road conditions inside the country. Virtually all of the destination points along the internal haul are connected by roads in good condition, which enables trucks to transport loads effectively and without delays.
- Industry dependence. Ore constitutes about 50 percent of delivered (internal and imported) freight. Construction materials, both mineral and nonmineral (such as stones and cement), constitute

TABLE 10.6 PERCENTAGE SHARE, BY WEIGHT, OF DIFFERENT MODES OF TRANSPORTATION, 1999–2003

<i>Mode</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>
<b>Passenger transportation</b>					
Railway	1	0.8	0.8	0.8	0.6
Vehicle	73.2	75.7	80.3	82.7	85.5
Air transportation	0.4	0.5	0.5	0.5	0.5
Other (underground, trams)	25.4	23	18.4	16	13.4
<b>Freight</b>					
Railway	29.2	31.8	28	26.8	30.1
Vehicle	52.4	46.3	52.1	63.1	57.9
Air transportation	0.3	0.3	0.2	0.1	0.1
Pipeline	18.1	21.6	19.7	10	11.9

Source: NSS.

TABLE 10.7 INTERNAL FREIGHT IN VOLUMES AND PERCENTAGE SHARES, 1999–2003

	1999	2000	2001	2002	2003
<b>Railroad</b>					
Internal (thousands tons)	407.1	333.6	355.3	854.1	891.4
Internal (%)	0.29	0.23	0.25	0.42	0.42
<b>Vehicle</b>					
Internal (thousands tons)	2,157.6	1,776.0	2,203.1	4,323.4	3,548.4
Internal (%)	0.87	0.86	0.84	0.91	0.87

Source: NSS.

another 15 percent. Therefore, an integrated operator would be unable to exercise its power on captive shippers (like the Gold Mining Company) if the competitive access restructuring is coupled with efficient regulation.

In other words, Armenia's railway sector is far more contestable<sup>12</sup> due to the strong competitive pressure from other modes of transportation.

**Economies of Scope, Coordinated Planning, and Reduced Transaction Costs** It is often noted that the relationship among the supplied services, the rolling stock used, and the quality, quantity, and technical characteristics of the infrastructure is so close that these aspects need to be planned together. Thus, assigning different services to several operators may decrease the utilization of the sector's staff and physical assets. This argument is especially relevant for the Armenia rail network, which is far from extensive.

**Increased Investment Incentives** In a vertically separated structure, an infrastructure owner considering an investment in a facility with only one potential operator will anticipate bargaining away some of the benefit from the new service once it comes on line. The other problem that may arise with a vertically separated structure is the difficulty of the coordination of the operator with the infrastructure owner on investment decisions. A competitive access structure (with an integrated operator) is not dependent on such coordination, which reduces incentive problems. However, there is a possible shortcoming associated with the implementation of a competitive access option that needs to be considered: an integrated operator may have strong incentives to keep possible entrants out.

The solution to this problem is usually addressed by involving private management through concession contract arrangements and through regulatory policy (the latter being the subject of the next subsection.) A private concession contract has the potential to stimulate the efficient development of the Armenian railway sector if the government implements a competitive access restructuring. (Concessions are a broader form of lease in which the contractor agrees to make certain fixed investments and maintains the use of the assets for a longer period.) A greater risk of closure of certain services, or of larger instability, is obviously a potential issue with a private company. Again, concession systems reduce the risks inherent in the involvement of private enterprise. The design of a concession contract is a complex undertaking that should take into account, among other things, the type of contract (for example, horizontal versus vertical, passenger versus freight), award and duration (for example, type of auction, selection), content (for example, obligation, rights, asset ownership), price control, quality regulation, and so forth. It requires additional in-depth analysis of the sector, which is beyond the scope of the current report. But the quality of the concession contract will determine the design of regulatory policy and is therefore critical to the process.

### *Efficient Regulation*

Although it is difficult to predict every situation that could undermine competition within the “competitive access/concession restructuring” option, Armenia should avoid two arrangements that affect incentives and deter efficient entry when designing its regulatory policy:

- Regulation should not constrain what an integrated operator can earn through cooperating with another entity. If earnings are constrained, the operator has a strong incentive to enlarge the portion of services it provides by hindering entry.
- Regulation should not permit firms to charge higher prices to shippers the more of their business they have, as this would also provide incentives for the firm to exclude other participants.

These two situations suggest that Armenia should adopt pricing principles (widely discussed in the literature on regulation economics) that are efficient under the competitive access option. These pricing principles include the following:

- Ramsey pricing. This pricing scheme is appropriate with multi-service operation segments with actual or potential competitive pressure. The Ramsey approach apportions all unattributable fixed

and common costs of the railway among its services on the basis of their demand characteristics. The challenge for the regulatory body in implementing this policy is the complex task of estimating demand for the services provided by the integrated operator.

- Stand-alone costs. Where there is market dominance, Armenia should implement economically rational ceilings on rates, which can be obtained from the stand-alone costs. Stand-alone costs are the costs of serving any captive shipper if the shipper is isolated from the railway's other customers. The benefit of this pricing principle is that it overcomes the problem of entry deterrence possible under a competitive access restructuring option.<sup>13</sup>
- Armenia should establish regulatory standards based on the principle that the integrated carrier that possesses a bottleneck should not refuse an agreement that provides full compensation of all its costs, including opportunity costs. The standards should be implemented once disputes about predation through competitive access arise.
- Given that with railways there is a one-way access bottleneck, access fees should be priced using the principle of efficient component pricing. Pricing should be based on the idea that an integrated carrier should offer the services of its bottleneck at a price that yields it the same return as if it had performed the end user's services itself.

### **Civil Aviation**

Issues relating to air traffic also provide grounds for concern. The national flag carrier, the state-owned Armenian Airlines, went bankrupt and was liquidated in 2003. A local company, Armavia, bought the liquidated Armenian Airlines and acquired Armenian route rights for flights to and from Armenia via an agreement with the government. There have been reports that whenever foreign airlines operating in Armenia have wanted to increase the number of their flights and have applied for permission to Civil Aviation, Civil Aviation has in turn sought the views of Armavia, which must be given greater weight by the Armavia agreement.

This clearly substantially puts Armenia at a disadvantage. A small, remote economy that implements policies that drive up the price of communications (whether they are telecommunications policies or transportation policies) is effectively exacerbating the costs of its small size and remoteness. The Armenian national interest requires that the government take as bold a policy towards air transport as it appears to be taking with the telecommunication monopoly. An Open Skies policy should be implemented without delay, provided an arrangement can be made with Armavia.<sup>14</sup>

## LACK OF COMPETITION IN DISTRIBUTION

Many private sector participants in Armenia operate in ways that would be unusual in the industrial countries. As is common in many countries with weak institutions, facilitation payments are frequently used as a means of ensuring that dealings with the public sector proceed without undue delay. However, unlike other countries, in Armenia the system has to date not degenerated into one where massive corruption is pervasive, although undoubtedly there is corruption that extends to the highest levels. Rather, facilitation payments have evolved into a system in which interlocking obligations arising from favors and interventions govern much of the interaction among the business community as well as that between businesses and the legal system. A person who acts to intercede on behalf of another becomes a *roof* and the benefactor incurs an obligation to return the favor in one form or another at some point in the future. In Armenia, there appear to be few rules which cannot be modified or adjusted through the intervention of a roof, even within the judicial system. In sectors where a powerful roof exists, the incumbents appear to have the power to make life extremely difficult for new entrants.

It is also noteworthy that foreign investors often do not have the network which provides them with a roof, and thus they frequently have more difficulty in navigating their way through the various bureaucracies and the judiciary. This reality has been reflected in all of the foreign investment surveys done on Armenia. In addition, companies that are only exporters claim that they are singled out for unfavorable treatment, especially with respect to VAT refunds.

This phenomenon can act as a substantial barrier to entry in the economy, on the part of foreign investors as well as for new local businesses that attempt to compete with well-established companies and individuals operating in the Armenian economy. Although there have been improvements recently, subtle methods are used to impose severe operating constraints on new competition, ranging from problems in clearing goods through customs, to inspections of various types by government officials, to outright sabotage of operations. Furthermore, such behavior is difficult to identify clearly because it is protected by all the members of a particular roof.

There are numerous and widespread anecdotes to the effect that the economy is dominated by a few powerful groups that maintain a tight control on certain activities, particularly imports of petroleum, sugar, flowers, and wheat. It is, however, difficult to obtain hard evidence on the allegations, and the deeper the investigation is, the greater the contradictions are. There do appear to be roofs operating in these sectors but, on the face of it, there is some competition. On the other hand, there are also widespread allegations that companies in this

area are anonymously owned by interlocking share holdings, so that effectively the sectors are controlled by a small number of people who are making large profits and who engage in extremely conspicuous consumption.

### **Petroleum Products**

Having no oil or natural gas resources, Armenia is totally dependent upon imports. Imports of fuel products constitute about 20 percent of total imports. This import group includes two major components in terms of volumes: petroleum products (including gasoline and diesel) and natural gas imports.

Statistics on petroleum product imports appear to have been underreported. First, all of the data largely exclude imports by the Defense Ministry, Internal Affairs, and the nuclear power station, so it is not possible to determine the total imports of these products. Furthermore, in spite of very rapid growth, statistics on gasoline and diesel imports into Armenia show that in 2000 there was a sharp drop in import volumes and only a very modest growth afterwards. This occurred despite a very sharp increase in automobile imports, which rough statistics indicate exceed 14,000 vehicles per year compared with 1,200 per year in 1999. Although oil prices rose in 2000, and demand may have been depressed by the fuel efficiency of recently imported automobiles and conversion of some motor vehicles from gasoline to natural gas, it does not seem likely that in the face of such rapid growth fuel consumption could go down. One explanation for the flat fuel imports is that there is smuggling of petroleum.

The structure of market concentration underwent changes during 1999–2000. In 1999 there was only one gasoline importer in Armenia, so that market power was located inside the borders of the country. In 2000 and 2001 the number of importers into the country increased; looking only at the number of operators within Armenia, the market could not be defined as uncompetitive. However, analyzing the import chain reveals that one supplier provides the bulk (88 percent) of imported gasoline to importers. While the concentration of direct importers has declined, the virtually single sourcing of supply for gasoline importers means that the supply chain remains highly concentrated. Even though it has been reported that one more company started to supply importers with gasoline in 2002, the share of the incumbent supplier firm remained dominant. It constituted about 70 percent of total supply to importers. (Noncompetitive behavior and its impact on the gasoline market and relationships to welfare losses are discussed in Box 10.1 and also shown in Table 10.8.)

### BOX 10.1 NONCOMPETITIVE BEHAVIOR IN THE GASOLINE MARKET

To stress the negative impact of noncompetitive behavior in the gasoline market we made a very simple calculation of welfare losses (see text Table 10.8). (For the explanation of the terms used in the analysis below, see Tirole 1988.) We assumed a linear market-specific demand curve and estimated its slope and intercept considering price-increase versus demand-decrease scenarios during 1999–2000. Such a decrease in demand is mainly explained by increases in international oil prices in contrast to the observed nonprice impact (such as increased imports of cars after 2000) on demand during later years.

It turns out that welfare loss, as a result of noncompetitive behavior in the gasoline market alone, was averaged at 1.3 percent of GDP. This loss figure can be even higher if we consider that there is a double marginalization (we have not included in the calculations the deadweight loss, which can occur as a result of the monopoly power of one supplier of importers) and that the same situation dominates in many other similar markets (such as the diesel market).

Moreover, the importance of liberalizing the petroleum oils market is accentuated by the fact that concentrated, rather high gasoline market profits (about 3.7 percent of GDP) have not contributed to reducing the unequal distribution of income in the country.

*Source:* Authors' calculations.

More interestingly, even though the large number of retail companies operating in Armenia, ensures retail competition, the retail mark-up price was substantially higher than the imported (wholesale) price (which we took to be customs clearing price). The gross profit mark-up, most of which probably occurs at the wholesale level, constituted more than half of the retail price in 2001 (Figure 10.2). Since competition at the retail level is strong, it is most unlikely that excess profits are being earned by retailers: most of the profits probably accrue to the wholesalers. These very rough calculations indicate that there appear to be large welfare losses arising from the concentration of the petroleum market, which could amount to the equivalent of over 1 percent of GDP. This loss figure would be even higher if we take into consideration the further profit margin earned by the single-source monopoly supplier of imports. Moreover, similar welfare losses can be expected to be experienced in other fuels, such as diesel. This is not included in the calculations of the deadweight loss, which can occur as a result of the monopoly power of the one supplier of imports.

TABLE 10.8 WELFARE CALCULATIONS IN THE PETROLEUM MARKET, 1999–2001

	1999	2000	2001
Retail price (drams per ton)	265,133.7	370,307.4	362,576.0
Customs clearing price (drams per ton)	118,300.0	145,100.0	159,200.0
Quantities consumed (tons)	258,100.0	181,400.0	187,500.0
Total profit (drams)	37,897,777,970.0	40,852,622,360.0	38,133,000,000.0
Estimated slope of the demand curve	-1.4	-1.4	-1.4
Estimated intercept of the demand curve	626,473.7	626,473.7	626,473.7
Quantities under customs clearing price	362,981.2	343,838.4	333,766.9
Deadweight loss (drams)	7,700,048,377.0	18,291,160,036.2	14,873,591,432.6
Deadweight loss (US\$)	14,528,393.2	33,256,654.6	26,094,020.1
GDP (US\$ million)	1,845.5	1,911.5	2,118.4
Deadweight loss as a percentage of GDP	0.8	1.8	1.3

Source: Author's calculations.

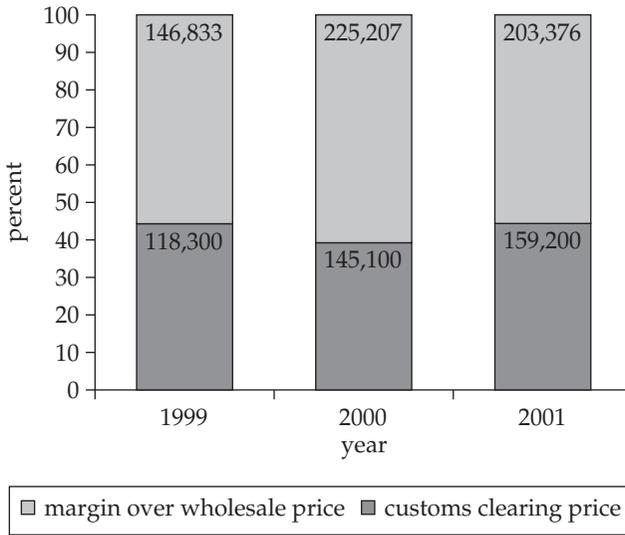
## Sugar

The vast majority of sugar imports are brought into Armenia by a single importer. The sugar importing company was investigated by the CPEC, but before a judgment could be reached, the importing company was dissolved and a new one was opened, but with the same shareholders. As a result, the original case did not proceed. Trade data indicate that 70 per cent of the imported sugar comes from the United Kingdom.

Monopoly power in the sugar market is reflected in the price and markup data. Figure 10.3 shows that the difference between the customs clearing price and the retail price of sugar is substantial—the retail margin is 47 percent, very high by any standards. As with petroleum, there is substantial competition at the retail level so excess profits are unlikely to be earned at this stage.

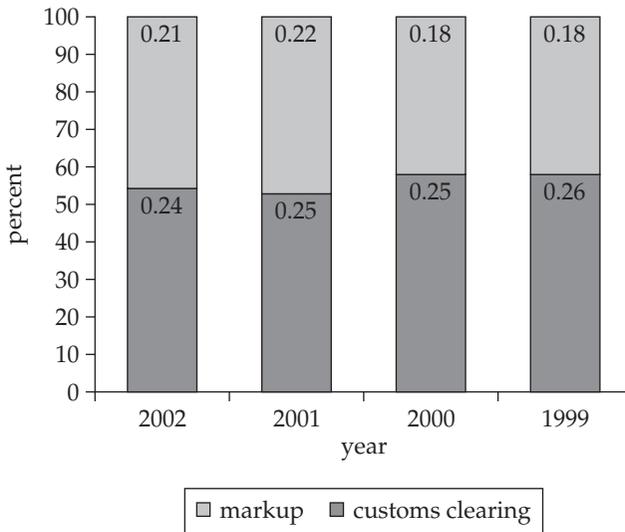
Table 10.9 reveals the patterns of the markup. Sugar has a very low demand price elasticity, which allows a high-profit-seeking importer with dominant power to hinder potential entrants. The sugar market profit was estimated to average around US\$14 million during 1999–2002.

FIGURE 10.2 GASOLINE PRICE STRUCTURE, 1999–2001  
(DRAMS PER TON)



Source: NSS.

FIGURE 10.3 SUGAR PRICE DECOMPOSITION (US\$ PER KILO)



Source: Author's calculations.

TABLE 10.9 SUGAR MARKET DATA, 1999–2002

	1999	2000	2001	2002
Markup (US\$/kilogram)	0.185	0.176	0.222	0.205
Percentage annual change of markup	—	-4.650	25.933	-7.349
Import of sugar (metric tons)	69,836	69,422	73,485	68,400
Percentage annual change in volumes of imported sugar	—	-0.592	5.853	-6.921

Source: NSS.

— Not available.

Some in Armenia argue that there are no large welfare issues arising from the importation of sugar. They point out that the market is small and the main supplier can use its dominant position to purchase large quantities of sugar at a low price. Therefore, even if there are some monopoly rents being extracted, the welfare losses are offset by lower wholesale prices than would exist if there were several importers buying at higher prices in the exporting countries. The flaw in this argument is that if the current importer had concerns about new entrants, it would not exploit market dominance to the same degree and would extract lower rents. In addition, the large number of businesses opening in areas where there is no restriction on competition illustrates the potential dynamism of the economy. Companies in the areas of ITC, restaurants, retail outlets, and building are being created in large numbers. Clearly, there is an entrepreneurial and dynamic element in the Armenian economy. Restricting competition harms this element as well as consumers.

### Wheat and Cut Flowers

Gathering data in other markets proved more difficult, and it was not possible to undertake an analysis as detailed as that for petroleum and sugar. Approximately 50 percent of Armenia's wheat is imported, as is the majority of cut flowers. There are widespread reports of the concentration of distribution in both of these products. Potential competitors are being harassed at the borders by customs, which has employed many nontariff restrictions (such as health standards, quality standards, and valuation prices) in order to delay imports to the point where costs arising from dealing with the delay erode any potential profit. These issues are discussed at greater length in the next section.

## HOW MONOPOLIES ARE MAINTAINED

Corruption and rent sharing with state officials are a pervasive reality of doing business in Armenia. These practices affect the competitive environment in many ways. Market incumbents make illicit payments to or enter into collusion with governmental officials, agreeing to share rents, which are generated as a result of collusion. There are reports of state officials being given shares in the incumbent companies, which distorts the incentives associated with increasing public welfare through greater competition. The incentive for officials who are also shareholders in the incumbent companies is to maintain the status quo. As a result, the abuse of the state power is used as a tool for maintaining monopolies in the market. Although illicit and sometimes violent “private methods” have been used to maintain a dominant position in one specific market, the abuse of state power remains the most effective and widespread method of maintaining monopoly power.

### The Customs Office

Armenia has made great strides in attaining compliance associated with WTO access. This has not prevented the Customs Office from remaining one of the predominant instruments for hampering or eliminating potential competitors, particularly in the distribution sector. Customs clearance and valuation procedures are far from being transparent and standardized (see Box 10.2), with substantial discretion being applied in the licensing of brokers, storage, freight transporters, and the operation of the free trade zone.

In addition, the continued widespread use of reference pricing in contravention of WTO commitments is another method of delaying imports. Since customs also has some responsibility for enforcing product standards (for example, on health and safety grounds), the number of potential administrative barriers is legion, particularly since some of these standards are also under the jurisdiction of the Ministry of Health. There are therefore numerous opportunities for delaying imports for a number of reasons. Some of these issues are discussed in greater detail in the following sections.

### Limiting the Number of Customs Brokers and Associated Activities

The Customs Office controls “unwanted” private enrollment in customs operation through the widely reported unfair and discretionary licensing of customs brokers.<sup>15</sup> The Customs Office appears to strictly limit the number of brokers through customs examinations. Each year

### BOX 10.2 ANTI-COMPETITIVE PRACTICES OF THE CUSTOMS OFFICE

Royal Armenian JV LTD imports 8,000–9,000 tons of green coffee annually, processes it, and exports 70 percent of the processed product (mostly to Europe). The company was founded in 1998, and 96 percent of its capital belongs to a private person, a citizen of the Republic of Cuba.

On July 2004 the chairman of the company publicly accused the State Customs Committee Deputy Chairman and other senior officials of personally soliciting a bribe last year in return for undervaluing the price of imported coffee beans, thereby reducing the import tax the company would be required to pay. After the company refused the offer, customs retaliated by overstating the value of the coffee imported at US\$1.8 per kilogram; the actual cost was US\$1.2, and the estimated cost for other importers was calculated to be less than US\$1 per kilogram. Royal Armenia won a legal action against the Customs Committee for discrimination, but the ruling that the increased tariff on their imports should be reduced has not been enforced. The chairman of the company was later reported as having retracted his accusation regarding the customs authorities.

*Source:* Based on interviews and newspaper reports.

there are examinations for customs brokers: even incumbents must take annual exams.<sup>16</sup> A reliable source reported to the mission that in 2003 apparently 30 out of 36 applicants passed the examination but after internal review the Customs Committee declared that there were only 5 successful applicants. One of the unsuccessful applicants (an operating broker) was apparently able to get another minister to call the chairman of the Customs Committee on his behalf, so that finally there were 6 successful applicants.

On the face of it, the procedure is entirely valid—a written examination subject to scrutiny and appeal. In practice, however, the results of the examination are subject to internal review and adjustment at the whim of the Customs Committee. This “informal review” procedure is not written down anywhere. Since there is such wide discretion, however, the Customs Committee can strictly control the number of brokers and can ensure that they are compliant through the annual examination.

### Clearing Procedures

Customs have introduced electronic clearing procedures to expedite the clearance of goods. Customs brokers, however, do not have access

to the computer system and therefore have to deal with paper documentation that nullifies many of the advantages of computerized clearance and that also keeps the brokers in the dark with respect to the status of the goods that they are attempting to clear. The result is that there are uncertainties in the process and delays that can cost importers substantial amounts, especially since they are charged for the storage of the goods that are held up. In late 2005 the customs authorities began piloting a direct trader input system and reforms towards automation in clearances in goods covering about 5 percent of imports. They undertook to extend the pilot to about 70 percent of imports by April 2006. If they are implemented successfully and in line with international good practice, these steps would constitute a major reform in customs administration and significantly benefit the forces of competition.

Another issue frequently cited by importers is the continued use of reference pricing by customs unless extensive documentation accompanies shipments.<sup>17</sup> If any of the documents are missing, then customs applies reference prices to the shipment, a practice that is not consistent with WTO rules. In other countries goods can be cleared with partial documentation under surety bonds that provide a guarantee in the event that the declaration was incorrect. However, the lack of financial system development in Armenia implies that surety bonds are difficult to obtain and that even when they are obtained, the cost is high. The problem of reference prices is further compounded by the relatively high VAT rate (20 percent) and the historic difficulty in obtaining drawbacks of VAT payments upon the export of any goods that use imports as inputs. However, a significant improvement has taken place in the practice of refunding VAT dues to exporters, in the course of 2005, both as to amounts and as to timeliness; this trend should continue.

### **The Role of the CPEC**

Should the CPEC be one of the pillars of the policy of promoting competition in Armenia? There are understandable concerns that it could become yet another layer of bureaucracy that leads to “inspections” and interference in the ability of businesses to function, which in turn could be used to harass entrepreneurs and to protect incumbency. Arguments in favor of the strengthening of the CPEC are based on the recognition that it could be one of the ways in which the restrictions on competition that abound in several sectors of the economy could be resisted.

The view of this chapter is that, in its present form, the CPEC is not a significant bulwark against anticompetitive behavior. It has neither the necessary skills, nor the staff, nor the facilities to operate effectively. Although it has been successful in a limited number of cases,<sup>18</sup> it is not

a force in areas where competition is obviously restricted. Its report on the petroleum market is deficient in depth as well as analysis.<sup>19</sup>

This does not mean that attempts to assist the CPEC therefore should be abandoned, since over the longer term the commission could be one of the instruments for promoting competition in Armenia. Modest technical assistance is warranted and perhaps some help with improving its ITC resources. It is unrealistic, however, to perceive the CPEC as useful in the shorter term. It needs several years to evolve into an instrument against restrictions on competition. Nevertheless, its continued existence is assured, and the interests of the private sector lie in its improving its technical competence.

### **BARRIERS TO ENTRY**

Formal barriers to entry have been reduced. For example, the cost of registering a business is now much reduced and occurs with few delays. The Armenian authorities are determined to eliminate delays altogether. However, reducing the costs of formalization does not address the many issues related to the benefits of being formal. As the next sections will point out, public goods related to the business sector are still inadequate. To enhance competition, the authorities are focusing on access to finance and access to the system of formal contracting. In Armenia, financial markets function poorly and the system of contracting and dispute resolution is haphazard at best and under normal circumstances is not effective. It does not provide Armenian businesses with incentives to formalize, particularly since it also allows petty officialdom to target formal businesses with inspections that have payoffs as their aim.

There has been some progress in reducing these inspections. For example, tax officials can only conduct one audit per year. However, they are still allowed to undertake "fact finding," which is not classified as an audit. Nevertheless, businesses report that information obtained during fact finding, which can occur as often as requested, is used in annual audits. The protection of the restriction on auditing is therefore no more than limited.

### **Financial Markets**

The relationship between financial market development and poverty alleviation is well established (see, for example, Holden and Prokopenko 2001). Financial markets play a key role in intermediating between savers and investors. In addition, the financing of new projects enhances openness and competition by ensuring that prof-

itable investment opportunities do not go untapped. Although it is currently difficult to measure the overall severity of anticompetitive practices owing to inefficient financial markets, two practices do put pressure on Armenia's competitive environment.

First, in product markets where a firm (usually with power or connections) has propitious access to or controls over financial instruments, the incentive is created to use them to affect the product market and thus hinder possible entrants. Second, there is indirect or financially driven deterrence. Because of the vulnerability of the financial sector Armenia's lending institutions are constrained by two lending options: either to be particularly cautious in entering into financial contracts with an incumbent firm or to restrict lending to other business entities in the same or a closely related product market as their returns become more or less sensitive to the effect of product market competition.<sup>20</sup> In both cases there is excessive pressure on product market competition.

Financially driven entry deterrence is most important when financial market competition is limited. This situation establishes an important policy implication: it is difficult to promote product market competition if financial markets are concentrated? This in turn suggests the need for more antitrust coordination among the regulators of financial and product markets than is currently the norm in Armenia.

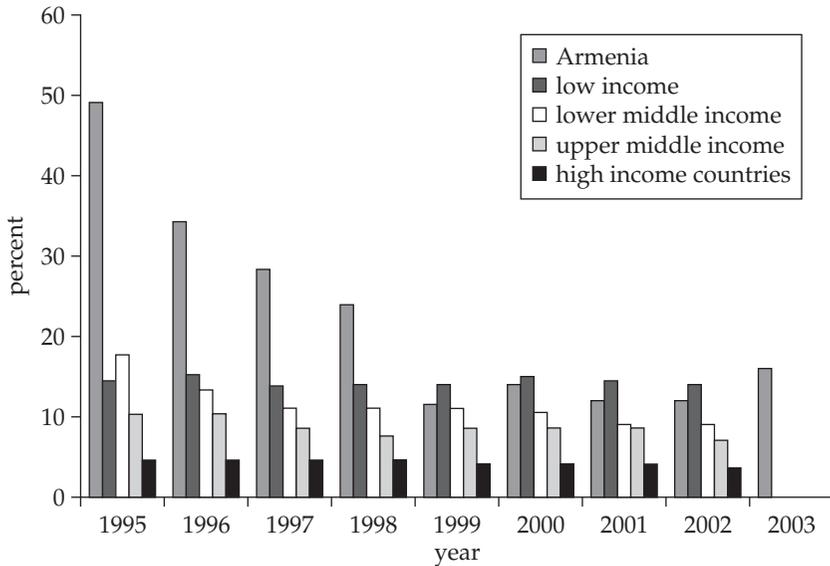
### *Financial Underdevelopment*

Financial markets in Armenia are bank dominated, underdeveloped, and effectively finance neither local production nor foreign trade.

Figures 10.4 and 10.5 show the level of financial market development in Armenia compared to that in other countries at various stages of development.<sup>21</sup> Even by the standards of low-income countries (those with per capita incomes of less than US\$1,000) the ratio of credit to the private sector is very low—only one-fourth that of the average credit-to-GDP ratio in other low-income countries. The lack of finance for business acts as a severe barrier to entry. Potential competitors cannot obtain finance for their businesses, either in the form of working capital or to finance foreign trade. The result is that incumbents' market dominance is rarely threatened by new entrants and that wealth remains concentrated among those with resources.

In spite of the low amount of credit to the private sector, there does not appear to be an excess demand for loans. On the contrary, at current rates of interest there is an excess supply of loanable funds. For example, the largest bank in Armenia, Hong Kong and Shanghai Banking Corporation (HSBC), lends a much smaller proportion of its liabilities (10 percent) to private business than it does in other countries in which it operates, where it lends 60 to 70 percent of liabilities.

FIGURE 10.4 INTEREST RATE SPREADS (LENDING RATE MINUS DEPOSIT RATE)



Source: IMF, *International Financial Statistics*. <http://ifs.apdi.net/imf/>.

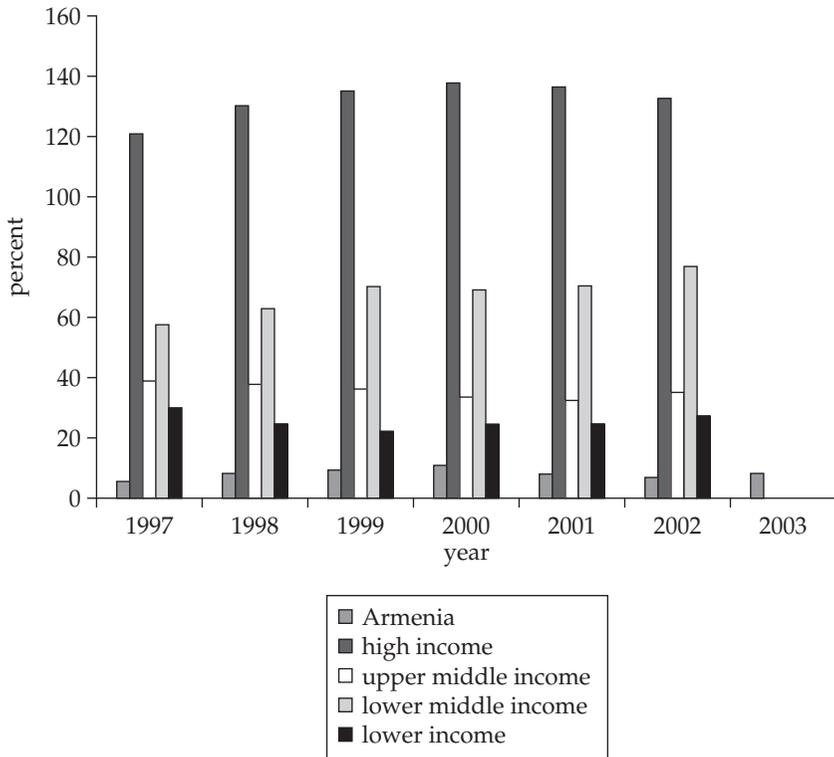
Although interest rate spreads between borrowing and lending rates have fallen, they remain higher than in other low-income countries. Financial activity in the foreign trade sector is limited. Some importers do use letters of credit in the banking system, but the practice is not widespread. There is little export financing. The practice of using irrevocable letters of credit as a basis for providing funds to fulfill export orders appears to be nonexistent. As a result, the financial system cannot be said to support the growth of trade, which in turn is the key to promoting more competition in Armenia. The essential skills in raising letters of credit are confined to a small number of banks. Before exporting under letters of credit can occur, training in the minutiae of the procedures will be required for most banks in Armenia.

Financial sector development is constrained by weaknesses in financial infrastructure, such as creditor rights, credit information, and corporate governance.

### *Weak Creditor Rights*

Weak creditor rights raise losses in the event of default, contributing to wider lending margins and reducing the availability of credit. This

FIGURE 10.5 DOMESTIC CREDIT TO THE PRIVATE SECTOR  
(PERCENT OF GDP)



Source: IMF, *International Financial Statistics*. <http://ifs.apdi.net/imf/>.

weakness arises from deficiencies in the law and practices governing collateral. To enhance creditor rights, the authorities will need to address the following issues.

*Secured Transactions Framework.* In Armenia, movable property cannot be used effectively as collateral to secure loans.<sup>22</sup> There are numerous problems with the secured transactions framework. Floating pledges are not allowed and there are no registries that allow pledges to be perfected. Repossession is time-consuming and costly. A particular problem with financing exports is that there is no provision that allows the use of future production as collateral and thus financing against export orders is not feasible. A similar problem arises with imports because there is no provision for pledging goods that are not in the possession of the borrower: goods that are being imported, even though they have been paid for by letter of credit,

cannot be seized in the event of default. The effect of the inadequacies of the collateral framework extends throughout the economy, with the result that banks correctly perceive lending as extremely risky.<sup>23</sup> To understand the necessary conditions for establishing a framework for secured transactions, it is essential to understand the four economically important stages of any system, which use the following:

1. *Creation*. The process by which the creditor establishes a security interest in a specific property (the collateral)
2. *Priority*. The process by which the lender establishes the priority of the security interest
3. *Publicity*. The process that makes public the priority of the security interest
4. *Enforcement*. The process by which, upon the debtor's default, the creditor will seize and sell the collateral to satisfy its claim

Each of these stages must function effectively for collateral-based lending to occur. The authorities are aware that currently none of these stages work well in Armenia and that they will need to ensure that reform supported by the World Bank as part of the PSRC, USAID, and other international financial institutions on collateral framework is implemented effectively. The government has adopted a plan to strengthen creditor rights, improve the civil procedures for debt recovery, and simplify the procedures for the certification for property sales and the registration of secured credit. The government has established a working group to review six draft laws in this connection which would establish the required legal environment for strengthening creditor rights.

### **Commercial Law and Contracting**

The law governing commercial transactions is inadequate, with the result that contracts tend to be informal and to take place between people who know each other well. The effect is a barrier to entry—arm's length contracting is a requirement of a well-functioning economic system. It also has the effect of increasing incentives for informal behavior, which is widely observed in Armenia. Problems include the following:

- Decisions on issues related to commercial transactions are based on an agglomeration of civil code laws, which makes the applicability of contract provisions uncertain.
- Contractual agreements are based on "unless otherwise governed by law" rather than on "unless otherwise stated in the contract"

provisions. Since many commercial transactions are subject to a wide range of laws rather than a more unified commercial code, this provision requires full knowledge of all the laws and implementing regulations that may apply to an agreement, which compounds the problem of the unavailability of translations.

- Not only does precedent not play a role in court decisions, but there is no record of cases being kept, although this is partly being addressed by a World Bank legal reform project.
- On top of the uncertainty arising from the commercial code, judges are widely viewed as incompetent and corrupt. As a result, businesses have little recourse if they are the victims of anticompetitive behavior.

### *Notaries and Formal Contracts*

The role of the notaries adds to the barriers to entry and the incentives for informal behavior. Notaries (appointed by the Minister of Justice) provide public services and are required to validate most contractual documents. Procedures are antiquated and slow. Notaries also act as judges and determine the validity of documents (and in many cases insist on preparing the documents). Notary fees and stamp fees are high and are based on the value of the transactions covered by the contract being notarized. The result is that many contracts remain informal because of the high cost of notarization. This situation also favors incumbents who have experience with working with one another.

***Credit Information*** The credit registry, which was introduced by the Central Bank in January 2003, aims to reduce credit risk by the creation of an information system on the creditworthiness of customers of banks and credit organizations operating in Armenia. However, while the credit registry has been beneficial to banks' supervisors, this information is limited to debtors of banks only. A private Credit Bureau began operations in early 2004 and has focused in its first year on obtaining information on debtors from the banks, from other financial institutions, from utility companies, and from government offices. This information should improve the ability of creditors to evaluate prospective borrowers' creditworthiness. However, the Credit Bureau has faced difficulties, because most banks are reluctant to provide information for free and to then have to pay for services. Furthermore, based on tradition and culture, Armenian borrowers are reluctant to share their information with others, and ensuring privacy protection substantially constrains the effectiveness of the Credit Bureau. It is currently revisiting its operating model and expanding ownership to include banks, with a view to remedying these obstacles.

In countries where credit bureaus have been established successfully, the central bank plays an important role in creating incentive mechanisms for commercial banks to share information on their customers. The analysis suggests several situations in which Armenia's Central Bank could play an active role in facilitating private credit bureau development:

- Credit bureau reports should be made a requirement for lending coupled with mechanisms to ensure efficient entry and exit by bureaus to avoid abuse of their exclusive rights.
- A borrower's explicit consent should be required prior to anyone's gaining access to their file, to ensure better privacy protection. Other actions that may prevent privacy violations include restrictions on banks for gathering certain kinds of information, the customer's right to access account information, validation of one's own files, and elimination of individual files after a certain period.
- Access to information by borrowers and credit institutions should be granted on the basis of membership. In other words, the principle of reciprocity should guide credit bureaus and should be stated in the contractual agreement between the bureau and credit institutions. Membership should not be based on fees in any form. However, credit bureau activity should be profit-oriented. In cases where a member provides inaccurate information or fails to provide data, sanctions (ranging from fines to loss of membership and hence denial to the bureau's files) should be imposed.
- Credit bureaus are exposed to potential conflicts of interest, especially if they are owned by a group of lenders (each lender wants to exploit the information provided by other lenders without disclosing his/her own). Therefore, Armenia should adopt a balanced-ownership policy. For example, credit bureaus could be incorporated as private companies and owned by a consortium of lenders to create the incentive for information exchange. Alternatively, independent ownership, coupled with a proper membership policy, could serve as an incentive to lenders to exchange information.
- Apart from the efficiency debate and the coexistence of different institutional arrangements, there is concern regarding the optimal amount of information sharing and its content. In contrast to relying on the general statement that information dissemination reduces adverse selection problems (due to bad risks in the population of credit seekers) and makes the information on which banks base their lending decision homogenous, the policy

for the development of an efficient credit-information sharing system should be focused on the regulation of the quality of the disclosed information.

- Furthermore, the authorities should work to enhance corporate governance, which is weak. While company law is sound, implementation is weak. Many corporations and some banks are not listed, and they may have relatively few owners who do not see the benefits of adopting the governance structures covered by the law (that is, open and closed joint-stock companies) that are intended to ensure good corporate governance. There is a need to broaden the coverage and enhance the enforcement of company law to strengthen disclosure, accounting, and oversight by corporate boards of directors.

*Corporate Governance* Corporate governance in Armenia is weak owing in large part to the lack of transparency of ownership and control in the banking and corporate sectors. The Detailed Assessment of Compliance with the OECD Principles of Corporate Governance indicated that while company law governing open and closed joint-stock companies is sound, implementation is weak. Only a limited number of corporations and banks choose to operate under this law, which is covered under securities legislation and enforced by exchanges and securities commissions. Many entities are closely held, are not publicly traded, and may have few owners who do not see the benefits of adopting a more formal governance structure. Hence, the enforcement of sound corporate governance practices through securities legislation and securities regulators is weak. There may be a need for a fundamental reform to enhance the coverage and enforcement of company law if corporate governance, disclosure, and accounting are to improve.

The opaque ownership structure of the corporate sector makes it more difficult for the banking sector to assess the risks on corporate sector exposures. Official disclosures of direct and indirect ownership are substantially weaker than in other transition economies. No disclosure of beneficial owners is required under Armenian law. This limits the ability of banks to ensure compliance with prudent limits on loan portfolio concentrations and related party transactions. Although legislation requires all companies to prepare their financial accounts in line with the Accounting Standards of the Republic of Armenia, in practice these standards are not observed or implemented, partly because of lack of training. Steps should be taken to improve accounting and auditing practices and financial reporting requirements and to strengthen public information, including information regarding beneficial owners of banks and publicly traded companies. Furthermore, the supervising boards of

Armenian companies are not sufficiently effective or accountable. The company law should establish the separation of company owners from company managers and should strengthen and clarify the fiduciary duties and accountability of boards of directors.

These shortcomings in corporate governance can be addressed through legal, institutional, and supervisory reforms. Given the weak implementation of company law, the Central Bank has developed a proposal to accelerate improvements in corporate governance in the banking sector through legislative and supervisory means and by introducing upward-consolidated supervision to address exposures to beneficial owners. There are a number of specific reforms applying to the corporate sector that should be implemented to address the shortcomings in corporate governance. They include improvements in accounting and auditing practices; financial reporting requirements; enhanced disclosure of the shareholders of corporations; improved access to information by the public, in particular by making the company registry publicly available; and strengthening the role of boards of directors.

### **Bureaucracy**

A further problem for businesses in Armenia is the failure of the government to issue VAT refunds to those companies that are primarily or solely engaged in exporting. For example, a company that exports smelted copper is owed large refund amounts that stretch over more than 12 months. While this is not an issue that can be said to impinge directly on competition in Armenia, it is another illustration of the failure of the state to protect property rights and the rights of businesses, and it is a further example of the limited benefits of being formal. Similar problems are reported by one of the major hotels in Yerevan, which is having difficulty getting VAT refunds on the cost of building.

A recent FIAS Report (World Bank 2004b) highlights the role of the tax authorities in raising transactions costs. Over 80 percent of respondents indicated dissatisfaction with their dealings on tax issues. Within the tax system and tax administration the most problematic issues are the “extra-legal requirement for advance payment of taxes,” the “frequency of changes in rules and rates,” and the “availability of information regarding the laws and regulations.” While these data must be interpreted cautiously (Armenian businesses are not known for their compliance with the tax codes), the widespread dissatisfaction with the lack of transparency of the process is indicative of the extent to which taxation can be used as an instrument for harassing entrants into areas that are dominated by incumbents.

## CONCLUSIONS AND POLICY IMPLICATIONS

There is little doubt that there is a serious lack of competition in some sectors of the Armenian economy. The preceding analysis indicates that in several sectors, particularly those related to imports and distribution, monopoly profits are being earned by a small group that is profiting greatly and imposing welfare losses. This chapter concludes that the concerns regarding lack of competition are warranted. It identifies three separate areas of the economy where competition, or the lack of it, is an issue. These areas are the following:

- the traditional sectors that are regulated—utilities and natural monopolies
- areas in which competition is widely perceived to be restricted, especially petroleum, sugar, wheat, and flowers
- barriers to entry that maintain the position of market incumbents

Nevertheless, it is important to recall that Armenia has been among the fastest-growing economies in the world for several years. This rapid growth is all the more noteworthy because it has taken place against a backdrop of closed borders.

Lack of competition, however, carries long-run efficiency implications as well as the danger that the apparent concentration of wealth could reduce political support for reform and limit the benefits of rapid growth. There is ample evidence of poverty in Armenia, even in Yerevan, and outside of the capital it is far worse. Poverty reduction requires that the benefits of growth are realized by the mass of the people. The more that competition is restricted and activities are reserved for incumbents, the less likely it is that the benefits of growth will be widespread.

There are additional unfortunate consequences of the dominance of the oligarchs in some sectors. The concentration of wealth provides substantial ability to grant “favors” to officialdom to subtly (and sometimes not so subtly) hinder competitors entering the market. The phenomenon of roofs, discussed in the section on business practices, is one manifestation of the way in which incumbents maintain their market power. In other cases, it appears that there are direct attempts to prevent competition. Widespread subversion of the “rules of the game” by the rich and powerful sends strong messages to those who are on the outside. It contributes to a general attitude that taxes should not be paid, officials should be bribed, and goods should be smuggled. This does nothing to develop the foundation for a modern competitive economy.

## **Geography and Competition Policy**

The Armenian economy is small and remote. One of the aims of policy should therefore be to ensure that nothing exacerbates these geographic facts of life. In particular, policy should ensure that communications and transport are as low cost as possible. In the past, this principle has not been adhered to and almost appears to have been designed to intensify the disadvantages of Armenia's geographic limitations. The ill-conceived awarding of the telecommunication monopoly to ArmenTel has substantially raised the cost of communications. The policy regarding regulating flights into and out of Yerevan raises the cost of traveling to and from the country. There is no valid economic reason for these restrictions. The government has started to take action regarding the telecommunications issues. It should take similar measures with regard to air transport and should declare an Open Skies policy, allowing any airline that wishes to fly to Armenia to land at Yerevan.

## **Regulated Sectors**

In the sectors that are traditionally the object of regulation, progress is being made. Actions are being taken to deal with the ArmenTel monopoly, and telecommunications regulation will come under the jurisdiction of the PSRC once pending legislation is passed by Parliament. Regulation of power generation and distribution, as well as natural gas, has advanced. Both of these industries are also regulated by the PSRC. The functioning of the PSRC appears to have improved—for example, they have reversed price increases in the energy sector. Although it is possible to quibble about the methods used as well as some of the details of regulation, there is no doubt that in this area significant progress has been made.

There are concerns regarding regulation in sectors that are still state-dominated, especially the railways, which are a vitally important industry given Armenia's transport problems. Currently, railways are both administered and regulated by the Ministry of Transport and Communications. Transport-intensive industries such as mining complain that attempts are being made to raise tariffs without any apparent justification. No options should be dismissed without consideration, including privatization of the railways and bringing regulation under the purview of the PSRC. Regulatory capabilities are scarce in Armenia, and consolidation under one body, which could then be the recipient of intensive technical assistance, could be the best policy option.

### *Areas Where Competition Is Restricted*

This chapter examines sectors of the economy that are widely regarded as suffering from lack of competition through monopoly and the restriction of competition in the distribution chain. It concludes that there is evidence that prices are higher than they would be if there were more competition, and that welfare losses are significant. Most of the sectors discussed are involved with the distribution of imported products. In one sense, the problem would disappear immediately if there were the ability to import freely. However, the chapter points out that customs has become an instrument for maintaining the monopoly position of incumbents. There are several things that can be done about this situation.

The first is to increase the transparency of the process. When light falls upon irregular practices, they tend to decline. Two steps are possible in the short run. First, make the computerized customs database available to brokers, including the clearance of all goods, so that restrictions on shipments must be explained. Second, make the customs examinations more transparent by following the letter of the law in this regard. All examination papers and the marking of the papers should be available for inspection.

Whether this is feasible from a political economy perspective is another matter. Recommendations for the reform of customs have been made by donors almost from the time of the country's independence. Some progress has been made, particularly with respect to the procedures related to Armenia's WTO accession. Nevertheless, there is still a long way to go in this regard and the process is clearly the main way in which monopoly positions are maintained. Since the number of access points to Armenia is limited as a result of closed borders with Azerbaijan and Turkey, the effectiveness of restricting certain imports is enhanced. In addition, the use of reference pricing is still widespread, in contravention of WTO undertakings. Although customs and revenue officials claim that it is necessary to check invoices in order to ensure that there is no cheating on VAT payments, there are alternative procedures that allow goods to be cleared pending a check on prices that are used successfully in other countries. There is no reason why these methods could not be adopted in Armenia.

Another avenue is open to the authorities to improve competition in the petroleum market. They could require that a high proportion (perhaps 50 percent) of the petroleum imported into Armenia must come from one of the large Western petroleum companies and that the invoices supplied with the shipment are made available for public inspection. Such a step would introduce contestability into the market and would improve transparency.

## The CPEC

In its present form, the CPEC's ability to ensure competitive markets in Armenia is limited. It lacks the resources and the skills to be effective, and it has no power to enforce its own judgments except through the court system, which itself is arbitrary and open to outside influences. The policy question is therefore whether devoting resources to strengthening the CPEC is warranted. Such assistance would take the form of upgrading the CPEC's resources, particularly in the ITC area, upgrading the skills of the CPEC, and perhaps giving it the power to enforce its judgments.

Concerns regarding strengthening the CPEC rest on the understandable desire to avoid yet another layer of bureaucracy that could be used as an instrument to harass business. However, the CPEC is not going to disappear; its existence is enshrined in law and it appears to have powers that so far have been untested. Upgrading its skills is necessary to prevent it from turning into the very institution that some fear it could become. The more professional the CPEC is, the less likely it will turn into an instrument for restricting rather than promoting competition.

## The Long-Term Promotion of Competition and Development

In the long run, promoting competition in Armenia is inseparable from promoting private sector development in the country. The ability to restrict competition frequently arises because the institutions that underlie private sector activity are underdeveloped, providing strong incentives for informal behavior. In Armenia, the public goods that provide the foundation for private sector development are weak. The court system does not function effectively, and arm's length contracting is risky, so that transactions tend to take place among those who know and trust each other. This gives powerful advantages to incumbents. Similarly, the financial system remains underdeveloped even by the standards of low-income countries. Hence, those who have substantial financial resources are in an especially strong position to maintain and strengthen their market dominance. The development of institutions supporting the private sector is the only long-run solution to promoting a competitive market environment. Legal reform, the strengthening of property rights, and corporate governance are some of the measures that will greatly enhance private sector activity. In addition, the institutions of government must be upgraded. They need to be of positive assistance to the private sector, rather than being the instruments for maintaining anticompetitive behavior that they are now. In particular, the reform of the customs service is the key to promoting competition.

### Shorter-Term Measures

Several of the suggestions in the preceding sections could be implemented with little delay. The announcement of an Open Skies policy would signal the government's commitment to establishing a more competitive business environment. An immediate change in the examinations for customs brokers would signal a commitment to transparency in customs procedures, as would giving brokers access to the computerized clearing system. Another measure that would promote competition would be to insist that a certain percentage of imports of petroleum be purchased from one of the large international petroleum companies and that the documentation be made publicly available.

### Suggestions for Further Work

There are a number of areas in which further work is needed in order to suggest more detailed reforms. The most important of these are the following:

- A thorough review of the commercial code is required in order to identify areas that are inimical to modern commercial practice and to suggest reforms. This review should be undertaken not only by lawyers but also by a team consisting of a lawyer and an economist in order to ensure that the incentives inherent in the code are identified from an economic as well as a legal perspective.
- A similar review of the consumer protection law is warranted in order to take stock of the system for consumer protection that underlies the role of the CPEC. Such a review would ensure that the CPEC does not become an instrument for the harassment of businesses and that the incentives in the law make sense from an economic perspective. This review could also look into the feasibility and desirability of establishing a small claims court where consumers and producers who have been harmed by anti-competitive behavior could sue the perpetrators.
- At this point, a stocktaking and review of the regulatory framework is also warranted, to determine how well it is now functioning, where further strengthening is needed, and how the PSRC can be further supported in its work.
- A thorough review is needed of the issues related to secured transactions reform, from an economic as well as a legal perspective. This should include the feasibility of using a similar approach to that taken in Romania (see Annex 10.1 to this chapter).

## ANNEX 10.1

### **An Example of Successful Secured Transactions Reform in Romania**

**R**ecent reform of the secured transactions framework in Romania has transformed the lending environment by facilitating the use of collateral as security for lending, not only by the banking system but also by equipment suppliers, wholesalers, and agricultural suppliers. There were many similarities between the Romanian financial sector before this reform and that in Armenia: severe financial underdevelopment, the inability of a large sector of the economy to access credit, and a distrust of banks. Therefore, use of this model could have significant potential for the development of the Armenian financial system in a way that could substantially reduce barriers to entry.

The essential elements of a well-functioning system of collateral provide for the creation and registration of collateral as security for a loan and its rapid repossession in the event of default. The Romanian reform involved first changing the law and legal institutions and second establishing a privately run registry where security interests regarding the pledging of property as collateral for loans could be recorded. This was done within the context of the civil code system that exists in Romania, which has further lessons for Armenia.

The main features of the reform included the implementation by the government (with the support of the World Bank) of a Law of Secured Transactions that permitted movable property, both tangible and intangible, to serve as collateral for a loan. The second step involved setting up the filing archive to permit the law to operate by recording pledges of property and establishing priority regarding which creditors have the first rights to repossess and sell the collateral in the event of default.

There are a number of innovative features of the secured transactions reform:

- The law abrogated all existing legislation affecting debt, so that there was no danger of ambiguity regarding the validity of the pledges.
- The filing archive in which pledges are recorded is run by an association of lenders, so that the public sector is not involved. The archive is electronic and priority is determined electronically at the time when pledges are recorded.
- No documents are necessary to file a security interest. This allows Internet-based filing, currently the only filing archive in the world to have this feature. The effect is to broaden coverage, particularly in the rural areas, as well as to reduce costs.
- No notaries are involved in the process.
- Repossession takes place outside the court system. If repossession is not disputed, the creditor can simply collect the pledged property. Lenders confirmed that repossession was not a problem.
- In the event of dispute, upon evidence of the validity of the debt, which does not require proof beyond the entry in the filing archive, an officer of the court can seize the pledged property without the necessity of a court hearing.
- Very harsh penalties for wrongful repossession discourage creditors from abusing the system.
- The new law and filing archive are among the most modern in the world, even among the developed countries.

Prior to the new law, credit in Romania was scarce and expensive. The Romanian financial sector was underdeveloped even by the standards of many transition economies and ranked near the bottom of Central and Eastern European economies in terms of financing private sector activities: in 2000, credit from deposit-taking banks to the private sector was equivalent to about 9 percent of GDP. Furthermore, this figure is an overestimate of the true provision of credit because some of it reflects loans from the state banks to bankrupt former state-owned enterprises (SOEs). In 1999, Romanian banks' nonperforming loans amounted to over one-third of total loans. Average real lending rates were high, but effectively there was very little arm's length lending. Financial markets were distorted by subsidized credit that provided opportunities for arbitrage across different loan instruments.

Following the introduction of the secured transactions reform in 2001, the impact on lending in Romania has been dramatic. In the first 18 months after the reform was implemented, there were over

400,000 loans against which security interests were registered. Over 100 banks registered security interests in the filing archive. Since there are 38 licensed banks in Romania, the implication is that scores of non-Romanian banks were lending in the country against collateral and registering their security interests.

Of the security interests that were registered and current in September 2003, nearly 20 percent represented nonbank secured loans. This is especially beneficial in rural areas that do not have bank offices. In addition, the geographic coverage has been extensive. As of 2003, there were filings of security interests in 42 of Romania's 43 counties. The ratio of domestic currency lending to the private sector to GDP rose by 86 percent in the period from 2000 to September 2003, and long-term lending denominated in lei rose sharply from less than 20 percent of total credit to nearly 40 percent. The business community supports the reform enthusiastically. Many of those interviewed spoke positively of the new framework. Bankers and members of the business community were equally enthusiastic. Credit is granted not only to companies in urban areas but also in rural regions where such diverse assets as cows and tractors are taken as collateral. Given the uniqueness of the secured transactions reform, this report recommends that there be an in-depth analysis of its impact. It is important to note, however, that the secured transactions reforms are difficult and require a great deal of attention to detail. Many attempts at secured transactions reforms in developing countries have not been successful and some are already being redone: the secured transactions reform in Ukraine initiated by the World Bank is an effort to redo the unsuccessful USAID reform of a few years ago.

## NOTES

1. This chapter was prepared by Paul Holden, Enterprise Research Institute, Washington, DC.

2. Moreover, the latter two organizations do not provide a competitiveness ranking for Armenia. This is due to the lack of relevant data and survey studies. A recent initiative will provide the WEF with the necessary information to include Armenia in their "Global Competitiveness Indicators" report.

3. For definitions please refer to the "Business Competitiveness Indicators" published semiannually by the Department of Trade and Industry in the United Kingdom (<http://217.154.27.195/sd/bci/index.htm>). We have not constructed business survival rates, claimant counts, or income deprivation, owing to the lack of data.

4. Business formation, employment, and average earnings figures are for 2001–04; gross value added figures are for 2000 and 2001.

5. The conclusions in the bulleted points that follow are a preliminary assessment; a deeper analysis based on the kind of data not yet available is required to draw firm conclusions.

6. These findings are based on evidence provided by the sample survey conducted by the NSS in 2002.

7. The dispute arose from existing inefficiencies. The mobile phone cards issued by ArmenTel were sold at a high premium on a secondary market. ArmenTel issued insufficient quantities of calling cards to meet the demand and the price was bid up to 3 or 4 times the face value of the cards. In addition, ISPs (Internet service providers) were required to go through ArmenTel to connect to the Internet, which resulted in unreliable connections and restricted their ability to compete on price. Service was also limited to modem connections only. ArmenTel maintained a monopoly on high-speed connections and charged prices that are 20 to 30 times more than countries with competition in the telecommunications sector.

8. ArmenTel was granted exclusive rights to a wide range of services under the 2004 license. However, Article 4.D states that under some conditions (which collectively may be called cases of inactiveness of the licensee in providing services), the regulator may allow another person to provide these services. It is difficult to imagine a situation where ArmenTel does not provide, among other things, fixed-line, international call, and mobile services.

9. Except for small producers, which can sell at a predetermined price until 2007.

10. Another possible form of restructuring is complete vertical separation. Under this arrangement the management (and, possibly, the ownership) of facilities is fully separated from other rail functions. The main advantage of this vertical unbundling is that rail transport is placed in a similar situation as road transport, especially regarding infrastructure planning. However, this form of restructuring is *currently* unacceptable to the Armenian railway sector given the reasons outlined in the chapter.

11. Integrated means that the operator controls not only the infrastructure but also other railroad services.

12. The theory of contestable markets (Baumol, Panzar, and Willig 1982) helped clarify the proper definition of the natural monopoly concept. It is true that duplicating the network infrastructure in the railway industry is generally inefficient due to fixed costs that, in addition, are largely sunk. Hence, the physical network is characterized by natural monopoly and there are significant entry barriers. However, the approach may be modulated if we consider a situation in which the main activities are subject to effective competitive pressure.

13. As an example, consider the case of the Gold Mining Company. With the competitive access option implemented, if ceiling prices were set using stand-alone cost practices, the integrated carrier would have ordinary business incentives to find and cooperate with efficient participants in its businesses

(say, finding a new company that is cost-efficient in loading and unloading freight), as the result of this cooperation would reduce the overall cost of serving a particular shipper and leave them with extra profit to share.

14. A comprehensive analysis is contained in Chapter 13 of this book. The study includes detailed recommendations and suggestions for the liberalization of the aviation sector and its effective regulation.

15. Customs brokers were legalized only three years ago.

16. Licensing fees are US\$500 per year, very high in a country where civil servants' salaries rarely exceed US\$100 per month.

17. Importers are required to present original documents, including the invoice, the contract covering the import, the certificate of origin, and an export declaration from the country of origin.

18. The CPEC has investigated a number of recent cases, among which was the successful elimination of a monopoly granted by the airport operator to a taxicab company. There have also been several hearings concerning the abuse of monopoly power by ArmenTel. The company had cut off the telephone lines of some Internet service providers (ISPs) without prior notification, suspecting them of providing VoIP service in Armenia. In almost all cases the CPEC made decisions in favor of the ISPs and fined ArmenTel to cover the losses incurred by ISPs.

19. A four-page analysis concluded that there is competition in the distribution of petroleum because of the fact that there are several wholesalers/importers within Armenia. The paper does point out that there is only one supplier/seller to the wholesalers but appeared not to view this as a problem.

20. Which attitude is the most relevant in practice is largely an empirical question. Overall insights demonstrate that difficulty in obtaining funding, rather than fear of aggressive behavior by an incumbent, is the factor which prevents firms in Armenia from entering the market.

21. The data for Armenia appear as percentages superimposed on the figures. For the countries in the sample, the figure is based on the ratio of credit to the private sector from deposit money banks and other financial institutions. For Armenia it is the ratio of credit to the nongovernment sector (sample of 47 countries). High-income countries are defined as countries where GDP per capita in 1999 was higher than US\$10,000.

22. For a more comprehensive review of collateral issues, see Holden (1997). Upper-middle-income countries are defined as countries where GDP per capita in 1999 was between US\$3,000 and US\$10,000. Lower-middle-income countries are defined as countries where GDP per capita in 1999 was between US\$1,000 and US\$3,000. Low-income countries are defined as countries where GDP per capita in 1999 was lower than US\$1,000 (Source: *International Financial Statistics* Database [<http://ifs.apdi.net/imf/>] and the World Bank's WDI Database [<http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:20899413~menuPK:232599~pagePK:64133150~piPK:64133175~theSitePK:239419,00.html>].

23. Some advocate “relationship lending” in terms of which banks make loans on the basis of the analysis of business plans and the borrower’s history as an entrepreneur. This is unlikely to happen. First, most lending to businesses in the United States is secured by collateral. Second, the skills available for drawing up business plans are scarce. Third, those who have run businesses successfully are often the entrenched interests in Armenia, so that loans go to those who have tight control of the business sector.



## CHAPTER 11

# **Real and Formal Ease of Doing Business in Armenia in Comparative Perspective: Implications for Regulatory Reforms**

“Those who wish to offer their countries the chance to become a modern society must direct their efforts not only toward eliminating certain conditions—the barriers of access to formal activity, the costs of remaining legal, the discrimination in capital markets, the state corporations—but also toward creating the basic institutions on which efficiency, social peace, and spontaneous cooperation are based in more advanced nations.” (De Soto 1999, p. 259)

### INTRODUCTION

Well-developed, market-supporting institutions, the contestability of domestic markets, the capacity of a government to enforce the rule of law, and macro-stability are all crucial to establishing an environment friendly to conducting business operations.<sup>1</sup> But so are regulations and other conditions influencing the transaction costs of business operations. Regulations, while important, do not have to be unnecessarily burdensome or costly, thereby deterring the entry of new businesses or undermining the competitiveness of existing ones.

The high “hassle” cost of conducting business provides a strong disincentive to establishing new firms and encourages existing firms to slip into the informal economy. In a similar way, burdensome customs procedures, the low efficiency of ports, high transportation costs due to regulatory arrangements, and high costs of other services raise transaction costs and undermine the competitiveness of domestic producers in international markets. To successfully take advantage of growth and employment opportunities in domestic dimensions, the hassle cost of conducting business has to be reduced in both domestic

and foreign dimensions. Better facilitation measures for foreign trade will be of little relevance if the domestic environment discourages the entry of new businesses and encourages the exit of firms either permanently or to the informal economy. Similarly, the limited capacity of firms to recover payments due from other firms discourages increased ties and limits the intensity of business activity, with negative consequences for domestic production and exports.

This analysis focuses on the domestic dimension of conducting business using the results of the World Bank's Doing Business survey (<http://www.doingbusiness.org>). In contrast to various other assessments of the quality of governance,<sup>2</sup> the Doing Business survey captures the tangible legal components of the investment climate together with their cost-burden and time-burden imposed on businesses across 145 countries (Djankov et al. 2000). The World Bank's Cost of Doing Business comparative survey (World Bank 2005) provides a useful diagnostic tool for conducting an initial assessment of the quality of the business environment in Armenia. It provides data on the tangible components shaping the cost of conducting business in Armenia and allows casting them in a comparative perspective. The survey covers the following seven areas: starting business, labor market flexibility, registering property, contract enforcement, bankruptcy, protection of investors, and getting credit. Each area has several different indicators ranging from 1 (protection of investors) to 5 (getting credit and labor market flexibility). These are not firms but local professionals dealing with issues related to each of these areas that have been surveyed in respective countries in both large cities and rural areas. The Cost of Doing Business's advantage over surveying firms is obvious. Professionals deal with respective issues on a day-to-day basis, whereas firms confront the issues only to the extent that the issues directly affect them. The former have an overall view, whereas the latter do not.

The procedure used to assess the ease of doing business in Armenia consists of two stages. First, we identify Armenia's relative position among transition economies in terms of an overall, formal ease of doing business. We identify best-practice indicators for each "doing business" area—not worldwide but among transition countries. Indicators for countries are expressed in terms of percent of the best practice set at 100. These are demanding benchmarks, as two transition countries—Lithuania and the Slovak Republic—are among the top 20 economies in the world on ease of doing business. We average the benchmarks for each of the seven areas covered in the Doing Business survey to obtain an overall assessment of the ease of doing business for each country.

Second, in order to capture the full extent to which the business environment is friendly or unfriendly, we bring to the fore the size

of the informal economy. The rationale is straightforward. The use of Cost of Doing Business indicators allows assessing the extent to which a country deviates from the best practice on each indicator within each area in terms of business laws and regulations. It does not address the quality of the state administration. Neither does it assess hassles associated with tax policies, tax and customs administration, frequency of inspections, cost of licenses, and so forth. While there are many explanations why businesses decide not to go formal, three reasons stand out: low chances of getting credit, fear of predatory administration and discreetly applied taxes, and lack of trust in the state's capacity to enforce contracts. While the survey captures both getting credit and contract enforcement, it does not capture informal administrative interventions. Moreover, the overall ranking procedure assigns the same weight to all areas of doing business, and within each area the procedure assumes that each indicator implies similar levels of ease or hassle. Regulations may be very liberal on all indicators within an area except one: as a result, a country may have a very high overall score in an area, while in reality one barrier makes other friendly regulations completely irrelevant.

The size of the informal sector provides indirect information on the weight of formal barriers as well as on variables not covered by the Doing Business survey. We assume that the sector provides information equal in terms of weight to the overall formal ease of doing business. Therefore, we take the average of performance in terms of the informal economy and ease of doing business as an indicator of the quality of the business environment. This index is referred to as the "revealed" or real ease of doing business.

Detailed analyses of Armenia's performance on each indicator in each area follow the logic presented above, but with a twist. First, strengths and weaknesses for each area are identified and assessed in the context of other transition countries. Second, since there appears to be a gap between Armenia's relatively good performance in the formal ease of doing business and the large size of the informal sector, the analysis proceeds to identify factors that discourage firms to go formal.

## **OVERALL EASE OF DOING BUSINESS IN ARMENIA AND OTHER TRANSITION COUNTRIES**

Table 11.1 presents the ranking of CIS and CEEC-10 economies in terms of the ease of doing business.<sup>3</sup> For each area, the values of indicators were normalized in terms of best practice in CIS and CEEC-10 economies. For instance, two areas of flexibility of employment are taken into account: (i) the Rigidity of Employment Index, which is an average of three indices (hiring, hours, and firing); and (ii) firing

costs, expressed in the number of weeks that an employer has to pay wages. Every indicator for each country is expressed in values ranging between 100 (best practice among CIS and CEEC-10 economies) and a lower value that is larger than zero. However, the value of the indicator is set at zero—representing the worst possible practice—when what might be said to be the law of jungle prevails, for example, in the absence of any laws or regulations directed at protecting the interests of domestic or foreign investors. The aggregate index of the ease of doing business in the post-communist world is the average of average values for each area.

In terms of the overall formal ease of doing business, Armenia ranks sixth among 20 transition economies. Doing business across all areas is on average easier than in three new EU member states (Hungary, Poland, and Slovenia) and easier than in all other CIS countries as well as in Bulgaria and Romania, the newest members of the EU.

Only three Baltic states (Estonia, Latvia, and Lithuania), the Czech Republic, and the Slovak Republic—all of them with strong reform credentials—score higher than Armenia. Within areas, Romania ranks highest in starting a business, the Slovak Republic in flexibility of the labor market, Lithuania in registering property and enforcing contracts, Latvia in closing a business, the Slovak Republic together with the Czech Republic and Lithuania in protecting investors, and the Czech Republic in access to credit (the high scores are marked in italics in Table 11.1).

Armenia owes its elevated ranking to the greater flexibility of its labor markets as compared to those in other transition economies; but broader comparisons suggest that labor markets are fairly rigid, particularly taking account of the size of compulsory severance payments. It owes its ranking also to simplicity and effectiveness in enforcing contracts and effective procedures in closing a business. Armenia's weakest areas are registering property and access to credit. Overall, however, even in the most streamlined and reformed areas, the level is well below the best practices in transition economies.

Armenia's scores do not set it apart from countries ranked higher in ease of doing business, as even countries with the best indicators for any given area have a long way to go to catch up with the best practice. As can be seen from the last line of Table 11.1, the distance is particularly large for labor market flexibility and registering property. While the comparison involves "ideal types," (that is, nonexistent economies with the best set of indicators either region-wide or world-wide), it nonetheless demonstrates that even the best practice in the region is far away from the best practice in the world.

The obtained ranking in terms of overall ease of doing business is surprising in two respects. First, considering the pressure of accession to the EU and the achieved degree of harmonization with the *acquis*

TABLE 11.1 RANKING OF CIS AND CEEC-10 ECONOMIES BY EASE OF DOING BUSINESS IN 2005

<i>Country</i>	<i>Starting business</i>	<i>Flexibility of employment</i>	<i>Registering property</i>	<i>Enforcing contracts</i>	<i>Closing business</i>	<i>Protecting investors</i>	<i>Getting credit</i>	<i>Ease of doing business</i>
Armenia	47	64	38	65	68	50	37	53
Azerbaijan	44	33	29	56	43	33	24	38
Belarus	18	50	48	54	44	17	44	39
Bulgaria	35	46	19	48	41	33	69	42
Czech Republic	33	56	28	72	18	100	89	57
Estonia	40	37	40	83	45	67	63	53
Georgia	39	51	18	54	53	83	56	50
Hungary	34	38	27	76	36	83	40	48
Kazakhstan	41	69	18	60	24	83	23	45
Kyrgyz Republic	70	54	22	28	53	50	31	44
Latvia	48	30	15	77	100	83	70	61
Lithuania	58	37	74	86	68	100	40	66
Moldova	33	50	26	51	41	50	36	41
Poland	32	49	19	51	60	67	57	48
Romania	79	17	17	51	27	33	53	39
Russian Federation	43	69	21	62	77	50	13	48
Slovak Republic	39	100	27	49	31	100	54	57
Slovenia	28	28	20	45	27	67	48	38
Ukraine	27	17	14	65	32	50	28	33
Uzbekistan	33	39	10	45	47	67	39	40

Source: Own calculations based on data in WB 2005.

*communautaire*, that is, the body of laws governing relations within the European Union communities, one would expect the CEEC-10, in particular the 8 new EU member states, to dominate the top 10 countries in terms of the formal ease of doing business. To a large extent this is the case, as 5 new members top the list. But two CIS members—Armenia and Georgia—outperformed Poland. Furthermore, another CIS country, Russia, also appears to have a friendlier regulatory framework for conducting business than two other new EU members, Hungary and Slovenia. The latter appears to have the most burdensome regulatory regime next to Ukraine, which is at the bottom of the list (Table 11.1). Bulgaria and Romania are relatively low in ranking in the formal ease of doing business, although they have already signed a protocol accession to the EU indicating the European Commission's seal of approval of their institutional and policy readiness to meet the requirements of membership scheduled for 2007. In addition to the countries mentioned above, Bulgaria ranks thirteenth, below Kazakhstan and the Kyrgyz Republic, while Romania ranks sixteenth, below Uzbekistan and Moldova.

In contrast to most CIS economies, all CEEC-10 economies appear to score high on indicators describing the quality of the legal infrastructure of financial markets, in particular the bankruptcy laws and collateral as well as market information on the quality of borrowers. They compare favorably with international standards. But some of them, most notably Slovenia, clearly fail on other counts.

Second, the relatively high position of Uzbekistan, a country that has made little progress in establishing market-supporting institutions, comes as another surprise. Its high position is due to the laws protecting investors and the ease of closing a business. These two areas alone are unlikely to encourage business start-ups and new investments in the presence of other impediments.

Both surprises stem in large part from the fact that the Doing Business survey takes into account selected formal ingredients of the business climate. Furthermore, the procedure that we use to rank economies in terms of the overall formal ease of doing business assigns equal weight to areas and indicators within areas. For instance, a low number of procedures would put a country higher up, which might not be offset sufficiently by a lengthy period needed to complete a procedure.<sup>4</sup> As a result, the ranking may be higher than the actual ease of completing a required procedure.

### **"REVEALED" EASE OF DOING BUSINESS**

The ease of doing business indicators for CIS/CEEC countries cannot capture each important ingredient determining the quality of the

business environment, simply because they are not designed to do so. Two examples illustrate what is left out.<sup>5</sup>

First, one of the “real world” tests of the quality of the regulatory regime is the size of the informal sector. Weak enforcement of property rights and difficulties in access to bank credits, combined with a capricious, corrupt, and predatory administration, keep businesses in the shadow economy. This implies that in countries with a higher value of the aggregate indicator for ease of doing business, the informal economy should be smaller, and vice versa. For instance, international evidence suggests that labor market rigidity is closely associated with the size of the informal economy (that is, the less flexible labor arrangements are the more frequent is exit to the informal sector).

Yet the value of the correlation coefficient between values of the overall ease of doing business indicators and the size of the informal economy in terms of gross national income (GNI) is, as expected, negative, but still low at 38 percent.

Upon closer examination, this finding should not come as a surprise. Consider for instance a simple, relatively business friendly regulatory regime deficient in one dimension, namely, very difficult access to credit. This alone might discourage an entrepreneur from registering a small firm: while there is no reward in establishing credit, there is a penalty in terms of formal payments. Considerations of tax evasion and avoiding other possible nuisances from the state administration may prevail over going legal. This seems to be the case with many CIS countries, especially Russia and Armenia, both of which score high in other areas of doing business but rank relatively low in the area of getting credit. In both countries financial markets function poorly, nullifying one of the main reasons for going formal. Poor market functioning does not provide Armenian businesses with incentives to formalize, particularly since this situation also allows petty officialdom to target formal businesses with inspections that have payoffs as their aim.

On the other hand, easy access to credit provides an incentive to move to or stay in the formal sector. For an entrepreneur seeking access to financing as well as to the system of formal contracting and legal protection in business transactions, credit alone may override concerns about other formal hassles associated with doing business. Access to credit probably explains the relatively low size of the informal economy in Poland or Slovenia, despite significant barriers to doing business.

Second, one would also expect the ease of doing business to be positively correlated with the falling incidence of corruption. But again this is not the case, at least when using the values of the Corruption Perception Index (CPI), annually estimated by Transparency International surveys, as a measure of the incidence of corruption in a

country. The correlation with ease of doing business values is positive but low at 33 percent.

Since corruption is highly correlated with the size of the informal economy, the use of the latter takes care of issues that are left out in the overall ease of doing business indicator. The ranking in terms of the values of CPI, averaged over 2000–04, does not widely diverge from that generated by the size of the informal economy. Countries perceived as having a lower incidence of corruption (that is, a higher value of CPI) tend also to have a smaller informal sector in terms of GDP. The correlation between corruption and the informal sector is 67 percent. Excluding the biggest spoiler, Belarus, the correlation goes up to 79 percent.<sup>6</sup>

Thus, a comprehensive assessment of the quality of the business climate should take into account both the formal ease of doing business and the size of the informal sector. Since the size of the informal sector is a less subjective measure than a CPI and both are strongly correlated, it is sufficient to incorporate information about the informal economy into the composite index of ease of doing business.

The proposed measure, which is thereafter referred to as the “revealed” overall ease of doing business,<sup>7</sup> assigns equal weight to formal ease and the size of the of informal economy. The size is expressed in terms of GNI and is normalized along similar lines as indicators of ease of doing business (Table 11.2). The values of the informal sector size are expressed on a scale from 1–100, with 100 assigned to the lowest value of the informal sector in CIS/CEEC countries. The Slovak Republic has the lowest size and therefore the value taken into account in calculating the “revealed ease” is 0.5 of 100. The lowest normalized level of this indicator is 28 for Georgia, with the highest informal economy of 67.3 percent in 2003.

Except for Uzbekistan’s high position, where the relatively low size of the informal economy may be due to strong state controls, the relative rankings reflect countries’ progress in building an institutional environment supporting private business activity. New EU members occupy the top 8 spots, with Slovenia moving up 11 spots compared to the overall ease of doing business indicator. On the other hand, several countries have dropped in overall ranking, with Georgia going down 10 spots, followed by Russia and Armenia.

Thus, incorporating the size of the informal sector would appear to provide a better indication of the business-friendly conditions of the existing regulatory arrangements than an indicator of an overall ease of doing business. As demonstrated above, the informal sector and unfriendly business regulation usually go together, with some exceptions. For reasons discussed earlier, the regulatory regime in Slovenia, despite the apparently heavy burden it imposes on businesses, does not encourage entrepreneurs to go underground. However, appar-

TABLE 11.2 SIZE OF THE INFORMAL ECONOMY AND “REVEALED” EASE OF DOING BUSINESS

<i>Country</i>	<i>Informal economy percent of 2003 GNI</i>	<i>“Revealed” ease of doing business indicator</i>	<i>Overall ease of doing business indicator</i>	<i>Difference between revealed and overall indicator</i>	<i>Memorandum: CPI, 2000–04</i>
Armenia	46.3	46.8	6	5	3.0
Azerbaijan	60.1	34.5	18	2	1.9
Belarus	48.1	39.2	17	1	4.1
Bulgaria	36.9	46.4	13	-1	4.0
Czech Rep.	19.1	77.8	4	-2	3.9
Estonia	n/a	74.0	5	-2	5.7
Georgia	67.3	39.3	7	10	2.1
Hungary	25.1	61.5	10	-5	4.9
Kazakhstan	43.2	44.6	11	3	2.3
Kyrgyz Rep.	39.8	45.8	12	1	2.2
Latvia	39.9	53.9	2	5	3.8
Lithuania	30.3	64.2	1	3	4.7
Moldova	45.1	41.4	14	2	2.3
Poland	27.6	58.2	8	-2	3.8
Romania	34.4	47.2	16	-6	2.7
Russian Federation	46.1	44.4	9	6	2.7
Slovak Rep.	18.9	78.5	3	-2	3.8
Slovenia	27.1	53.7	19	-11	6.0
Ukraine	52.2	34.6	20	-1	2.3
Uzbekistan	34.1	47.7	15	-6	2.5

*Source:* Authors’ calculations based on data in WB 2005 and Web site of Transparency International (<http://www.transparency.org/>).

*Note:* CPI is the average for 2000–04. 1 = maximum incidence of corruption; 100 = minimum incidence of corruption.

ently friendlier regimes in Armenia, Georgia, and Russia are not sufficient to retain businesses in the formal sector, to the detriment of economic growth and productivity. International experience suggests that productivity levels are two to four times lower in the informal sector than in the formal economy.

When the size of the informal economy does not move in tandem with the difficulty of doing business, it suggests that other ingredients of the business climate that are not captured by the Doing Business survey effectively discourage potential entrepreneurs from entering the formal economy. These other “negative” factors are strongly present in Armenia, Georgia, and Russia.

Negative factors usually stem from capricious and predatory administrations whose interventions effectively weaken the potentially positive impact of regulatory reforms. They include excessive costs of transparency, burdensome tax regulations, and high, unstable tax rates. These factors may raise the hassle cost of doing business to levels not tolerated by most businesses. However, these explanations, together with the incidence of corruption, are generic answers, and more detailed analysis is needed in the particular country context.

### **WEAKNESSES AND STRENGTHS OF THE REGULATORY REGIME**

How does Armenia score in various areas of doing business? We benchmark the values of the respective indicators for Armenia against those for CEEC-8 countries,<sup>8</sup> CIS economies, Russia, New Zealand, and best practice across the globe. The rationale behind the choice of CEEC-8, CIS economies, and Russia as comparators is straightforward. Except for Slovenia, they all share the legacy of central planning or, more precisely, of the overregulation and micromanagement of the economy by the administration. Therefore they provide a meaningful frame of reference for assessing the progress in establishing a business-friendly environment. Furthermore, Armenia potentially competes with them for foreign investments while it does not benefit from the advantage of its geographical location close to the core of the global economy. Russia has the least onerous regulatory environment among CIS economies across all dimensions of doing business, whereas New Zealand scores highest in the world in terms of ease of doing business. Table 11.3 also contains information about the best values worldwide for each indicator. Reviewing the data in Table 11.3 leads to the following general observation: the regulatory burden of conducting business in Armenia is relatively low, especially when benchmarked against CIS and CEEC-8 economies.

On a positive note, Armenia fares quite well in several areas of doing business. Entry is easy. So is exit as well as transferring property rights. It is easy to start a business in Armenia. It costs only US\$64 in administrative fees, requires a minimum capital of US\$44 that the entrepreneur has to deposit before registration kicks in, and takes 25 days. Contrast these entry conditions with US\$116, US\$819, and 32 days in a median CIS economy or US\$142, US\$3,199, and 46 days in a median CEEC-8 economy. Although the difference in favor of Armenia is smaller as far as costs are concerned, when expressed in relation to GDP per capita it remains considerable.

Armenia does not make it difficult—relative to CIS and CEEC-8 comparators—for investors to register property (that is, to transfer the property title from a seller to a buyer). It is a relatively simple operation involving four procedures and costing less than 1 percent of the value of the property. It takes less time (18 days) than in comparator countries, excluding the world's least repressive countries toward businesses.

Neither do Armenian regulations create barriers for businesses that go bankrupt and are forced to exit. Claimants recover 39.6 percent of the amount they are owed. This is less than in Russia but almost the same as in a median CEEC-8 country and considerably more than in median CIS. It also takes less time to resolve foreclosure or bankruptcy and the cost of closing a business is a smaller percentage of the value of a troubled business. The cost (4 percent) is the same as in Russia but the time (1.9 years) is longer.

Since the worst indicator *does the most* to discourage business activity under most circumstances, the following question is pertinent to an overall assessment of the regulatory and policy hassle felt by businesses: which aspects of Armenia's regulatory environment are the most burdensome for private firms? While overall in each area Armenia scores high compared to its peers from CIS and CEEC-8 countries, within some areas the indicators point to weaknesses. These areas are labor markets (firing and hiring), access to credit, and contract enforcement. As for contract enforcement, it takes more money (18 percent of the debt as compared with 14 percent), but other indicators favor Armenia.

In a very important dimension of labor markets, Armenia's business environment has significant weaknesses even when benchmarked against only other CIS countries. The high value of the "difficulty to fire index," combined with an obligation to pay the wages of a fired worker over a period of 30 weeks, significantly reduces the flexibility of Armenia's labor market. More favorable values for the remaining two indicators do little to lessen constraints on hiring and firing in response to business conditions.

TABLE 11.3 DOING BUSINESS IN ARMENIA AND SELECTED COMPARATORS, 2004

<i>Area</i>	<i>Indicator</i>	<i>Armenia</i>	<i>CIS-10 median</i>	<i>Russia</i>	<i>CEEC-8 median</i>	<i>Best practice in CEEC and CIS</i>	<i>New Zealand</i>	<i>Best practice</i>
Starting a business	Number of procedures	10	10	9	9	5	2	2
	Time (days)	25	32	36	46	18	12	2
	Cost (% of income per capita)	7.0	14.2	6.7	12.0	3.7	0.2	0.0
	Minimum capital (% of income per capita)	4.5	23.3	5.6	47.9	0.0	0.0	0.0
Hiring and firing workers	Difficulty of hiring index (0–100)	33	33	0	33	0	11	0
	Rigidity of hours index (0–100)	40	60	60	60	20	0	0
	Difficulty of firing index (0–100)	10	60	20	60	10	10	0
	Rigidity of employment index (0–100)	28	44	27	44	10	7	0
	Firing costs (severance payments in weeks of wages)	30	21	17	21	17	0	0
Registering property	Number of procedures	4	7	5	5	3	2	1
	Time (days)	18	71	354	72	3	2	1
	Cost (% of property value)	0.9	2.2	9.5	2.1	0.5	0.2	0.0

TABLE 11.3 (CONTINUED)

<i>Area</i>	<i>Indicator</i>	<i>Armenia</i>	<i>CIS-10 median</i>	<i>Russia</i>	<i>CEEC-8 median</i>	<i>Best practice in CEEC and CIS</i>	<i>New Zealand</i>	<i>Best practice</i>
Enforcing contracts	Number of procedures	24	29	29	24	17	19	11
	Time (days)	195	324	395	333	150	50	27
	Cost (% of debt)	17.8	18.0	9.5	10.8	8.1	4.8	4.2
Closing a business	Time of insolvency (years)	1.9	3.8	1.5	2.5	1.1	2.0	0.41
	Cost (% of estate)	4.0	7.4	4.0	18	4.0	4.0	1.0
	Recovery rate (cents on the US\$)	39.6	5.3	48.4	39.8	85.0	71.4	92.0
Protecting investors	Investors disclosure index (0–7)	3	3	3	5	6	5	7
Getting credit	Cost to create collateral (% income per capita)	0.9	3.6	11.6	3.7	0.6	0.0	0.0
	Legal rights index (0–10)	4	5.0	3	6	9	9	10
	Credit information index (0–6)	..	0.0	0	4	5	5	6
	Public registry coverage (per 1,000 adults)	..	0.0	0	6	44	0	637
	Private bureau coverage (per 1,000 adults)	0	0.0	0	17	380	978	1,000

Source: Data from World Bank (2005).

.. Negligible.

Research shows the crucial importance of labor market flexibility for both reducing unemployment and boosting investment. While the relationship between low unemployment rates and high flexibility is empirically firmly established, the impact of labor market flexibility on FDI appears to be significant as well. A recent study (Javorcik and Spatareanu 2004) using the labor market indicators from the Doing Business database for 2002 shows that, all else being equal, flexibility in labor markets has a significant impact on FDI flows. For instance, if the flexibility of the host country labor market increases from the level of the Slovak Republic (inflexible prior to reforms in 2003) to the level of Hungary (flexible), the volume of FDI goes up by between 14 and 18 percent. Moreover, in line with intuition, FDI in service sectors appears to be more sensitive to labor regulations than investment into manufacturing.

Armenia also has a relatively low score in terms of investors' protection, with the disclosure index of 3 putting it on a par with Russia. The absence of regulations compelling disclosure has several negative consequences: investment is lower as potential investors fear expropriation, the stock market is undercapitalized, economic growth is lower than under full disclosure, and returns from investment are lower (World Bank 2005, pp. 56–57).

But more powerful financial constraints to doing business relate to other legal underpinnings of financial markets in Armenia. Although the cost of creating collateral is very low by both regional and international standards and the legal rights index is within a median range, this should not necessarily imply easy conditions for getting credit. The contrary is the case, as the difficulties faced by firms in obtaining credit in Armenia clearly demonstrate. The absence of the institutionalized information on borrowers that should be available to the banking sector curtails lending and also offsets the potentially positive impact of the relatively low costs of creating collateral and the decent standards of protection of creditor rights in bankruptcy.

The lack of market information on the quality of borrowers, combined with the absence of a secured transactions framework, is a binding constraint on lending. Furthermore, movable property cannot be used effectively as collateral to secure loans in Armenia, as repossession is time consuming and costly. Neither can collateral-based lending function effectively, as Armenia does not have an effective framework for creating and enforcing claims—that is, a framework for secured transactions is not yet in place (Holden and Sahakyan 2004). The effects of the inadequacies of the collateral framework extend throughout the economy, with the result that banks correctly perceive lending as extremely risky.

The gap between Armenia and the median of comparators is lower in registering property: the number of procedures is only slightly higher (4 versus 3) but it takes significantly more time to complete the process (18 days versus 3 days). This is also the case in closing a business. The time of insolvency is longer (1.9 years versus 1.2 years), although it is lower than in New Zealand (2 years), with the best international practice at 0.41 years. The recovery rate of 39.6 cents on the U.S. dollar (that is, the percent of what creditors collect on their debt) is below Lithuania's level, but similar to the CEEC-8 median of 39.8. An indicator on starting a business is lagging behind comparator values; the indicator is higher than in Lithuania but lower than the median value for the CEEC-8.

Although Armenia appears to be a top performer among CIS countries, this is not sufficient. An important consideration is that Armenia has to neutralize the negative effects of its remoteness to the centers of gravity of global markets and of its being landlocked. The frame of reference for Armenia's regulatory reforms should be at least the best practice in the CIS/CEEC-10 region, if not the best international practice. Here, on both counts, the differences are huge, even though Armenia fares quite well overall in relation to other former centrally planned economies.

### **THE COEXISTENCE OF FORMAL EASE OF DOING BUSINESS AND THE INFORMAL ECONOMY**

Why does such a large informal economy coexist with relatively high formal ease of doing business? The answer may be found in identifying the specific factors that raise the cost of doing business above the "formal" levels, namely those factors identified in the Doing Business survey. In other words, what are the main ingredients contributing to the fact that the actual costs exceed the formal costs of compliance?

Interviews and surveys covering various areas of the business environment paint a picture of general dissatisfaction on the part of businesses with the quality of the regulations, administrative requirements, and bureaucratic behavior of state agencies, despite some improvements over the last three years. The reasons for this assessment are manifold. First, difficulties encountered in interaction with tax administration, compounded by unstable and frequently changed rules and tax rates, are cited as a major barrier to conducting business in Armenia. This is perceived as a bigger problem than corruption by both local- and foreign-owned firms, albeit for local firms corruption continues to be regarded as a significant barrier.<sup>9</sup> Administrative Regulatory Cost

Surveys (RCSs), which have been conducted in Armenia on an annual basis since 2000, persistently identify tax administration as the greatest obstacle to conducting business. For instance, in both 2003 and 2004 more than 80 percent of respondents identified tax administration as the largest obstacle. The view appears to be shared by foreign-owned firms to the tune of 90 percent of all respondents (FIAS 2003). Furthermore, foreign-owned businesses complained that the tax burden in 2003 considerably increased compared to 1999. Uncertainty associated with frequent changes in policy was flagged by around three-fourths of RCS respondents.

The second barrier relates to the costs that businesses have to incur in order to meet the requirements of administrative regulations. According to the RCS, the costs remain huge and there has been no major improvement over the past several years. Most costs are not related to formal and informal payments but to the imposed burden of time and resources that firms must allocate to assure regulatory compliance.

The third barrier is the “irregular” payments extracted by customs and the time consuming procedures. Customs clearance procedures are applied with equal zeal not only to imports but also to exports. The time needed to complete customs clearance as well as the amount of effort undertaken by a firm to deal with customs are shocking, especially for exports. Furthermore, traders are charged by customs for the storage of the held goods. Such conditions add to the overall high cost of conducting foreign trade transactions in Armenia and corroborate businesses’ complaints about nontransparent procedures and nontariff trade barriers.

In consequence, it appears that the most obvious benefits of the computerization of customs services (that is, reducing the release time of consignments and slashing the documentation or bureaucratic burden put on a trader or customs broker) have so far failed to materialize. Neither traders nor customs brokers have access to the system. The old practices of bureaucratic delays fueling corruption combined with lack of capacity in customs administration continue.

Finally, although Armenia is no exception to the generally poor record of most transition countries in establishing the rule of law and strengthening the courts, the situation has improved on several important counts.<sup>10</sup> Armenia has made large strides in judicial reforms and is “the only country where significantly more respondents viewed the courts as fairer in 2002 than in 1999” (Anderson, Bernstein, and Gray 2005). Considering, however, that in 2000 only 2 percent of firms surveyed viewed judges as honest (CES 2000), the improvement should be measured from the low starting point. Fairness, however, does not exhaust all of the dimensions related to efficiently functioning courts.

Other important dimensions from the point of view of conducting business include the perceived honesty or dishonesty of judges, the capacity to implement enacted commercial laws, and the ability to adjudicate disputes in an efficient and timely manner. It appears that firms regard Armenia's courts as relatively honest. In response to a question about the frequency of unofficial payments when dealing with the courts, firms surveyed under Business Environment and Enterprise Performance Surveys (BEEPS) identified the courts as not extracting bribes on a significant scale. The percent of firms negatively assessing courts on this dimension was among the lowest in the region and on a par with Slovenia, Estonia, and Lithuania. Moreover, Armenia, together with Lithuania, recorded the largest improvement among 26 transition economies between 1999 and 2002. Although most respondents perceive the courts in transition countries as neither honest nor fair, the percent of those who do not share this view is comparatively high at 30 percent, putting Armenia in the same group as Croatia and Latvia.

Like most other transition economies, Armenia has experienced the growing gap between the enacted legislation that has laid the ground for a market economy and the capacity of courts to implement new commercial laws. This gap between the extent of commercial legislation existing in 1999 (the so-called "legal extensiveness") and the degree to which it was being implemented at that time (that is, the "legal effectiveness") was particularly high for Armenia. It was well above the level in other transition countries (EBRD 1999). Although this "implementation gap" persisted in 2002, it fell drastically, reaching the level registered in the Czech Republic.

A very important dimension from the perspective of firms is the ability of courts to adjudicate disputes in an efficient and timely manner, as this reduces uncertainty in actual or potential business deals. The BEEPS surveys asked respondents about the fairness, honesty, affordability, ability to enforce decisions, and speed of the courts. Armenian courts had improved dramatically in terms of speed. In fact, Armenia, together with Hungary, Macedonia, Latvia, Lithuania, and the Czech Republic, showed the largest improvement in the perceived speediness of courts between 1999 and 2002. While in 1999 only 10 percent of firms viewed courts as quick, in Armenia this proportion rose to 25 percent of respondents, comparable to Hungary. This should rise further once the case management and court administration systems currently being developed are put in place to help fill the statistical and knowledge gap that has been reducing the effectiveness of the courts in Armenia.

According to firms participating in the BEEPS, Armenian courts are not only quick but also affordable by CEEC/CIS standards.

To sum up, the reasons for the large size of the informal sector in Armenia stem mostly from the high regulatory compliance costs that are due to official and unofficial payments, the instabilities in the state policies toward the business sector, and predatory tax and customs administrations, but not from weaknesses in the judicial system. While efforts designed to reform the judiciary should continue, improving tax and customs administration together with injecting stability into business regulations and policies stand out as major “other” ingredients that account for the gap between the formal and the revealed real ease of doing business in Armenia.

## CONCLUSIONS AND POLICY RECOMMENDATIONS

What does this imply for Armenian reforms? First of all, these “other ingredients” that allow the state administration (for example, tax, customs, and sanitary administrations as well as building inspections) to harass businesses need to be dealt with. Beyond the reform of tax and customs administration and the continuing work on simplifying the state–business interface, other immediate measures might be implemented. These would include fixing tax rates for a specified period of time in a manner assuring the credibility of the government’s commitment; limiting the number of inspections, audits, and fact-finding visits allowed over a specified period of time;<sup>11</sup> and reviewing and simplifying customs clearance procedures.

Although “other ingredients” should be at the top of the reform agenda, this should not imply a lack of urgency in bringing the discussed areas of doing business in line with best practice. Armenia has to neutralize the negative effects of its remoteness to the centers of gravity of global markets and of being landlocked.

While the authorities should aspire to move toward the best practice in each area and in each indicator, some weaknesses could be overcome by instituting “quick fixes.” Such fixes assume that political opposition to the loss of rents usually associated with opaque regulations could be overcome. The fixes might include the following measures in the areas listed below:

- **Getting credit.** Establish market information on the quality of borrowers and undertake other measures that facilitate access to financing. This would involve, in particular, establishing a framework for secured transactions to ensure conditions for collateral-based borrowing.<sup>12</sup>
- **Reforming the labor market.** Review and change labor regulations with the goal of removing those that do not allow for flexible and open (in terms of tasks performed) term contracts; those

that limit the number of work hours or the number of shifts; and those that compel an entrepreneur to pay a severance package currently comprising the equivalent of 30 weeks' wages. In particular, the last should be drastically reduced, if not zeroed, as is the case in New Zealand.

- **Starting a business.** Streamline the number of procedures to two, remove the capital requirement, and lower fees and other administrative charges. Although these significant capital requirements are often justified as protection against damage from failing businesses, countries with the friendliest conditions for business startups impose very small costs, if any. The reasoning behind simplicity and low administrative costs is simple: to encourage new business activity and ensure that it takes place within the realms of the formal economy.
- **Registering property.** Reduce the time needed to register property. Ease of registering property is a necessary condition, albeit not sufficient, to bring assets into the formal sector, which, in turn, allows using the assets to obtain financing.
- **Protecting investors.** Introduce laws covering the remaining areas of disclosure of financial information and ownership that will protect investors and shareholders against fraud. Armenia has three out of seven relevant regulations. However, their positive impact hinges critically on improvements in assuring the legal protection of investors.
- **Enforcing contracts.** Improving contract enforcement is a long-term project involving the review of judicial procedures and the organization of courts. Given its importance, which is growing with economic development, it should be a constant fixture on the government's reform agenda.

Although the hassle cost of doing business has been significantly reduced, the challenge ahead is to bring regulations in line with the best international practice. Because of its remote location from major world markets, Armenia needs to remove all administrative barriers that unnecessarily raise transaction costs including the costs of entry and exit as well as the costs of conducting business operations.

## NOTES

1. This chapter was prepared by Bartek Kaminski, University of Maryland, College Park, and the World Bank.

2. Transparency International CPI scores, EBRD scores of the progress in transition, and the World Bank governance indicators capture either the perception of investors (transparency) of the extent of graft in the country or the

relative performance of a country in terms of implemented reforms (EBRD Transition Reports) or an overall assessment of a country's capacity to govern (Kaufmann, Kraay and Mastruzzi 2003).

3. The CEEC-10 includes eight new EU members (the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic, and Slovenia) and two prospective 2007 members, Bulgaria and Romania. The CIS includes Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, the Kyrgyz Republic, Moldova, the Russian Federation, Ukraine, and Uzbekistan. The Doing Business survey does not cover two remaining CIS members, Tajikistan and Turkmenistan.

4. This should not suggest that streamlining procedures is an exercise in futility. As long as it is accompanied by fewer documents and permissions, it may ultimately help reduce time spent on procedures and will certainly curtail the potential for extracting bribes.

5. For a more detailed discussion, see Kaminski (2005).

6. Countries that "spoil" to the largest extent an otherwise almost perfect picture are Belarus, Slovenia, and the Slovak Republic. The first two have large informal economies and a low perception of corruption, whereas the Slovak Republic has higher corruption in relation to its small informal sector.

7. It is "revealed" because it takes into account the extent to which businesses express a preference to opt out from the official economy or to stay in it.

8. The CEEC-8 countries are the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovenia, and the Slovak Republic.

9. According to the 2004 RCS, 71 percent of respondents identified corruption as a persistent problem, up from 66 percent over the previous year. Interestingly, corruption appears to be much less of a problem for foreign-owned firms than for domestic companies (FIAS 2003).

10. According to the World Bank study reviewing progress in judicial reform in transition economies, progress has been much weaker in all transition countries than in other areas of institutional reform since 1990. Furthermore, firms' perceptions of the legal and judicial systems in transition countries are worse than comparable perceptions in most other regions of the world, according to a recent world-wide survey of business executives (Anderson, Bernstein, and Gray 2005).

11. Although tax officials can conduct only one audit per year, they are allowed to undertake as many "fact-finding" visits, not classified as an audit, as they wish. Furthermore, information obtained during such "fact finding" visits is used in annual audits. The protection of the restriction on auditing is therefore limited.

12. For practical recommendations concerning the design of a legal framework for secured transactions, see Holden and Sahakyan (2004).

## CHAPTER 12

# Armenia's External Performance and Policy Remedies

### INTRODUCTION

Armenia's macroeconomic growth performance has been impressive over the last half decade.<sup>1</sup> So has its foreign trade performance, with exports having emerged recently as the major driver of GDP growth. Yet unemployment continues to stay at double-digit levels and the brain drain has not been reversed, which points to limited employment opportunities across a wide range of skills in Armenia. A World Bank study (2002a) argued that to date Armenia's output growth had not been accompanied by employment generation and poverty reduction, primarily because the business environment was not supportive of enterprise restructuring and new entry for most of the period. From the perspective of 2005, nothing points to any change in this respect. It appears that exports have also had a limited contribution to employment growth.

What can be done to increase growth rates beyond the levels already achieved and, simultaneously, reduce unemployment and poverty? Missed opportunities in the export of goods may be linked to four major barriers that prevent Armenia from fully reaping the benefits offered by globalization and that may jeopardize its impressive export growth performance: stalled structural reforms, transport, network-based information technology, and the customs/VAT rebate regime. Weaknesses in these areas have been responsible for some atypical features of Armenia's export performance, namely, the underrepresentation of unskilled labor-intensive products in its export basket due in large part to the limited participation in the clothing global value chains and the virtual absence of Armenian firms in a new division of labor spurred by production fragmentation. Network trade has been the most rapidly growing component of world trade over the last two

decades. Except for diamonds and software, Armenia appears to have missed this opportunity.

Armenia's two export success stories—diamonds and software—corroborate, with an ironic twist, the above assessment. While the two are different, drawing policy conclusions from their success stories would make it possible to circumvent the weaknesses of Armenia's regime in shaping external interaction as well as to soften the external adversities that are due to the country's geography. More important, these stories demonstrate that benefits from reforms that addressed the above weaknesses might be quick to come because they would tap into two great assets—the high quality of human capital and the Armenian diaspora.

Several observations emerge from this discussion:

- Armenia has largely completed the process of implementing first-generation reforms. Prices are not only stable but are also almost fully shaped by market forces. Armenia's exchange and foreign trade regimes are liberal and do not obstruct trade and financial flows.
- Progress in the implementation of structural reforms has been uneven. For the last three years reforms appear to have stalled. Consequently, there has been no perceptible change in FDI inflows, although they remain some of the highest among CIS economies.
- While structural reforms take time, some measures that would improve Armenia's attractiveness can be implemented with the stroke of a pen. These include establishing a "white list" of companies to receive "flowing treatment" by customs, and a quick VAT rebate scheme.
- Other recommended measures—better regulatory oversight of telecommunications and unilateral open sky liberalization—may take time to implement, but they should be addressed urgently.

Liberalization of trade in services may improve the quality and availability of services through competition, economies of scale, and, last but not least, incentives to policy makers to improve the regulatory environment. The benefits of services liberalization are not limited to the services sectors themselves: they affect all other economic activities. In view of the fact that services contribute on average around 10–20 percent to the production cost of a product and account for all trading costs (transport, trade finance, insurance, communications, and distribution services), the savings from stronger competition from foreign providers can indeed be substantial, as can gains in competitiveness in the international markets of both services and goods.

## **FOREIGN TRADE AND UNTAPPED OPPORTUNITIES: PERFORMANCE, SPILLOVERS, AND FACTOR ENDOWMENTS**

Considering the adverse geopolitical conditions peculiar to Armenia and the country's lackluster trade performance through most of the 1990s, the very strong export growth performance after the contraction preceding the Russian financial crisis in August 1998 comes as surprise. Contrary to various assessments following the economic stagnation in 1998–99 the Armenian economy has displayed surprising vitality, driven mainly by its impressive export growth performance. This vitality indicates an important turnaround in Armenia's post-central planning economic performance in three important dimensions.

First, the turnaround is based on restructured industrial capacities. The inherited industrial capacities that were incompatible with market disciplines appear to have been mostly dismantled; the emerging industrial structure meets the demanding requirements of international markets, as witnessed by the export growth performance. No other CIS economy recorded such strong growth in 1999–2003. Armenian firms have also outperformed other non-oil CIS competitors in both the CIS (Russian) and the EU markets, with their shares in the respective markets increasing significantly in the 1999–2003 period. Their share in total EU imports doubled in 2003 alone. Against the background of falling Russian imports from most CIS countries, the Armenian performance appears particularly impressive, with the value of exports of goods more than doubling between 1999 and 2003. Trade with the CIS appears to be driven no longer by the post-Soviet hysteria in trade patterns, with the emerging trade reflecting a comparative advantage in these now increasingly competitive markets as these countries make progress in structural reforms.

Second, the readjustment in the geographical pattern of trade reflecting the economic weight of regional markets appears to be complete. While in 1995 Russia, together with other CIS countries, took 56 percent of Armenia's exports and supplied 49 percent of Armenia's imports of goods, these shares fell to 25 percent and 27 percent, respectively, in 1999, and 19 percent and 23 percent, respectively, in 2003. The shift has been largely toward the EU-15,<sup>2</sup> whose share in Armenian exports rose from 26 percent in 1995 to 48 percent in 2003 and in imports from 15 percent to 32 percent over the same period.

Last but not least, the expansion in exports has not been confined to goods but has also included services, especially if the estimate putting exports of ITC services at around US\$100 million rather than US\$11 million reported in the balance-of-payments category of "computer and information services" is roughly correct. With or without a revised figure for these services, revenues from services increased

more than expenditures. With a revised figure, the balance of trade in services swung to a surplus in 2003, and the overall deficit in trade in goods and services was significantly lower.

### **Export Performance in a CIS Perspective**

Armenia's exports of goods and services—even excluding the estimate of unreported exports of ICT services—in terms of value recorded had the largest growth among the CIS peers in 1999–2003, well above the next best performer, Turkmenistan. Although it might be argued that the growth occurred against a very low base, the fall in trade over the 1990s was not a distinctive feature of Armenia's performance. All CIS countries experienced a huge slump in trade before and immediately after the collapse of the FSU, estimated at around 80 percent between 1990 and 1993 (Michalopoulos and Tarr 1994, p. 5). Although the 1998 financial crisis in Russia punctured the export recovery then under way in all CIS countries (World Bank 2004), exports had contracted earlier in terms of value. In order to account for the differences in the "initial base," as a baseline, Table 12.1 tabulates the index for 2003 using the peak value of exports in a year preceding the contraction (for the respective years, see note (1) to Table 12.1). Except for Azerbaijan, exports of other CIS countries increased less than in Armenia.

Sales to customers in Armenia's two most important markets—the EU and Russia—have driven export growth. These two markets jointly took 60 percent of its total exports in 2003. Armenia was the only country in the CIS that succeeded in readjusting its export offer to the dramatically expanding and shifting Russian import demand toward more sophisticated, higher-quality goods. While suppliers from highly developed countries outperformed Armenian exporters in Russian markets, these were not firms from other CIS countries. Armenia was the only CIS economy whose share in Russia's total imports increased over 1999–2003. Armenia's performance in EU markets has also been superior over the entire 1998–2003 period, except for the contraction in 2001. While, all other CIS non-oil exporters have increased their presence in EU markets relative to other suppliers, except for the Kyrgyz Republic and Uzbekistan, Armenia's gains in import shares were the largest in the 1999–2003 period.

Although Armenia's exports as share of GDP also recorded the strongest performance among the CIS economies, its share of exports in GDP was one of the lowest in the CIS. Despite a much larger population, Ukraine, with a GDP per capita that is only 7 percent larger than that of Armenia, has exports per capita that are 60 percent higher. Only in Georgia, the Russian Federation, and Uzbekistan was this share lower. However, except for Georgia, with a population 57 percent larger (albeit with a GDP only 20 percent higher), both Russia and Uzbekistan

TABLE 12.1 CIS: TOTAL EXPORTS, EXPORT GROWTH, AND SHARE OF EXPORTS IN GDP, 1999–2003

Country	GDP per capita		Index, 2003	Total exports per capita		Index, 2003	Exports as percent of GDP		Index, 2003
	1999	2003	1999=100	1999	2003	1999=100(1)	1999	2003	Note (1)=100
Armenia	601	916	152	125	338	271	21	37	267
<b>Azerbaijan</b>	<b>550</b>	<b>838</b>	<b>152</b>	<b>154</b>	<b>351</b>	<b>228</b>	<b>28</b>	<b>42</b>	<b>311</b>
Belarus	1,235	1,224	99	653	929	142	53	76	116
Georgia	561	700	125	148	212	144	26	30	106
<b>Kazakhstan</b>	<b>1,141</b>	<b>1,966</b>	<b>172</b>	<b>468</b>	<b>927</b>	<b>198</b>	<b>41</b>	<b>47</b>	<b>172</b>
Kyrgyz Rep.	245	341	139	103	133	129	42	39	88
Moldova	278	443	159	146	236	162	53	53	85
<b>Russian Federation</b>	<b>1,372</b>	<b>3,018</b>	<b>220</b>	<b>593</b>	<b>966</b>	<b>163</b>	<b>43</b>	<b>32</b>	<b>137</b>
Tajikistan	167	190	114	107	128	119	64	67	103
Ukraine	658	976	148	353	547	155	54	56	137
Uzbekistan	333	378	113	119	137	115	36	36	83

Source: Derived from the World Bank Sima database (<http://sima/datasite/sima-web/default.htm>).

Note: (1) Data are from 1995 for Tajikistan; 1996 for Armenia, Russia, and Ukraine; and 1997 for the remaining eight CIS countries. These are the years when the value of exports of goods peaked before it subsequently fell in 1997 and 1998. (2) Net exporters of oil and gas are marked in bold. No data were available for Turkmenistan.

have a much larger domestic economy. Furthermore, exports of goods and services as a percent of Armenia's GDP were also significantly lower than in Moldova (53 percent in 2003), with a smaller GDP per capita, and more developed in Lithuania (56 percent in 2003).

Hence, the level of openness of the Armenian economy remains low and its prosperity critically depends on an acceleration in trade growth performance. Without strong export growth well above GDP growth, Armenia will not catch up with more developed economies.

### **Commercial Services and Nondiamond Exports**

Since 1999 exports have been growing faster than GDP on an annual basis, with the differential sharply increasing in 2002–03 (Figure 12.1). The share of exports of goods and services in GDP rose from 19 percent in 1998 to 37 percent in 2003, while the share of imports fell from 53 percent to 49 percent. Consequently, the import coverage by exports of goods and services has improved: exports in terms of imports increased from 42 percent in 1999 to 63 percent in 2002 and 64 percent in 2003. Moreover, a strong GDP growth performance considerably lessened an overall potentially negative macroeconomic impact of trade imbalances. In terms of GDP, the trade deficit has been falling rather rapidly, from 38 percent in 1997 to 27 percent in 2000 and 12 percent in 2003.

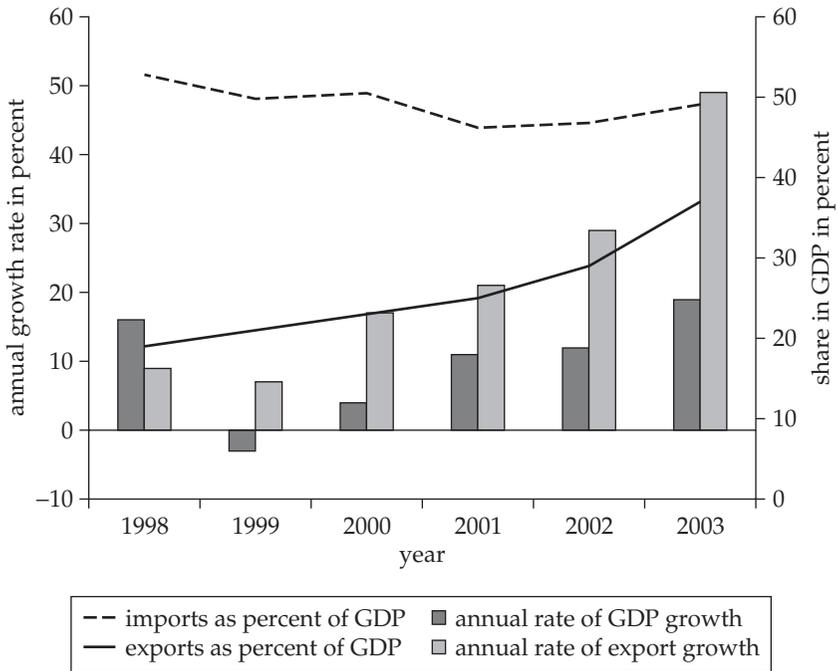
While the annual growth rates of exports of services, as captured in balance of payments statistics, lagged behind the growth of GDP in 2001–03, exports of goods were the driving force behind Armenia's GDP growth performance. But international statistics may fail to account for exports of services. In fact, it appears that exports of services were an important factor behind Armenia's impressive external performance.

#### *Trade in Services*

Growth in Armenia's trade in services is well below the growth of trade in goods. The share of commercial services (excluding government transactions) in Armenia's total exports of goods and services peaked in 1998 at 34 percent and fell to 25 percent in 2002 and 19 percent in 2003.

But the "contraction" or "stagnation" in exports of services is relative and does not suggest that the services sector is not on a sound footing. The relative decline has occurred against a blockbuster performance of trade in goods and the rapid growth of the GDP. The value of exports of services increased 53 percent between 1999 and 2003. This would have been an impressive performance had there been a weaker performance in the trade in goods. But over the 1999–

FIGURE 12.1 DYNAMICS OF EXPORTS OF GOODS AND SERVICES AND GDP AND CHANGE IN EXPORTS AND IMPORTS AS PERCENT OF GDP, 1998–2003



Source: IMF Balance of Payments statistics and World Bank Sima database.

2003 period exports of goods more than tripled. Therefore, the matter deserves a closer examination.

Trade in services is defined in GATS (the General Agreement on Trade in Services) as the supply of a service through any of four “modes of supply.” Mode 1 is services supplied from one country to another (for example, international telephone calls), officially known as “cross-border supply.” Mode 2 consists of consumers from one country making use of a service in another country (for example, tourism), officially known as “consumption abroad.” Mode 3 involves a company from one country setting up subsidiaries or branches to provide services in another country (for example, a bank from one country setting up operations in another country), officially known as “commercial presence.” Mode 4 involves individuals traveling from their own country to supply services in another country (for example, an actor or a construction worker), officially known as “movement of natural persons.”

Although specific commitments under GATS are defined in terms of the four standard modes of supply, the trade statistics for the available services are not reported according to a mode of supply and do not allow taking a full account of trade in services. International transactions as defined in the national accounts and balance of payments statistics diverge from the GATS definition of services. Even if some transactions can be captured in balance of payments statistics, the latter suffer from three major deficiencies: they do not distinguish between modes of supply; the definition of a resident and a non-resident differs from the GATS; and the breakdown of services differs from the GATS. The factors of production staying longer than a year in a country are treated as having acquired the status of resident. Furthermore, local sales of foreign entities are no longer treated as transactions between residents and nonresidents, and as such captured by balance of payments statistics. Transactions falling into such modes of supply as commercial presence and movement of natural persons are not reported in these statistics. Balance of payments statistics do not distinguish between modes of supply (that is, cross-border supply, consumption abroad, commercial presence, or presence of natural persons for less than a year). Furthermore, within WTO definitions, all services except transport and travel are identified as “other commercial services” and services exercised by governments are excluded.

Hence, as long as a new reference framework for measuring trade in services according to GATS is not in place, proxies derived from the balance of payments statistics and information from other sources are the only way to estimate services trade. The current practice is to use balance of payments statistics categories other than travel and construction as a proxy for cross-border supply (mode 1); “travel” as an indicator of consumption abroad of a service (mode 2); and “compensation of employees” together with labor-related statistics from the balance of payments as a proxy for the presence of natural persons (mode 4). The balance of payments statistics do not allow the capture of activities falling under a commercial presence, with the exception of construction services (mode 3). Some estimates of mode 3 can be derived from FAT (foreign affiliate transfers) statistics, if available, or data on FDI stocks together with production statistics such as value added (share of foreign firms in a market) or turnover of foreign firms with their share in respective markets for services.

Proxies are what they are—only surrogates for the absence of statistical concepts and methodologies that would allow gauging trade in line with the GATS classification. The major problems stem from the two following weaknesses of balance of payments statistics from the point of view of the task at hand. First, the balance of payments category “travel” tends to overestimate trade in mode 1, as it includes

consumption of goods. The statistics do not provide information that allows for distinguishing what tourists and business travelers spend on hotels, transportation, services in restaurants, and foods and other goods. Second, some balance of payments components may fall into more than one mode of delivery; that is, it is impossible to assess how a service has been provided. For instance, the transaction between a resident and a nonresident of a country concerning the provision of a computer-related service may take place over the Internet (cross-border, mode 1) or on the site of a resident firm by an expert dispatched by a foreign firm (commercial presence, mode 4).

Taking all these factors into consideration, the data presented in Table 12.2, limited to the balance of payments and FDI statistics, seek to capture trade in services according to the mode of supply. Not surprisingly, transborder trade in services (mode 1), comprising all balance of payments categories except travel and construction, accounts for the largest share. Construction activities and information on FDI in services are used to assess the scope of trade under mode 3. No data have been available to assess the services trade related to the presence of natural persons (mode 4).

Commercial presence (mode 3—that is, the supply of services by foreign-owned firms) is of particular interest, as it potentially has a positive impact on the business climate, provided that a competitive environment is in place. While we do not have data on the foreign firms' share of the total value of services provided by various sectors, the total stock of FDI in services appears to be quite large. On average, FDI inflows in services amounted to 3 percent of GDP over 1998–2003. Their impact on employment might have been considerably higher than the FDI figures alone might imply. For instance, provision of software services—a trademark of Armenia's rapidly developing specialization—is a knowledge-intensive rather than capital-intensive activity, and such low-capital activities have been rapidly expanding in Armenia. Lycos Armenia, a subsidiary of a large multinational software corporation, is an interesting example (Box 12.1).

However, some of these inflows have failed to generate high-quality and low-price services. The primary example is the telecommunications services. This sector accounted for 43 percent of total FDI flows to services over 1998–2003, but the restriction of competition in this sector (as discussed in chapter 10 of this book) has meant expensive and poor quality services.

The existence of competitive markets for services combined with the commercial presence of foreign-owned firms is crucial to trade in both goods and services. FDI amounting to US\$25 million invested in hotels and restaurants has probably contributed to exports in mode 2—that is, to tourism. FDI peaked over 1998–2000, whereas

TABLE 12.2 TRADE IN SERVICES BY MODE OF SUPPLY, 1999–2003 (US\$ MILLION)

<i>Mode of supply</i>	<i>Exports (revenues)</i>					<i>Imports (expenditures)</i>				
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003
Mode 1: <i>Transborder supply</i>	93.6	91.7	112.2	104.6	115.9	142.9	136.5	146.5	155.2	170.1
Mode 2: <i>Consumption abroad</i>	31.0	37.8	64.9	63.3	71.3	36.7	39.7	39.7	53.9	68.5
Mode 3: <i>Commercial presence</i>										

*Source:* Own calculations based on Armenian official Balance of Payments statistics.

### BOX 12.1 LYCOS ARMENIA ON THE MOVE

Lycos Armenia provides four insights into the development of ICT services in Armenia. First, it shows the ability of Armenians to build upon human skills developed before independence. Lycos Europe (originally founded in May 1997 as a joint venture between Lycos Inc., USA, and Bertelsmann AG, Germany)<sup>a</sup>, a leading European Internet firm running one of the most popular Internet portals, moved to Armenia in August 2002 with the purchase of the local branch of Brience Inc., a mobile software solution provider company based in San Francisco. Brience Inc. did not establish the company in Armenia but acquired in 2000 a local Armenian company, started in 1986, that was one of first users worldwide of Java technology.

Second, the case of Lycos Armenia illustrates strong growth potential and Armenia's strong comparative advantage in ICT-related activities. Lycos Armenia has become the largest developer of software within the Lycos Europe network. The staff of Lycos Armenia grew from 55 to 170 in early 2005, with plans to further increase to 220 employees over 2005. The French media reported that the company intends to lay off 75 employees in its Paris division and has offered 34 of them employment in its expanding subsidiary in Armenia.

Third, these are highly paid jobs. According to ICT sources, an experienced software expert makes around US\$ 1,000 a month.

Last but not least, Lycos Armenia cooperates mainly with other firms of the Lycos network. The commercial presence is designed not to serve local markets but to develop "programmed" products for sale in world markets.

*Sources:* See Lycos' Web site (<http://www.lycos-europe.am/pages/history.htm>).

a. Lycos Europe has branches in all major European capitals, and its total workforce is estimated at 900. The company's single largest shareholder is the U.S. group Terra Lycos, which created one of the world's first Internet search engines in the mid-1990s.

the value of exports under mode 2 (mostly tourism) more than doubled over 1999–2001. Since exports continued to rise in 2003 despite falling inflows, clearly viable infrastructure for future business and individual travel has been established. The congruence in the time profiles of FDI inflows and exports under mode 2 does not seem to be accidental. Furthermore, investments of US\$3.7 million in 2003 in air transportation services or, more precisely, in the modernization of Yerevan Airport (leased to a foreign contractor) have provided an incentive to returning tourists and business persons. The airport also has facilities to handle air cargo efficiently, with a potentially positive impact on trade in goods.

The link between commercial presence and trade in goods is both direct and indirect. The direct link is that without logistics-related and other commercial services, no trade on a significant scale can take place. Foreign providers may contribute to services' availability and low prices. The indirect link is the contribution of commercial presence to an improved business climate and an increase in the country's attractiveness to FDI. For instance, the presence of internationally recognized banks and freight integrators may tip the balance in favor of a decision to invest. Their presence has probably contributed to the expansion in exports of ITC services, as it established a safe venue for payments for services. Similarly, the foreign presence exceeding US\$10 million over 2001–03 in such areas as R&D and education is likely to have valuable spillover effects that will enhance the competitiveness of knowledge-intensive sectors of the economy.

Although Armenia's trade in services does not appear to be strong in contrast to trade in goods, the alleged contraction or stagnation in exports of services is relative and does not suggest that the services sector is not on a sound footing.

In fact, it appears that trade in services has been grossly underestimated, as statistics fail to capture the lion's share of exports of services provided, for instance, over the Internet. The balance of payments statistics estimate the value of exports of computer and information services (falling in mode 11 of the transborder supply) at US\$11 million in 2003, up from US\$1 million in 2002. Other widely quoted estimates of ITC exports in Armenia put their value (almost exclusively encompassing Internet solutions, embedded system designs, and telecommunication systems software architectures) at around US\$100 million.<sup>3</sup> If this is indeed the case, then Armenia has been a huge net exporter of services. Services as a share of total exports were 28 percent rather than the reported 19 percent.

In brief, the inclusion of this estimate of ITC exports of services significantly changes the overall picture of Armenia's interaction with the global economy. It suggests a much higher level of openness of the Armenian economy. More important, it also suggests that external interaction has a crucial role in driving Armenia's GDP growth and reducing unemployment.

### *Exports of Goods*

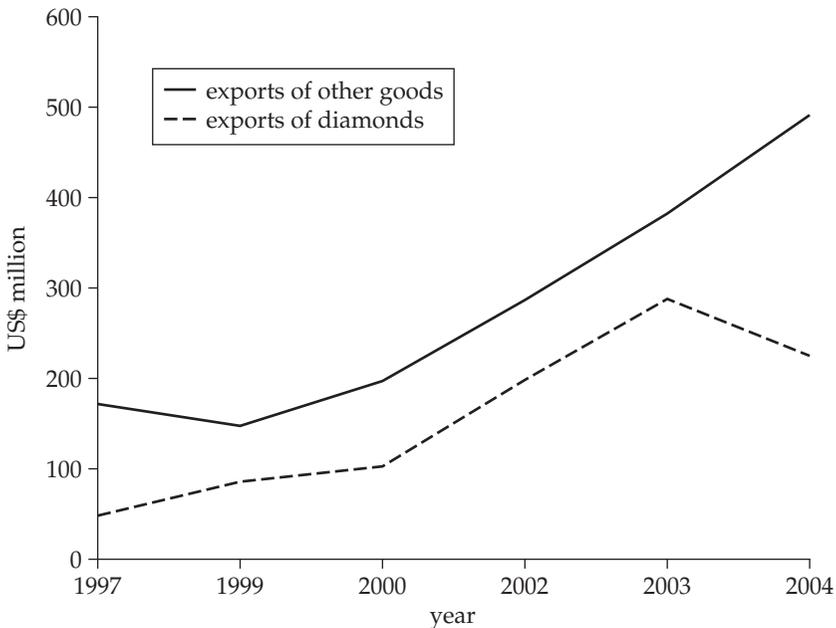
While diamonds have been major contributors to Armenia's expansion of exports of goods, they have not been the only levers of growth. First, an increase in the share of diamonds in total exports until 2003, which grew at an average least-square rate of 44 percent, reflected the impressive growth of all exports, not the result of the stagnat-

ing exports of nondiamond products. With an annual growth rate of 33 percent over 1999–2003, nondiamond exports also experienced impressive growth. As a result, they caught up with diamond exports in terms of value in 2003, with their share in total exports of almost 50 percent. But in 2004 nondiamond exports continued their impressive growth, while diamond exports contracted (Figure 12.2).

Second, the increase in concentration was not merely the result of the growth in diamond exports but also of the deepening export specialization and less marginal presence in world markets. There has been little change in the largest export sectors, as the correlation between the shares of exports of 25 four-digit SITC product groups in 1999 and 2003 is very high at 98 percent. However, the top nine SITC Rev 2 four-digit sectors (excluding diamonds) in exports in 2003 experienced stronger growth than diamonds. Their average annual growth rate was 39 percent in 1999–2003, and the share of diamonds in the top ten sectors fell from 63 percent in 1999 to 60 percent in 2003.

What are the nondiamond products that Armenia exports? By far the single most important group is spirits and liqueurs (SITC 1124), whose

FIGURE 12.2 EXPORTS OF DIAMONDS AND OTHER PRODUCTS, 1997–2004



Source: Derived from data reported by Armenia to the UN COMTRADE database.

foreign sales quadrupled between 1999 and 2003 and whose share in total exports of goods rose from 5 percent to 13 percent over this period. Other products include nonferrous base metals (SITC 28882), jewelry (8973), ores and concentrates of nonferrous metals (2879), ferro-alloys (6716), metal-cutting machine tools (7361), aluminum alloys (6842), copper alloys (6821), and copper ores (2871). Taken together, these products contributed 30 percent to total exports in 2003.

Armenia appears also to have been regaining a competitive advantage in other products in which it used to specialize when it was part of the former Soviet Union. These products include ores and concentrates of nonferrous metals, liqueurs, tungsten, molybdenum, tantalum, magnum, copper, and ferro-alloys. However, except for liqueurs and ores and concentrates of nonferrous metals, the EU has replaced the former Soviet republics as the major export market. In 2003 it took 100 percent of all exports of tungsten, molybdenum, tantalum, and magnum (SITC 6891), 100 percent of exports of ferro-alloys, and 95 percent of exports of copper alloys.

Nevertheless, a bad sign is that manufactures other than diamonds were conspicuously absent in Armenia's exports. Although the share of manufactures excluding chemicals increased in Armenia's total exports from 39 percent in 2000 to 60 percent in 2003, this was mainly due to the increase in exports of diamonds. Other manufactured exports fell in terms of value from US\$59 million in 2000 to US\$44 million in 2002 and increased to US\$54 million in 2003. Their share in total exports fell from 29 percent in 2000 to 11 percent in 2002 and 10 percent in 2003.

While the sluggish growth of manufactured exports other than diamonds in the presence of Armenia's potential comparative advantage should raise policy concerns, there is nothing inherently wrong with a large concentration of exports. High concentration is the result of the small size of the national economy and its narrow industrial base. There is one important stipulation, however. If the bulk of export revenues comes from a commodity subject to weather conditions and high volatility in international markets, then a national economy may be vulnerable to external shocks. But this is not the case with diamonds and Armenia. Diamonds seem to be less vulnerable than other "single crops," including textiles and clothing, to international supply or demand volatility for two reasons.

First, Armenian firms are firmly entrenched in a global diamond value chain through international investors, albeit not completely invulnerable. Armenian diamond-polishing factories are parts of both the Antwerp-centered link and the Israeli-based Lev Leviev Group. There is an important caveat, however: some activities depend on supplies from Russia. A contraction of almost 75 percent in the Russian supply of

raw diamonds in 2004 has affected Armenia's diamond export performance. Thus in 2004, the value of Armenia's diamond exports contracted 33 percent. Both total and EU-destined exports, however, increased in terms of value, but exports to Israel, one of the major recipients of diamonds cut in Armenia, significantly contracted (Table 12.3).

Second, the diamond market remains fairly controlled, with prices displaying remarkable stability. Although previous performance is not necessarily an indication of future performance, a sudden fall in prices and demand is rather unlikely. As *The Economist* (2004) notes, "the cartel isn't forever." However, it adds that no major player would seek to bring the prices down.

Yet spillovers from diamond production appear to be relatively limited, as value added locally is limited to employing the local labor force and using energy and other services. There are no other inputs into diamond production, which is mainly a gem-cutting operation. Thus, the high value of diamond exports, accounting for half of total exports, overstates their overall impact on economic welfare.

On the other hand, one may argue that reliance of exports on just one sector of the economy does not set Armenia aside from many other transition economies. For instance, the share of the 10 best-performing sectors in total exports exceeded two-thirds in 2003 in at least five transition economies—Albania, Azerbaijan, Kazakhstan, the Kyrgyz Republic, and Moldova. A single sector was responsible for around half (or more) of the total exports of Azerbaijan, Kazakhstan, and the Kyrgyz Republic (Table 12.4). There were different sectors involved—gold mining in the Kyrgyz Republic, oil in Azerbaijan and Kazakhstan, and textiles and clothing in Albania, Bulgaria, Macedonia and Moldova, albeit the concentration of exports in the last was significantly lower.

Both oil and clothing, however, have different characteristics from diamonds, as they usually involve higher value left in a country (oil), higher value added in a country, or are produced locally. The clothing sector is more labor intensive than diamond cutting and has the potential to generate spillover effects provided the economic regime is friendly toward private business activity. Revenues from oil, if not mismanaged by central authorities, can contribute to the development of a country's infrastructure, thereby facilitating trade.

These observations should not diminish Armenia's success in finding an attractive niche in global markets. But they add urgency to adopting measures that would expand Armenia's export offer. Other exports are already emerging, indicating the growing specialization and falling marginalization of Armenian suppliers in international markets. It is hoped that diamonds will continue to shine, providing employment and reducing poverty.

TABLE 12.3 RECIPIENTS OF ARMENIA'S EXPORTS, 2000–04 (US\$ MILLION)

<i>Share of exports</i>	2000	2001	2002	2003	2004	<i>Index, 2004 2000 = 100</i>
European Union	247	196	245	351	401	162
Israel	2	20	80	123	100	5,005
Total	300	342	347	566	591	465
Total annual change	n.a.	14%	2%	63%	4%	197
Memorandum share in world exports	0.005%	0.006%	0.005%	0.008%	0.007%	138
EU-15 imports (including intra-EU trade)	0.005%	0.004%	0.005%	0.008%	0.006%	139

*Source:* Own calculations based on data from the IMF Direction of Trade database (<http://www.imf.org/external/data.htm#data>).

n.a. not applicable

TABLE 12.4 SECTOR CONCENTRATION OF EXPORTS IN SELECTED TRANSITION ECONOMIES, 2003 (PERCENT)

Country	Share of top ten SITC Rev 2 4-digit sectors	Share of the largest item in a SITC Rev 2 4-digit sector	Share of clothing	Share of oil and oil-related products
Albania	69	26	34	n.a.
Armenia	83	50	n.a.	n.a.
Azerbaijan	91	70	n.a.	85
Bulgaria	29	6	20	n.a.
Kazakhstan	78	45	n.a.	58
Kyrgyz Republic	74	45	n.a.	n.a.
Macedonia	45	7	30	n.a.
Moldova	53	28	15	n.a.

Source: Own calculations based on the UN COMTRADE database (<http://unstats.un.org/unsd/comtrade/default.aspx>).

Note: n.a. stands for not applicable; that is, the share in total exports is below 5 percent.

### Low Participation of Unskilled Labor in Exports

Armenia's factor endowments suggest specialization in natural resources and labor-intensive products. Armenia has significant deposits of copper and zinc and traditionally has been a producer of industrial minerals. It is amply endowed in clay, construction stones, and semiprecious gems, with small amounts of mined gold as well. Armenia also has climate conditions that favor agriculture and is noted for the quality of its fruits and grapes. Last but not least, it has a large pool of a relatively low-cost labor, both highly skilled and unskilled. Hence, products that are intensive in the use of unskilled labor and in the use of natural resources should dominate its export basket. On the import side, Armenia should be a large importer of capital and skilled labor-intensive products together with fuels.

The factor intensities of Armenia's exports of goods, however, do not fully corroborate these expectations. Armenia is a net exporter of skilled labor-intensive products and a net importer of all other products, including unskilled labor-intensive and natural resource-intensive products (Table 12.5). But in line with its endowments, natural resource-intensive products accounted in 2003 for more than half of Armenia's total exports.

The evolution and the current factor content of Armenia's exports point to two conflicting developments: the emergence of market discipline and the persistence of domestic barriers to the efficient allocation

TABLE 12.5 FACTOR INTENSITIES OF ARMENIAN TRADE  
IN 1997, 2000, AND 2003

<i>Factor intensity</i>	<i>Export value (in US\$ million)</i>			<i>Export share (in percent)</i>		
	1997	2000	2003	1997	2000	2003
Natural resources	98	34	284	45.8	17.4	52.6
Unskilled labor	12	6	5	5.7	3.3	0.9
Capital	35	34	17	16.3	17.4	3.1
Skilled labor	63	111	214	29.3	57.1	39.7
Total	213	195	540	100	100	100

<i>Factor intensity</i>	<i>Exports in percent of imports</i>			<i>Import share (in percent)</i>		
	1997	2000	2003	1997	2000	2003
Natural resources	24.2	7.8	39.2	53.6	52.3	62.3
Unskilled labor	34.0	13.9	6.3	4.7	5.5	6.5
Capital	25.1	18.9	8.3	18.4	21.8	17.4
Skilled labor	94.1	120.6	133.4	8.8	11.1	13.8
Total	28.3	23.5	46.3	100.0	100.0	100.0

*Source:* Own calculations based on Armenia's national data as reported to the UN COMTRADE database (<http://unstats.un.org/unsd/comtrade/default.aspx>).

*Note:* Factors are taken from SITC-4 Rev. 1.

of resources in the national economy. The marginalization of exports of capital-intensive products points to an ongoing industrial restructuring in line with Armenia's endowments, illustrated by the disappearance of industrial capacities, inherited from Soviet-style industrialization, that were noncompetitive without government subsidies. This readjustment occurred in 2000–03, with the share of capital-intensive products falling from 17 percent to 3 percent (Table 12.5). Their exports in terms of value fell 50 percent between 2000 and 2003.

While the fall in capital-intensive exports provides evidence of the implementation of market-oriented reform measures, a very low share of unskilled labor-intensive products in Armenia's exports points to unfinished reforms. While among the CEEC-10 and SEE-5 economies the lowest share of unskilled labor-intensive products was 10 percent (Hungary), in 2003 this share in Armenia's exports—as well as in the exports of four other CIS economies (Azerbaijan, Georgia, Russia, and Kazakhstan)—was a mere 1 percent. The contraction in the share of unskilled labor-intensive products was not the result of faster growth of other exports, as the value of exports of unskilled labor-intensive products was lower in 2003 than in 2000. Similarly and more gener-

ally, stagnation in the exports of manufactures other than diamonds in 2000–03 points to the inability of tapping Armenia's major asset—the availability of a cheap and disciplined labor force.

Hence, although open economies based on competitive markets have a unique trade pattern reflecting their endowment, this is yet to become the case with Armenia. The discord between Armenia's exports and its endowments in production factors points to either a deficiency in the mechanisms allocating capital and labor in the economy or to adverse external factors beyond government control. The former has to do with the low quality of the business environment, whereas the latter may include protectionist conditions in market access or high transportation costs. Access to most markets, excluding Azerbaijan and Turkey, is not a barrier, as it is either preferential (as with the CIS, EU-25 and other highly developed OECD economies) or based on Armenia's most favored nation status. But transportation is clearly a barrier in most land-locked countries. High transportation costs favor exports of those products with high value relative to weight and discourage sales of the bulky low-cost products of light industry, which usually involve unskilled labor-intensive activities.

Whatever the explanation, the low share of unskilled labor-intensive products in Armenia's exports while unemployment remains at double-digit levels points to Armenia's inability to tap the opportunities offered by global markets.

Furthermore, even a quick examination of Armenia's exports suggests that to date they have contributed little to reducing unemployment and poverty. Unemployment has been locked for more than a decade at high double-digit levels (around 30 percent), two-thirds of the formally employed continue to be in the low value-added sectors of the economy (agriculture and trade), and one-third of Armenians were below the poverty line in 2003.

In 2003, McKinsey warned that the Armenian GDP growth pattern, relying on a narrow base and generating limited employment effects, would encounter difficulties by 2005–06 (McKinsey & Company 2003). Exports can help to reverse the current growth pattern provided that reform measures remove barriers to business activity. Once the barriers are removed, investors would take advantage of Armenia's assets—an educated labor force, the low labor cost, and the presence of the diaspora—and would turn the potential comparative advantage into a revealed one.

### **Untapped Opportunities in Global Markets**

The idiosyncrasy of Armenia's export basket in terms of factor intensities stems, on the one hand, from its ability to tap the benefits of becoming part of a global value chain for diamonds and, on the other

hand, from its inability to take advantage of opportunities created by the emerging forms of the global division of labor. The outsourcing of services and production activities has been the driving force of world trade. Thanks to technological progress and the information revolution, it has become possible to divide the industry's value chain, including services, into smaller functions that can be contracted out to independent suppliers. This fragmentation of production has offered unique opportunities for producers in small countries to move from servicing their limited local markets to supplying large multinational firms and, indirectly, their customers throughout the world. The major sectors in which this process has been taking place are textiles and clothing, footwear, furniture, automobiles, computers, semiconductors, and heavy machinery. Automobiles and ICT represent the most dynamic networks.

The sequence observed in successful European transition economies was the movement from textiles and clothing, footwear, and furniture to automobiles, heavy machinery, and ICT. Armenia has successfully entered the diamond global value chain but has yet to participate in other value chains and networks, including first-stage simple networks. Textiles and clothing have almost disappeared in Armenian exports, as the value of their exports fell from US\$13 million in 1999 to US\$1.7 million in 2003. As for another easily accessible network, Armenia has never been an exporter of furniture and its parts. The situation has not changed, as Armenian firms have not plugged into the global supply chains of multinational retailers of furniture. Exports of furniture and its parts have been practically nonexistent: their value was well below US\$100,000 in 2003. Nor have Armenian firms become part of the second-stage, more sophisticated, networks of production and distribution.

Given the country's location and lack of tradition, it is not surprising that no Armenian firm has become a supplier to major producers of automobiles. However, Armenia's absence from the global supply chains of ICT firms comes as a surprise. Despite outstanding success in the development of the ICT sector, nothing indicates the participation of Armenian firms in e-networks (such as electronics, including office equipment and telecommunications). ICT firms have not been able to take full advantage of huge opportunities for outsourcing created by recent changes in the ICT sector worldwide. With the disappearance of the global "one-stop-shop" industry structures in the early 1990s,<sup>4</sup> opportunities have emerged for new entrants. Armenian firms have successfully entered the software and imaging technology niches. But they have failed to enter other stages of the production and delivery processes—in particular, as providers of front-end customer contact/support services or suppliers of components (for example, metal, plastics, and electronic components).<sup>5</sup>

In all, the manufacturing sector remains underrepresented in Armenia's export offer. It has clearly underperformed both domestically and internationally, as construction and other services have driven GDP growth and diamonds have driven export growth. This represents an important missed opportunity. Owing to its ample endowment in skilled labor, Armenia's strongest comparative advantage lies in the manufacturing sector.

### **FDI: Missed Opportunities and Factor Intensities of Armenian Exports**

The discord in Armenia's exports in terms of factor intensities reminds one of similar discords revealed in the exports of many economies during the initial stages of the transition from central planning.<sup>6</sup> Former Czechoslovakia, Hungary, and Poland experienced this in the early 1990s. FDI inflows have subsequently been responsible for closing the gap between the endowments and the factor content of exports. Trade in network products in particular has led to the increase in shares of skilled labor- and capital-intensive products in their exports.

FDI has yet to accomplish the same task in Armenia for two reasons. First, FDI inflows have been relatively low. Armenia has performed very well in terms of attracting FDI by CIS standards, excluding oil-rich countries (Azerbaijan, Kazakhstan, and Russia).<sup>7</sup> But these have not been very demanding benchmarks. It should be borne in mind that its FDI inflows per capita were significantly lower than the simple average of FDI per capita in the CEEC-8 (Table 12.6).

Second, although FDI as a percent of Armenia's GDP was quite significant (only 0.3 percentage points below the simple average for CEEC-8 economies), this would not change the picture significantly in terms of its impact on trade in part for at least three reasons. First, FDI inflows into Armenia are of relatively recent vintage. Until the sale of 90 percent of ArmenTel to OTE of Greece for US\$142.5 million in late 1997,<sup>8</sup> the total FDI inflows into Armenia in 1990–97 were less than US\$50 million.<sup>9</sup> Second, almost one-fifth of the total FDI inflows over 1995–2003 went into telecommunications with rather disappointing results, as current penetration rates for fixed and mobile services in Armenia remain significantly below the regional benchmarks, resulting in a rather marginal improvement in the quality of these services. Third, other infrastructure-related sectors (such as water, electricity, and aviation) have accounted for a sizable share of total FDI inflows (Table 12.6). While these inflows, as well as investment in hotels, restaurants, and so forth, are important for creating an environment enabling business activity, it usually takes time before they have a positive impact on such activities.

TABLE 12.6 FDI INFLOWS COMPARED, 1995–2003

<i>Countries</i>	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	<i>Average 2000–03</i>
<i>FDI per capita</i>											
Armenia	2	5	5	58	42	39	24	47	49	74	40
CIS-11 (simple average)	7	16	23	36	28	22	30	38	57		36
CIS-8 (excluding oil-rich)	5	7	14	24	16	15	15	20	22		18
CEEC-8 (simple average)	123	100	102	123	100	102	171	220	239		183
<i>FDI as percent of GDP</i>											
Armenia	0.5	1.1	1.1	12.3	7.0	6.3	3.6	6.0	5.5	5.5	5.3
CIS-11 (simple average)	1.1	3.0	3.7	5.7	4.1	3.3	3.6	4.5	6.8	6.8	4.5
CIS-8 (excluding oil-rich)	1.1	1.4	2.4	3.5	2.6	3.0	3.0	2.8	3.2	3.2	3.0
CEEC-8 (simple average)	3.7	3.1	3.2	5.5	4.8	5.8	5.6	7.4	5.0	5.0	5.8

Source: NSS and EBRD *Annual Transition Reports* (various issues) for other countries.

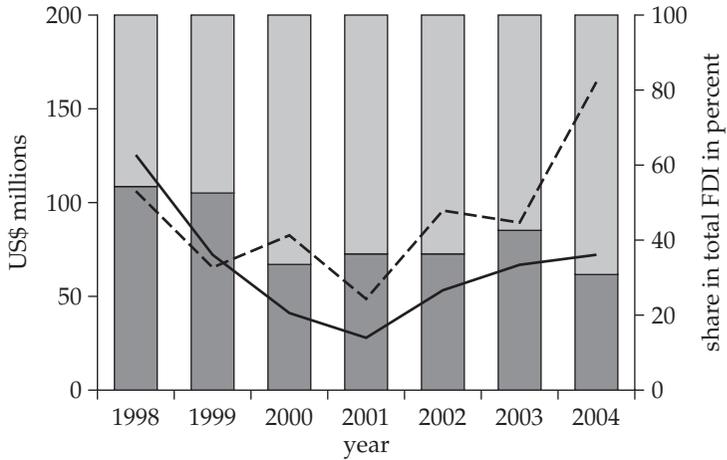
Indeed, there are reasons to believe that their impact on both exports and patterns of growth will be felt soon. It should be considered, first, that foreign inflows into Armenia have not consisted merely of FDI. In fact, Armenia has been the largest recipient of foreign aid per capita among CIS countries and, in addition, foreign remittances have amounted to around one-fifth of GDP on average for the last six years. Kuznetsov and Sabel (2004) rightly observe that remittances, private transfers from diaspora Armenians, and FDI inflows should provide a springboard for business development and entrepreneurship, provided that the institutional environment becomes more business friendly.

Second, the high-quality FDI inflows—that is, those attracted by prospects of returns not based on special rents negotiated with the government (as was the case with the privatization of telecommunications)—account for the growing share of FDI inward stock in Armenia. Total FDI in 2002–04 accounted for almost half (49 percent) of the total FDI inflows to Armenia since independence. This coincides with significant progress being made in implementing structural reforms, which usually augurs well for attracting high quality investors. So does the fact that 53 percent of total FDI over 2002–04 was not related to large-scale privatization (Figure 12.3).

The composition of FDI inflows suggests that efficiency gains may be accruing in certain sectors to the benefit of potential exports. First, while the proportion of cumulative FDI inflows over 1995–2003 going to the industrial sector (56 percent) is in line with similar shares in the CEEC-8 economies, most of these investments have been concentrated in two industries—electricity and beverage production. These two industries took almost two-thirds of cumulative inflows going to industries. Mining absorbed another 15 percent of cumulative FDI flows to the industrial sector. Exports of beverages (brandy) soared, confirming the positive impact of FDI on exports. Their value more than doubled in 2000 alone, with their share in total exports rising from 5 percent in 1999 to 8 percent in 2000 and 13 percent in 2003. Similarly, one suspects that the revival of exports of ores was linked to FDI. These exports collapsed in 1999 and reached the 1997 level only in 2002. Ores and other mining were among the largest recipients of FDI in 1998–99, taking US\$50 million, or 27 percent, of all industrial FDI at that time. In addition, the successful privatization of the Zangezur copper-molybdenum plant in Kajaran to Germany's Chromimet will dramatically increase the degree of processing embodied in the exports of molybdenum (Grigorian 2005).

Second, there were also some investments in the manufacturing sector that may increase export potential. For instance, the medical, optical and measurement equipment area and the communications

FIGURE 12.3 PRIVATIZATION AND FDI INFLOWS, 1998–2004



■ other	46%	48%	66%	64%	64%	57%	69%
■ privatization	54%	53%	34%	36%	36%	43%	31%
-- other	107	64	83	49	95	90	163
— privatization	125	71	42	27	54	67	72

Source: Derived from NSS official data as reported in Grigorian (2005).

equipment area, both regarded as knowledge-intensive sectors, have attracted significant FDI inflows. In 2003, US\$57 million worth of FDI went to medical, optical and measurement equipment, which received US\$9 million in 2002–03 (Table 12.7). Furthermore, the almost US\$6 million in FDI that went to the furniture sector over 2001–02 may be a harbinger of participation in global furniture networks. But this remains to be seen.

In all, although there appears to be a strong correspondence between sectors that received significant inflows of FDI and their export performance, the problem remains that FDI inflows did not rush to the labor-intensive manufacturing sectors. By the same token, Armenia has not become part of the sophisticated global production and distribution networks. More significantly, except for diamonds, Armenia did not become part of value chains such as clothing and furniture, where outsourcing does not necessarily require significant inflows of FDI and know-how.

TABLE 12.7 RECEIPT OF FDI INFLOWS BY SECTOR, 1998–2003

<i>Sector</i>	<i>US\$ million</i>						<i>Total FDI 2003</i>	<i>Share in %</i>
	<i>1998</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>		
Agriculture	0.0	0.0	0.0	0.2	3.4	0.0	3.6	0.4
Industry	98.9	94.7	56.5	35.3	86.0	102.2	473.6	55.5
Electricity, gas, hot water, and steam production and distribution	43.3	42.0	42.0	24.9	42.4	3.8	198.3	41.9
Food and beverage production	13.2	37.7	7.8	3.9	13.6	12.9	89.0	18.8
Medical, optical, and measurement equipment and watch production	0.0	0.0	0.0	0.9	0.5	57.0	58.5	12.4
Ore (metal-bearing) mining and other subsectors of mining	29.0	10.5	3.4	0.7	3.3	12.2	59.2	12.5
Chemical industry	2.6	0.2	0.2	0.7	10.8	0.3	14.8	3.1
Metallurgy	0.6	0.5	0.4	2.2	3.0	6.4	13.0	2.7
Radio, broadcasting, and communications equipment production	0.0	0.0	0.0	0.0	2.6	6.0	8.5	1.8
Services	133.5	35.6	63.5	40.4	51.5	51.3	375.8	44.1

Source: NSS.

### **Conclusion: The Cost of Missed Opportunities**

The cost of missed opportunities seems to be significant. First, where textiles and clothing are concerned, the activity is highly labor-intensive, creating employment opportunities for a low-skilled and cheap, usually female, labor force. The welfare cost of the collapse of these exports is very significant.

Second, the incorporation of local producers into other production and marketing networks as well as the supply of ICT consumer services could extend significant benefits to Armenia. This arrangement usually brings new technologies and managerial know-how as well as direct access to larger markets and thus brings in the benefits of economies of scale. Networks boost exports without making local firms incur marketing expenses and provide for greater stability in earnings, thanks to the global reach of a “parent” company. The fragmentation of production eliminates the need to gain competency in all stages and aspects of production and allows a small country to focus on a subset of activities. At the same time, production sharing can broaden the range of final products whose components are produced in the small country and thus protect the country from a demand shock to a particular good.

Third, with a stronger export performance, the growth of the Armenian economy could have been potentially higher and more employment-oriented. While exports have recorded a healthy growth since 1999, export growth continues to be concentrated mainly in sectors with limited employment opportunities. The expansion of manufactured exports, especially those associated with global value chains and production and distribution networks, would go a long way toward addressing the challenge of stronger export performance.

### **BUSINESS ENVIRONMENT AND POLICIES OBSTRUCTING EXTERNAL BUSINESS INTERACTION**

The discord between Armenia’s exports and its endowments in production factors points to either a deficiency in the mechanisms of allocation, which discourages domestic and foreign investment, or adverse external factors beyond government control. Governments have little control over geography, although they can do a lot to lighten the negative impact of remote locations from major world markets. As a beginning, they may address weaknesses in the business environment, improve the contestability of domestic markets, and introduce measures to bring down the cost of entry, exit, and conduct of business activity in both internal and external dimensions. In fact, the experi-

ence of successful transition economies suggests that two elements have to be in place: the successful implementation of first-generation reforms (such as liberalization of prices, foreign trade, and exchange regimes), and a consistent movement toward a rule-based institutional regime with the capacity of enforcement. The former is relatively easy to implement, in the absence of political opposition, whereas the latter requires the state's advanced institutional capacity.

The reasons for Armenia's failure to tap opportunities have nothing to do with first-generation reforms, as Armenia completed the first-generation reform project almost a decade ago. By 1995, prices for most if not all tradables were fully liberalized, small-scale privatization was completed, the domestic currency had become convertible, and foreign trade and exchange rate regimes were fully liberalized. Inflation, after a period of hyperinflation following the dissolution of the former Soviet Union, appears to be firmly under control. As a result of a tight monetary policy and the appreciation of the national currency, inflation was at 2 percent in 2004. According to international assessments, Armenia has caught up with highly developed economies in first-generation policy areas.

However, the benefits of first-generation reforms cannot be fully taken advantage of unless they are accompanied by steady progress in implementing institutional, second-generation reforms. Instead, the unfinished agenda of much more demanding and complex structural reforms together with trade facilitation measures appears to be a barrier to a more extensive involvement of Armenian firms in the finer global division of labor based on in-time production, inventory management, and complex Web-based communication links. The question to which we shall now turn is about the progress achieved in structural reforms and their impact on FDI inflows.

### **Unfinished Agenda of Second-Generation Reforms**

While progress in first-generation reforms is relatively straightforward to assess (for example, by inflation, or convertibility of domestic currency for current account transactions), this is not the case with second-generation reforms that cover, as a rule, activities and policy areas in which progress can be gauged only indirectly. Moreover, these reforms usually tend to be highly intertwined. Progress in one area can be "neutered" by the lack of progress in another. For instance, large-scale privatization may be completed. Yet its benefits may not materialize if privatized companies are subsidized by state-owned banks, as was the case in the Czech Republic in the mid-1990s, or the competition policy is unable to contain the banks' abuse of a dominant position. The same applies to various indicators that measure the

quality of the business climate. Huge minimum capital requirements or instabilities in tax policies, for example, may offset the simplicity of procedures for business entry.

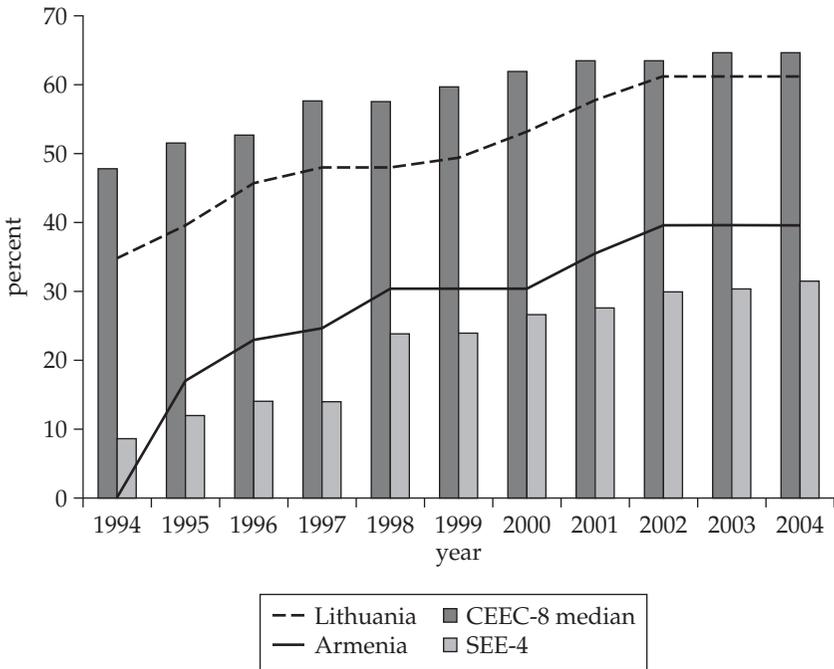
How does Armenia compare with other transition economies in terms of progress achieved in economic reforms? Since Armenia's performance has been superior to that of other CIS economies, we use two other, more demanding, comparators: new Central European EU members (CEEC-8), and Lithuania (like Armenia, a former Soviet republic). In order to answer this question, we construct an index of progress in second-generation reforms. The index is derived from EBRD transition indicators of policies that achieved progress in different areas directly related to restructuring. These areas include government and enterprise restructuring, large-scale privatization, banking reform and interest rate liberalization, security markets and nonbank financial institutions, and competition policy. The average of scores in each of these areas—normalized for a minimum score of 1 to equal zero and a maximum score of 4.5 to equal 100—is the indicator of progress in structural reforms. For countries that achieved institutional maturity in terms of establishing institutions supporting competitive markets, the indicator is equal to 100, whereas for those that have not started the process, it equals zero.

The indicator of progress in structural reforms also appears to provide a good measure of the quality of governance and the incidence of corruption. The value of the correlation coefficient for the structural progress indicator for 27 transition economies of Europe and Central Asia and corruption perception indices compiled by Transparency International was 73 percent in 2004. The positive correlation is higher for governance indicators (including average of political stability, government effectiveness, and regulatory quality),<sup>10</sup> as compiled by the World Bank. For the 1998–2002 averages, its value was 93 percent. In other words, countries with higher values of the structural progress indicator are better governed and are less corrupt.

The results presented in Figure 12.4 clearly show that moving to the institutional environment of highly developed countries takes time. The median value of a structural aggregate reform index for new EU CEEC-8 member states stood in 2004 at 66 percent of the level of mature market economies. While it is almost two-thirds percent above the level of institutional maturity achieved by Armenia (40 percent), CEEC-8 countries have a long way to go to catch up with highly developed countries.

Armenia also has long way to go. The greatest “distance” separating it from institutions in highly developed countries is in competition and security markets and nonbank financial institutions—both at 29 percent of the “normal market-economy” level (Table 12.8). Other

FIGURE 12.4 PROGRESS IN STRUCTURAL REFORMS:  
VALUES OF SRI, 1994–2004 (IN PERCENT)



Note: The aggregate is the average of scores ranging between 1 (no liberalization) and 4.5 (liberalization at the levels of highly developed market economies) for government and enterprise restructuring, competition policy, banking reform and interest rate liberalization, security markets and nonbank financial institutions, and large-scale privatization. It has been normalized with 1=0 and 4.5=100. SEE-4 includes Albania, Bosnia and Herzegovina, Macedonia, and Serbia and Montenegro. Source: Own calculations based on data from EBRD *Annual Transition Reports*.

institutional areas where the value of the index is below its average for second-generation reforms are government and enterprise restructuring (38 percent) and banking reform and interest rate liberalization (38 percent). The most advanced area of structural reforms is large-scale privatization (67 percent).

Another interesting observation that can be derived from data in Figure 12.4 and Table 12.8 is that EBRD's scores move in leaps and bounds. They appear to catch not incremental changes but rather step-wise changes. It is as though various reform measures have to reach momentum pushing them to a higher level of institutional maturity, although reversals are possible. Large-scale privatization was locked

TABLE 12.8 PROGRESS OF STRUCTURAL REFORM IN ARMENIA AND LITHUANIA, 1994–2004

<i>Area of reform</i>	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<b>Large-scale privatization</b>											
Armenia	0	29	57	57	57	57	57	57	67	67	67
Lithuania	57	57	57	57	57	57	57	67	76	76	76
<b>Government and enterprise restructuring</b>											
Armenia	0	29	29	29	29	29	29	29	38	38	38
Lithuania	29	29	57	48	48	48	48	48	57	57	57
<b>Banking reform and interest rate liberalization</b>											
Armenia	0	29	29	38	38	38	38	38	38	38	38
Lithuania	29	57	57	57	57	57	57	57	57	57	57
<b>Security markets and nonbank financial institutions</b>											
Armenia	0	0	0	0	29	29	29	29	29	29	29
Lithuania	29	29	29	38	38	48	57	57	57	57	57
<b>Competition policy</b>											
Armenia	0	0	0	0	0	0	0	29	29	29	29
Lithuania	29	29	29	38	38	38	48	57	57	57	57

*Source:* Own calculations based on data from EBRD Annual Transition Reports.

*Note:* For an explanation, see notes to Figure 6.4.

at the same level for seven years in Lithuania and six years in Armenia before moving to a higher level in 2001 and 2002, respectively. However, while Lithuania progressed subsequently, Armenia remains at the level of the Lithuanian privatization program in 2001.

How do the two countries compare in other areas? First, let us note that Armenia's progress in areas other than large-scale privatization has been less than Lithuania's. Second, Lithuania is ahead on all structural counts, but the gap is the largest in competition policy and security markets, with Armenia at Lithuania's level in 1994–96 in both areas. In banking reform and interest rate liberalization, Lithuania's experience illustrates how much can be achieved within one year. While in 1995 Armenia lagged one year compared with Lithuania, the latter jumped to a higher plateau of 57 percent in 1996; a level that Armenia has yet to achieve. A similar gap in government and enterprise restructuring again illustrates that a faster pace of structural reforms is possible provided the government is credibly committed to these reforms.

Hence, although the indicators suggest that Armenia is lagging behind Lithuania, the gaps can be closed relatively swiftly, as the experience of structural reforms in Lithuania clearly shows. The challenge is to accelerate the implementation of often painful measures. Their implementation is critical, as is argued throughout this study, in order to shift Armenia's export patterns to those that would generate larger gains in employment and would take advantage of Armenia's unique assets.

### **Second-Generation Reforms and FDI**

The absence of rapid progress in structural reforms has a negative impact on FDI, as empirical research has amply demonstrated. Garibaldi et al. (2002) have shown that the quality of institutions explains the variation in FDI flows to transition economies. In a similar vein, Broadman et al. (2004, p. 20), plotting the data on FDI per capita and EBRD's governance and enterprise restructuring indices for all Balkan countries, also find a strong positive association between these two variables. There is evidence that institutional quality towers over other determinants of FDI location. For instance, Campos and Kinoshita (2003) examined three groups of determinants: The first group comprised the cost of labor, the size of the domestic market, the skills of labor, the quality of infrastructure, and proximity to EU markets. The second group included institutions, macroeconomic policy, and other policies that facilitate the conduct of business. The third group was related to agglomeration economies (that is, new investors following decisions made by earlier investors to take advantage

of positive spillovers related to knowledge spillovers, and the availability of specialized labor and intermediate inputs). Their main finding was that institutions and agglomeration economies explain the directions of FDI flows to transition economies; taken together they outweigh other determinants related to labor costs, proximity to EU markets, and size of the domestic market.

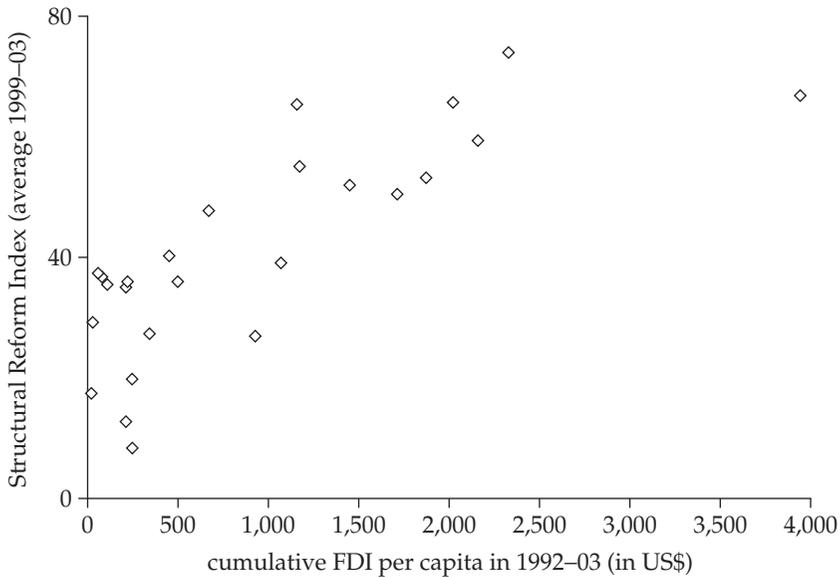
Although the conclusion about the primacy of institutions appears to contradict other findings on the determinants of FDI inflows, the contradiction is more apparent than real for three reasons. First, most empirical studies identify unit labor cost, openness to trade, the size of the host economy, and the proximity to the EU as major factors explaining the differences in FDI inflows. But countries bordering the EU-15 (except those bordering Greece) have also moved rapidly in transition to competitive markets. Consequently, proximity has also somehow influenced the pace of transition, although the presence of potential foreign investors has also probably had an influence on reforms. Second, richer countries are, to paraphrase Fisher, Sahay and Vegh (1998), closer to Brussels. Richer countries have also better institutions and are thus more attractive to FDI. Last but not least, openness to trade influences the extent to which domestic markets are competitive. The contestability of domestic markets, in turn, reduces the extent to which distortions might affect the developments in unit labor costs. The structural reform indicator indirectly captures the contestability of domestic markets and thereby the developments in unit labor costs.

The variation in progress in structural reforms and the quality of governance correspond fairly closely to the variation in cumulative FDI net inflows per capita over 1990–2003. The coefficient of correlation for the CEEC-10, CIS-12, and SEE-4 countries between the values of the Structural Reform Index (SRI)<sup>11</sup> averaged over 1999–2003 and cumulative FDI per capita over 1990–2003 was 79 percent. The value of the correlation coefficient increases to 83 percent when oil-rich economies are excluded. The rationale is straightforward: the oil sector operates according to different rules from those for the rest of the economy, and oil rather than governance is a magnet for FDI.

As can be seen from Figure 12.5 and Table 12.9, countries whose institutions were below 40 percent of the level in industrialized market economies failed to exceed US\$500 worth of cumulative net FDI inflows per capita. The only exception was oil-rich Kazakhstan. Kazakhstan, however, had the highest value of SRI (41.9) among CIS economies in 2003, followed by the Kyrgyz Republic (40.0) and Armenia (39.9).

Geography—probably combined with the size of the domestic economy and good external contacts—does count. Its impact is par-

FIGURE 12.5 TOTAL FDI INFLOWS PER CAPITA AND SRI, 1999–2003



Source: NSS and EBRD *Transition Reports* (various issues) for other countries.

ticularly visible in the case of the CIS economies as compared with the SEE economies and in the variation of FDI inflows. Macedonia, with a similar value of SRI as Armenia, obtained 61 percent more in cumulative FDI inflows per capita. Less advanced Albania obtained 12 percent more. But this may also work the other way around—better-located Moldova has attracted less FDI than Armenia, despite similar progress in reforms. The explanation lies in the political instability in Moldova. An additional factor that may explain the variation is the choice of method of large-scale privatization and, therefore, the ability to attract strategic investors from abroad.

The fact that variation of FDI flows to non-oil CIS economies cannot be directly linked to differences in progress in structural reforms paradoxically may point to the reforms' importance. The coefficient of correlation between FDI flows to non-oil CIS economies and an SRI of a mere 20 percent suggests that a certain threshold in structural reforms has to be achieved in order to attract FDI inflows equal roughly to a value of SRI of 50. Geography, the size of the domestic market, and preferential access to Russian markets may explain the FDI stock per capita of Belarus (now bordering the expanded EU),

TABLE 12.9 CORRELATION OF FDI (1990–2003) AND SRI (1999–2003)

<i>Country</i>	<i>SRI</i>	<i>FDI (US\$)</i>	<i>Country</i>	<i>SRI</i>	<i>FDI (US\$)</i>
Albania	27.4	351	Latvia	52.9	1,461
Armenia	35.4	313	Lithuania	56.4	1,184
Azerbaijan	27.1	934	Macedonia	36.6	505
Belarus	13.0	222	Moldova	35.8	227
Bosnia & Herzegovina	20.2	258	Poland	65.5	1,166
Bulgaria	48.4	676	Romania	40.8	455
Croatia	51.0	1,712	Russian Federation	37.7	67
Czech Republic	67.4	3,939	Serbia and Montenegro	9.9	260
Estonia	66.7	2,027	Slovak Republic	60.2	2,161
Georgia	35.4	222	Slovenia	53.7	1,875
Hungary	73.9	2,335	Tajikistan	17.5	32
Kazakhstan	39.2	1,078	Ukraine	35.8	115
Kyrgyz Republic	36.2	84	Uzbekistan	28.6	42

*Source:* Own calculations based on data derived from EBRD Transition Reports and IMF balance of payments statistics.

*Note:* Table shows the correlation of FDI cumulative inflows per capita over 1990–2003 in U.S. dollars and values of the SRI averaged over 1999–2003.

despite a disastrous record of structural reforms—roughly the same as the much more institutionally advanced Georgia or Moldova. Similarly, Armenia, with relatively easy access to seaports in Georgia, attracted 3.7 times more FDI on a per capita basis than the Kyrgyz Republic, despite a similar record of structural reforms. While geography may be part of the explanation, the bottom line is that in both countries the rules for FDI entry are crafted outside of the rules that apply to domestic businesses. Furthermore, privatization decisions, especially in telecommunications, distort the overall picture for countries that have attracted relatively low FDI inflows. Had a similar diagram been produced for Central European transition economies in 1996, the values of FDI stock per capita and the progress in structural reform indices would be similarly dispersed, with Hungary as an outlier.<sup>12</sup>

While academics often ponder whether FDI determines the quality of the business climate or vice versa, the bottom line is that politicians cannot coerce foreign investors into investing in a country; but they can create an environment that attracts investments, domestic and foreign alike. The challenge facing the government is to revive the implementation of structural reforms. Being at the top among the CIS economies in transitioning to competitive markets is not sufficient

for competing successfully for foreign investment. It should be noted that former "CMEA<sup>13</sup> comrades" from Central Europe not only have a much better location but also belong to the pan-European economic architecture underlying the largest free trade area for industrial products in the world. Armenia cannot compete on this count. On top of this, these economies are much more advanced in terms of institutional structures that support markets. This is the only area where Armenia could compete. Armenia's position at the halfway point of the most advanced of these economies will not do. The negative impact of geography may be partly offset by the establishment of a business environment that is friendly to foreign and domestic investors. Given its location, Armenia is potentially attractive not only for firms operating out of the EU but also for firms willing to expand their presence in the Middle East.

### **"Doing Business" Environment: Small Firms and the Diaspora**

Armenia's huge asset is its highly entrepreneurial and very successful diaspora, spread mostly throughout the Middle East, the United States, Russia, and Western Europe. It is not only successful but also large, amounting to about 4.7 to 5.3 million people compared to the country's population of around 3.8 million. It has already contributed enormously to the country's well-being through lobbying in its respective countries for foreign aid, promoting foreign investment in Armenia from firms in its countries of residence, supplying humanitarian assistance, building transport infrastructure, transferring know-how, and providing valuable commercial contacts. Grigorian (2005) provides many illustrations of the Armenian diaspora having been the drivers of numerous important business projects in Armenia including the entry of the HSBC Bank, now the largest bank in Armenia, the management of the Yerevan Airport, and the development of the ICT sector.

Nevertheless, there is a widespread sense that this potential has not been fully tapped. The perception is justified by the gap between the diaspora's developmental assistance, private transfers, and remittances, on the one hand, and the diaspora's FDI in Armenia on the other hand. The latter has been huge, whereas the former has been rather limited.

Thus, the policy challenge is not only to attract the diaspora's direct investments but also to encourage the recipients of remittances to use them in establishing new small businesses. This can be accomplished only through improving the business climate.

Complaints by large foreign firms operating in Armenia about the business environment are fewer and less intense than those voiced

by smaller firms. Large foreign firms do not complain about corruption, and their assessment of interaction with state administration is also less critical (Grigorian 2005, Kaminski 2005b). This comes as no surprise; with easy access to the authorities, large firms are less likely to fall prey to various government agencies. While these comments should not be read as painting a rosy picture of the regulatory regime for large firms, the crux of the matter is that small firms have a much tougher life and that formal arrangements constrain them to a greater degree.

However, size should not be the reason for discrimination. Small firms, especially foreign-owned small firms, can be beautiful. They often have a much larger impact on the domestic economy than their size might indicate. The experience of many countries shows that foreign-owned firms do not have to be large in order to have a positive impact on economic growth and employment and to boost foreign trade performance. For instance, the drivers of Romania's recent impressive export expansion have been small, foreign-owned (mainly Italian and German) firms (Kaminski and Ng 2004). Their presence entails significant benefits to a country going well beyond their small size. The Romanian experience indicates that a very large number of relatively small foreign firms can generate significant knowledge spillovers to domestic firms. An econometric study of the CEEC-8 (excluding Latvia and Lithuania but including Bulgaria and Romania) has found the existence of these spillovers only in Romania and not in other studied transition economies (Damijan et al. 2003). In a similar vein, Javorcik and Spatareanu (2004a) have also found positive horizontal spillovers in Romania.

Many different components, including public safety, the quality of the environment, and so forth, determine whether a country's business environment is friendly or unfriendly toward small businesses. The World Bank's Doing Business survey offers the possibility of identifying the formal barriers and also compares the changes between 2003 (the date of the first survey) and 2005. In addition, it provides information on formal arrangements existing in other countries. The 2005 survey differs from the 2003 survey, as its scope has been significantly extended. Two new areas—registering property and protecting investors—were added to the previously covered areas of starting a business, labor market flexibility, contract enforcement, and bankruptcy. In addition, there were changes in indicators within areas. Indicators describing "labor market flexibility" have been expanded to include a very important variable—the cost of firing in terms of weeks of severance payments. Also, the indicators describing "closing a business" have new variables—the cost of recovery and the cost of closure.

Similarly, a new indicator—the cost of creating collateral—has been added to the “getting credit” area of doing business.

Armenia has one of the friendliest (if not the friendliest) formal regimes for doing business among the CIS countries. Its formal regulatory arrangements also compare favorably with those of new EU member states, although when other factors not covered by the Doing Business survey are taken into account, Armenia's ranking drops.<sup>14</sup>

The 2003–05 period witnessed improvements in many areas determining the formal cost of doing business (Table 12.10). First, it has become easier to start a business. The cost of registration fell 18 percent and the minimum capital requirement was lowered almost 60 percent. Second, labor regulations now allow for greater flexibility, with the index of rigidity of employment falling 50 percent. Last, but not least, the formal legal protection of creditors has improved.

What are the major formal barriers as seen from the point of view of a potential small investor from abroad or a local resident contemplating starting a business thanks to remittances from abroad? We assume that getting credit is somehow much less relevant. Two concerns would top the list: labor flexibility and contract enforcement. First, the firing cost of 30 weeks of wages constitutes a huge barrier to increasing employment and, therefore, to starting a business. Second, there appears to be some deterioration in the conditions relevant to enforcing contracts. The cost of debt collection has increased. So has the number of days needed to enforce a contract, although this may be the result of too optimistic an assessment for 2003.

But formal regulations do not tell the whole story. Barriers stem not only from regulations but also from the administrative environment. Various surveys indicate that, despite significant progress achieved over the last couple of years, significant barriers still remain. Among the areas not covered by the Doing Business surveys are the tax and customs administrations, policy-induced uncertainties, corruption, limited access to financing, and weak infrastructure.<sup>15</sup> Policy-induced uncertainties combined with the tax administration appear to stand out as the major factor constraining entry to business and preventing firms from exiting the informal sector.

Hence, in order to have the diaspora play a larger role in business development, the following areas have to be addressed: severance costs; contract enforcement; stability of economic policies; and reform of the tax and customs administrations. The empirical evidence from countries that have succeeded in attracting investment from their emigrants indicates a strong and direct relationship between the business climate and the number of firms established with foreign participation.

TABLE 12.10 FORMAL BARRIERS TO DOING BUSINESS IN ARMENIA, 2003 AND 2005

<i>Area</i>	<i>Indicator</i>	2003	2005	<i>Change (%)</i>	<i>Best Practice in CEEC/CIS</i>	<i>In percent of Best CIS/CEEC Practice</i>
Starting a business	Number of procedures	10	10	0	5	50
	Time (days)	25	25	0	18	72
	Cost (% of income per capita)	8.5	7	18	3.7	53
	Minimum capital (% of income per capita)	11	4.5	59	0.0	0
Hiring and firing workers	Difficulty of hiring index (0–100)	51	33	35	0	0
	Rigidity of hours index (0–100)	84	40	52	20	50
	Difficulty of firing index (0–100)	37	10	73	10	100
	Rigidity of employment index (0–100)	57	28	51	10	36
Registering property	Firing costs: severance payments in weeks of wages)	—	30	—	17	57
	Number of procedures	—	4	—	3	75
	Time (days)	—	18	—	3	17
	Cost (% of property value)	—	0.9	—	0.5	56
Enforcing contracts	Number of procedures	22	24	–9	17	71
	Time (days)	65	195	–200	150	77
	Cost (% of debt)	15.3	17.8	–16	8.1	46
Closing a business	Time of insolvency (years)	1.9	1.9	0	1.1	58
	Cost (% of estate)	—	4.0	—	4.0	100
	Recovery rate (cents on the US\$)	—	39.6	—	85.0	47
Protecting investors	Investors disclosure index (0–7)	—	3	—	6	50
Getting credit	Cost to create collateral (% income per capita)	—	0.9	—	0.6	67
	Legal rights index 0–10	2	4	100	9	44

Source: Data from World Bank (2005a).

— = not available

### Unfriendly Environment for Attracting Outsourcing

A host of factors determines whether a country can successfully enter new forms of global division of labor based on outsourcing. Armenia passes the global test on several of them but fails on many others, thereby eroding the benefits from good policies. These factors include the contestability of domestic markets (that is, the extent to which imports and foreign investors may challenge their domestic equivalents) and the quality of services linking domestic production facilities with external outlets. The provision of services, including customs, in a timely and smooth fashion at low cost is critical to a country's becoming part of the global supply chains now mostly based on the in-time management of production and inventories.

#### *Liberal Foreign Trade and Investment Regimes Are Not Enough*

Armenia's foreign trade regime is liberal and stable, thanks to WTO commitments. First, access to Armenian markets of goods is very liberal in terms of official border and behind-the-border arrangements. Tariffs are low, not only by CIS standards but by international standards as well. Although Armenia's weighted and unweighted average MFN tariff rates are twice as high as in the EU, they are still well below 5 percent (Table 12.11).

Second, commitments made upon accession to the WTO have infused a considerable degree of stability and predictability into Armenia's foreign trade policy. This has also reduced, though not completely eliminated, the potential for the capture of foreign trade decisions by narrow interest groups by providing a government with tools to tame the rent-seekers. Armenia's two-band tariff regime, with applied MFN tariff rates at 0 or 10 percent ad valorem, has been locked at low levels, thanks to accession to the WTO. Armenia's schedule of MFN "bound" tariff rates has seven ad valorem rates—0, 4, 5, 6.5, 8, 10, and 15 percent.<sup>16</sup> But, as a condition of accession, Armenia has been required to bind tariffs across all Harmonized System items. In addition, Armenia has committed itself, as a result of direct pressure from members of its WTO working party, to review periodically the specific tariff rates to assure that these do not exceed their equivalents of ad valorem bound tariff rates.<sup>17</sup>

Third, the legal arrangements concerning entry to the services sectors are very liberal and are locked in by Armenia's commitments made as a condition for accession to the WTO in 2003. With the notable exception of telecommunications services, which are temporarily exempt from MFN, other sectors have been open to most modes of supply, with the usual caveat concerning restrictions on the employment of foreigners.<sup>18</sup>

TABLE 12.11 AVERAGE APPLIED AND BOUND MFN TARIFF RATES IN SELECTED COUNTRIES (PERCENT)

<i>Good</i>	<i>Tariff</i>	<i>Armenia</i> 2001	<i>Kyrgyz Republic</i> 2002	<i>Lithuania</i> 2003	<i>European Union (15)</i> 2002
Total goods	Simple average (%)	3.3	4.5	1.3	1.5
	Weighted average (%)	2.2	3.2	0.6	1.4
Agricultural goods	Simple average (%)	8.3	7.1	4.7	3.2
	Weighted average (%)	6.6	6.6	4.3	2.9
Industrial goods	Simple average (%)	2.9	4.3	1.0	1.3
	Weighted average (%)	1.1	2.7	0.3	1.3
Bound rate of all goods	Simple average (%)	8.5	7.4	9.2	3.9
	Weighted average (%)	9.6	6.4	9.4	3.0
Binding	Coverage (%)	100.0	99.9	100.0	100.0
Memorandum: Simple average tariff rate in 2004		3.0	5.2	1.5	1.5

Sources: UNCTAD Trade Analysis and Information System (TRAINS) (<http://www.unctad.org/trains>); WTO IDB database (<http://wits.worldbank.org/witsweb/>); and IMF Trade Policy Information database (<http://www.imf.org/external/data.htm#data>) for 2004.

Fourth, no legal restrictions are in place on foreign capital inflows. The foreign investment regime, governed by the 1994 Law on Foreign Investment, provides for national treatment, MFN treatment, and full repatriation of capital and earnings. The law banning foreigners from owning land (they can only lease it) is not restrictive, as companies registered by foreigners in Armenia as Armenian business entities have this right.

However, Armenia's capacity to generate a stronger export performance thanks to entering outsourcing operations ultimately depends on the strength of those areas in which it does pass the global test of becoming an attractive location for business operations. Despite liberal arrangements underlying both foreign trade and foreign investment regimes, these areas are not fully business friendly. Consider the following: WTO rules on trade in goods tend to be loosely implemented, which raises export and import transaction costs significantly. In contravention of the WTO rules, the Armenian customs uses reference prices for a number of imported goods. The GATT Agreement on Customs Valuation requires customs inspectors to rely on the transaction value—the price paid or payable in the market—when calculating ad valorem duties instead of using reference or minimum prices that are set artificially by the government.<sup>19</sup> Although Armenia has made significant strides in dismantling the Soviet-era GOST mandatory standards and establishing a modern, market-based standards regime, imports still face both technical and sanitary and phytosanitary barriers. The latter are not only complex but are arbitrarily implemented (see Holden and Sahakyan 2004, p. 13). The barriers, in the opinion of international businesses, relate to the inconsistent application of tax, customs (especially valuation), and regulatory rules, especially in the area of trade. While these may not be prohibitive for large firms with easy access to high levels of state administration, they create a perception of unfair competition and add uncertainty for medium-size businesses and other market entrants.

Furthermore, neither commitments under the WTO agreements nor legal provisions protecting private property rights and enforcing contracts are sufficient when the capacity of the courts remains limited. The courts operate slowly in the enforcement of contracts and in mediating commercial disputes and firms do not trust the ability of the courts to act independently and enforce decisions. Neither do they trust the impartiality of the state administration, regarded by businesses as corrupt. To make things worse, there are weaknesses in the tax administration, the capacity of the CPEC to enforce competition laws is weak, and the capacity of the judicial system to enforce contracts and protect private property is weak.

In all, Armenia's relatively liberal foreign trade and foreign investment regimes will fail to bring benefits in the absence of transparency,

consistency, fairness, and effectiveness in the implementation of regulations and laws. This absence has been responsible for the relatively low FDI inflows despite an apparent lack of formal barriers.

***Barriers to Just-In-Time Operation and Global Networking*** Nevertheless, Armenia's success in entering the diamond global value chain shows that even within the constraints related to weaknesses in the business, institutional, and policy environments, economic policy "quick-fixes" are available. In order to attract outsourcing activities, several conditions have to be met. They all boil down to time and transaction costs. Since interaction among the production blocs of border-spanning production networks is based on just-in-time production and inventory management, such interaction is particularly vulnerable to delays and disruptions in individual stages of the supply chain. The weakest link in the service chain in a country may tip the balance against including a firm in the global supply chain. A service chain includes backbone services (for example, telecommunications, transport, financial services such as banking and insurance, and securities trading), distribution and business services (such as legal, accounting, and consulting services), as well as customs procedures.

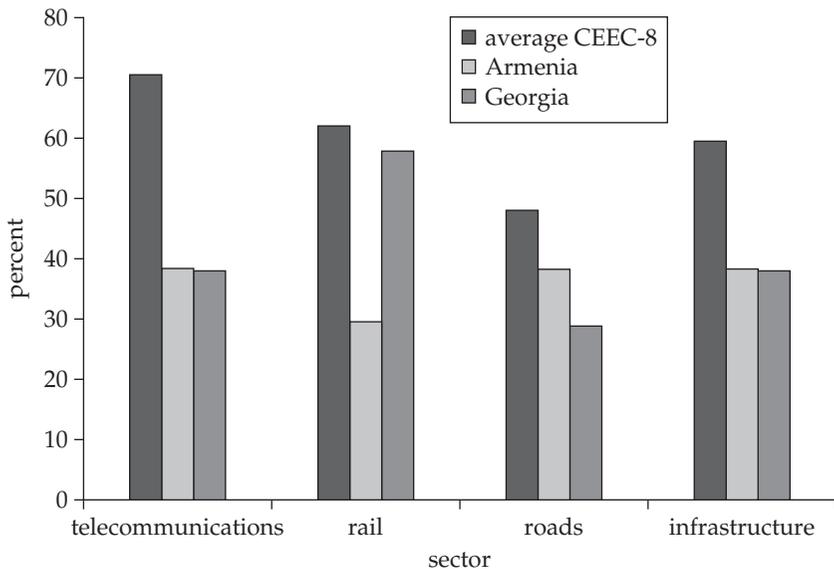
Hence, the quality of service links that would ensure their smooth operation is critical in the location decisions of multinational corporations. Services linking production operations include procedures for the simplification and harmonization of international trade, the state of the infrastructure and its management, together with the provision of such backbone services as telecommunications, banking, insurance, transportation, business services, and so forth. Together with customs, related border clearance regulatory procedures, technical standards regulations, and port efficiency, backbone services shape the ease and speed with which goods and services move across national borders, and therefore they are crucial to trade in goods. Poor-quality backbone services and trade facilitation deter foreign firms from incorporating domestic firms into their supply chains. They also act as a barrier to other types of trade. Consequently, improvements in the domestic business climate may produce limited beneficial economic effects if they are not accompanied by similar improvements in trade facilitation. In short, weakness in any of these services may take a country off the radar screen of firms searching to locate outsourcing activities abroad.

Which of these services that facilitate the maintenance of smoothly operating links among production operations in various countries are the most restraining in Armenia? As can be seen from data based on EBRD's assessment of the quality of infrastructure in terms of offered services (EBRD, various years), Armenia has a long way to go to achieve the levels found in highly developed economies, not to men-

tion the CEEC-8. Across all categories, Armenia's level is below 40 percent of the levels in highly developed economies (Figure 12.6). The difference is largest for rail transport, still managed by a highly inefficient, state-owned railway company (Holden and Sahakayan 2004). But there are two important caveats. First, although roads are a better alternative for shipments than rail transport, ultimately the quality of roads and port management in Georgia will determine the final cost of transportation for many goods shipped through Georgia's seaports. Second, the EBRD's assessment of the telecommunications infrastructure, which puts it on a par with Georgia, appears to be based solely on the change of ownership from state to private. The indicator was raised to 38 percent in 1997 following the privatization of ArmenTel and subsequently stayed at this level.

A positive development that can be inferred from Armenia's balance of payments statistics related to services is that transport appears to have become much less of a barrier than in the past. The combination of Armenia's landlocked situation and problems in transport corridors, exacerbated by geopolitics, has always contributed to very high

FIGURE 12.6 QUALITY OF INFRASTRUCTURE IN ARMENIA AGAINST GEORGIA, THE CEEC-8, AND HIGHLY DEVELOPED COUNTRIES



Source: Calculated from data in the EBRD infrastructure database.

Note: The scores ranging between 1 (worst case) and 4.5 (level of highly developed market economies) have been normalized with 1=0 and 4.5=100.

transportation costs. Competition in logistics-related sectors combined with the improvement in the security situation in Georgia appears to have resulted in falling transport costs of trade.

This is not to suggest that transportation has ceased to be a barrier. The ratio of transportation to the value of exports, a measure used by Faye et al. (2004) to compare transportation barriers faced by landlocked countries, remains high, although it has declined considerably. The Faye et al. (2003) study put the Armenian value of this ratio at 0.35 in 2001, well ahead of other landlocked countries such as Kazakhstan (0.04), Azerbaijan (0.07), Moldova (0.10), Georgia (0.08), the Kyrgyz Republic (0.13), Mongolia (0.16), and Turkmenistan (0.15). Although the value of this ratio for 2003 (0.22) still places Armenia at the top of this particular sample of landlocked countries, this is 40 percent below the level in 2001.

The consensus emerging from interviews and various studies of the Armenian economy including the EBRD report (EBRD various years) on infrastructure in transition economies, seems to point to barriers in network-based ITC infrastructure, customs and other nontariff trade barriers, and transportation. Considering the significant externalities associated with the telecommunications infrastructure, this sector is clearly close to, if not at the top of, the list of major impediments. A high level of telecommunications infrastructure is not only relevant for global supply chains but also has a huge potentially positive impact on education, health services, government services including customs, and so forth.

***The Telecommunications Infrastructure as a Barrier*** Rapid technological development in the electronics, computer, and telecommunications industries has eroded the inherent natural monopoly characteristics of telecommunications. By the same token, it has weakened the negative impacts of the government's decision to grant a legal near monopoly (until 2013) to ArmenTel, the local telecommunications company owned by OTE. The weakening is not significant, however, because until the end of 2004 the monopoly also encompassed cellular and "last mile" Internet services (that is, it covered technological changes that open competition to other providers).<sup>20</sup> As a result, the only area that has escaped the monopoly's reach, albeit not completely, is VoIP via satellite. This might have contributed to a lower volume of officially captured international calls. But satellite communication is not a full substitute for access through lines, and these are monopolized. While modern technologies offer some ways of circumventing the monopoly reach of ArmenTel, the bottom line is that it controls the decisive "last mile" and cable access.

How has ArmenTel's monopoly affected the development of telecommunications in Armenia? One way of addressing this question

is to compare the cost and the use of telecommunications services in Armenia with other CIS countries. This may not be a very demanding benchmark, as many other CIS countries have had equally poorly handled privatizations and some still maintain a state monopoly. But even against these not very demanding comparators, the general conclusion one may draw from the data tabulated in Table 12.12 is that, overall, Armenia's telecommunications services compared to other CIS countries contracted over 1998–2002.

This movement down has varied depending on the indicator. Armenia, the Kyrgyz Republic, and Turkmenistan are the only CIS countries in which the number of telephone main lines per 1,000 people declined between 1998 and 2002. Despite an increase in 2002 over 2001, the international outgoing traffic from Armenia declined significantly more, on average, than that from other CIS countries.

Last but not least, the negative impact of the monopoly exercised by ArmenTel on the development of the Internet has also been significant, albeit probably lower than in other areas discussed. The cost of using the Internet in Armenia was 41 percent higher than the average for the CIS. Users in Azerbaijan and Tajikistan were charged more. The price in terms of gross national income was lower than the average but only because Tajikistan's charges raised the average. Again, users in Armenia paid more than users in other CIS countries, except for Azerbaijan and Tajikistan.

The high cost of access, combined with the lack of telephone services in many rural areas, has resulted in a surprisingly low number of Internet users. As can be seen from data in Table 12.12, Armenia was well below the CIS average and, except for the Kyrgyz Republic, had the lowest increase in 2002 over 2001. This does not augur well for the continuing development of the ICT sectors in Armenia.

These indicators do not capture the quality of telephone services nor the cost and availability of mobile phones. Both are reportedly low and are not available in many rural areas. In 2002 the average number of mobile phones per 1,000 people in the EU-8 was, on average, 32 times higher, in the SEE-4 it was 12 times higher, in the CIS, 3 times higher, and in neighboring Georgia, more than 5 times higher. While in 2003 the number of mobile phones increased more in Armenia (to 38.1 per 1,000 people) than in Georgia (111.3 per 1,000), the density is still almost three times lower. The number of cellular phones per 1,000 people is significantly lower than in neighboring Georgia.

Unreliable connections, limited to modem connections, result in a low quality of Internet services. Moreover, ArmenTel's monopoly hinders the ability of Internet service providers to compete in price (Holden and Sahakyan 2004). The prices for high-speed connections charged by ArmenTel are around 30 times those in countries where telecommunications services are not monopolized.

TABLE 12.12 INDICATORS OF TELECOMMUNICATIONS PENETRATION IN ARMENIA AND OTHER CIS COUNTRIES, 1998–2003

Country	Telephone mainlines (per 1,000 people)		Mobile phones (per 1,000 people)		International telecom, outgoing traffic (minutes per subscriber)		Internet total monthly price		Internet users	
	1998	2002	2001	2002	1998	2002	(US\$ per 20 hours of use)	(% of monthly GNI per capita)	1998	2002
Armenia	147	143	6.7	18.9	102	67	45	68	1.1	15.8
Azerbaijan	89	113	91.4	106.9	58	35	108	183	0.4	36.9
Belarus	248	299	13.9	46.7	71	81	13	11	0.7	81.6
Georgia	122	131	60.6	102.1	73	—	26	48	1	14.9
Kazakhstan	109	130	36.2	64.3	67	63	34	27	1.2	15.7
Kyrgyz Republic	78	77	5.4	10.4	81	46	15	62	0.7	29.8
Moldova	150	161	51.3	76.9	81	75	19	50	2.5	34.1
Russian Federation	199	242	52.8	120.1	36	34	10	6	8.1	40.9
Tajikistan	37	37	0.3	2.1	45	42	54	362	—	0.5
Turkmenistan	82	77	—	—	43	64	20	20	—	—
Ukraine	191	216	44.2	83.8	48	36	17	26	2.9	18
Uzbekistan	64	66	5.1	7.4	47	36	20	54	0.2	10.9
Average CIS	126	141	33.4	58.1	63	53	32	76	2.7	44.4
Armenia in % CIS	116	101	20.1	32.6	163	126	141	89	39	36

Source: WDI.

— not available

How can the poor state of telecommunications services be reconciled with the very impressive development of the export-oriented ICT sector, which sets Armenia apart from other countries in the region? The answer is relatively straightforward: ICT firms in Armenia specialize in software development, whose final product is amenable to cross-border supply. Software can be sent over the Internet. While the quality of connections may create problems, these problems can be overcome—for example, through the use of satellite connections.

These possibilities notwithstanding, telecommunications services are a barrier to the development of the ICT sector. Satellites may allow the transmission of data and operations on line for ICT firms, but they fail when it comes to the high-quality transmission of voice. Providers of front-end customer contact/support services cannot perform many functions through satellites. The problem is that the only other available mode, a high-speed landline connection, is too expensive (as mentioned above, 30 times more than under competitive conditions) to perform these services from Armenia. Consequently, despite the availability in Armenia of cheap, highly skilled labor, other countries take advantage of the outsourcing of these services, which has been dramatically growing in recent years.

Another area in which the availability of new information and communications technologies is increasingly popular is just-in-time production/inventory management. Without these technologies, it is impossible to track the movement of products among various production operations and their inventories. The ability to introduce sophisticated information links is the key to success, not only in sophisticated production processes, but also, increasingly, for garment manufacturers (Abernathy et al. 1999; Evans and Harrigan 2003).

The broader point is that high-quality telecommunications infrastructures and services are crucial to the development of a contemporary economy and the shift toward higher knowledge-intensity activity. The absence of high-quality services and their high costs affect all sectors of the economy, often amounting to the equivalent of a prohibitive tax. It is impossible to estimate how many transactions have not taken place because of this situation. Neither is it possible to say how many industrial operations would have been transferred to Armenia had there been more efficient telecommunications services. It is, however, indisputable that very high telecommunications costs have severely exacerbated the disadvantages associated with Armenia's geographical location.

**Customs: An Impediment to Network Trade** The major problems with customs stem from the lack of the harmonization of customs practices in Armenia and Georgia, nontransparency in clearance regulations and procedures accompanied by corruption, and the limited

application of ITC in border clearance systems. Corruption and the imposition of unofficial fees at the border are widespread and dramatically raise the transaction costs. According to one estimate, unofficial fees accounted for around 6–13 percent of the total cost of transport on the railway from Armenia to Georgia (Molnar and Ojala 2003).

The WTO accession process and the computerization of customs have so far fallen well short of improving the quality of customs services. In defiance of the WTO rules, reference prices arbitrarily set by the government are used, and customs procedures have yet to achieve the WTO standards of transparency. Finally, there is a built-in asymmetry in the customs/traders relationship, hugely favoring the latter and offering little resort to WTO-determined rules for the settlement of disputes in cases such as differences in the valuation of a consignment.

The time needed to complete customs clearance, as well as the amount of effort undertaken by a firm to deal with customs, are considerable, especially for exports. Furthermore, traders are charged by customs for storage of the held goods. This further adds to the overall high cost of conducting foreign trade transactions in Armenia.

Thus, it appears that the most obvious benefits of the computerization of customs services (that is, reducing the release time of consignments and slashing the documentation or bureaucratic burden put on a trader or customs broker) have so far failed to materialize. Neither traders nor customs brokers have access to the system. The old practice of bureaucratic delays fueling corruption, combined with lack of capacity in customs administration, continues.

***VAT Rebate Mechanism: An Impediment to Network Trade*** While many different factors unnecessarily raise the transaction costs of foreign trade activities, discouraging the entry of new firms and expansion, one stands out in particular—the VAT rebate mechanism. Following the practice of most countries using VAT, Armenia levies VAT on imports to be reimbursed on imported inputs used to make exported products. The complaint of Armenian businesses is that VAT reimbursements do not occur quickly enough and are underpaid by the government. A recent survey notes that only 44 percent of surveyed firms entitled to the refund have claimed it. The reason is not difficult to understand. Consider that for the remaining 56 percent of companies, it took, on average, 145 days to receive their VAT refund. Moreover, on average, they received 15 percent less than the amount to which they were entitled by the law.

Delays in VAT reimbursements amount to firms being compelled to provide interest-free loans to the government and to expend their limited managerial and administrative resources on interacting with

the state administration. Under any circumstances, this practice raises the cost to businesses. In Armenia, limited liquidity owing to high interest rates and difficulties in access to financing further raise this cost, turning it into a significant barrier to trade.

In all, VAT refund procedures are a huge barrier to the integration of Armenian businesses into global markets and to FDI inflows. The extra costs of transaction undercut the competitiveness of Armenian firms and discourage potential investors, such as large multinationals, to move parts of their global production to Armenia to take advantage of the available skills and cheap labor.

*Air Transport: An Untapped Opportunity to Reduce Distance* One of the most surprising developments in Armenia's foreign trade has been the shift from air transport to land transport as a major mode of transporting goods in and out of Armenia. This is rather unexpected, considering that Armenia is landlocked and the problems in transport corridors are exacerbated by geopolitics. It also defies the international trend of air service outputs growing approximately twice as fast as GDP (Gillen, Morrison, and Stewart 2003).

It seems that the falling cost of road and sea transport compared to the cost of air transport has triggered the change. Consider the following. First, there has been a very considerable fall in the transportation costs of exports and imports of goods. The ratio of total freight and insurance to total trade in goods fell from 0.12 in 2000 to 0.08 in 2003, driven almost exclusively by the falling cost of shipping exports. The ratio to exports fell from 0.41 to 0.22 (Table 12.13).<sup>21</sup>

Second, the improvement in transportation costs has been accompanied by falling shipments of goods by air. Freight shipped by air measured in terms of weight stood in 2003 at 64 percent of its 2000 level and 57 percent of this level in terms of million tons per kilometer (Andrew 2005).

TABLE 12.13 RATIO OF TRANSPORTATION COSTS TO TRADE, 1998–2003

<i>Ratio</i>	1998	1999	2000	2001	2002	2003
Ratio of total freight and insurance to exports of goods	0.45	0.44	0.41	0.37	0.26	0.22
Ratio of total freight and insurance to imports of goods	0.08	0.10	0.10	0.10	0.10	0.09
Ratio of total freight and insurance to total trade in goods	0.10	0.11	0.12	0.12	0.09	0.08

Source: Own calculations based on Armenian official balance of payments statistics.

Third, the cost of airfreight has risen, as expenditures and revenues from airfreight services—as reported in Armenia’s balance of payments statistics—fell only slightly from US\$2.2 million in 2000 to US\$2.1 million in 2003.

Thus, one may conclude that while the cost of transportation by land and sea was falling, that by air has been increasing. Providers of air cargo services have proved to be unable to retain their clients or to lure new ones with more attractive prices. On the contrary, the cost appears to have been going up. Had more aircraft belly space been available thanks to the increase in the number of passenger flights, lower air cargo rates would have attracted a much larger portion of shipments than has been the case. This clearly has not happened, as there was no significant increase in the frequency of flights.

Furthermore, the fall in the share of the most dynamic worldwide mode of transport, air transport, in Armenia’s exports and imports cannot be attributed to the fall in the competitiveness of air transport services owing to poor infrastructure. It is the result of the government’s restrictive aviation policy. The poor infrastructure component has been largely addressed thanks to the government’s decision, in line with the current best international practice, to sign a 30-year concession agreement with Argentina-based *Corporación America* for the management of the Yerevan Zvartnots International Airport in 2003. Already, perceptible improvements in airport infrastructure and management, combined with the airport’s modern container handling facility built with financing from the EBRD, has considerably eased the infrastructure barrier.

However, a well managed airport is yet to be matched by a government policy that removes regulatory obstacles to an increase in supply of aviation services and a drop in their costs.

## CONCLUSION

Armenia misses several ingredients that are needed if it is to become attractive to foreign investments and international outsourcing, including participation in a new form of the division of labor driven by the globalization of production. First, the quality of the business environment as measured by the SRI is below 50 percent of the institutional maturity of highly developed market economies. As the experience of transition economies amply demonstrates, no significant inflows of high-quality FDI take place unless the value exceeds 50 percent. Structural reforms appear to have failed to produce competitive markets, despite progress achieved in the formal regulatory arrangements that shape the hassle cost of doing business. But some unreformed

major policy areas (such as inflexible employment, nonstable tax policies, and burdensome and predatory tax administration) continue to discourage the establishment of new businesses, including those of potential Armenian expatriates.

Second, there are three major barriers that prevent Armenia from fully reaping the benefits offered by globalization and from sustaining its impressive export growth performance. These barriers relate to transport, telecommunications, and the efficiency of the customs/VAT rebate regime. While the outsourcing of just-in-time production and supply-chain management has been altering the competitive landscape of many countries by relocating business activities and providing new sources of entry into international markets, weaknesses in these areas have been responsible for Armenia's missed opportunities in tapping new markets and sources of growth. More precisely, weaknesses in these areas account for some atypical features of the Armenian export performance (that is, the underrepresentation of unskilled labor-intensive products in its export basket due in large part to the country's limited participation in clothing global value chains and the virtual absence of network trade). The low quality of telecommunications services in Armenia makes it virtually impossible, or extremely costly, to implement the just-in-time production/inventory management under which many international networks of production and distribution operate. The impact of high transportation costs is similar. In short, the three major barriers inhibit participation in the division of labor based on production fragmentation.

## **POLICY REMEDIES**

Armenia's limited presence in the global garments value chain and network trade, and the almost complete absence of Armenian providers of some ICT customer support services, have not been the result of adverse external conditions. On the contrary, the adversities have been home made and as such can be addressed by a change in government policies.

While the constraints imposed by geography or the requirements of "high politics" are difficult to overcome, contemporary technology, combined with the right mix of policies, may considerably ease their negative impact. The country will not become part of network trade as long as weaknesses in the service chain produce delays and disruptions that raise transaction costs. The weakest link in the service chain in a country may tip the balance against the inclusion and establishment of firms that will participate in the global supply chain.

### **Why Diamonds and Software—and Nothing Else?**

Neither the potential constraints of geography or politics on outsourcing has affected Armenia's strong and expanding presence in the diamond value chain and the export of software. This raises the question of whether the experience from these two success stories is transferable to other areas of outsourcing. While the two are different, they share three characteristics in common: they demonstrate a high quality of human capital, they have the ability to tap external contacts helped by the Armenian diaspora, and they have characteristics that allow them to circumvent the vagaries of Armenia's economic regime and the adversities due to geography.

On these counts, Armenia's success in software supply chains is much less sensitive to the quality of the business environment and geographical distance. Exporters do not have to deal with customs controls and the state authorities cannot monitor their external sales. Moreover, distance is not a barrier as long as there is access to the Internet.

In contrast, government policies weigh more heavily on the diamond chain. There are four factors that set diamonds apart. First, the cost of transporting them is inherently low, albeit not as low as for software exports. Diamonds entering or leaving Armenia do not face a transportation barrier. Since they are light and high value-added items, they can be cheaply transported by air and airfreight rates have little impact on the overall cost.

Second, the government has provided a relatively friendly customs services regime for diamonds that has not been extended across all sectors of the economy. Unlike firms in other sectors, diamond firms are subject to a simplified customs clearing regime, which compels customs to have gems cleared within a day, accept the invoice value, and conduct in-house clearance, if needed.<sup>22</sup>

Third, delayed VAT rebates are much less of a problem than for other exporters, as less capital is tied up. The MFN applied tariff rate on raw diamonds is zero, and an importer does not have to pay VAT on imported inputs but only on local ones. Since the operation mainly involves the use of local labor, these expenditures are very low.

Last but not least, just-in-time production and supply-chain management are of lesser importance in the diamond business. So is the intensity of communications links.

Although diamonds are unique, their success provides an indication of what needs to be done in terms of policies to increase the probability of the emergence of other supply chains in Armenia. First, while not much can be done to reduce land transport costs (except for better management of railways), liberalization of the aviation policy

is clearly within the purview of the government. Although there are no guarantees that liberalization would immediately cut airfreight costs, international experience suggests that it usually does. Second, the friendliness of the customs and VAT rebate mechanism is transferable, although the latter needs closer redesigning. Third, the issue of telecommunications and network-based information technology is critical to participation in the networks of production and distribution, but not in all networks. Participation in the clothing value chain appears to be less dependent on the quality of information services.

The lesson from both diamonds and software is straightforward: the removal of the administrative barriers that raise the cost of international transactions, combined with measures to “reduce distance” from major markets and to address the telecommunications infrastructure, is the best way to tap Armenia’s most important asset—its high-quality human capital.

### **Customs and VAT: “White List” and Other Remedies**

Ideally, the government should extend the same customs rules that it applies to diamond-cutting activity to other sectors of the economy, albeit with some extras. This would entail reducing the time for customs clearance to a day, accepting the invoice value, and conducting in-house clearance, if needed. While these steps would be a dramatic improvement over the current practice, other elements that raise transaction costs would also have to be addressed. The existing VAT refund system clearly tops the list. As mentioned earlier, even firms in the diamond-cutting business complain about it, although they do not pay VAT on diamonds brought for cutting.

However, extending a “diamond-like” regime with an improved VAT refund mechanism to all sectors of the economy may be difficult for the following reason. Diamond operations are under the customs regime of inward processing, but with a twist. Whereas inputs crossing customs borders are usually subject to tariff rates and indirect taxes if sold domestically, the tariff rate on diamonds is zero and no taxes are levied. By the same token, a domestic firm has no incentive to sell the imported input, which circumvents customs domestically and deprives the budget of customs and other tax revenue. In short, there is no need for duty drawback, temporary admissions, or bonded warehouse schemes, which require a considerable capacity on the part of the customs administration to be really effective. Computerization, if accompanied by administrative reforms and changes in customs procedures commensurate with the newly acquired technological capacities, may significantly improve this capacity. However, improvement may take some time.

Therefore, the alternative would be to move gradually and establish a diamond-like regime in terms of administrative efficiency for a selected group of firms on a “white list.” Firms on the white list would be subject to special treatment by the customs and VAT administrations. Customs would be obliged to complete customs clearance within a day; they would have to observe the provisions of the WTO Agreement on Customs Valuation instead of using reference prices; and they would be obliged to run an effective scheme that provides duty waivers and exemptions from other restrictions on imported inputs for established exporters that import inputs, whether for domestic production or export, or both.<sup>23</sup> VAT administration would be obliged to rebate VAT to a firm on the same day that exports are cleared by customs. For any delays, a firm would be entitled to a refund plus interest.

*Which firms, in addition to diamond-cutting firms, should be put on a white list?* While the criteria may be subject to further discussion, the general guidelines are easily discernible.

- The process and criteria should be transparent and open to public scrutiny by the mass media and by nongovernmental organizations, such as business associations.
- Foreign-owned firms publicly traded on the U.S. and EU stock exchanges should be automatically included. Their operations are subject to the highest standards of international scrutiny—they can ill-afford to enter into shady business operations. This would take care of participation in the global networks of production and distribution, simply because their major movers are publicly traded large multinational corporations.
- Firms operating in the ICT sector should also be included in the white list. The reasons are straightforward. Their use of imported inputs is limited and the value added created locally is huge. Their exports are not subject to customs clearing procedures. In fact, they are virtually impossible to monitor. But in order to claim duty and VAT rebates, they would have to disclose some transactions to the financial authorities. The overall direct benefits to ICT firms of being included in the white list are lower than for exporters of manufactures, although firms in this sector are as vociferous in their criticism of the VAT rebate scheme as diamond-cutting firms. Furthermore, this would be a significant step in improving the business climate for one of the most important sectors of the Armenian economy: ICT is critical to Armenia’s move to a knowledge-intensive economy.
- For the remaining firms, one would have to identify one or two criteria related to a record of past dealings with the tax administration. One criterion might involve the number of years in

existence; another might take into account the past record of dealing with tax and customs administration. Both would have to be very clearly defined. The general idea would be to reward law-abiding firms. Firms that do meet the criterion of length of existence but are involved in inward processing, such as garments and footwear, might be exempted.

Representatives from government and other relevant business administrations would annually or semiannually update the white list. A mechanism should be designed and implemented to address the grievances of those that have not been included. However, if the criteria are precisely defined and transparently implemented, the number of cases handled under this mechanism would be limited.

A white list alone would not be sufficient. There are other areas which might be fixed relatively quickly. These "quick fixes" would include the following:

- Establish an Independent Professional Association of Customs Brokers. The association would be empowered to license and scrutinize its members. In order to assure integrity and responsibility, it would operate according to a transparent Code of Conduct that would be obligatory for all its members, and it would have an institutional voice in the government bodies responsible for overseeing customs administration.
- Open the customs computer system to customs brokers.
- Bring customs-related documents in line with what is really required under a computerized system of the Automated System for Customs Data (ASYCUDA) type.
- Simplify the customs clearance procedures for exports. Under normal circumstances, the customs clearance of exports serves one major purpose: to make sure that the shipment does not contain products banned for exports. Once an exporter produces a certificate of origin issued by the Chamber of Commerce, the shipment should be cleared immediately. Hence, one should introduce a strict time limit on releasing a shipment; if it is exceeded, a shipment should be released immediately.
- Sign the WTO Information Technology Agreement (ITA).<sup>24</sup> This would place zero MFN applied tariff rates on most ITC-related products.

The above measures are relatively easy to implement. While they require the close attention of policy makers, they consume administrative resources in a very moderate way. Over the longer haul, they will actually reduce the administrative burden.

### **Air Transport: Liberalization**

For a small landlocked economy the best aviation policy is that of unilateral liberalization (that is, opening access to the country to any carrier meeting financial and safety requirements from any country). This should be the option that Armenia should adopt as quickly as possible.

However, given the government's transfer of route rights as part of the privatization deal with Armavia in 2001, there may be potential problems with the implementation of the unilateral liberalization option. While these commitments require detailed examination, the combination of unilateral and bilateral Open Skies agreements might be the best option to pursue. The former would simply involve Armenia's unilateral commitment to open its air space and airports to carriers (subject to their meeting safety requirements) from a selected country or a regional grouping. The bilateral arrangement, which would have to be negotiated bilaterally, would open the country's market (airspace together with landing rights) to any provider from either country and provides the fifth freedom of the air.<sup>25</sup>

Armenia should be able to strike Open Skies agreements with the United States, United Arab Emirates, and Bahrain. Since all three are important markets and the latter two offer outlets to other connections, these agreements would be of significant economic importance to Armenia. The reason that United Arab Emirates and Bahrain might be interested in Open Skies agreements is that both have carriers with well-connected hubs offering a Yerevan passenger extensive connections throughout the Middle East and Asia. In addition to the Middle East and Asia, this would also offer an extra air cargo link to European markets.<sup>26</sup>

*Unilateral liberalization is probably the only option available to Armenia in its dealings with the EU.* The EU has to date displayed little interest in signing Open Skies agreements with small countries and appears to be interested in pursuing a different approach to liberalization from that used by the United States. The EU has been extending European Civil Aviation Area types of arrangements to other countries. Within the parameters of this approach, the CIS might be a potential partner but not Armenia alone. Under these circumstances, the Open Skies agreement is an unlikely option, and Armenia should remove restrictions on carriers and inbound flights. A preferred option would be to announce full unilateral opening with the stroke of a pen. However, depending on the assessment of arrangements with Armavia, and in order to soften the negative impact of increased competition and lower fares on Armavia, the Armenian government could declare a sequence of steps over time toward full unilateral Open Skies for EU carriers.

*What approach should be taken toward the aviation arrangements with Russia?* An unequivocal answer to this question would require a detailed examination of the current bilateral agreement as well as the CIS framework. Theoretically, Armenia can gain a lot from Open Skies arrangements among CIS countries fashioned after the EU European Civil Aviation Area model. But this would take time, as Armenia would have to sell the idea to other CIS members.

In the meantime, the change in the status quo would lose its urgency once the recommended mix of Open Skies bilateral agreements and unilateral liberalization with the EU was implemented. A likely increase in the number of flights connecting Yerevan with the Middle East, United States, and the EU would exert competitive pressures on airlines servicing routes to Moscow and other destinations in Russia.

Without a detailed econometric exercise it would be impossible to provide a quantitative estimate of the static and dynamic costs imposed on the national economy by the current aviation policy; however, these costs are significant. But some insights as to the impact of the restrictive aviation policy on airfares can be derived from the experience of bilateral Open Skies agreements<sup>27</sup> in countries that have deregulated the domestic aviation sector, as well as a look at airfares on routes similar to those to Yerevan. The U.S. Department of Transportation (DOT) compared average passenger airfares over 1996–99 in transatlantic markets in non-Open Skies and Open Skies traffic: the latter fell 20.1 percent and the former 10.3 percent (U.S. DOT 2000). Passengers traveling on Open Skies arrangements have thus gained an additional 12 percent. The consulting firm Brattle Group attributed the fall of between 18 percent and 28 percent in airfares to transatlantic alliances made possible by EU-U.S. Open Skies agreements (Brattle Group 2004).

Econometric studies have sought to estimate the impact of international liberalization on airfares. Doove et al. (2001) report on the OECD study to model the influence of various provisions of bilateral aviation agreements on air transport. Designation requirements (limits on the number of airlines allowed to provide services), restrictions on airlines' capacity and market share, and restrictions on charter services collectively raise international airfares by between 3 and 22 percent. Doove et al. (2001) warn, however, that given the limited coverage of the restrictions on international aviation, the OECD study seriously underestimates the cost of restrictive arrangements. Their own study covering routes among 35 countries finds a very high cost of bilateral restrictions. The transportation costs increase with the restrictiveness of a bilateral regime—the more restrictive the regime is, the higher are the airfares. For instance, business airfares on routes to and from Mexico (high restrictions) are 227 percent higher than under a liberal

benchmark regime, whereas in Ireland (low restrictions) they are 32 percent higher (Doove et al. 2001, p. 39).

Other evidence suggesting that airline liberalization has been a contributing factor to economic development comes from Ireland, often described as a Celtic Tiger because of its spectacular economic growth performance over the last decade or so. It is often overlooked that among the measures that created a “virtuous circle” leading to the Irish economic boom were not only public expenditure cutbacks that allowed for tax reductions but also airline deregulation. The latter “facilitated a more than doubling of tourist numbers over the following decade” and contributed significantly to FDI inflows (Barry 2003, p. 909).

Indeed, the historical evidence from countries that have deregulated the domestic aviation sector (such as the United States and the EU) is indisputable. Passengers and shipping companies in both the EU and the United States have experienced a dramatic decline in airfares. Thanks to the opening of the sector to new entrants, the existing carriers have been exposed to strong competitive pressures. These pressures in turn have reduced profits and costs through gains in productivity. The entry of the so-called low-cost carriers (LCC) has halved airfares and stimulated volume by at least 70 percent in both the EU and the United States. Competition has also been responsible for a more rapid adaptation and diffusion of new technologies. The combination of liberalization and technological progress has been behind a 3.5 percent average annual decline in real yield over 1991–2001.

It should be understood, however, that the costs of bilateral aviation agreements are not only higher prices of air transport due to the absence of competition or to limited competition. In fact, they also involve the much more important, and more difficult to estimate, costs of forgone opportunities. These costs are potentially huge, as lower airfares boost tourism and create new opportunities for firms to market their products. Tourists, in turn, increase the demand for a variety of services and goods. Examples abound. Not solely oil but mainly the unilateral liberalization of aviation policy has contributed to Dubai’s impressive economic development, driven largely by tourism and services. The result of a formal, unilateral, open-access policy pursued by the UAE since the 1980s is that Dubai is now served by around 100 airlines to 145 destinations and its local carrier has become a formidable world-class competitor. More important, it has become a tourist and business center in the Middle East. Last but not least, one suspects that the probability for a firm to become incorporated in the global production and distribution networks increasingly on the basis of just-in-time production is low in the absence of reliable low-cost air transport services.

### **Network-based ITC: Importance of a Good Regulatory Structure and Government Policies**

The issue of telecommunications should be part of a broader strategy designed to support the development of network-based ITC that draws on Armenia's revealed multiple strengths in this area. The existence of externalities justifies the government's support. These externalities include a positive impact on education, government services, health services, and labor productivity in other sectors of the economy, as well as the prospects of participation in global supply chains. Telecommunications is part of a broader ITC infrastructure.

The government faces the difficult task of reducing the negative impact of some of the most damaging monopoly provisions of its contract with ArmenTel without endangering the credibility of Armenia's commitment to the rule of law. It has already made significant strides in improving the contestability of the telecommunications markets by (i) revoking some provisions through negotiations, and (ii) enhancing the capacity of the regulatory structure. Despite the progress made, both tasks are far from being complete. As mentioned earlier, the new Settlement Agreement between the government and ArmenTel/OTE has provided for the immediate partial liberalization of the market and further liberalization in 2009. The government issued a second GSM license to K-Telecom. Although K-Telecom did not face competitive tenders, the license is more demanding in terms of required investments than that of ArmenTel's GSM branch. Competition in the mobile sector between ArmenTel and K-Telecom is already positively affecting sector development.

There is the continuing challenge of creating a highly transparent regulatory structure to oversee the ArmenTel and subsequently doing what regulators should do—liberalizing markets in order to facilitate competition. Leaving aside the legal issues involved, the negative impacts of the monopoly might have been significantly eased had the government earlier established a body to oversee the implementation of the privatization agreement. The existing structure empowering the CPEC to intervene in telecommunications is not yet regarded as fully satisfactory.<sup>28</sup>

Thus, as long as a monopoly is in place, the best remedy to limit its costs would be to establish a board overseeing the implementation of the privatization agreement and the practices of ArmenTel. The independent board should have all of the institutional features that would enable it to function effectively once telecommunications is demonopolized. The government might consider adopting the provisions on regulatory principles contained in the WTO Telecommunications Reference Paper that WTO member countries should follow. The reference paper

has been used effectively by WTO members not only as a guideline but also as a credibility-enhancing mechanism (Mattoo 2000).

## SUMMARY OF POLICY RECOMMENDATIONS

Recommendations on how to deal with the three major barriers of transportation, telecommunications, and customs and the VAT regime can be summarized as follows:

- **Transport.** The focus should be on aviation policy. The recommendations are as follows:
  - Conclude Open Skies agreements with the United States, Bahrain, and Dubai.
  - Undertake unilateral liberalization with the EU—that is, give EU-based carriers unlimited access to Armenian air space and airports.
- **Telecommunications.** Independently of efforts to legally revoke monopoly provisions of the agreement, the government should take the following actions:
  - Set a highly transparent regulatory structure initially overseeing the provision of telecommunications services by ArmenTel.
  - Sign the WTO Information Technology Agreement.
- **Customs and VAT Regime.** The recommendations can be summarized as follows:
  - Create a “white list” of firms with VAT and customs preferential treatment (similar to the one currently afforded to diamond firms).

Preferential treatment means the following:

- Complete customs clearance within a day.
- Terminate the practice of reference prices.
- Establish an effective scheme that provides duty waivers and exemptions from other restrictions on imported inputs for established exporters.
- Rebate VAT to firms on the same day that exports are cleared by customs. For any delays, a firm would be entitled to a refund plus interest.
- Establish an Independent Professional Association of Customs Brokers.
- Open the customs computer system to customs brokers.
- Bring customs-related documents in line with what is really required under a computerized system of the ASYCUDA type.

- Simplify customs clearance procedures for exports with a strict time limit on releasing a shipment; if it is exceeded, a shipment should be immediately released.

## NOTES

1. This chapter was prepared by Bartek Kaminski, University of Maryland, College Park, and the World Bank.

2. The EU-15 countries are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

3. This estimate may be closer to the mark than that in the balance of payments statistics. The ICT sector, employing about 0.5 percent of the total workforce, generates almost 5 percent of Armenia's GDP (Adonian, Chalyan, and Gurdjian 2004). Therefore, the value added of this sector would be around US\$140 million in 2003. With the ICT sector output almost exclusively designated for sales mainly in the United States, Russia, the Netherlands, Germany, Georgia, and France (ADA 2003, p. 14), a conservative estimate that 25 percent of the sector's valued added is sold domestically would yield around US\$100 million in exports.

4. A large number of firms connected through complex and borderless supply chains made up of high-volume multicustomer and multinational specialists at each level have replaced the vertically integrated firms still dominant in the 1980s and early 1990s.

5. The front-end, customer centric, portion of the supply chain includes service providers such as contact centers, order processing, and technical support. At the same level is the order fulfillment hub, which is a combination of a logistics center with order picking and configuration capabilities.

6. There is a caveat. While skilled labor-intensive products were underrepresented in their export baskets and unskilled labor-intensive exports grew fastest, Armenia "suffers" from the "excessive presence" of the former and underrepresentation of the latter.

7. In terms of the average FDI in terms of GDP in 1998–2003, Armenia ranked second among non-oil CIS countries after Moldova—the average was 8.5 percent for Moldova and 5.3 percent for Armenia.

8. ArmenTel was established in 1994 as a joint venture between the Ministry of Communications (51 percent) and Trans World Telecom (49 percent); the venture was formed to upgrade the network and introduce mobile services. Trans World Telecom received US\$55 million, or 39 percent, of the total amount of the sale to OTE.

9. In 1998, privatization proceeds amounted to US\$125.1 million, of which US\$118.3 million came from privatization of two enterprises in the telecommunications and energy sectors (Grigorian 2005).

10. There are two arguments for focusing solely on these indicators. First, these indicators are critical dimensions of the business climate. Political stability affects investment decisions and in extreme situations its absence may disrupt economic activities. The quality of regulation is of little relevance unless supported by the government's capacity to enforce regulations. Second, three other indicators pertinent to such dimensions of governance as the rule of law, control of corruption, and voice and accountability are not taken into account, as they do not yield extra information. For all transition economies, they are strongly correlated with the selected three indicators, with the values of correlation coefficients equal to or above 0.9. For the explanation and data, see [http://www.worldbank.org/wbi/governance/gov\\_data.htm](http://www.worldbank.org/wbi/governance/gov_data.htm).

11. The SRI is derived from EBRD transition indicators for competition policy, government and enterprise restructuring, large-scale privatization, banking reform and interest rate liberalization, and policy and regulations for security markets and nonbank financial institutions.

12. This was clearly the case with Hungary in 1995, when the government opened so-called strategic sectors to foreign investors, producing a huge increase in FDI inflows. In this year alone the stock of FDI increased 67 percent, and the annual inflow was not matched in 1996–2004.

13. Council for Mutual Economic Assistance.

14. For an in-depth analysis, see Kaminski (2005).

15. For an extensive analysis based on firms' surveys, see "Administrative Barriers Update: Fourth Annual Regulatory and Administrative Costs Survey: Armenia," by Development Network NGO for FIAS (March 2004).

16. The simple average bound tariff rate for all products is 8.6 percent, with the average rate of 14.9 percent for agricultural products and 7.7 percent for industrial products (own calculations based on Armenia's "Bound" Schedule). Both averages put Armenia in the middle of transition economies. For agricultural products, Albania, the Slovak Republic, and the Czech Republic (prior to EU accession) have lower rates of 9.4 percent and 10 percent. Estonia's and Latvia's rates are higher—17.5 and 34.6 percent, correspondingly. For industrial products, Albania, the Czech Republic together with the Slovak Republic, Hungary, and Estonia have lower average rates of 6.6, 4.2, 6.9, and 7.3 percent, respectively.

17. This is an extra Armenia-specific commitment coming on top of all other commitments to observe the provisions of the WTO Agreement.

18. Armenia, however, has made a precommitment to "provide unlimited market access for all basic and value added telecommunications services to the sub-sector initially covered by the monopoly immediately upon suspension or termination of monopoly rights in that sub-sector on or at anytime prior to the end of the monopoly" (WTO 2002).

19. The agreement spells out procedures to follow when customs inspectors suspect that traders are misreporting.

20. On November 25, 2004, the government signed a new Settlement Agreement that ended the arbitration and litigation process and terminated

ArmenTel's exclusive rights by the issuance of a second mobile license, and provided for the possibility of a third GSM license in 2009.

21. In spite of an 85 percent increase in the value of total trade turnover in goods between 1999 and 2003, expenditures and receipts from cargo services—taxing both exports and imports—increased over this period by only 36 percent. Since there has been no major change in the composition of trade over 1999–2003, one can argue that the fall in logistics-related costs has made possible a larger increase in trade in goods than in expenditures on freight and insurance.

22. The standard procedure is as follows. Upon the arrival of a shipment at the airport or cargo terminal, it is transported in a sealed case to a factory by the special security service unit escorted by customs officers. Once it is safely delivered, a customs officer opens the sealed case and proceeds with customs clearance. The same steps in reverse order are followed when diamonds are ready for export.

23. The design and implementation of waivers and exemptions would require the attention of policy makers. The possible mechanisms are a rebate scheme on account, a deferred drawback, or a temporary admissions mechanism.

24. The ITA is a tariff-cutting mechanism that emerged from the Singapore WTO Ministerial in 1996. The Agreement zeroes out tariff rates on all IT products—components as well as final products. Most of these products have a high R&D component, but not all of them. For instance, articles as ordinary as cash registers and water pressure gauges are also considered “information technology.” For details, see [http://www.wto.org/english/tratop\\_e/inftec\\_e/inftec\\_e.htm](http://www.wto.org/english/tratop_e/inftec_e/inftec_e.htm). As of July 2004, there are 63 participants, including the remaining CIS WTO members (that is, Georgia, the Kyrgyz Republic, and Moldova).

25. The “fifth freedom of the air” offers the right of an airline from one economy to carry traffic between two other economies provided the flight originates or terminates in its own economy.

26. The reasons the United States is likely to accept the offer are twofold: one is related to the Armenian diaspora and commercial relations in the United States, and another is related to its international aviation policy. The pressure from the diaspora would be seconded by pressure from U.S. carriers interested in further expansion of flights to Armenia. As for the U.S. aviation policy aspect, signing an agreement would be only natural, as the United States has a proven record of willingness to negotiate and sign these agreements. At present, it has Open Skies deals with 63 countries including Uzbekistan. The U.S. type of Open Skies agreement typically includes the fifth freedom code-share rights for U.S. carriers extended beyond hubs outside the United States. This would allow a U.S. carrier to add its code to any strategic partner airline, for example, a EU carrier flight into Yerevan.

27. These agreements vary in their provisions, but one component is constant: any carrier from either country can operate any service from its home country to any destination in the other country.

28. A blatant example of the absence of any meaningful oversight is the case of mobile phone cards. The scheme, reminiscent of the rationing of shortages under central planning, consists in setting the official price well below the market clearing level and selling some portion of them with a huge premium (3–4 times above the nominal price) on the black market. The scheme is a rip-off not only for consumers but also for the owners of ArmenTel. No sensible regulator would have tolerated it under any circumstances.

## CHAPTER 13

# Civil Aviation Policy

### SUMMARY

Armenia has fairly poor international civil aviation connectivities.<sup>1</sup> There are five flights a day to Moscow, an average of five to European hubs, and infrequent connections to Middle East and Asian hubs. Limited capacity translates through to relatively higher prices. While it is likely that Armenian air markets will grow, probably faster than the economy grows, the level of value added by aviation to the economy and job creation will be less than it could be. Current government policy contributes to the suboptimal growth: both regulatory and commercial arrangements are restrictive. The benefits from the low-cost carrier (LCC) innovation are unlikely to be realized. International experience shows the competition and economic development benefits from removal of such restrictions. Armenia should seek to eliminate these government-imposed economic entry barriers, subject to Armenian airlines having the opportunity to compete, as soon as possible. The government's agreement regarding Armavia would need to be reevaluated as part of a reform process.

Well-managed Armenian airlines should be viable in less restrictive, more competitive markets, although this cannot be guaranteed, as it cannot be in any market. Even were Armenia to move to a non-restrictive policy immediately, restrictions on certain key routes would continue to remain as a result of policies followed by other countries. There is a need to ensure that competition law is operating effectively. The remaining restrictive airline ownership and control requirements internationally are a problem that requires a multilateral solution. In a more liberal environment, the government's focus in the future should be on ensuring safety, and security, addressing any adverse environmental impacts, and ensuring an effective and efficient infrastructure.

## INTRODUCTION

Civil aviation has been recognized increasingly as being an important component of a successful strategy for economic development and poverty alleviation. The advantages that aviation offers in terms of saving time and “reducing” distance play a major role in creating opportunities, growing markets, strengthening international linkages, and reducing barriers. This is particularly important and valuable for countries with limited or no land linkages.

Landlocked countries tend to have lower per capita incomes than other countries (Gallup and Sachs 1998). A study on the effects of higher transport costs (land and sea) faced by landlocked countries suggests that a 10 percent reduction in these costs will boost trade by 20 percent (Limao and Venables 2001). The evidence suggests that air cargo allows distant countries actually to have a comparative advantage in high value-added products for high-income markets (see, for example, the use by Chinese firms of air freight in supplying the U.S. market, suggesting that China has developed a surprising degree of comparative advantage in high value-added products). These studies suggest a strong imperative to undertake all possible policies to offset the fundamental disadvantage: international civil aviation policy is an obvious instrument.

An appropriate government policy, effectively implemented, is important in maximizing the potential of aviation. In addition to the government’s core responsibility of ensuring national security, the government has placed a priority on high rates of sustainable economic growth to lift living standards and alleviate poverty. Where restrictive agreements exist in aviation, local airlines usually argue that there is the necessity of continuing the restrictions to protect or assist them for a variety of reasons. As with any protection or industry assistance, there are costs to the consumers, the businesses, and the economy along with the loss of critical competitive pressures on airlines. The government has to evaluate these economy-wide costs of the benefits obtained from the protection against its overall objectives.

In addition, if these benefits are important, the government would want to consider whether there are lower-cost ways of delivering these benefits, for example, as explicit subsidies to any airline willing to provide the desired additional service rather than continuing with the government-imposed entry barriers.

The international evidence in aviation and Armenia’s own experience with liberalization and competition in other markets suggest that the government’s policy towards aviation should emphasize the objective of totally eliminating the historic and comprehensive government-imposed economic entry barriers to Armenia’s aviation markets (see Box 13.1).

### BOX 13.1 ARMENIAN AVIATION MARKET ENTRY RESTRICTIONS

These restrictions include the following:

- government limits on the number of airlines
- government limits on the frequencies, schedules, capacities, and services offered by airlines
- strict limits on networks (the so-called fifth freedom)\*
- requirements or permissions for airlines to “coordinate” activities
- pricing restrictions
- ownership and control requirements

*Source:* Staff analysis.

\* The “right” of an airline to carry traffic between two other countries if the flight originates or terminates in its home country.

A number of countries have made substantial progress towards the full elimination of such restrictions in international air markets. Full liberalization has not been fully achieved anywhere internationally in civil aviation, but the EU single air market perhaps offers the best example implemented to date. For example, subject to satisfying safety and security requirements, Czech-owned airlines (but not U.S. or Armenian) can now fly between London and Dublin offering any range of services they wish, subject only to safety, security, and general competition law. The Czechs now have an LCC, Smartwings, operating in EU markets and started operations in markets outside of the EU in 2005 (further details can be found in Attachment 6). Latvia’s airBaltic,<sup>2</sup> which has LCC characteristics, has grown rapidly and now operates out of both Riga and Lithuania’s Vilnius (further details can be found in Attachment 5).

Governments can and will continue to place a high priority on safe and secure air services, in line with international treaty obligations. This should be the focus of government policy and administration along with ensuring that general laws, including competition law, work well and the key infrastructure services operate efficiently and effectively. These are major challenges in their own right and will need ongoing government attention.

This chapter has the following structure:

- the approach followed in the preparation of this chapter
- the current international situation
- the key facts

- existing government policy
- Armenian airlines and the agreement with Armavia
- international experience with aviation liberalization
- policy options for the government
- concerns with liberalization
- aviation infrastructure
- government decision-making processes
- conclusions

### **APPROACH OF THIS CHAPTER**

Following the agreement between the government and the World Bank that the issue of the regulation of Armenian international air services would be studied further, meetings were held with a range of government and private sector officials in Yerevan. This allowed the key areas of concern to be better defined and a work program identified. Information and data have been provided by the General Director of Civil Aviation (GDCA). We are grateful for this cooperation and assistance. A survey of departing passengers at Yerevan International Airport was undertaken in early November 2004 to ascertain origin and departure information. International studies on the experiences of other countries with aviation liberalization were examined and are summarized in this report. With the cooperation of the authorities in the respective countries, the Bank also prepared short case studies on the experience of some Eastern European countries with international aviation policy. These are summarized below and the case studies are attached. Reform options were examined from the perspective of their applicability to the Armenian circumstances. A draft of the report was submitted to the government in March 2005. This report reflects comments received to date.

### **THE CURRENT INTERNATIONAL SITUATION**

As a result of the 1944 Chicago Convention, the operations of international civil air services are mainly regulated by air service agreements (ASAs) established on a bilateral basis. Since World War II, air markets have been highly regulated by governments for economic rather than safety reasons.<sup>3</sup> Box 13.1 lists the range of restrictions involved in this approach. The current intergovernmental bilateral nature of air service regulation means that achieving a fully (economically) unrestricted air service market in line with other liberalized markets requires the agreement of each partner country as an initial step. Such agreements can be regarded as “liberal” or nonrestrictive, as with the U.S. Open Skies agreement model, or they might be restrictive, as with the cur-

rent U.S.–U.K. air service agreement—the so-called Bermuda II Agreement. For example, under the latter only two U.S. carriers can serve Heathrow–U.S. markets.

It would be possible for Armenia to “offer” to, say, Austria that Armenia desires to modify the existing air service agreement so that any EU airline<sup>4</sup> could fly between Austria and Armenia offering as many services as it wishes regardless of whether Austria was willing to agree to the same arrangements for Armenian carriers. Logically, Austria should accept this offer but Austria’s agreement to the new arrangements is still likely to be necessary. Open Skies policies involve two countries agreeing to the elimination of all of the restrictions listed in Box 13.1 for carriers meeting the ownership and control requirements. This means that neither country’s airlines could effectively monopolize the market as another carrier from either country could enter the market, although not necessarily a carrier owned by nationals of third countries.

### **Ownership Restrictions Will Remain a Problem**

Thus, even the most unrestrictive bilateral agreements still impose requirements that airlines operating under these agreements must be substantially owned and effectively controlled by nationals of one of the partner states.<sup>5</sup> This restriction is particularly important for countries with small capital markets, but even for bigger countries it is an increasing problem and constraint. Some countries are more willing than others to interpret the rules flexibly. There are examples where, often for very sensible reasons, substantial ownership and effective control is held by non-nationals (for example, Air Pacific, in theory a Fijian airline under Fijian ASAs, is generally regarded as being controlled by Australian-owned Qantas).

Increasingly, the rules are being circumvented in arrangements such as the Air Pacific model. These technically nonconforming arrangements are always at risk of challenge by **any** bilateral partner country with landing rights potentially being withdrawn. Thus, the particular ownership and financing arrangements for an airline must meet the requirements of the most “demanding” partner country: ownership and control arrangements are unique and ubiquitous for each airline. Quid pro quos are often involved to achieve this.

### **THE KEY FACTS**

In spite of a fast-growing economy, Armenian aviation outputs have been dropping for cargo, but rising recently for passengers, albeit from a low base (see Table 13.1 and Figure 13.1). Recovery from the Russian

TABLE 13.1 ZVARTNOTS' AIRPORT FREIGHT VOLUMES, 1997–2004

<i>Freight</i>	1997	1998	1999	2000	2001	2002	2003	2004
Freight shipped by air transport (thousand metric ton)	26.5	18.9	13.5	13.8	11.5	8.4	8.8	9.2
Freight turnover in air transportation (million tonne-km)	21.2	15.2	12.7	9.6	9.1	5.8	5.5	9.9

*Source:* GDCA.

economic crisis is cited as the explanation for the situation and improved land links is the explanation for Russia's economic recovery. Armenian and foreign airlines report increasing traffic currently. Given the country's high economic growth rate, this is the normal expectation.

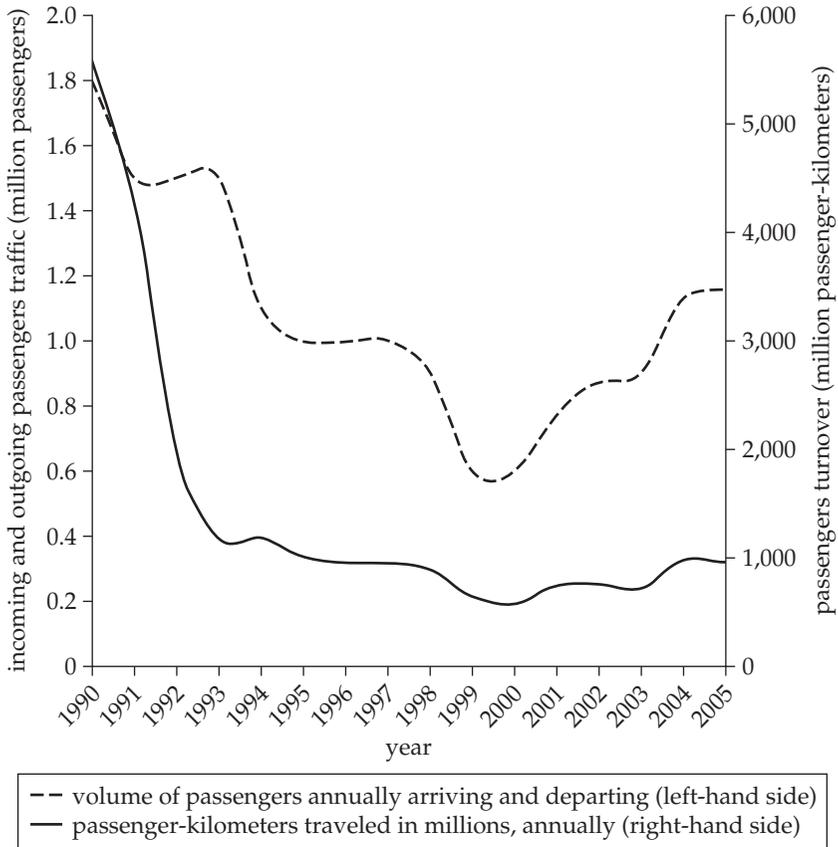
Figure 13.1 gives a longer view in respect of passenger numbers and distance traveled.

Armenia has adequate aviation infrastructure, including an EBRD-funded cargo facility, although the terminal at Yerevan's Zvartnots International Airport (the country's main airport) is not designed to handle the number of passengers carried by modern aircraft, given the security requirements and passenger expectations. The airport<sup>6</sup> has embarked on a terminal expansion program. When completed this will allow the airport to handle 4 million passengers annually.

Generally, air service outputs grow approximately 50 percent faster than the economy (Gillen, Morrison, and Stewart 2003). Given Armenia's starting position of low incomes, an underdeveloped air market, and strong economic prospects, this outperformance should be regarded as minimal. On the other hand, a restrictive international air service regime and the ensuing higher costs and prices would reduce output and probably growth. The flights offered to and from Armenia appear relatively limited compared with other countries with a similar population. A printout of a typical day's Departure Board at Zvartnots International Airport is contained in Attachment 1. It shows that there are approximately five flights a day on average to Western hubs, five flights per day to Moscow, and limited connections to the east and south.

Countries with more liberal ASA policies often have higher international air connectivities. For example, Latvia currently has a population of 2 million, although with a higher per capita income than Armenia. Riga Airport's timetable currently shows 28 daily flights to hub airports (the weekly timetable is given in Attachment 2). New

FIGURE 13.1 ZVARTNOTS AIRPORT PASSENGER VOLUMES,  
1990–2005



Source: GDCA, Armenia.

Zealand (an isolated country with a slightly larger population than Armenia's but with higher incomes) has approximately 50 flights on a typical day to a recognized hub airport such as Sydney. Many of these flights are by high-capacity, wide-body aircraft. The Czech airline (CSA) has a current winter schedule offering approximately 35 daily connections to hubs.

It has not been possible to obtain good data on actual air fares and cargo rates in Armenia. Craig Jenks (see Annex 13.1) has used information on actual passenger yields from Computer Reservation Service

(CRS) databases to produce some data on the Armenian air services markets. The study drew on data from travel on the Yerevan to EU markets, as well as the Riga (RIX), Tallin (TLL), and Larnaca (LCA) to EU markets over the same time periods. The data exclude Internet and direct bookings with carriers. The comparators were chosen as being distant from the main EU markets (although not as distant as Armenia) but, more important, as markets being subject to EU liberalization effects. This is not a rigorous study of the effects of liberalization but it is illustrative and is suggestive of lines for further research. Jenks's report can be found in Annex 13.1.

Table 13.2 summarizes the results. The consultant concludes that the data show that Yerevan–EU yields (the average actual air fares on a per passenger-kilometer basis), when adjusted for differences in distance, are higher than the comparators, with the partial exception of Tallin. The consultant highlights the impact of the entry of an LCC, Ryanair, on the Heathrow–Riga yields when the airline entered the market but serving it from Stansted, U.K.

### **Connectivities**

The relatively low level of connectivity except for Moscow must mean that travelers face either the need to transit via Moscow or an intermittent schedule, by international standards, with costs in terms of time and reduced options. Two or three flights a day on a particular route to a recognized hub would be more consistent with modern business and tourism requirements. For example, Austrian Airlines now operates three flights a day between Sofia and Vienna.<sup>7</sup> This is not to suggest that the Armenian market is currently large enough for such frequencies and volumes in the short term but is just to indicate that it will be potentially costly if government regulation precludes such development. The Latvian experience discussed later in the chapter is instructive.

### **Results of the Airport Survey**

A survey using the U.K. Civil Aviation Administration (CAA) airport survey methodology was prepared and undertaken by a local consultant under the supervision of the General Civil Aviation Department and the World Bank. The airport survey was undertaken over a one-week period in early November 2004. Armenian residents made up just over half of the sample. The analysis suggests that the average return ticket price was US\$350. This is high in relation to the incomes of even Armenian business travelers. Of this group, 60 percent had incomes below US\$6,000 per year. Almost 90 percent of nonbusiness travelers had incomes below US\$6,000 per year.

TABLE 13.2 COMPARATIVE YEREVAN–EU AIR FARES

<i>EU</i>	<i>What fare "should be" (US\$)</i>	<i>Fare in last 12 months (US\$)</i>	<i>Compared to "should be" (%)</i>	<i>Fare in February– April 2005 (US\$)</i>	<i>Compared to "should be" (%)</i>
EVN	333	355	6.6 over	377	13.2 over
TLL	225	209	7.1 under	287	27.5 over
RIX	200	178	11 under	171	14.5 under
LCA	312	202	35.2 under	197	36.8 under

*Source:* See Annex 13.1.

Passengers traveling for the stated purpose of business made up 30 percent of the sample (51 percent of travelers destined for Europe had business as their prime purpose for traveling). However, the proportion of those traveling on business class tickets was around 6 percent: most of them were flying on economy-class tickets. Consistent with the observation from airline schedules, the initial destination of 77 percent of travelers was Russia, 4 percent were going to other CIS countries, and 15 percent were flying directly to European airports, leaving only a small percentage of travelers flying to the Middle East, Turkey, and Iran. However, in terms of *final* destinations, 57 percent were terminating their flights in Europe or the Americas. This may be indicative of the current restrictive regime forcing people to hub through Moscow rather than using more desirable direct connections if available and cost-effective.

### Cargo

The other benefit of modern passenger aircraft is its incidental cargo capacity. As cargo and mail services are offered almost as a side benefit of passenger services, pricing can be much more flexible than that required by dedicated cargo aircraft. Wide-body aircraft offer particular benefits to the cargo market. The evidence suggests that the available cargo space is generally in high demand for time-sensitive valuable cargos.

### CURRENT ARMENIAN INTERNATIONAL AVIATION POLICY

Armenia has a current statement of aviation policy and strategy. The government also has some 43 bilateral air service agreements, with some negotiated but still to be signed. The key features in the

air service agreements with Armenia's main potential air markets are outlined in the table in Attachment 4. This table, reflecting the elements in Box 13.1, specifies whether the current agreements, as implemented by subsequent intergovernmental agreements, allow or require the following:

- the designation of only one or of multiple airlines by Armenia
- limitations on the number of seats offered or the size of the plane operated
- limitations on frequencies offered
- fifth freedom rights
- coordination between airlines on services and prices
- government intervention on air fares
- national ownership and control of airlines

From an economic perspective, all of the current agreements can be regarded as being restrictive, some potentially important ones highly so. For example, we understand that the Armenia-Russia bilateral agreement limited the airlines of each country to providing no more than 135,000 seats in 2004. We also understand that this was fully used and that the limit for 2005 has been agreed at 161,000 seats in each direction, together with an option for additional flights at peak periods.

Austrian Airlines' usual policy is to provide daily flights as a minimum. Austrian operates a year-round service, reducing aircraft size if necessary during the low season. Austrian cited its Vienna-Sofia service to illustrate its strategy. During the pre-reform 1980s the airline provided three to five services per week owing to a restrictive Austrian-Bulgarian ASA. Now, with a more liberalized policy environment, Austrian is operating three daily services (see Attachment 7).

The air service agreement with United Kingdom permits a designated airline from each nation to provide a daily service on Armenia-United Kingdom routes with narrow body aircraft. This includes the option of access to the well connected Heathrow airport, airport slots permitting. A British Airways affiliate, BMed, provides less than weekly services currently, operated in connection with their service flying onto Bishkek. Armenia does not permit BMed to provide services between Yerevan and Bishkek (or Tashkent, which was served on the same basis previously); that is allow fifth freedom rights. It is obvious that BMed would have space available on these type of routes as passengers would leave and join the service in Yerevan from/to London.

While GDCA informed us that nonscheduled charter flights and dedicated cargo flights are unconstrained by either regulation or

policy, we understand that there have been some difficulties in getting approval for particular services. In addition, as charter airlines are increasingly offering schedules of flight-only services in response to the competition of LCCs such as Ryanair and Internet bookings, these otherwise charter services will be constrained by the relevant air service agreement restrictions on scheduled services. Overall, the current policy is likely to have the effect of preventing services that otherwise would be offered.

### **ARMENIAN AIRLINES AND THE AGREEMENT WITH ARMAVIA**

Two carriers were designated by the Armenian government in respect of its air service agreements:

- Armenian International Airlines (AIA)
- Armavia

Integral to the establishment and operation of these airlines was the transfer of what were regarded as valuable route rights to each of the airlines. These rights are only valuable if they are restrictive. Capacity is less than would be provided in the absence of these restrictions, prices are higher, higher profits are earned, and national output is lower.

#### **AIA**

AIA had one aircraft that operated routes to Beirut, Paris, Athens, and Dubai with low frequencies up until the end of 2004. According to the privately owned AIA, it was operating a higher-frequency service than the now-defunct state-owned Armenian Airlines had operated to both Paris and Dubai. However, the rights transferred to AIA expired on December 31, 2004. At that point the rights were transferred to Armavia under the government's agreement with Armavia. AIA has ceased operations, leasing out the aircraft. If AIA had retained the rights the airline management said that it would have considered expanding its fleet.

#### **Armavia**

At the time of its establishment, Armavia was substantially owned and effectively controlled by the Russian airline, Siberian Airlines. The bulk of the Armenian route rights are held by Armavia under a

ten-year agreement with the government and Siberian Airlines titled, "Investment Agreement Relating to the Provision of Finance to Armavia," signed on March 14, 2003 (the "Agreement"). This Agreement requires that Siberian Airlines shall own no less than 67 percent of Armavia (Clause 4.2). Siberian's interest has now been sold to Armenian interests.

The route schedule for winter 2004–05 for Armavia is in Attachment 3. There is an obvious focus on Russian routes in the schedule with less emphasis on Western and southern linkages (for example, the schedule shows only a handful of flights per week into European hubs). From Armenia's perspective there would seem to be two concerns, given the importance of the Armenia-Russia air market for Armenian economic development:

- The restrictive nature of the Armenian-Russian ASA.
- The restrictive nature of Russian ASAs generally, limiting connecting opportunities for Armenia–Moscow market customers, offering as it does the most frequent connection opportunity. For example, Aeroflot has only one, or possibly two, daily flights to Los Angeles and two flights a week to the key Chicago hub.

The cost and the loss of opportunities resulting from this focus could be a double "tax" on the Armenian economy.

The Agreement gives Armavia Armenian route rights on a "long-term exclusive basis" (Schedule 2 2.1[a]). Clause 2(1)(f) of Schedule 2 of the Agreement suggests that Armavia can initiate and finance any Armenian government attempts to improve existing ASAs or enter into new ASAs. The former is to be from Armavia's perspective alone, whereas new ASAs are from Armavia's and Armenia's perspective jointly. Armavia has the right of "first refusal" for any new rights received by Armenia under air service agreements. Thus, there are significant limitations on available route rights being given to any potential Armenian competitors to Armavia. In addition, the government would be required to indemnify the airline for any damages caused by government actions that modify or hinder the performance of the Agreement (Section 5[2]). This would seem to cover the government's agreeing to allow more foreign airline capacity and to allow the entry of new Armenian airlines into Armenian international air markets without Armavia's agreement.

Unlike many countries, Armenia does not now have a state-owned airline; however, the implicit policy via the Agreement with Siberia and Armavia reflects a desire to have some Armenian airline capacity. The Agreement requires that Armavia should operate modern Boeing and/or Airbus equipment at least on Western routes.

## INTERNATIONAL EXPERIENCE WITH AVIATION LIBERALIZATION

The removal of government-imposed economic entry barriers to aviation has been associated with the rapid growth of these markets in many countries. The removal of these economic restrictions occurred first in the United States in the late 1970s, and subsequently in Chile, the EU, and the Antipodes. A more recent example is some degree of deregulation of domestic aviation and liberalization of international air services in India (*Financial Times* 2005). The outcome of liberalization has been dramatic: indeed, the development of LCCs such as Southwest Airlines in the United States and Ryanair in the EU is often regarded as the most visible example of the benefits of the removal of government-imposed economic entry barriers in **any** market.

Safety standards have been maintained. New services, more services, and lower airfares (including by the so-called legacy or incumbent carriers) are widespread results of deregulation. Airlines are able and willing to serve markets where it is profitable to do so. The airline industry has become much more efficient. As in any market, some airlines have financial problems, and some disappear into bankruptcy. In spite of that, and indeed, because of that, the services have continued to be provided and markets have continued to grow. The contribution to the economy is higher. In India, reform has resulted in greatly improved services to customers and the increased competition has forced the incumbent airlines, the state-owned Air India and Indian Airlines, to improve their performance.

### Empirical Evidence

#### *The United States*

Moving beyond the anecdotal examples, there is considerable empirical evidence of the benefits of comprehensive reform. For example, air fares in the United States are estimated to be 24 percent lower than they would have been if the regulated market had continued (Winston and Morrison 2003). Lower average air fares have resulted in substantial market expansion and an increased range of services. The LCC innovation is unlikely to have occurred in regulated markets. Perhaps just as important, the research suggests that the threat of competition, rather than the actual competition, that arises from reform also results in benefits to consumers. That is, the evidence is that the opportunity for a competing airline to enter a service puts pressure on incumbent airlines to improve their services and lower prices, thereby benefiting customers. This is important for smaller markets such as Armenia.

This evidence might be criticized as being domestic in nature and ignoring the complications imposed by the international bilateral system. A U.S. Department of Transportation study on the effects of U.S. Open Skies agreements compared to traditional ASAs suggests that the liberalization due to Open Skies agreements has resulted in increased services and lower fares.<sup>10</sup>

A comprehensive study of the effects on U.S. international air cargo markets of Open Skies agreements suggests a reduction in prices (Micco and Serebrisky 2004): this is in a situation in which U.S. bilateral agreements usually did not constrain dedicated cargo airliners in any case.

### *The EU*

A recent study commissioned by the European Commission investigated the benefits to be gained by removing the remaining government-imposed economic restrictions in the overall U.S.-EU international aviation market. Even though some key U.S.-European bilateral agreements are of the Open Skies type,<sup>11</sup> (for example, the U.S. agreements with the Netherlands, France, and Germany), the removal of the remaining restrictions is estimated to generate a further increase of approximately 10 percent in aviation outputs along with substantial cost savings (The Brattle Group 2002a).

### *The Netherlands*

It might be argued that these are major markets and similar results may not be found for smaller markets. A study for the Dutch government (The Brattle Group 2002b) estimated that the Dutch Open Skies agreements boosted outputs on the Netherlands–U.S. routes by 51 percent and on the Netherlands–Kenya routes by 157 percent. There was a significant positive effect on aviation employment in the Netherlands as a result. The study also indicated that the Netherlands received a strategic benefit by being the first among its European neighbors to reform.

### *Australia*

The Australian Productivity Commission's investigation of the effects of the removal of government-imposed restrictions on Australian international aviation produced estimates of significant overall gains to the economy (Productivity Commission 1999).

### *Chile*

The Chilean government considers that the Chilean Open Skies policy contributed to the rapid 10 percent per year growth in passengers over

the 1989–2002 period (with 9 percent per year for cargo). The number of services offered in the Chilean international air services market increased from 104 to 329 over the same period. Chilean carriers provided 47 of these services in 1989, rising to 148 over the period. A short paper by the Chilean government on this issue, provided to the International Civil Aviation Organization (ICAO), is provided in Attachment 8.

### *Lebanon*

A recent European Commission (EC) paper on the EU's international aviation strategy (EC 2004) cites Lebanon's own Open Skies policy as delivering a dynamic air market as the local tourism markets grow rapidly. The local airline, MEA, appears to have coped and responded to the challenge successfully.

The European Commission's estimate is calculated by fully offsetting the much larger gains to existing passengers from these lower prices by the reduced benefits to the airlines.<sup>12</sup> The estimate is purely indicative and is likely to be the upper bound for the likely gains from price changes resulting from liberalization. In particular, the available liberalization options for the government, even when fully implemented, may still not make the Armenian market attractive to LCC operations.

Moreover, even if Armenia were to fully liberalize immediately, these gains would not occur straight away. As is noted above, the agreement of the bilateral partner country is needed to implement full liberalization. Even with this agreement, airlines need to decide on increasing schedules and undertaking the necessary market development activities. The European experience shows that LCCs do not enter markets immediately and that LCCs are only starting to enter markets regulated by ASAs. Further examples of the experiences with liberalization are given in Box 13.2.

### **Effects of Liberalization in Armenia**

Airline yields have indeed been falling in real terms for some time. With full competition, prices will come closer to best practice least-cost over time, as is the trend in the United States, the EU, and other liberalized markets with the removal of government-imposed regulatory barriers, the full entry of LCCs, and the efficient utilization of new technologies.

This estimate of the effects of liberalization does not allow for the gains in quality that come from greater competition. With competition, airlines will have a stronger incentive to target service quality more closely to consumer preferences and willingness to pay. This would boost economic welfare further (see also Box 13.3).

**BOX 13.2 CASE STUDIES: ADDITIONAL LIBERALIZATION EXPERIENCES**

In response to suggestions from some interested parties in Armenia we also examined the experiences of some smaller countries (Latvia, the Czech Republic, and Bulgaria) that had engaged in liberalization in cooperation with the respective authorities.

**Latvia**

Latvia and the Czech Republic liberalized ahead of EU accession, for different reasons. Latvia saw the importance of air links, was unwilling and unable to cover the losses incurred by the incumbent airline (an Aeroflot legacy operation), and decided to allow market solutions to the provision of air services while focusing scarce government resources on aviation infrastructure. There has been a dramatic opening of the Latvian-European air markets over the last 10 years. Air travel volumes initially reduced dramatically as subsidies on the old internal USSR routes disappeared. Following a period of much lower activity, rapid growth in the air markets occurred with EU accession and the reorientation of airBaltic toward an LCC model to meet the LCC challenge that came with the EU-required liberalization (see Attachment 5 for more details).

**The Czech Republic**

In the early 1990s, the Czech government saw the potential in their tourism market as being best addressed by unrestricted international markets. The incumbent carrier (CSA) was not able to refute these arguments. Growth has been extremely rapid and the incumbent carrier has adjusted to meet the increasingly competitive threats. Other Czech carriers have entered the market (see Attachment 6 for further details).

**Bulgaria**

While still operating fully within the bilateral Austrian-Bulgarian ASA framework, Bulgaria has liberalized to ensure that air services are provided, given that the incumbent state carrier was performing poorly. The level of connectivity is high as a result of increased services by nonBulgarian airlines. No LCCs have yet attempted to enter these markets. This reflects the earlier observation that LCCs function best in deregulated markets and their operation seems inconsistent with the inherent rigidities of the regulation and associated compliance under bilateral ASAs. (Fuller details are given in Attachment 7.)

*Source:* Staff analysis.

### BOX 13.3 ECONOMIC BENEFITS OF LIBERALIZATION: AN ILLUSTRATIVE CALCULATION

The available Armenian data do not permit a comprehensive assessment of the likely effects of the removal of the existing economic restrictions. A possible way of thinking about the effects of liberalizing Armenia's aviation market would be to consider the results from the U.S. domestic liberalization, the best documented and analyzed case, as being the benchmark for the long-term effects of full liberalization. As is noted in the text, the movement away from the highly regulated U.S. domestic market in the 1970s resulted in a drop in prices of 24 percent. This drop factors in the effect of the entry of LCCs such as Southwest Airlines, which were able to expand nationwide with liberalization.

A recent survey<sup>a</sup> suggests price elasticities as being in the range of 1 (that is, demand grows by 10 percent in response to a price reduction of 10 percent). Thus the 24 percent price reduction estimated would result in outputs being 24 percent higher, all other things being equal.

With Armenian passenger volumes being in excess of 1 million in 2004 (Table 13.1), a 24 percent increase in volumes would translate into approximately another 250,000 passengers through the airport in a year. The airport survey indicates average single price of US\$184 and a return ticket price of US\$436. Assuming a single ticket price of US\$200, this suggests a net economic welfare gain of over US\$6 million per year to Armenia from better pricing alone.

*Source:* Staff analysis.

a. Gillen, Morrison, and Stewart (2003). This survey shows short-haul business travelers to be less responsive to price changes whereas leisure travelers are much more responsive. All of the business-class travelers to and from Armenia probably fall into the former category. While the airport survey shows that some 30 percent of travelers could be regarded as being business travelers, most were traveling on cheaper economy tickets. Overall an elasticity of 1 is probably reasonable.

ICAO in its publication *Economic Contribution of Civil Aviation* (2000) estimates a threefold multiplier between aviation outputs and wider economic impacts: that is, US\$100 of aviation outputs generate US\$325 of additional outputs in the wider economy. The employment multiplier is higher, according to the same publication.

### Policy Options for the Government

The foregoing suggests that there are gains available to the government from instituting a comprehensive liberalization policy for civil aviation. The government would wish to convince itself and other interested parties that benefits from liberalization policy would likely

exceed any costs in comparison with the next best policy option and that any policy and implementation risks could be managed. The main policy options that would represent a movement from the status quo include the following:

- unilateral liberalization
- adoption of the EU single air market principles
- adoption of an Open Skies policy for international air services
- phased liberalization

### *The Status Quo*

The status quo, the continuation of the current policy, would not mean that the government would not change bilateral agreements and their implementation at all. In fact, it would probably mean that the government would respond to proposals from Armavia or from partner governments (usually on behalf of their airlines) to undertake negotiations that would result in the creation of additional traffic “rights.” Even monopolies respond to changes in demand and costs. For example, constraining airline schedules to allow 100 percent load-factor aircraft operation is not a profitable commercial strategy, even for monopolists: operating schedules that result in lower load factors are more profitable. The increases in capacity offered by incumbent airlines and the entry of Lufthansa can be seen in this context.

Airline behavior is a factor in the restrictiveness of the current policy. Traditional bilateral air service agreements tend to create duopolies: namely, two airlines, one from each country. The degree of “cooperation” between them depends on a range of factors including the attitude of both governments and whether competition law is applied and is effective.<sup>13</sup> Highly “cooperative” duopolies behave as monopolies, constraining the capacity to raise prices to the profit-maximizing level. Depending on these factors, either one or both of the airlines will approach the government(s) when it seems profitable to expand capacity. These expansions will be less than what would prevail in a competitive market, but they will occur. Air services would increase with a growing market, but opportunities would be forgone and costs would be higher than they need to be. The need for government agreement, negotiations, permits, and so forth obviously raises the costs of making proposals for new capacity.

The government’s agreement with Armavia will result in a more restrictive approach to capacity additions than would prevail if the government were able to consider or initiate proposals for additional services without such an agreement. The length of the agreement and the exclusivity given to Armavia, along with the indemnifications

given under the agreement, mean that the government is effectively committed to a restrictive approach until March 2013. The government's approach to the obligations regarding a minimum of network operations, and the sanctions available for breaches, may have some offsetting influence on an otherwise restrictive approach. Nevertheless, the existence of the agreement, with its clear and exclusive allocation of existing route rights, including those reallocated from AIA, suggests that the government's international aviation policy will be strongly influenced by Armavia's commercial interests while the agreement is in place.

### *Unilateral Liberalization*

The general view is that the policy that contributes most to a country's economic output and income is the earliest possible removal of trade restrictions such as import quotas and tariffs, regardless of other countries' actions. Political economy considerations have caused countries to liberalize more slowly and often on bilateral and multilateral bases. Because of the bilateral nature of aviation, unilateral liberalization, while removing barriers, carries with it the risk that the other countries may allow their airlines to monopolize the bilateral markets.

This would place the country that is liberalizing at a disadvantage unless the other country is credibly committed to liberalization. For this reason the unilateral liberalization of aviation regardless of the policy of other countries may not be the best policy for a reforming country. Liberalizing within an intergovernmental framework is likely to be less risky even if it is slower. Because of the network nature of efficient airline operations and the benefits of air markets being open to the more efficient airlines, a multilateral approach is the most desirable one, although it is more difficult to achieve. The EU probably offers the best model.

### *Adoption of the EU Single Air Market Principles*

The adoption of the EU single air market principles would remove all government-imposed economic entry barriers (as would Open Skies) but would, in principle, also provide greater flexibility in terms of ownership and control requirements. Any airline owned and controlled by nationals of a signatory country would be free to serve any route to and from Armenia. The notions of route rights and freedoms would disappear. The only regulatory approvals would be for safety, generally handled through the issuance and monitoring of an Air Operator's Certificate, along with associated permits, licenses, and so forth for airlines and staff registered in Armenia. No further permits

or licenses relating to economic regulation would be necessary. In such a liberalized policy environment an airline's assessment as to whether to provide a service would be based on the potential passenger and cargo markets both ways, as well as the fares and charges versus the costs of providing the services. If a service on the route is expected to be profitable, then the service is likely to be provided (and to continue to be provided); if it is not profitable, service would be suspended.

The EC's statement on its aviation policy towards its neighbors (mentioned earlier in this section) suggests that the EC is unlikely to offer entry to its single air market to countries such as Armenia in the near future: its priorities are elsewhere (such as the United States and the Asia-Pacific region, where bilateral Open Skies and multilateral arrangements are in place). If such an equivalent arrangement could be negotiated with a regional or CIS grouping (as African countries have done, although with little evident effectiveness to date, with the Yamoussoukro Declaration concerning a single African air market), this would offer intrinsic benefits and would also increase the prospect of such an arrangement "joining" the EU single air market, provided it is compatible with EU principles.

#### *Adoption of an Open Skies Policy for International Air Services*

An Open Skies policy would involve the government's stating that its aim, with the coming into force of new agreements, would be the **removal** of the following restrictions, **provided** Armenian airlines have reciprocal opportunities to compete:

- government limits on the number of airlines
- government limits on frequencies, schedules, capacities, and services offered by airlines
- requirements for airlines to "coordinate" activities
- pricing restrictions

Competition between the airlines of the two countries would be regulated only by competition law in addition to normal safety and security laws. As a result, competition law would normally mean that interairline agreements in these markets would generally only be permitted if there were demonstrated net benefits to consumers. Chile pioneered this policy approach in 1979 (Attachment 8). The United States initiated its Open Skies model in the 1980s.

Open Skies would be implemented by bilateral negotiations with partners. To communicate its policy stance, Armenia could consider joining the APEC-related Multilateral Agreement on the Liberalization of International Air Transportation.<sup>14</sup> This agreement makes clear that

the restrictions listed above no longer apply. Airlines from signatory nations can act without any economic regulatory restraint in the air markets in these nations. Any nation that is a signatory to core international treaties on aviation security can join the agreement. The key elements are outlined in Attachment 9.

Bilateral negotiations to achieve full liberalization may be rapid: the bilateral partner agrees with the policy and a new ASA is agreed upon, literally by the exchange of faxes, e-mails, or diplomatic notes/letters. Negotiations may also be slow: the partner only wishes for gradual implementation. In the latter case the government will need to decide on its tactics of balancing the long-term policy objective versus protecting its interests in the short term (for example, by avoiding foreign foreclosure of the relevant Armenian air market). Staged or phased implementation is often the outcome of such balancing.

### *Phased Liberalization*

There is obviously a wide range of possibilities although it is desirable that the long-term objective of the liberalization is clear. In addition to the inherent phasing that would probably occur in full liberalization because of the bilateral nature of the current arrangements, the government could communicate to bilateral partners that it would be willing, **on a reciprocal basis**, to immediately ease airline designation requirements and capacity and frequency restrictions.

The multilateral Pacific Islands Air Service Agreement provides one approach. Three phases are included with the liberalization according to this agreement:

*Phase 1:* When the Agreement comes into effect, signatory nations allow airlines of the signatory nations to have unrestricted access on routes between these nations; frequency, capacity, and pricing limits are removed.

*Phase 2:* Six months after Phase 1, the Agreement becomes an Internal Single Aviation Market (ISAM), in which airlines can also exercise fifth freedom rights that allow signatory airlines to operate networks between signatory states. Ownership and control rules would be relaxed.

*Phase 3:* Two years after Phase 1, the ISAM becomes a Full Single Aviation Market and Australia and New Zealand would become eligible to join.

One practical policy for the government would be for it to state that each airline operating on each current air route could operate as many

frequencies as could be, or are, operated on the Yerevan-Moscow route (for example, three per day) without further capacity restrictions, provided the aircraft is type-approved by the JAA/EASA<sup>15</sup> or the equivalent. This could be coupled with the government endorsing a multi-airline policy on each ASA together with declaring a willingness to unilaterally grant fifth freedom rights.

A more modest reduction in restrictions would be to offer each existing bilateral partner a daily frequency for each airline with no other capacity limitations, with immediate effect. This would allow CSA and Lufthansa, for example, to increase their services if it was commercially viable. It would also allow airlines to operate higher-capacity, wide-body aircraft during the peak season if the airline considered that the demand warranted this.

As with Lebanon, fifth freedom rights could be liberalized immediately, unilaterally. For example, Armenia could permit U.K. airlines to provide services on the Yerevan-Tashkent and Tbilisi-Yerevan market. The services would be provided only if the option was commercially viable and the agreement of the other country was forthcoming. The argument for this arrangement is that there would be benefits to Armenia in terms of increased services. The cost would be reduced bargaining power (for example, the cost of obtaining the right from the United Kingdom for Armavia to fly London-Los Angeles). We assess these costs as being small. First, the probability of receiving such rights is low outside of broader liberalization packages; second, the value to Armenia (and Armavia) is very low, because the additional costs to Armavia of flying beyond London would be high compared with its competitors, and the effects on the Armenian economy from additional competition on the transatlantic market would be near zero.

### *Effects of the Government-Armavia Agreement on Reform Options*

As discussed above, this agreement gives Armavia exclusive rights for a period of 10 years from March 2003 to operate the existing Armenian air rights, with the London, Vienna, and Brussels air routes being the noted exceptions. There is explicit provision for indemnities from the government for any actions that adversely affect the airline. The government would need to be clear about any constraints this agreement would impose on the usual government freedom of action to remove regulatory impediments.

These issues would require careful legal analysis, and any subsequent policy decision should be constrained by the overarching policy aim of ensuring respect for property rights, including those given via contracts.

## PROBLEMS WITH LIBERALIZATION

The main arguments and concerns that are raised when liberalization is proposed for international aviation are the following:

- the risk of the loss of services to and from Armenia
- the related concern that Armenian-based carriers will be uncompetitive
- the concern that opportunities for Yerevan hub development may be forgone

These are related questions. In a liberalized market there is obviously no guarantee that any airline will survive even as more services are provided in a growing market. Even in highly regulated markets commercial success is not guaranteed. As with any market, the greater percentage of new firms will either fail or remain small. Few will succeed and grow substantially. As competition is introduced through reductions in government-imposed entry restrictions, incumbent airlines may have to adjust by lowering costs, including employment costs. The overwhelming evidence is that the outcome of this process is better for customers and the economy than the outcome of highly regulated markets or markets dominated by state or private enterprises that are protected or inefficient. Employment in the aggregate is higher, even if the employment costs of the previously protected airlines come under pressure. With airlines, the risk of “nonentry” is not a major issue in a liberalized environment: AIA has shown that commercial airline operators are quick to exploit profitable opportunities.

The bilateral approach also gives some advantages to incumbent airlines at their “home” airport (such as location of crews). These advantages may partially offset the higher costs at the partner airport and in the partner’s airspace (a concern raised by Armavia in respect of Russia). The rules under the Chicago Convention that established the ICAO oblige member states to operate their air traffic services on a purely cost-recovery basis. In addition, countries are under obligation not to discriminate between home and foreign carriers. Even so, the rules allow considerable flexibility in terms of cost allocation and charging structure. Maintaining restrictive ASAs is a costly mechanism for addressing this problem.

Without regulatory impediments and with an “investment-conducive” business climate, entry to the airline business does not appear to be a problem. Airlines exist to serve commercially viable markets, and with liberalization markets are larger than they otherwise would be.

Recent experience suggests that there are few, if any, economies of scale in airlines—certainly, fewer than was considered the case. Sunk

costs are low. Point-to-point services are competing very successfully with network carriers in the United States, Europe, and developing countries such as India. They are generally gaining market share at the expense of the legacy carriers. It is not clear whether the network carriers using hub airports will ultimately out-perform point-to-point carriers or vice versa. Only the latter have been consistently profitable in recent years, but they are now coming under pressure from new entrants. The LCCs have cost advantages, including higher aircraft utilization and higher employment productivity. The network carriers offer higher frequencies but require transfers, which often entail longer journey times for customers.

There seems little reason why a well-managed, customer-focused, cost-effective Armenian airline would not be viable in a liberalized environment. The example of airBaltic is illustrative, as is AIA. We reiterate the point that such carriers would receive some protection (although a declining amount) as liberalization is implemented and other airlines respond to new opportunities (possibly including other Armenian carriers). There would be a basic and growing point-to-point business. Well-run Armenian airlines would probably have a medium-term labor cost advantage but a fuel cost disadvantage. There is and will be considerable excess infrastructure capacity, although the airlines and the CPEC are concerned about airport charges (this is discussed further below). The ownership and control restrictions are a problem for countries with smaller capital markets and must disadvantage airlines domiciled in these markets. However, the experience of AIA (and, indeed, Armavia) suggests that the problem is not insurmountable.

Beyond the assistance given by the home base and the assistance from the inevitable gradual withdrawal of regulatory protection, it is important, in terms of ultimately developing a liberalized air services market, that no further government assistance (whether fiscal, ownership, or regulatory) is given to local airlines. International experience has shown that such assistance or protection, no matter how well intentioned, usually results in management's losing focus on customers, markets, and competitors, and concentrating instead on ensuring continued government assistance. The withdrawal of protection or assistance is often difficult to achieve so that the costs to the economy continue longer than expected. Protected firms rarely prosper on a self-sustaining basis.

### **Transit Traffic**

Depending on the quality and pricing of the airlines and the infrastructure compared to that of other locations (such as Vienna, Cairo, Istanbul, or Dubai), transit traffic may or may not develop. The mar-

ket for transit traffic is inherently competitive compared to point-to-point markets. Success depends on an effective combination of airline and infrastructure services as well as a sound location. Successful airlines generally determine whether an airport becomes a hub rather than vice versa: Vienna/Frankfurt and Brussels/Zurich are contrasting examples. In the latter cases considerable investment in the infrastructure has delivered a lower than expected payoff because of weaknesses in the airlines compared to their competitors.

### **The Role of Competition Law**

Incumbent airlines often argue that they will be at risk for increased predation in a liberalized environment. International experience suggests that the increase in competition resulting from liberalization has required competition authorities to respond appropriately but few real problems have arisen, despite many concerns about predation (such as pricing being below an airline's [avoidable] costs in order to reduce competition). It is generally recognized that predation is more of concern with state-owned commercial entities, including airlines. Although issues of jurisdiction have to be addressed, given the inherent international status of aviation, agreements between the competition authorities in the countries at either end of a particular market are generally adequate to address this problem.

We understand that the Armenian competition law offers the usual protection in the form of a prohibition against the abuse of a dominant market position to distort competition. The competition authorities consider that there may be a jurisdictional problem in the law in terms of the Armenian international aviation markets. Jurisdiction could be reviewed if there is indeed a problem, although the authorities have advised that there is also a CIS agreement covering anticompetitive behavior that they can utilize. We acknowledge that the risk of predatory behavior is higher with state-controlled airlines such as Aeroflot; therefore, ensuring that the law is robust is desirable. There are also suitable bilateral arrangements for addressing any jurisdictional concerns.

### **Safety**

Safety regulators may be faced with a greater number of airlines entering (and exiting) the air markets. Issues concerning the funding of the regulators together with their efficiency and effectiveness are likely to arise. Generally, airlines are willing to pay cost-related charges for cost-effective regulatory services. It would be desirable if government budgetary and civil service rules recognized this fact and allowed a well-performing, transparent, and accountable safety regulator a greater degree of autonomy in regard to the remuneration

of key technical staff and overall budgets. Contracting out may be a viable least-cost option for ensuring that specialized regulatory skills are available. One aspect of accountability is a requirement for the safety regulator to consult with airlines concerning its business planning, resourcing, rule making, and general enforcement policies.

## ARMENIAN AVIATION INFRASTRUCTURE

Infrastructure costs (airports and air traffic control [ATC]) can make up 10 percent or more of an airline's costs. Ensuring an effective home base assists a locally domiciled airline. Alternatively, if the "home" airport delivers poor value for money, a home base makes it more difficult for local carriers to survive and prosper. Local carriers can be advantaged or disadvantaged by local infrastructure performance, as it often uses more of those services than the foreign carriers do. The local airlines usually face higher unit costs at foreign airports than the foreign airlines face at their home airports (for example, because relatively low usage of those airports would not usually qualify for volume discounts, and the use of an airline's ground handling services is uneconomic).

The Zvartnots Airport concession places limits on **real** core aeronautical charges (landing, parking, passenger, and so forth) but these charges can be adjusted to allow the airport to earn a 20 percent internal rate of return (post tax) on the funds invested in the airport over the life<sup>16</sup> of the concession.<sup>17</sup> The airport manager is required to modernize the airport and is implementing an investment program that will significantly increase capacity and service quality over the next three years. The funds invested in the airport will rise by some US\$35 million from this first tranche of investment. The concession agreement will thus allow the company to seek to increase charges to earn the allowed return on the enlarged investment.

The incentives for the airport manager will be to set airport charges that will maximize profits, given the expected demand, subject to the 20 percent cap on rate of return. The airport passenger charge (of US\$11 currently)<sup>18</sup> would generate the bulk of the airport's revenue, but other areas are likely to be subject to new or increased charges. The recent debate over the increase in the kerosene charge by the airport as the monopoly supplier (under the concession) is an example.

If the 20 percent allowed rate of return is above the airport's cost of capital then the airport will have an incentive to increase the funds invested up to the point at which further allowed charge increases would no longer be profitable.<sup>19</sup> The concession provides for the airport's investment plan to be specified in a master plan for the airport. This plan needs government approval. The government, then, is in the

usual position of an economic regulator of having to take a position on the value of a proposed airport investment that will avoid the possible overinvestment risks posed by the allowed rate of return. This assessment is difficult in the absence of the full output-related pricing of airport services. The government would have to use public sector cost-benefit analysis as a core assessment tool to inform its reaction to the airport's proposals.

The airport passenger charge, given the additional government departure levy of approximately US\$28 per passenger and other charges to airlines, may raise questions about whether attempting to pass on all costs to airline customers would be a commercially viable strategy in the short term. That is, the restriction on pricing from the concession may not be binding in the near term. The expected traffic volumes are the critical uncertainty and volumes will be affected by both the total cost of using the airport and the restrictiveness of the civil aviation regulatory regime. It is noteworthy that the Latvian government recently abolished its approximately US\$15 per passenger departure charge at Riga airport in an attempt to boost the Latvian air market.<sup>20</sup>

Managing the Zvartnots concession will be a challenge for the government. It is desirable that the Concession Agreement and competition law operate in a consistent manner to ensure the following conditions:

- All parties (airport and airlines in particular) are clear as to their rights and obligations in terms of airport infrastructure services and charges thereon.
- Commercial arrangements between the infrastructure service providers and customers are encouraged to the extent possible and that the master plan for the development of the airport services arises out of this process rather than vice versa. This would allow a better sharing of risk and would improve incentives for the best possible business decisions, thereby increasing the chances that airport investments are customer driven.
- There is a clear government policy on airport pricing under, and consistent with, the concession, developed after consultation with the airport and customers. Among other things, this policy could cover how the government will assess revisions to the master plan, its expectations as to the airport's consultations with airlines and other interested parties, the way in which the government will approach the issue of demand projections, the relevant cost and revenue basis, and the expectations as to the frequency of price adjustments. The last issue bears on whether the government would wish to have the concession operate more as a price cap with its stronger incentive properties rather than purely on a rate-of-return basis.

The concession agreement also gives Yerevan Airport exclusive rights on Armenian non-CIS air links. This is an undesirable restraint on trade. Interairport competition has been shown to deliver benefits to airlines, to customers, and to the economy. However, as it is a term in the concession, the agreement of the airport manager would have to be obtained to change this restraint.

## GOVERNMENT DECISION-MAKING PROCESSES

Sound and transparent government decision-making processes for future Armenian civil aviation policy should lead to better policy formulation and implementation. The first step would seem to be the development of a government policy on international civil aviation. This is now under way. Such a policy should be consistent with the government's overall development strategy. To ensure the ownership of such a policy by interested parties to the extent possible, this policy should be developed openly, both within and outside of government.

Government departments with interests in economic development, international linkages, and tourism should also be involved, along with consultation with such key parties as airlines and the airport, to ensure an economy-wide perspective. The Czech Republic case study (see Attachment 6) highlights the fact that government economic agencies played an important part in developing and implementing Czech international aviation policy.

Once the policy is finalized, following the consideration of and responses to the consultation, the most appropriate agency needs to be tasked with implementing the policy and to be held accountable accordingly. As the issues involved in implementing the policy will often require government input, it would be desirable to have the ongoing involvement of these other agencies in advising the government. We understand that a commission chaired by the GDCA already exists to address some aviation issues. This commission's mandate could be extended to cover international civil aviation policy. The commission could be tasked with developing a strategy for implementing the government's policy and reporting the progress of the implementation.

## CONCLUSIONS

International aviation policy is a strategic issue for the government. The evidence suggests that landlocked countries have lower per capita incomes. It also suggests that air transport can give isolated countries

a comparative advantage in high value goods compared to countries closer to major markets. The evidence also indicates that current policies result in relatively expensive air services. It is unlikely that LCCs would be attracted to serving the Armenian market. These facts emphasize the importance of making sure that government policies do not impede growth of Armenia's international commercial air links.

Armenia has relatively poor connectivities and capacities for international aviation. While the outlook is toward growth as the demand grows, the performance could be better. The current government policy, both regulatory and commercial, contributes to poor performance. The benefits to be gained from liberalization appear significant. The costs of liberalizing, apart from problems with the agreement with Armavia, would be low.

Unilateral liberalization has risks and the EU single air market model may be difficult to implement. A policy approach along the lines of an Open Skies liberalization offers the highest return to Armenia. With the government's priority of sustained high rates of economic growth, the analysis and evidence suggest that the government should adopt the objective of eliminating government-imposed economic entry barriers to Armenia's air markets as soon as possible, provided Armenian airlines have reciprocal opportunities to compete.

The development of a strategy to renegotiate the agreement with Armavia to ensure that the desired civil aviation policy can be implemented may need to be part of the initial work program for aviation policy. It is likely that, even if the government adopts full liberalization on a reciprocal basis as its policy, the practicality of implementation will give significant protection to Armavia over the medium term. In addition, given the small size of the markets and the size of the aircraft operated, the addition of capacity, even when permitted, will be incremental, albeit important.

There is no guarantee that services will be provided in a liberalized environment: rather, services will depend on the underlying commercial viability and on customer demand. Generally, however, outputs are higher in liberalized situations than in highly regulated alternatives. Compared to the liberalization of other markets, the inherently gradual approach to liberalization in international aviation will enable the government to better monitor developments.

The Dutch case study cited earlier suggests that there are advantages to being the "first mover" in liberalization. This may be important in the region. The EU expansion and the spread of Open Skies agreements (like that between India and the United States) signal increasingly competitive air services markets internationally. It is important that airlines are exposed to competitive pressures as early as possible so that they can take advantage of the opportunities

resulting from liberalization, rather than needing protection from it, in view of the much higher costs to the economy of protection. Well-managed incumbent airlines will clearly recognize both the opportunities and threat arising from liberalization and will change their organizations so as to take advantage of the opportunities and, importantly, to manage the increased risks.

## ATTACHMENT 1

Zvartnots International Airport,  
Sample Departure Board

WINTER 2005 Flight No	Destination	Code	Airline	Scheduled aircraft type	Sched. time	Est./ Actual check-in start	Check-in end	Desk	Est./ Actual time	Actual aircraft type	Remark
D9 664	ROSTOV	ROV	AEROFLOT-DON, JSC	TU-154	30, 11:45	30, 08:44	30, 11:31		02, 11:45		DELAYED
U8 516	MOSCOW	DME	ARMAVIA AIRCOMPANY LTD	A-320	30, 18:05	30, 15:05		23	31, 20:00		BOARDING
U8 510	MOSCOW	DME	ARMAVIA AIRCOMPANY LTD	A-320	31, 09:45	31, 06:45	31, 19:59		31, 20:15		DELAYED
U8 991	NOVOSIBIRSK	OVB	ARMAVIA AIRCOMPANY LTD	A-320	31, 11:35						CANCELED
CPN 7917	TEHRAN	THR	CASPIAN AIRLINES	TU-154	31, 13:00	31, 10:04	31, 13:18		03, 13:00		DELAYED
MI 6338	MIN.VODY	MRV	KAVMINVODYAVIA SAC	TU-134	31, 15:00						CANCELED
SU 194	MOSCOW	SVO	AEROFLOT-RUSSIAN AIRLINES OJSC	TU-154	31, 16:15	31, 13:14	31, 15:48		31, 17:10	TU-154M	
S7 906	MOSCOW	DME	SIBERIAN AIRLINES, OJSC	TU-154	31, 16:55	31, 14:03	31, 16:43		31, 20:00		BOARDING
9D 324	KAZAN >	KZN	PERM AIRLINES FSUE	TU-134	31, 18:00	31, 15:05	31, 17:35		31, 22:00		DELAYED
9D 324	> PERM	PEE	PERM AIRLINES FSUE	TU-134	31, 18:00	31, 15:05	31, 17:35		31, 22:00		DELAYED
U8 516	MOSCOW	DME	ARMAVIA AIRCOMPANY LTD	A-320	31, 18:05	31, 15:05		12,22	31, 20:15		DELAYED
U8 5011	ISTANBUL	IST	ARMAVIA AIRCOMPANY LTD	A-320	01, 00:30	31, 21:30		3,4			ON TIME
U8 5011*	ISTANBUL	IST	FLY AIR	A-320	01, 00:30	31, 21:30		5,6			ON TIME
U8 825	ODESSA	ODS	ARMAVIA AIRCOMPANY LTD	A-320	01, 00:35	31, 21:35		17,18,19			ON TIME
U8 347	ALEPPO	ALP	ARMAVIA AIRCOMPANY LTD	A-320	01, 02:30	31, 23:30		10,11,12			ON TIME
SU 192	MOSCOW	SVO	AEROFLOT-RUSSIAN AIRLINES OJSC	TU-154	01, 04:55	01, 01:55		17,18,19			ON TIME

## ATTACHMENT 2

**Riga International Airport Departure Board,  
January 2005**

Riga to Amsterdam						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1234567	07:10	08:30	KL1320	F70		Amsterdam Airport Schiphol
1-3-5-7	07:20	08:40	BT611	735		Amsterdam Airport Schiphol
1234567	13:50	15:10	KL1324	F70		Amsterdam Airport Schiphol
Riga to Berlin						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1234567	10:05	10:50	EZY4596	319		Berlin—Schönefeld Airport
-----6-	13:10	14:00	BT211	AR7		Berlin—Tegel Airport
12345-7	18:05	18:55	BT211	735		Berlin—Tegel Airport
Riga to Brussels						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
12345-7	07:30	09:15	BT601	AR7		Brussels International Airport Company
Riga to Cologne						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
12345-7	07:00	08:15	BT227	735		Cologne/Bonn Airport

*Note:* Under “Days” number 1 refers to Monday, 7 to Sunday.

Riga to Copenhagen						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1234567	07:00	07:30	BT131	735		Copenhagen—Kastrup International Airport
1234567	13:20	13:50	BT135	735		Copenhagen—Kastrup International Airport
1234567	18:10	18:40	BT139	735		Copenhagen—Kastrup International Airport
Riga to Dublin						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
-2-4-6-	22:55	00:10	BT661	735		Dublin Airport
Riga to Frankfurt						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1234567	13:40	15:10	LH3247	AR8		Frankfurt Airport
1234567	22:10	22:30	FR4373	738		Frankfurt-Hahn Airport
Riga to Geneva						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
----6-	06:25	08:15	BT641	735	to 26.03	Geneva International Airport
Riga to Hamburg						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
----6-	11:05	11:55	BT251	735		Hamburg Airport
12345-7	13:30	14:10	BT251	735		Hamburg Airport

Note: Under "Days" number 1 refers to Monday, 7 to Sunday.

Riga to Helsinki						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
12345--	07:30	08:40	BT301	F50		Helsinki—Vantaa Airport
12345-7	11:20	12:35	AY3124	AT7		Helsinki—Vantaa Airport
-----6-	12:10	13:25	AY124	AT7		Helsinki—Vantaa Airport
1234567	13:50	15:00	AY3128	AT7		Helsinki—Vantaa Airport
12345--	17:45	18:55	AY3126	AT7		Helsinki—Vantaa Airport
12345-7	18:05	19:15	BT305	F50		Helsinki—Vantaa Airport
Riga to Kiev						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
12-45-7	13:30	15:15	BT402	AR7		Kiev—Boryspil State International Airport
Riga to London						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1-3-567	09:10	10:10	BA881	320		London—Heathrow Airport
--4--	10:45	11:45	BA881	320		London—Heathrow Airport
1234567	16:05	17:05	BT651	735		London—Heathrow Airport
1234567	22:50	23:25	FR2643	738		London—Stansted Airport
Riga to Manchester						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1-3-5--	13:00	13:55	BT671	735		Manchester Airport

Note: Under “Days” number 1 refers to Monday, 7 to Sunday.

Riga to Milan						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
-2-4-67	13:00	14:55	BT701	735		Milan—Malpensa Airport
Riga to Minsk						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1-3-5-7	13:20	14:35	BT412	F50		Minsk National Airport
Riga to Moscow						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1--4-6-	07:00	09:50	SU184	TU5		Moscow—Sheremetyevo Airport
12-45-7	11:00	13:40	BT502	735		Moscow—Sheremetyevo Airport
Riga to Munich						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1234567	16:30	17:50	LH3248	CR7		Munich International Airport
Riga to New York						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
--4--7	12:40	15:30	HY101	763		New York—John F Kennedy I. A.
Riga to Oslo						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
12345-7	20:00	20:35	BT151	735/AR7		Oslo Airport

*Note:* Under “Days” number 1 refers to Monday, 7 to Sunday.

Riga to Prague						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1234-67	07:00	08:00	OK883	735		Prague—Ruzyne Airport
12345-7	15:15	16:10	OK881	735		Prague—Ruzyne Airport
Riga to St. Petersburg						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1-3-5-7	20:00	20:35	BT443	F50		Pulkovo International Airport
Riga to Stockholm						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1234567	07:40	07:50	BT101	735		Stockholm—Arlanda Airport
----6-	16:10	16:15	BT109	AR7		Stockholm—Arlanda Airport
1234567	17:20	17:35	FR1963	738	from 21.02	Stockholm—Skavsta Airport
12345-7	18:15	18:20	BT109	AR7		Stockholm—Arlanda Airport
Riga to Stuttgart						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1-3-5-7	17:35	19:05	BT295	AR7		Stuttgart Airport
Riga to Tallinn						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
12345--	07:45	08:40	BT311	F50		Tallinn Airport
12345--	19:40	20:35	BT315	F50		Tallinn Airport

*Note:* Under “Days” number 1 refers to Monday, 7 to Sunday.

Riga to Tampere						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1234567	19:40	20:50	FR2734	738		Tampere—Pirkkala Airport
Riga to Tashkent						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1---5--	11:15	19:05	HY102	763		Tashkent—Yuzhny Airport
Riga to Vienna						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1-3-567	07:30	08:35	BT231	AR7		Vienna International Airport
1234567	15:00	15:50	OS694	CR1		Vienna International Airport
Riga to Vilnius						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
12345--	08:30	09:25	BT341	F50		Vilnius International Airport
12345--	17:00	17:55	BT343	F50		Vilnius International Airport
Riga to Warsaw						
DAYS	DEPARTURE	ARRIVAL	FLIGHT NR	AIRCRAFT	NOTE	AIRPORT
1234567	14:35	14:55	LO784	ER4/E70		Warsaw—Frederic Chopin Airport

*Note:* Under “Days” number 1 refers to Monday, 7 to Sunday.

## ATTACHMENT 3

## Part 1: Armavia Route Schedule (Winter 2004–05)

<i>Region</i>	<i>Destinations</i>	<i>Weekly Frequency</i>
Middle East and Gulf	Aleppo	1
Europe	Amsterdam	1
Russian Federation	Anapa	2
Asia	Ashkhabad	1
Europe	Athens	1
Middle East and Gulf	Beirut	1
Middle East and Gulf	Dubai	2
Russian Federation	Yekaterinburg	1
Ukraine	Kiev	1
Russian Federation	Krasnodar	3
Russian Federation	Min-Vodi	3
Russian Federation	Moscow (Dom)	20
Russian Federation	Nizhniy Novgorod	1
Russian Federation	Novossibirsk	4
Ukraine	Odessa	1
Europe	Paris	2
Russian Federation	Rostov	2
Russian Federation	Saint Petersburg	1
Russian Federation	Samara	1
Russian Federation	Min-Vodi	3
Russian Federation	Moscow (Dom)	20
Russian Federation	Nizhniy Novgorod	1
Russian Federation	Novossibirsk	4
Ukraine	Odessa	1
Europe	Paris	2
Russian Federation	Rostov	2
Russian Federation	Saint Petersburg	1
Russian Federation	Samara	1
Ukraine	Simferopol	1
Russian Federation	Sochi	4
Europe	Istanbul	2
Russian Federation	Stavropol	2
Asia	Tashkent	1
Middle East and Gulf	Tehran	2
Russian Federation	Volgograd	1
	<b>26 routes</b>	<b>62</b>

## Part 2: Armavia Route Schedule versus Its Obligations in the Investment Agreement

<i>Region</i>	<i>Destination</i>	<i>Frequency</i>	<i>Guaranteed network of routes</i>	
			<i>Number of routes</i>	<i>Frequency</i>
Asia	Ashkhabad	1	No requirement	
Asia	Tashkent	1		
<b>TOTAL</b>		<b>2</b>		
Europe	Amsterdam	1	Western and Eastern Europe	
Europe	Athens	1		
Europe	Paris	2		
Europe	Istanbul	2		
<b>TOTAL</b>	<b>4</b>	<b>6</b>	<b>4</b>	<b>10</b>
Middle East and Gulf	Aleppo	1	Middle East and Gulf	
Middle East and Gulf	Beirut	1		
Middle East and Gulf	Dubai	2		
Middle East and Gulf	Tehran	2		
<b>TOTAL</b>	<b>4</b>	<b>6</b>	<b>3</b>	<b>6</b>
Russian Federation	Anapa	2	Russia	
Russian Federation	Yekaterinburg	1		
Russian Federation	Krasnodar	3		
Russian Federation	Min-Vodi	3		
Russian Federation	Moscow (Dom)	20		
Russian Federation	Nizhniy Novgorod	1		
Russian Federation	Novosibirsk	4		
Russian Federation	Rostov	2		
Russian Federation	Saint Petersburg	1		
Russian Federation	Samara	1		
Russian Federation	Sochi	4		
Russian Federation	Stavropol	2		
Russian Federation	Volgograd	1		
<b>TOTAL</b>	<b>13</b>	<b>45</b>		<b>10</b>
Ukraine	Kiev	1	Ukraine	
Ukraine	Odessa	1		
Ukraine	Simferopol	1		
<b>TOTAL</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>5</b>

Comment: This data suggests noncompliance for Europe and Ukraine in terms of the Investment Agreement.

## ATTACHMENT 4

## Key Features of Main Armenia Air Service Agreements

<i>No.</i>	<i>Country</i>	<i>Date of signature</i>	<i>Multiple or single airline designation</i>	<i>Limitations on the number of seats offered</i>	<i>Limitations of frequencies offered</i>	<i>Coordination between airlines on services and prices</i>	<i>Government intervention on air fares</i>
1	Austria	February 2002	Single.	n.a.	7 flights per week.	The designated airlines shall agree between themselves on the tariffs to be charged in respect of the agreed services.	Double approval regime.
2	Belgium	June 2001	Multiple: each contracting party has the right to designate one or more airlines (Art. 3, Clause 1).	n.a.	1 weekly is allowed.	Tariff shall be established by each of the designated airlines, if possible after consultation between those airlines (Art. 13, Clause 1).	Double approval regime.

<i>No.</i>	<i>Country</i>	<i>Date of signature</i>	<i>Multiple or single airline designation</i>	<i>Limitations on the number of seats offered</i>	<i>Limitations of frequencies offered</i>	<i>Coordination between airlines on services and prices</i>	<i>Government intervention on air fares</i>
3	Czech Republic		Multiple, in principle. At the same time, unless explicitly agreed otherwise between the regulators, there shall be no more than one designated airline from each country <i>for each individual route</i> (Article 3, Clause 1).	Yes. If a designated airline of one country wishes to change type of aircraft to one with higher seating capacity, it shall request permission from the regulator of other country (Art. 14, Clause 4). Narrow-body aircraft only approved at this stage.	Four flights per week. A third flight may be introduced at any time. Czechs plan to do so in spring (end of off-season).	Neither regulator will require their designated airlines to consult other airlines before filing tariffs for approval, nor will they prevent such consultation (Art. 13, Clause 4).  Designated airlines of one country shall take into account the interests of other country's airline so as not to affect unduly the services that the latter provide on the whole or part of the same routes (Art. 14, Clause 2)	Double approval regime.

<i>No.</i>	<i>Country</i>	<i>Date of signature</i>	<i>Multiple or single airline designation</i>	<i>Limitations on the number of seats offered</i>	<i>Limitations of frequencies offered</i>	<i>Coordination between airlines on services and prices</i>	<i>Government intervention on air fares</i>
4	Germany	May 1998	Multiple (Art. 3, Clause 1a).	To ensure fair and equal treatment of any designated airline, the frequency, the type of aircraft to be used with regard to capacity, as well as flight schedules shall be subject to approval by respective aeronautical authorities (Art. 8, Clause 4).	In the initial phase the frequencies are limited to two weekly services (Route Schedule, Clause VI).	n.a.	Double approval regime.

<i>No.</i>	<i>Country</i>	<i>Date of signature</i>	<i>Multiple or single airline designation</i>	<i>Limitations on the number of seats offered</i>	<i>Limitations of frequencies offered</i>	<i>Coordination between airlines on services and prices</i>	<i>Government intervention on air fares</i>
5	Greece	December 1994	Single (Art. 3, Clause 1).	The capacity to be provided (including frequency of services and the type of aircraft to be used by the designated airlines of the contracting parties on the agreed services) shall be agreed upon by the aeronautical authorities upon recommendation made by airlines. The airlines shall make such recommendation after due consultations between themselves (Art. 11, Clause 5).	Current agreement is for two flights per week.	The designated airlines shall agree between themselves on the tariffs to be charged in respect of the agreed services (Art. 12, Clause 2b).	Double approval regime.

<i>No.</i>	<i>Country</i>	<i>Date of signature</i>	<i>Multiple or single airline designation</i>	<i>Limitations on the number of seats offered</i>	<i>Limitations of frequencies offered</i>	<i>Coordination between airlines on services and prices</i>	<i>Government intervention on air fares</i>
6	Iran	January 2001	Multiple (Art. 3, Clause 1).	The capacity to be provided (including frequency of services and the type of aircraft to be used by the designated airlines of the contracting parties on the agreed services) shall be agreed upon by the aeronautical authorities upon suggestion made by airlines. The airlines shall make such suggestion after due consultations between themselves (Art. 8, Clause 5).	3 weekly flights are allowed.	The designated airlines shall agree between themselves on the tariffs in respect of the agreed services (Art. 10, Clause 2b).	Double approval regime.

<i>No.</i>	<i>Country</i>	<i>Date of signature</i>	<i>Multiple or single airline designation</i>	<i>Limitations on the number of seats offered</i>	<i>Limitations of frequencies offered</i>	<i>Coordination between airlines on services and prices</i>	<i>Government intervention on air fares</i>
7	Kazakhstan	September 1999	Multiple.	Respective aeronautical authorities regulate the capacity and frequency of flights (Art. 6, Clause 3).		The designated airlines shall agree between themselves on the tariffs to be charged (Art. 11, Clause 2).	Double approval regime.
8	Lebanon	September 1998	Multiple.	The capacity provided by designated airline of one party together with the capacity provided by the designated airline of the other party shall be maintained in reasonable relationship.	1 weekly flight.	The capacity to be provided shall be agreed between the airlines and approved by the aeronautical authorities (Art. 5, Clause 5).  The tariffs shall, if possible, be agreed upon between the designated airlines (Art. 8, Clause 2).	Double approval regime.

No.	Country	Date of signature	<i>Multiple or single airline designation</i>	<i>Limitations on the number of seats offered</i>	<i>Limitations of frequencies offered</i>	<i>Coordination between airlines on services and prices</i>	<i>Government intervention on air fares</i>
9	Netherlands	November 1999	Single.	The airline designated by one party shall notify the aeronautical authorities about the frequency, type of aircraft, configuration, and number of seats (Art. 9, Clause 1).	2 weekly flights.	The tariffs shall be agreed between designated airlines (Art. 6, Clause 2).	Double approval regime.
10	Russia	October 1993	Multiple; Russia has designated Aeroflot and Siberia.	The airline designated by one party shall notify the aeronautical authorities about the frequency, type of aircraft, configuration, and number of seats (Art. 14, Clause 1). but no approval or veto in ASA. The 2004 seat limit was 135,000.		The tariffs shall, if possible, be agreed upon between the designated airlines. (Art. 13, Clause 2). If not agreed, each airline would determine tariffs in its own way and upon its sole discretion. The clause above calls for cooperation and coordination only in cases when it is possible.	Double approval regime.

<i>No.</i>	<i>Country</i>	<i>Date of signature</i>	<i>Multiple or single airline designation</i>	<i>Limitations on the number of seats offered</i>	<i>Limitations of frequencies offered</i>	<i>Coordination between airlines on services and prices</i>	<i>Government intervention on air fares</i>
11	Syrian Arab Republic	December 2001	Single.	The capacity to be provided at the outset shall be agreed between both contracting parties before the agreed services are inaugurated (Art. 3, Clause 4).	The designated airline of one party shall provide to the aeronautical authorities of the other party information regarding the nature of services, timetables, and types of aircraft, including capacity (Art. 14, Clause 5).  1 weekly flight is allowed.	The tariffs shall, if possible, be established by mutual agreement by the designated airlines of both parties (Art. 14, Clause 2).	Double approval regime.
12	Turkmenistan	August 1993	Multiple (Art. 3, Clause 1).	The capacities of each of the parties should be equal, unless otherwise agreed to by the aeronautical authorities (Art. 14, Clause 4).	The designated airline of one party shall provide to the aeronautical authorities of the other party information regarding the nature of services, timetables, and types of aircraft, including capacity (Art. 15).	The tariffs shall, if possible, be agreed upon between the designated airlines (Art. 6, Clause 2).	Double approval regime.

<i>No.</i>	<i>Country</i>	<i>Date of signature</i>	<i>Multiple or single airline designation</i>	<i>Limitations on the number of seats offered</i>	<i>Limitations of frequencies offered</i>	<i>Coordination between airlines on services and prices</i>	<i>Government intervention on air fares</i>
13	Ukraine	June 1995	Multiple (Art. 3, Clause 1).	Capacities are defined by mutual agreement between the contracting parties (Art. 11, Clause 4).		The tariffs, if possible, shall be agreed upon between the designated airlines (Art. 12, Clause 2).	Double approval regime.
14	United Kingdom and Northern Ireland	February 1994	Multiple (Article 4, Clause 1).	Armenian approval is needed on specific aircraft to be operated, but in theory any U.K. airline could seek to operate any size aircraft they wish.	Up to seven services per week; three are operated.	The designated airline of one country shall take into account the interests of the designated airlines of the other country so as not to <i>affect unduly</i> the services that the latter provide on whole or part of the same routes.	Double approval regime.

*Note:* The fifth freedom rights are not granted or stipulated in any of the ASAs.

In all ASAs there is an ownership and control requirement; that is, the regulator shall have the right to withhold authorization if the ownership and control requirement is not satisfied.

## ATTACHMENT 5

**Case Study: Latvian Civil Aviation Policy\***

Latvia has a population of 2 million. With the breakup of the Soviet Union, Latvia, like Armenia and other FSU states, had an integrated service that comprised the airline, the airport, and air traffic control (ATC). Riga Airport was handling around 2 million passengers a year at that time. The air markets were entirely within the USSR, all operated by Aeroflot. The high volumes of air travel resulted from the extraordinary low air fares charged by Aeroflot (11 rubles, US\$6, for a Moscow-Riga round trip). Air fares were below economic costs. The assets of all aspects of the aviation services were run down and service quality was low.

**REBUILDING INFRASTRUCTURE AS THE INITIAL PRIORITY**

The Latvian government was heavily constrained in terms of financial resources. In a period of rapid change and adjustment, the government's initial priority was to restore the aviation infrastructure, which included allowing and requiring the Latvian state airline, operating Aeroflot legacy equipment initially, to pay its own way. Relatively high charges were introduced at Riga Airport: US\$15 per departing passenger, similar to the charge at the much more expensive Stockholm Airport. The airport and ATC were set up separately as joint stock state-owned enterprises (SOEs). Formally, the shares are held by the Minister of Transport on behalf of the government. Today, separate units in the Ministry of Transport advise the Minister on ownership versus regulatory/policy issues.

The aviation infrastructure has developed considerably and is up to EU standards. There is ample capacity for the foreseeable future. Cost competitiveness has become a concern. As a consequence, the departure charge was abolished on November 1, 2004. In addition, the airport introduced volume discounts for airlines. These discounts are published and can amount to 80 percent for the largest volume operators—currently, airBaltic and Ryanair.

\*This case study describes conditions and policies as of 2004.

## LATVIAN AIRLINES

Air Baltic, the state airline, went bankrupt in 1995. The company was resurrected as airBaltic, majority owned by the government but with a “strategic” partner, SAS, with 47 percent of the shares. Initially airBaltic operated as a small feeder service into SAS hubs using only six aircraft. Over the last few years it has transformed itself into a larger operator in the style of the U.K.-based easyJet company and has been focusing on an LCC model with both Riga and Vilnius as bases. However, airBaltic only acquired the LCC “workhorse” Boeing 737s in significant numbers in 2004. AirBaltic has operated at a profit from since 2001–02 and reported a LVL 1.1 million profit on sales of LVL 33.5 million and assets of LVL 15.8 million in fiscal 2003.<sup>21</sup>

With regard to the long-term ownership of airBaltic, it seems that the government would like to divest its shareholding. It is also understood that SAS would like to increase its holding. However, the government and airBaltic are concerned with the ownership and control requirements in Latvian non-EU ASAs: Russia is the obvious example. Although it is accepted that many countries are now treating these requirements in a flexible manner, Latvia is concerned that such “good will” is required on a continuing basis and may have a “price.” To avoid this, Latvia would have to ensure that “ownership and control” would remain in Latvian hands if the government shares were privatized. This might be both costly and restrictive in the small Latvian capital market.

AirBaltic considers that its costs are now below those of easyJet but still above Ryanair. This is partly a scale factor, but Ryanair, in their view, has the advantage of better prices for infrastructure services (that is, Ryanair holds auctions among airports for new services and often achieves net payments for new services). AirBaltic has a small labor-cost advantage for nonpilot staff, reflecting lower Latvian labor costs. AirBaltic does not have the aircraft utilization that Ryanair has, partly because of its different aircraft mix and partly because it flies into hubs such as Heathrow and Copenhagen where rotations are inevitably lower. Although airBaltic does not believe that there are offsetting margins from passengers from services to such airports, presumably they would not operate such services if this were not the case. Overall, however, airBaltic, with very little regulatory protection, has cost fundamentals that are close to best practice.

## GOVERNMENT INTERNATIONAL AVIATION POLICY (IAP)

The emphasis on developing infrastructure, with the consequential effects on the cost base (mainly fixed and sunk), has led the government to have a bias towards measures that would stimulate the growth

in traffic to boost the revenue of the infrastructure services. Thus, the government has attempted to negotiate liberal rather than restrictive air service agreements. Operating within its Law on Aviation, Latvia, for example, accepted a liberal agreement with the United Kingdom in 1992. This agreement permitted multiple designations of airlines by each country, unlimited frequency/capacity, and a requirement for the double disapproval by governments of air fares (a more liberal arrangement, given that it would be difficult to get two governments to agree to disapprove an airline proposal). Fifth freedom rights were given to both parties. Latvian airlines first developed the London market with services to Gatwick Airport. Although these services eventually ceased, British Airways entered the market with daily services to the better-connected Heathrow Airport where the slot values are very high.<sup>22</sup> AirBaltic now also offers daily services to Heathrow.

The bilateral agreements with the Scandinavian countries were more restrictive, reflecting the countries' focus on SAS and their objective of developing Stockholm and Copenhagen as hub airports. Thus, in contrast to the U.K. ASA, only single designation of an airline was allowed by either party. In addition, only one city (that is, airport) was allowed to be served. No fifth freedom rights were included. Importantly, however, airline cooperation was discouraged in the ASAs.

The ASA with Germany was one of the first negotiated. Essentially because of German requirements, it was much more restrictive. While it allowed for two airlines on each side, it did so only because the German government needed to accommodate a Hamburg-based airline. Otherwise, it was a single designation agreement specifying a maximum of 8 weekly frequencies to one point in Germany. A renegotiation in 1996 reduced the restrictions slightly, increasing the frequency limit to 14 as demand increased, adding more city points that could be served (Berlin, for example), and adding fifth freedom rights. The Austrian ASA was more restrictive again, and the Latvian government could not get a French agreement to open negotiations.

These agreements and those with other EU members have been overtaken by Latvia's accession to the EU, with the consequential adoption of essentially Open Skies policies along with the more liberal EU-wide ownership and control requirements.<sup>23</sup> Once Latvia was to join the EU, it was obvious that LCCs would be both a threat to and an opportunity for Latvian economic development. Market stimulation from more services and lower prices was clearly seen to benefit the Latvian economy, particularly the developing tourism market. Incumbent airlines such as airBaltic would have greater exposure to competition, and home-base cost disadvantages would become a major issue.

On the other hand, Latvia still does not have an ASA with Russia. An initial ASA has been negotiated but never formally signed. The

initialled agreement is very restrictive. It inherently requires air services to be agreed between airlines and then by the respective governments. This allows and encourages the air market to be controlled by a monopoly, albeit with two airline parties and subsequent government endorsement. (It is worth noting in passing that competition law in Latvia does not cover international aviation markets.) The outcome is restrictive: seven frequencies a week to Moscow by airBaltic and Aeroflot (the latter operates only four frequencies, currently). Recently the airlines agreed to a daily frequency to Saint Petersburg.

In contrast, Latvia's agreements with Ukraine and Belarus are similar to the U.K. ASA described above. A factor in these countries has been the weakness of their respective airlines. This is also the position with Bulgaria, but not with Romania, where attempts continue to be made by the government to strengthen the incumbent state airline by retaining regulatory restrictions in the market.

Cargo is unrestricted, as are charters. Cargo is generally handled entirely by belly-hold capacity in the passenger aircraft.

## OUTCOMES

Outputs measured in terms of aircraft movements and passengers have grown steadily since the mid-1990s (see Table 13.3 below). Growth in recent years has accelerated dramatically with airBaltic alone reporting a 75 percent increase in passengers carried in the first nine months of 2004, compared to the same period in 2003. Airfares in the competitive markets have dropped significantly. It is not clear how sustainable the increased supply is. Load factors are barely 50 percent on average. There may be supply adjustments by the less competitive airlines unless demand continues to grow rapidly.

Current volumes, however, are still below the (abnormal) levels experienced in the years immediately prior to the collapse of the USSR. Thus the last 15 years have seen a dramatic and ongoing reorientation of the Latvian air markets toward the less regulated and more commercial markets with Europe. Deregulation has allowed the commercial development of the market, particularly delivery of the benefits from the LCC innovation. Well-managed Latvian carriers suggest that local airlines can survive and develop in such environments. Air links with the economically important but regulatory constrained Russia remain poor and massively underdeveloped.

TABLE 13.3 PASSENGER THROUGHPUT, RIGA AIRPORT, 1990–2005

<i>Year</i>	<i>Numbers (thousands)</i>
1990	2,200
1991	1,828
1992	341
1993	310
1994	392
1995	491
1996	497
1997	531
1998	555
1999	562
2000	574
2001	623
2002	633
2003	712
2004*	1,000
2005*	1,500

\* Indicates estimate and forecast, respectively.

Source: Latvian Civil Aviation Policy

## ATTACHMENT 6

**Case Study: Czech Experience  
with Aviation Liberalization**

## THE SITUATION

Since the Czech Republic's accession to the EU, the government has had a fully liberal international aviation policy (IAP) with respect to EU markets. However, the Czech government had been liberalizing international air services since the collapse of the Soviet Union and the ending of the communist regime in the Republic. For example, the Czech Republic signed one of the first Open Skies agreements with the United States in 1996. It has effective Open Skies agreements with Lebanon, the United Arab Emirates, and Jordan. It has managed to achieve the introduction of "multi-designation" clauses in many bilateral ASAs so that each country can nominate as many airlines as it wishes to operate services in that bilateral market. For example, this was achieved with France in 1990 and the United Kingdom in 1998. It also aims to remove any restrictions on routes, frequency, and capacity. The Czech Republic also seeks the ability to grant the fifth freedom rights allowed for in ASAs. For example, the Czech ASAs with the United Arab Emirates and Sri Lanka allow Czech airlines to carry Dubai-Colombo passengers. The Czechs also seek to have what is usually regarded as a relatively liberal price-setting regime, namely, "double disapproval"<sup>24</sup> of air fares, rather than the more restrictive "double approval" regime where each fare change must be approved by both government parties to the ASA.

In spite of this the Czech Republic has a number of restrictive bilateral ASAs—for example, with Russia, Ukraine, Turkey, Romania, and Armenia. This illustrates the point that in international aviation, liberalization requires bilateral agreement. The Czech Republic-Russia bilateral ASA limits the number of airlines (one from each country—CSA [Czech Airlines] and Aeroflot currently). It further limits the markets that can be served (only four cities in Russia) and the capacity that can be offered. Capacity is currently limited to 14 frequencies per week for CSA and 7 for Aeroflot in the Prague-Moscow air market, with substantial code-sharing by Aeroflot using CSA aircraft. The two airlines are required to come to a commercial agreement in respect of services actually offered, given those permitted by the then-current ASA. This reinforces the

already strong incentive to the two airlines to act as a monopoly and to restrict capacity below the level that would otherwise be offered by the two, generating higher prices and profits as a result. (Public policy and law in virtually all other markets outlaws such monopolization and price fixing for that reason.) Such requirements for commercial cooperation have been quite common in ASAs internationally, with the exception of those involving the United States, where antitrust law had early application to international aviation. Even without such requirements, the incentives for collusion are high where ASAs are restrictive and if international air service markets are excluded from competition law, or if such law is ineffective.

### THE MARKETS

The Czech Republic's international air markets in aggregate have grown rapidly since 1994.<sup>25</sup> Outputs measured in terms of passengers and passenger-kilometers (p-km) have almost tripled since then and are expected to have done so by the end of 2004. Cargo has grown less rapidly, reflecting the Russian economic crisis in the late 1990s and the improved competitiveness of land transport in the period leading up to, and after, EU accession. Outputs at Prague Airport have been growing by 35 percent per year in recent years. And the airport has developed a significant transfer passenger business: over 10 percent of passengers are now in transit. As a comparison, 34 percent of travelers through London's Heathrow airport are in transit. The presence in the Czech Republic markets of LCCs, including the Czech Republic-domiciled Smartwings, along with EastJet, is solid and visible evidence of liberalization and the benefits to customers, Czechs, and visitors. The key data are summarized in Table 13.4.

TABLE 13.4 CZECH AIRLINE DATA, 1999–2003

<i>Czech airlines only</i>	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Passenger (thousands)	1,622	1,805	1,916	2,104	2,328	2,850	3,450	3,894	4,243	4,531
Passenger/km (millions)	2,581	3,029	3,148	3,502	3,671	4,335	5,855	6,383	6,882	7,081
Cargo (million tons/km)	26	33	26	27	56	30	38	29	32	41
All passengers (thousands)	2,818	3,278	3,919	4,508	4,716	4,945	5,696	6,241	6,431	7,737

## CZECH AIRLINES

Czech Airlines (CSA) has coped with the introduction of competition. It is a very different airline from the one operating in the late 1980s. It now has modern equipment and operates to best practice standards. CSA is effectively a state-owned airline, substantially owned by government banks and investment funds. It operates broadly on a break-even basis with a small profit in 2003. In spite of significantly increased competition, it is maintaining market share on routes containing traditionally strong competitors. An examination of CSA's 2004–05 winter schedule shows an extensive network including approximately 35 daily connections to hub airports, with linkages to Paris's Charles-de-Gaulle Airport being particularly important. This reflects CSA's membership in the Delta-Air France Sky Team alliance.

Travel Service is a privately owned charter airline. With the Czech Republic joining the European Civil Aviation Area, and in anticipation of EU accession, the Travel Service established Smartwings as an LCC.

## POLICY

The Czech Republic does not have a formal policy statement of its approach to international aviation policy. Authorities pointed out that in the immediate period after the end of World War II, Czechoslovakia operated what could be regarded as a nonrestrictive policy by international standards. Under the communist governments a more traditional restrictive policy was followed. With the collapse of the Soviet Union, the Czech Republic moved rapidly toward a less restrictive approach. This reflected the liberalizing tendencies of the new government in the Czech Republic and a desire to open up rapidly to the West by building maximum international linkages. There was an awareness of the significant tourism potential of the Czech Republic. Governments saw that this could be best achieved by a less restrictive IAP, and CSA was unable to defend a completely restrictive policy. It must be noted that CSA does obtain some assistance via higher prices from being the main beneficiary of the restrictive ASAs that have been in place and are likely to be in place for some time to come (for example, the Russian ASA).

## POLICYMAKING PROCESS

In developing negotiating positions for the Czech Republic, the authorities are strongly guided by the requests of Czech airlines, predominantly CSA to date. In respect of developing or expanding new

markets the airlines are expected to approach the other government to obtain the necessary approvals. The Czech government would expect to be approached only after negotiations had been undertaken to the furthest extent by the airlines. Prior to seeking talks with the bilateral partner country, a proposed negotiating strategy would be developed by the Ministry of Transport and circulated to interested ministries for their views. These ministries usually comprise Foreign Affairs, Finance, Industry, Regional Development (with a particular interest in tourism), and the Civil Aviation Authority. A governmental negotiating position emerges from these consultations and discussions.

With substantial progress in liberalization, the Civil Aviation Authority's focus in regard to IAP has increasingly been on safety and security issues. This is in line with developments in other developed countries. Understandably, much of the effort is now undertaken in EU forums. The Czech Republic is heavily involved in the ICAO process and EUROCONTROL<sup>26</sup> and, in line with international best practice, implements ICAO rules and recommendations regarding safety and security.

## INFRASTRUCTURE

Czech aviation infrastructure in the form of airports and air traffic control is not regarded as an impediment to the development of aviation in a liberalized market. The international airports are SOEs with a high degree of autonomy devolved to the boards of the enterprises. They are developing in line with the expected demand and are managing to keep their charges well below the European average while improving service quality.

## CONCLUSION

The Czech Republic has for several reasons moved from a restrictive to a relatively open IAP since the late 1980s. There remain several important restrictive ASAs to the east and southeast of the Republic. The air services markets, where restrictions have been lifted or removed, have grown relatively fast with considerable benefits to consumers and the Czech economy. The Czech air service providers have expanded but, as in any competitive market, ongoing pressure will be placed on them by other EU-domiciled airlines that may be able to offer services more cost-effectively or to offer service combinations with better value for money. But there is little doubt given this experience that the desired services will be provided as the market changes and grows. Costs will continue to evolve toward least-cost levels with the impetus being driven by LCCs.

## ATTACHMENT 7

**Case Study: Bulgarian International  
Aviation Policy****BULGARIA'S APPROACH TO INTERNATIONAL AIR  
SERVICES NEGOTIATIONS OVER THE LAST DECADE  
AND HOW BILATERAL AIR SERVICES AGREEMENTS  
HAVE CHANGED**

Over the last 10 years bilateral ASAs have not changed substantially. They are still based on the Chicago Convention principles. Since 1990 a multiple designation clause has been used instead of single designation. Multiple designations mean that each of the contracting parties may designate one or more carriers to operate scheduled air services on the routes specified in the ASA. Single designation means only one carrier. To date, none of Bulgaria's bilateral contracting parties has designated a LCC to operate scheduled air services to Bulgaria and vice versa. In the view of the Bulgarian authorities, the LCC's philosophy and marketing behavior is oriented toward the kinds of services that counter-balance scheduled operation's traditions and practices. The agreements between Bulgaria and the following countries have a multiple designation clause: Azerbaijan, Armenia, Bahrain, Belarus, Georgia, Iran, Ireland, Kazakhstan, Korea, Latvia, Macedonia, Maldives, Moldova, Russia, the Slovak Republic, Uzbekistan, Ukraine, South Africa, Croatia, Algeria, the United Kingdom, Ghana, Ethiopia, Zambia, Zimbabwe, Cuba, Lebanon, Luxembourg, Nigeria, Singapore, Syria, Sudan, Tanzania, Tunisia, Turkey, Finland, France, Austria, Greece, Albania, Serbia and Montenegro, and the United Arab Emirates.

Since 1997, some new clauses have been included in ASAs such as security clauses and code-sharing clauses. A few agreements contain a provision for fifth freedom traffic rights, but on a strict reciprocal basis. The ASA with Austria contains such a clause. Other fifth freedom provisions have been agreed through memorandums of understanding (MoUs) or exchange of letters (for example, with Iran, the United Arab Emirates, the Maldives, Macedonia, and Albania). This traffic right is basically granted on a portion of a route and requires the explicit consent of a third country involved. For instance, a Bulgarian carrier that operates Sofia-Skopje on third- and fourth-freedom traffic rights wishes to extend the service to Tirana and to take passengers from Skopje to Tirana and vice versa. That could only happen when

both Macedonian and Albanian authorities grant such a right. In this case Albania is a third country with respect to the bilateral agreement between Bulgaria and Macedonia. In the view of the Bulgarian authorities, the fifth freedom right is usually granted on a case-by-case basis, has operational character, and involves market and political considerations. This is why it is obtained by virtue of confidential MoUs or letters rather than by bilateral agreements. It helps carriers to optimize aircraft capacity, to increase load factors, and to advertise and sell two or more portions of a service as a through service (that is, seamless service).

Intergovernmental negotiations on airline capacity and frequency still ensure allocations on the basis of fair and equal opportunities for designated carriers of both sides, as well as on the basis of market demand (that is, designated carriers are required to prove the “public need of air transportation”). The partner governments usually agree on the maximum number of weekly frequencies irrespective of the size of aircraft or seats available.

However, over the last three or four years, and especially after Balkan Airlines ceased operations, the main Western European carriers increased their capacity and frequencies to and from Bulgaria (see Table 13.5). This was affected mainly through MoUs signed between aviation authorities. Thus, despite equal opportunities, the real capacity offered by those carriers exceeds that of their Bulgarian competitors.

Those are the maximum rights granted and used, irrespective of the size of aircraft or seats available. That is, airlines have scheduled services to the maximum that the bilateral agreements permitted. Alternatively, Bulgaria and its main air market partners negotiated for what the airlines wanted to fly. LH and AUA were granted the right to increase their services because none of the Bulgarian carriers operated to Germany and Austria in 2001 and because the traffic demand

TABLE 13.5 WEEKLY FREQUENCIES OF AIR SERVICES OFFERED

<i>Carrier</i>	<i>1994–95</i>	<i>2001–02</i>	<i>2002–03</i>	<i>2004–05</i>
Alitalia	3	11	10	11
British Airways	4	7	7	7
Lufthansa (LH)	4	21	21	21
Austrian Airlines (AUA)	3	18	21	21
Air France	4	7	7	7
CSA	3	6	9	11
Malev	3	7	9	9
Olympic	3	6	7	9
LOT (Polish company)	1	7	7	7

on these destinations had always been very high. In addition, their fares, reflecting their level of service, are also high; therefore, in principle whoever enters the respective market at a later stage (using the Bulgarian rights) and offers cheaper services should be successful in terms of load factor, profit, etc. This was the case on the Sofia–Vienna route when Bulgaria Air and Viaggio entered the market, and it was the reason why AUA’s share fell in 2003 despite AUA’s much greater frequencies than those of their Bulgarian competitors. The above services contain no fifth freedom traffic right—they are third and fourth freedoms.

According to the Bank Settlement Plan, data for market shares in terms of revenue, passenger traffic, and tickets sold are as follows (Table 13.6):

TABLE 13.6 MARKET SHARES

<i>Carrier</i>	<i>June 2001 (Percent)</i>	<i>2003 (Percent)</i>
Austrian Airlines	16	9.82
Lufthansa	16	16.25
Air France	13	n.a
CSA	11.9	10.66
Alitalia	9.8	n.a
Malev	9.3	n.a
Bulgaria Air	0	16.86

The Bulgarian CAA and the Ministry of Transport and Communications have elaborated a strategy for the development of air transport in Bulgaria. It is available on the CAA Web site or through the Transport Policy Directorate at the Ministry. The CAA does not have an English translation.

ASAs do not deal with charter or cargo services.

In respect of an air fare approval mechanism, this is typically “double-approval”—that is, both governments need to approve a new airfare before it can be offered. Only the ASA with Bosnia and Herzegovina contains a “double-disapproval” clause.

Bulgaria Air is a 100 percent state-owned company. It will be privatized soon. It is not an LCC but is a traditional scheduled operator. Other main airlines are as follows:

- *Scheduled:* Hemus Air and Viaggio
- *Charter:* Bulgarian Air Charter, Air Via, and Balkan Holidays Air
- *Mainly cargo:* Air Sofia and Vega Airlines

With regard to ownership and control provisions, this matter is regulated by bilateral agreements. After accession to the EU, Bulgarian airlines will be regulated by the European Community Law (community carriers will be majority owned and effectively controlled by EU nationals). Any Bulgarian carrier that wishes to operate scheduled services should comply with the requirement of majority ownership and control contained in bilateral ASAs (up to EU accession). For charter or cargo operations, there is no such requirement.

The process of EU accession preparations started in 1998–99 with the harmonization of primary and secondary legislation. In 2003 Bulgaria finalized technical negotiations with the European Community on Chapter 9, which was provisionally closed. Until accession, Bulgaria will continue adopting new European Community air transport *acquis*, the JAA requirements, and the EASA regulations.

## ATTACHMENT 8

**The Policy of Open Skies in Chile****BACKGROUND**

At the end of the 1970s, Chile started to make profound changes to its economic structure, promoting a social market economy system based on private ownership of the means of production, private initiative, and social harmony, as elements necessary for the economic development of the country. In this context, Executive Order 2.564 was issued in 1979, confirming the so-called Open Skies policy in our country. This policy is based on the following fundamental principles:

**Free entry into markets**

The power to grant commercial air permits was repealed, since it was considered that these are granted directly by the act that allows both Chilean and foreign airlines to operate freely in the country, provided that they comply with insurance requirements and technical/operational safety requirements. As an exception, the Junta de Aeronáutica Civil de Chile (JAC) may restrict foreign airlines in the following cases:

- i) if their country of origin applies restrictions to Chilean airlines (bilateral reciprocity)
- ii) if the foreign airline operates on a route which is restricted by another country for Chilean airlines and it is considered that such restrictions are significantly affecting Chilean airlines (optional power and at the judgment of the authority).

**Freedom of prices**

Airlines are permitted to freely establish tariffs. They only have to register them with the JAC. The authority does not have power to set and object to prices. As an exception, the JAC can set tariffs if the authority of the other country does not accept the freedom of tariffs; this situation has never occurred in practice. Within Chile, there is a totally open system in operation. When all the tariffs were set by the authority, lower tariffs were not achieved and competition was avoided. The tariff levels were proposed by the airlines and were generally accepted by the authority, since it did not have access to the actual cost basis of the airlines.

### *Minimum intervention by the authority*

This is reflected in the following:

- i) The markets are competitive, with the advantages of quality and prices that this implies.
- ii) Air transport services were moved totally to the private sector;
- iii) The authority was debureaucratized when irrelevant procedures and controls were removed. It was thus possible for airlines to quickly modify their operations whenever they needed to and only the technical implications were checked.

### LIBERALIZATION OF THE REGULATORY FRAMEWORK

The harmony between Article 1, paragraph 1, of Executive Order 2.564 and Articles 4, 5, and 10 of the same Executive Order ensures adherence to the principle of **free entry into the market**. Chilean and foreign airlines will be able to establish domestic, international, scheduled, or nonscheduled passenger or cargo air transport services, as well as specialized aerial work services, without limitations with respect to aircraft, title held on it, capacity offered, places of operation, frequency of services, itineraries, and tariffs, and without the need for further approval by the commercial air authority other than insurance requirements and the technical/operational safety requirements.

Furthermore, **freedom of tariffs** is one of the basic assumptions of the social market economy, and it is thus being applied in air transport. Executive Order 2.564 repealed the powers of the JAC to set tariffs and these were left to be set freely by each airline. At first, tariffs rose, but then they were quickly stabilized with competition until they stayed at normal levels. Nevertheless, Article 2, paragraph 4, of Executive Order 2.564 establishes that in cases where the JAC has not set tariffs, the airlines will have to register with that authority the tariffs that they will apply. The purpose is to give transparency to the market by keeping a public record of tariffs.

Finally, **minimum intervention** by the authority is reflected by the fact that Executive Order 2.564 did not grant the JAC extensive powers to intervene in markets, except on an ad hoc and specific basis—that is, to check insurance and to negotiate reciprocity. If the international air traffic rights are restricted by another country and if there is more than one Chilean airline interested in exercising the same rights, Executive Order 2.564 establishes that there should be a call for tenders for these rights on the basis only of money tenders, without any other consideration by the JAC. The objective is to avoid subjective evaluations in assigning routes.

## EFFECTS AND EVOLUTION

In order to see what the effects have been of the Open Skies policy applied by Chile, it is useful to differentiate what has occurred domestically from what has occurred internationally.

### Domestic

Domestically, the policy of absolute freedom to enter into markets and set prices has been maintained. This has made it possible to expand domestic traffic from 800,000 passengers in 1989 to 2,900,000 passengers in 2002—an increase of 255 percent and with an annual average growth rate of 11 percent. Air cargo increased by 225 percent in the same period, with an annual average growth rate of 10 percent. The number of services departing from Santiago increased from 100 per week in 1989 to around 364 per week at the end of the last century. This means that it more than tripled in this period.

### International

Internationally, in all bilateral negotiations, the Chilean aviation authority offers and promotes extensive and unrestricted openness, which is not always shared by other countries. Since 1989, the government has been intensifying efforts to obtain greater openness with other countries, in order to create greater opportunities for Chilean airlines through negotiations between aviation authorities, on the basis of economic complementation agreements signed by Chile. This has helped to increase Chile's international traffic from 957,000 passengers in 1989 to 3,066,000 in 2002—a 221 percent increase with an annual average growth rate of 10 percent. International air cargo measured in tonnes has increased in the same period by 207 percent, with an annual average growth rate of 9 percent. The number of international services increased from 104 in 1989 to 329 in 2000. This means that supply tripled. In spite of the strong competition that has existed between Chilean and foreign airlines on Chile's international routes, Chilean airlines increased their international passenger traffic; participation, also measured in terms of passengers, increased too. Furthermore, there are presently 15 foreign airlines with 134 services per week competing in Chile's market. Chilean airlines presently have 148 international services per week, in comparison with the 47 that they had in 1989. International cargo traffic (tonnes) of Chilean airlines increased by 162 percent, with an annual growth rate of 8 percent.

## ATTACHMENT 9

## Multilateral Agreement on the Liberalization of International Air Transportation\*

With the purpose of promoting Open Skies air services arrangements, the Multilateral Agreement on the Liberalization of International Air Transportation was negotiated on October 31–November 2, 2000, at Kona, Hawaii, and signed in Washington, DC on May 1, 2001, by Brunei Darussalam, Chile, New Zealand, Singapore, and the United States.

The Agreement entered into force on December 21, 2001.

A Protocol to the Agreement was also negotiated and was signed in Washington, DC, on May 1, 2001, by Brunei Darussalam, New Zealand, and Singapore. The Protocol provides for parties to exchange seventh freedom passenger and sabotage rights.

The Protocol entered into force on December 21, 2001.

The key features of the Multilateral Agreement are as follows:

- an open route schedule
- open traffic rights including seventh freedom cargo services
- open capacity
- airline investment provisions that focus on effective control and principal place of business, but protect against flag of convenience carriers
- multiple airline designation
- third-country code-sharing
- a minimal tariff filing regime

The Agreement is open to accession by any state that is party to the following aviation security conventions: the *Convention on Offences and Certain other Acts Committed on Board Aircraft*, done at Tokyo on September 14, 1963; the *Convention for the Suppression of Unlawful Seizure of Aircraft*, done at The Hague on December 16, 1970; the *Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation*,

\*This attachment is copied from the Web site for the Multilateral Agreement on the Liberalization of International Air Transportation: [www.maliat.govt.nz](http://www.maliat.govt.nz).

done at Montreal on September 23, 1971; and the *Protocol for the Suppression of Unlawful Acts of Violence at Airports Serving International Civil Aviation*, done at Montreal on February 24, 1988.

The Web site for the Multilateral Agreement is also used to give notice of the following:

For the Agreement:

- accessions to the Agreement
- designation of airlines
- any exercise of the right to withhold, revoke, suspend, limit, or impose conditions on the operating authorization of an airline
- nonapplication of the Agreement as between any parties
- amendments to the Agreement
- withdrawals from the Agreement

For the Protocol:

- expressions of consent to be bound by the Protocol
- reservations with respect to the grant of sabotage rights
- nonapplication of the Protocol as between parties
- amendments to the Protocol
- withdrawals from the Protocol

The New Zealand Government is the depositary state for the Agreement and Protocol.

## ANNEX 13.1

# Yerevan, Riga, Tallinn, and Larnaca Airlines—CRS MIDT Yield Analysis

### CONTEXT

The Armenian government has a restrictive bilateral access policy for aviation.

Latvia and Estonia started to liberalize a few years ago and have been totally open for intra-EU flights since EU accession on May 1, 2005.

Cyprus has been largely open for many years due to a focus on tourism industry needs.

The objective of this study, as per the agreed Terms of Reference, is to compare yield data (average fare divided by distance) for key EU markets to/from these four countries.

### Acquisition of CRS Data

CRS MIDT passenger bookings data has been acquired and analyzed for the following selected markets:

- 13 mainly EU markets to/from YEREVAN, ARMENIA (EVN)
- 11 mainly EU markets to/from TALLINN, ESTONIA (TLL)
- 11 mainly EU markets to/from RIGA, LATVIA (RIX)
- 13 mainly EU markets to/from LARNACA, CYPRUS (LCA)

The markets were selected according to these criteria:

- The largest EU markets by nonstop capacity were all included.
- Airports with no nonstop capacity to EVN and other airports are included if they are high in the normal “pecking order” of EU

airports and likely to have significant 1-stop flows, despite the absence of nonstops (for example EVN–BRU).

- Most of the markets selected are above 1,400 kilometers in order to reduce the yield-distorting impact of shorter distances (but this impact will still need to be addressed).
- For London traffic, Heathrow (LHR) was selected.\*
- EVN–Moscow data was also acquired due to importance of this market.
- A pair of key non-EU markets, Dubai and New York (JFK), was acquired for EVN, RIX, TLL, and LCA.

Each airport pair comprises the following data:

#### Trip Origin and Destination Airports

- Annual passenger bookings
  - Premium Booking (first)
  - Class 2 Booking (business)
  - Class 3 Booking (full economy)
  - Class 4 Booking (discount economy)
- Average fare
  - Premium Booking (first)
  - Class 2 Booking (business)
  - Class 3 Booking (full economy)
  - Class 4 Booking (discount economy)
- Total passenger bookings
- Industry average total fare per airport pair
- Yield per revenue passenger kilometer

Data for two time periods were bought:

The *most recent* time period is May 1, 2004–April 30, 2005.

A *previous time* period was bought for comparative purposes: May 2002–April 2003.

CRS MIDT data:

- comprises traffic bookings acquired from a computerized reservations system (CRS)
- is adjusted for all CRS bookings (under an agreement between all CRS providers)

\*Key nonstops from London to EVN, RIX, and LCA have in recent years all served LHR. But TLL has been served from Gatwick (LGW): our data do not capture that flow. Since Estonia and Latvia joined the EU, low-cost service not booked via CRS has been added from Luton (LTN) and Stansted (STN). Our data show the impact of this on yields at LHR.

- is adjusted for no-shows (bookings that do not result in travel)
- is largely *not* adjusted for non-CRS bookings by Internet or direct purchase from a carrier
- *excludes* all taxes from the fare computation

What is the reliability of CRS MIDT data?

The answer varies by market.

For the data acquired here, we estimate:

- Yield data is fairly reliable.
- Volume data is not reliable, as non-CRS bookings are common in our target markets.
  - There are extensive bookings via *pre-CRS* methods like visiting an airline office.
  - There are extensive bookings via *post-CRS* methods such as carrier Internet sites.

The volume data in several EVN markets is clearly understated. However, the yield data corresponds to all other available information about EVN markets (including known BA or other pricing) and is fully credible.

#### BOX 13A.1.1 SEQUENCE OF DATA IN EXCEL FILE

Raw data	EVN, RIX, TLL,LCA raw data for two selected 1-year periods
Target data	As above, organized by market by month
Target summary	Annual summaries
Cluster summary	Summaries per 3-month period for EVN, RIX, TLL, and LCA: <ul style="list-style-type: none"> <li>• to/from eight key EU airports: LHR, CDG, AMS, BRU, FRA, DUS, VIE, and FCO</li> <li>• to/from LHR only</li> </ul>
Fare chart	Fare vs. distance for sample of 2,000 markets <sup>a</sup>
Yield chart	As above, by yield

a. It should be pointed out that the sample of 2,000 markets or the fare versus distance analysis does not include domestic U.S. or intra-Western Europe data, where the full impact of low-cost carriers has been most felt and fares are much lower. The fare versus distance chart should be seen in relation to a recent U.S. DOT report, which showed that the average fare for a 1,600 kilometer (1,000 mile) trip has dropped 20 percent in the past 5 years and is now US\$118, well below the fare for that distance in our chart.

In the attached Excel file, the data is arranged in the following sequence of sheets, progressing from raw data to user-friendly formatting of the material:

The reason for the last two charts is to facilitate average fare and yield comparisons on a distance-adjusted basis:

- EVN markets generally feature greater distances than the RIX, TLL, and LCA markets (even after our attempt to select longer-haul markets from the non-EVN points).
- It is therefore vital to adjust for the distance differential, by factoring in by how much yields per kilometer should be lower as distance increases.

## RESULTS

What does the MIDT data show? The key tables to focus on are the Cluster Summary. They allow yield analysis comparison along these dimensions:

- differences between EVN, RIX, TLL, and LCA
- over time by 3-month period
- over time for May 2002–April 2003 versus May 2004–April 2005
- for just LHR, or LHR/CDG/AMS/BRU/FRA/DUS/VIE/FCO combined.

The Fare and Yield Charts (at end of the Excel file) should be consulted simultaneously with the analysis of the Cluster Summary. The reason is that average yield *must* be looked at only in relation to distance, due to the very substantial efficiency gains in operating cost per kilometer as an aircraft travels a progressively greater distance.

The Cluster Summary invites close perusal and analysis.

The data show that:

- EVN yields have been largely higher than for the other three markets
- LHR–RIX and –TLL have had some LCC-induced yield declines since EU accession
- LCA yields have been consistently lower throughout the periods analyzed.

Here are some of the key findings, factoring in the distance adjustment, for LHR only:

TABLE 13A.1.1 KEY FINDINGS, LHR ONLY

<i>LHR only</i>	<i>What fare "should be" (US\$ as per chart)</i>	<i>Fare in last 12 months (US\$)</i>	<i>Compared to "should be" (%)</i>	<i>Fare in Feb.–April 2005 (US\$)</i>	<i>Compared to "should be" (%)</i>
EVN	350	388	11 over	323	7.7 under
TLL	233	197	15.5 under	206	11.5 under
RIX	225	163	27.5 under	78	65 under
LCA	333	201	39.6 under	197	40.8 under

Here are comparable findings, factoring in distance adjustment, for the eight key EU cities:

TABLE 13A.1.2 KEY FINDINGS, EIGHT EU CITIES

<i>EU cities</i>	<i>What fare "should be" (US\$ as per chart)</i>	<i>Fare in last 12 months (US\$)</i>	<i>Compared to "should be" (%)</i>	<i>Fare in Feb.–April 2005 (US\$)</i>	<i>Compared to "should be" (%)</i>
EVN	333	355	6.6 over	377	13.2 over
TLL	225	209	7.1 under	287	27.5 over
RIX	200	178	11 under	171	14.5 under
LCA	312	202	35.2 under	197	36.8 under

EVN fares have been generally:

- over the "should be" level
- higher in relation to the "should be" level than the three other airports

There is just one exception to each of these generalizations:

- In the February–April 2005 quarter, EVN-LHR fares dropped below the "should be" level. However, they did so by much less than the LHR fares to the other three points.
- In the February–April 2005 quarter, TLL to/from eight cities fares soared and so were further above the "should be" level than EVN.

What were some of the trends over time?

### BOX 13A.1.2 IMPACT OF RYANAIR ON THE MARKET

Ryanair entered the London–Riga route (RIX–STN) on November 1, 2004, six months after the accession of Latvia to the EU.

Ryanair passengers book mainly on the Internet and so are not shown in our MIDT data. However, a good estimate of Ryanair volumes and yields on RIX–STN can be obtained from how it operates elsewhere. The capacity offered by Ryanair is a daily flight with a 189-seat Boeing 737-800. The system load factor of Ryanair in 2004 was 83 percent (slightly higher at 84 percent in May 2005). Applying the 83 percent load factor, Ryanair’s annual passenger volume on RIX–STN would be **114,515 per year**. It is unlikely to be much different from this number.

Ryanair’s average yield has been running at about 4 U.S. cents per kilometer. Applying this 4 cents per kilometer to the STN–RIX 1,659 kilometer distance, Ryanair will charge an average of about US\$66 per one-way fare (probably less, as the distance is above Ryanair’s average and so yield per kilometer is likely to be lower). This compares with a US\$55 average fare network-wide fare on Ryanair. US\$55 is also (coincidentally) the fare to which the LHR–RIX fare had dropped for network carrier traffic in the MIDT data, in the last month of our sample (April 2005).

In general, the markets surveyed showed yield increases from the first to the second one-year period. EVN yields rose by somewhat less but not enough to significantly change its high-yield status in the group.

One noteworthy change is the substantial drop in RIX–LHR yield in the last surveyed quarter. This is the direct result of Ryanair entering the Stansted–Riga market late last year.

This report addresses yields much more than volume, due to inability to get at volumes reliably. It is nevertheless of interest to estimate the impact of Ryanair on the market (Box 13A.1.2).

Riga yields have in effect embarked on a path towards Larnaca yields. In the near future, further LCC incursions into both TLL and RIX from not only London *but also other western European cities* are likely to further depress yield and stimulate traffic.

In discussion with the government of Armenia, the points to highlight could pivot around the observation of EVN yield versus the other three markets in the last quarter surveyed:

- The *numerical* values of EVN versus TLL and RIX yields per RPK are apparently quite similar. But this is hugely misleading. EVN is at about double the distance, so yield per distance should be much lower. In effect, passengers to/from EVN *are paying a very large penalty for the distance* that they should not have to pay.

FIGURE 13A.1.1 AVERAGE FARE

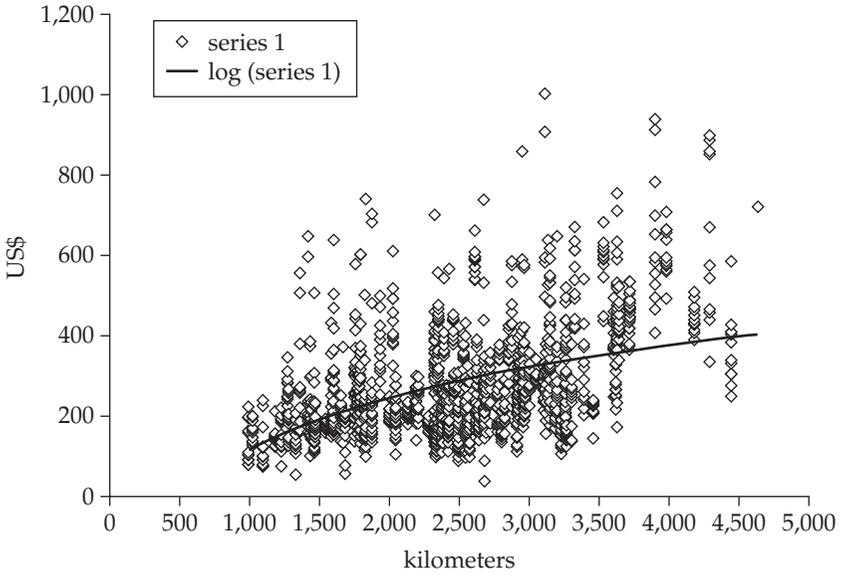
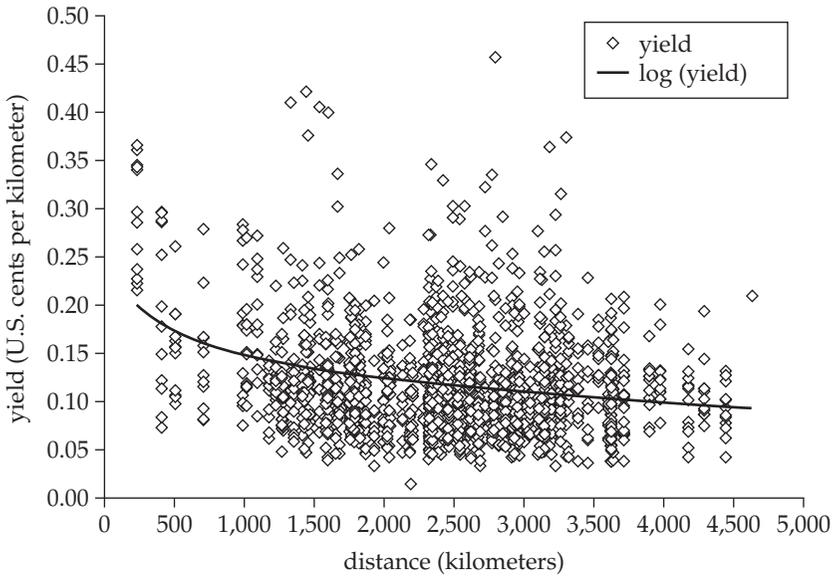


FIGURE 13A.1.2 YIELD BY DISTANCE



- LCA yields are clearly much lower. One might expect this result in a tourism market with large volumes. Again this would be very misleading. Cyprus is a large tourism market because of a concerted, multipronged hotel, infrastructure, and airline industry effort over many decades. It is not just a question of beaches, as that does not explain why tourists flock to Prague, Singapore, or many other places. Armenia has strong tourist (and other price-sensitive) potential *that will very likely not be realized* if the pace of liberalization and level of air fares is consistently more aggressive in other countries.

The findings of this report are consistent with other evidence on the impact of airline industry liberalization and deregulation.

## NOTES

1. This chapter was prepared by Douglas Andrew, World Bank.
2. With 47 percent of the shares owned by Scandinavian Airline Systems (SAS).
3. It is generally considered that the United Kingdom's concern about the competitiveness of U.S. airlines with U.K. airlines immediately after the end of World War II resulted in these protective arrangements which have endured up to the present. The concerns of the immediate postwar period can be regarded as a variant of the usual "infant industry" argument for protection. Sixty years later many airlines, benefiting from the remaining restrictions, still use elements of these arguments to resist liberalization and competition.
4. Austria as a member of the EU would only be able to agree to a change that covers all EU carriers.
5. As is noted above, the EU is requiring member countries to change this provision in ASAs to cover any airline owned and controlled by an EU member.
6. American International Airports.
7. See Attachment 7 for details.
8. However, any Armenian airline would have to obtain slots at Heathrow. Qantas was reported recently as buying two pairs of slots (landing and take-offs) for US\$36 million (Gatwick or Stansted Airports would be alternative, much cheaper airports). In spite of this, airBaltic does operate into Heathrow using, it is understood, slots provided by SAS. See Attachment 5.
9. We understand that there have even been examples of travelers flying from Armenia to London and then to Tashkent via Yerevan and returning the same way.
10. The list of the 59 countries with which the United States has Open Skies agreements can be found at [www.dot.gov/aviation](http://www.dot.gov/aviation). Uzbekistan and

the United Arab Emirates have such agreements, for example. India and the United States have recently agreed on an Open Skies agreement. South Africa and the United States are in talks on such an agreement.

11. That is, there are none of the restrictions mentioned in Box 13.1, but there are the usual ownership and control restrictions.

12. Noting that the airlines are all actually foreign owned, it could be argued that the actual gross economic welfare gain to Armenia is the total of US\$6 million plus the savings to existing passengers, a further US\$50 million (approximately US\$50 per ticket multiplied by 1 million passengers).

13. Collusion to fix prices directly or indirectly is usually per se illegal under competition law.

14. MALIAT, [www.maliat.govt.nz](http://www.maliat.govt.nz). The United States, Singapore, Chile, and New Zealand are the main current signatories.

15. Joint Aviation Authorities, European Aviation Safety Agency.

16. Thirty years, but the term can be adjusted as another mechanism for allowing the airport to earn its return.

17. We understand that the concessionaire also has taken over the responsibility for servicing the debts associated with the EBRD loan that was used to finance the airport cargo facility.

18. There is a separate government charge on departing passengers of approximately US\$20.

19. In regulatory economics this is called the “Averch-Johnson” effect after the two American economists who identified the effect as a consequence of rate-of-return regulation of U.S. utilities. See, for example, Spulber (1989), p. 287.

20. See Attachment 5. The United Arab Emirates recently imposed a departure charge of Dh 30 (US\$4) per passenger.

21. [www.airbaltic.com](http://www.airbaltic.com). AirBaltic leases most of its aircraft.

22. QANTAS recently won an auction to buy 4 slot pairs at Heathrow for US\$36 million.

23. EU replaces national ownership and control.

24. This means that both governments that are party to a particular ASA would have to disagree with an air fare for it to be blocked. Even this requirement has costs, given the desirability of no restrictions beyond competition law once government economic entry barriers are removed.

25. The Czech authorities informed us that there are data problems prior to 1994. For example, the Slovak Republic and the Czech Republic were formed as separate countries in 1993.

26. [http://www.eurocontrol.int/corporate/public/subsite\\_homepage/index.html](http://www.eurocontrol.int/corporate/public/subsite_homepage/index.html).



## CHAPTER 14

# Moving toward Knowledge-Based Competitiveness

### SUMMARY

#### Why Knowledge? Armenia's Growth Paradox (Section 1)

Knowledge has always been an essential element for progress in economies and societies.<sup>1</sup> In today's global economy, knowledge has become an even more decisive factor in competitiveness, growth, and wealth. What could be called a "knowledge revolution" has been triggered by the conjunction of several global trends that have created new opportunities for access and use of knowledge and information. What could and should a landlocked, low-income country with an educated population do to exploit new opportunities associated with the knowledge revolution?

Armenia stands out from other FSU countries (and some would say, from the rest of the world) by a peculiar blend of the following five features that are of particular relevance to knowledge-based competitiveness:<sup>2</sup>

- **A significant annual inflow into the labor force of** motivated people who value knowledge and higher education. Armenia's private higher education (although of a predictably low quality) is one of the most vibrant sectors of the economy.
- **A large stock** of highly educated population yet with largely obsolete specialized skills. In the former USSR, Armenia specialized in R&D, and, all the tribulations of the past 12 years notwithstanding, Armenia still boasts a critical mass of human capital that sustains a culture that values knowledge. However, this stock has been eroded recently owing to emigration, a low level of public spending on education, and delayed reforms in university education.

- **A large and entrepreneurial diaspora** that is as generous in philanthropic contributions to Armenia as (with few exceptions) it is reticent in business initiatives.
- **Weak local entrepreneurship.** Although there are some first movers (for example, in the software and jewelry sectors), they are nowhere close to the critical mass. Clusters and value chains are not developing. There are of course the usual reasons of a weak investment climate and geographical isolation, but these do not appear to be the main problem. Armenian entrepreneurs and policy makers alike do not appreciate (and hence do not seek to improve) the value of **intangibles** (brand names, business reputation, marketing and managerial skills, networks, and so forth). This is where a large stock of educated engineers and scientists, with their attendant focus on assets one can touch, turns to a disadvantage.
- **Fragmentation of the policy debate.** Traditions of collective actions and public-private partnership are also weak.

**The main objective** of this study is to suggest how Armenia's three main advantages—the demand for knowledge among young people, the stock of existing domestic human capital, and the diaspora networks—can trigger a quick expansion in skill-intensive and export-driven entrepreneurship. The strong growth Armenia boasts now is a unique window of opportunity to generate self-reinforcing dynamics: that is, virtuous circles of interaction of the flow and the stock of human capital and the diaspora. The issue is not so much new investments in physical assets (which still dominate the agenda of the government, the international financial organizations, and the diaspora) but the mobilization and recombination of the existing human capital, triggered by an initially modest investment in intangibles such as mechanisms of knowledge and skill transfer from the diaspora to Armenia. Hence, the major value of the study is not necessarily its specific policy recommendations but that it provides (i) a different perspective on familiar problems, (ii) an invitation for policy makers to change the mindset, and (iii) the identification of pilot knowledge-intensive initiatives.

Armenia faces a “study overhang”: donors finance far too many studies in comparison with innovative practical initiatives. The following three components of the potential value added of the study are deemed most important:

- *“Credible provocateur.”* This conveys a sense of urgency for a new policy agenda so that, given the global challenges the country faces, the agenda (at least in some areas, such as life-long learning) cannot deal in the business as usual mode.

- *Lessons from the relevant best practices.* These lessons give the gist of how others accomplished the transition to a knowledge-based economy and competitiveness. There was particular interest in the lessons from Ireland, Greece, and Israel.
- *Policy recommendations: more on the “how” than the “what.”* The study intends to emphasize the importance of pilot projects as an instrument for building public trust and broadening opportunities for investment and knowledge transfer.

After a severe recession in the early 1990s, the Armenian economy demonstrated a strong economic recovery. Yet the sustainability and quality of Armenia’s economic recovery remains a concern. The issue is: What will be the source of further growth in the medium and long terms? The factor advantages that Armenia possesses are an educated labor force, low labor costs, and the presence of a diaspora. To take advantage of these factors, Armenia needs to embark on a transition to a knowledge economy.

The term “knowledge economy” (KE) has been coined to reflect the increased importance of knowledge as a critical factor for economic performance. A knowledge-based economy is one in which organizations and people acquire, create, disseminate, and use knowledge more effectively for greater economic and social development. Such an economy requires the following:

- an economic and institutional regime that provides incentives for the efficient creation, dissemination, and use of existing knowledge
- an educated and skilled population that can create and use knowledge
- a system of research centers, universities, think tanks, consultants, firms, and other organizations that can tap into the growing stock of global knowledge and assimilate and adapt it to local needs
- a dynamic information infrastructure that can facilitate the effective communication, dissemination, and processing of information

The first section of the report sets the stage for the report’s recommendations by providing a detailed benchmarking of Armenia’s position in the global KE. It describes Armenia’s growth paradox: there is a high potential of knowledge utilization that shows tantalizing promise (for instance, in the nascent software cluster and certain enterprises of heavy industry) yet remains largely untapped.

## **Which Way Forward? Toward a National Agenda of Knowledge-Based Competitiveness (Section 2)**

To move forward, Armenia needs to implement major reforms in innovation, education, and ICT systems. The reform agenda is as challenging as the institutional impediments to reforms. A pragmatic agenda to get around the many institutional rigidities that Armenia faces is to create both a bottom-up and a top-down momentum for change by fostering stakeholder awareness. This should help achieve a consensus on dealing with some of the key obstacles at the national level (to enhance demand for an institutional change) and moving ahead with concrete, manageable, bottom-up approaches that can serve as demonstration projects for the larger agenda (to ensure success breeds success).

Armenia has already made some advances in that direction. Drawing on a diversity of best practices, we suggest that Armenia construct and implement a strategy to move toward knowledge-based competitiveness in three stages:

- **Immediate agenda.** Embark on massive awareness-building and initiation of pilot projects and initiatives to demonstrate the potential of knowledge-based competitiveness.
- **Medium-term agenda (2005–08).** Create a springboard for major reforms by assuring that the following happen:
  - make major improvements in the investment climate
  - strengthen stakeholders for reforms
  - proceed with a private sector-led shared vision process (Armenia 2025).
- **Long-term agenda (2008 onward).** Undertake major reforms that will transform and create world-class innovation, education systems, and an ICT infrastructure.

Table 14.1 outlines the medium-term agenda (establishing a springboard for a KE) and longer-term agenda (major reforms and creating a world-class KE infrastructure). In retrospect, we view the last decade (from 1995 to 2003) as a phase of “building foundations.” Armenia’s accession to the WTO in 2003 was an important event signaling that Armenia had assured macroeconomic and socioeconomic stability and created the basic institutional foundations for a market economy. We argue that the time has come for a new stage of policy: the creation of a critical mass of stakeholders for reforms. That, in turn, would imply a two-pronged strategy:

- **Top-down approach:** Dramatically reduce the administrative barriers to growth and dramatically improve the investment climate.

TABLE 14.1 SEQUENCING OF THE ARMENIA KE POLICY AGENDA

<i>Stages of economic reform and growth</i>	<i>Major constraints</i>	<i>Drivers of growth</i>	<i>Thrust of government policy</i>	<i>Examples of policy initiatives</i>	<i>Benchmarks</i>
Building foundations 1995–2003	Sustainability of macroeconomic stability and market reforms	Remittances and other transfers from abroad  Infrastructure and services	<b>Assuring macro and social stability</b>  Some initiatives to improve innovation climate	Infrastructure projects  Creation of business council	Signaling event: accession to WTO (2003)  Other indicators: investment share in GDP, private investment in GDP (reasonably high)  Level of knowledge-based exports (very low)  Business share in innovation (practically nil)
Establishing a springboard for KE, 2005–8	Dearth of role models and stakeholders for reforms (self-made start-up and spin-off entrepreneurs)	Increasing share of merchandise exports; growing role of services	<b>Assuring a critical mass of stakeholders for reforms</b> through a two pronged strategy:  Top-down: dramatic reduction of administrative barriers to growth  Bottom-up: facilitation of private sector-driven “centers of excellence”	Competitive grant schemes to enhance business innovation  Creation of innovation council	Signaling events:  A multinational establishes knowledge-intensive operations in Armenia  Elimination of ArmenTel monopoly  Some skilled emigrants come back and become successful entrepreneurs  Rising share of business R&D and merchandise exports
Major reforms: creating world-class KE infrastructure, 2008–15	Human capital constraint: inadequate stock and flow of technical skills  Inadequate ICT infrastructure	Skill-intensive exports  Robust internal demand	Major overhaul of education, ICT infrastructure, and innovation systems	Wide-scale introduction of income-contingent scheme to finance private higher education	Significant return migration of highly skilled.  Robust knowledge-intensive clusters are established

Source: Elaboration by the author.

- Bottom-up approach: Facilitate private sector-driven “centers of excellence” in innovation, enterprise upgrading, education, and ICT.

This policy stage should be characterized by more strategic and proactive government policies to improve innovation, the education systems, and the ICT infrastructure. By a proactive approach we do not mean a “picking winners” sectoral industrial policy. Rather, the focus should be on functional interventions that are open to all eligible stakeholders and that would accelerate the existing policy trends rather than creating from scratch.

Examples of policy initiatives in this vein include competitive grant schemes to enhance business innovation (more on this appears below) and the establishment of an innovation council to assure linkages among higher education, R&D organizations, and the enterprise sector. Benchmarks and signaling events of the completion of this stage of reform could be as diverse as the following:

- A brand name multinational establishes knowledge-intensive operations in Armenia.
- The ArmenTel monopoly is eliminated.
- Some skilled emigrants come back to Armenia and become successful entrepreneurs.
- There is a rising share of business R&D in the overall R&D budget and of merchandise exports in overall exports.

The achievement of these benchmarks will signal the formation of a critical mass of stakeholders for reform, which would allow Armenia to engage in major (and quite painful) reforms in innovation, the enterprise upgrading system, and the ICT infrastructure. We will not discuss in detail the long-run agenda for change. The discussion that follows focuses on the “what” and “how” of the medium-term agenda (establishing a springboard for the KE).

The report shows that from the perspective of the KE, two major immediate constraints are (i) an extremely weak and fragmented innovation system characterized by the isolation of productive sector, universities, and research institutes; and (ii) the low quality and high prices of ITC infrastructure. From a longer-term perspective, human capital (particularly technical and managerial skills) is a major constraint. Table 14.2 summarizes these critical constraints from the perspective of the KE and a relevant medium-term policy agenda to alleviate these constraints.

TABLE 14.2 SPECIFIC POLICY INITIATIVES AS ENTRY POINTS TO ADDRESS SYSTEMIC CONSTRAINTS

<i>System</i>	<i>Main objectives</i>	<i>Specific initiatives</i>	<i>Relevant best practices (discussed in Section 3)</i>
<b>Innovation system</b>	Enhance linkages between productive sector, universities, and science organizations.	Competitive grant scheme to promote business R&D and training.  Seed support to venture capital fund.	U.K. Teaching Company Scheme.
<b>Education system</b>	Reform curriculum of basic, secondary, and higher education.	Technology/design facility on the basis of major university.  Distant education project collaboration with diaspora.  Establish National Innovation Council to bring together education, R&D organizations, and industry.	Competence center models (in design stage in Estonia).
<b>ICT infrastructure</b>	Improve quality of ICT services and reduce its costs.	Institutional strengthening of public utility regulator.	Liberalization policies in ICT infrastructure in some central European countries.

Source: Author's own elaboration.

### **How to Implement the Strategy? From Vision to Action (Section 3)**

Implementation capabilities are a critical issue not only in Armenia but in many semi-industrialized economies. This is due to the simultaneous weakness of both government and market institutions. Pragmatism—adopting and adapting what works even though it may result in idiosyncratic institutions—is a main thrust of our recommendations. Given that most knowledge-based activities are concentrated in the capital city of Yerevan, Armenia is tantamount to a city state. It can become a laboratory for pragmatic institutions to enhance the transformation of knowledge to wealth. Some pilot solutions can be adopted and adapted, starting with Armenia’s two nascent clusters: the jewelry and diamond cluster and the software cluster.

The third section of this report analyzes the reasons for the disappointing performance of the existing initiatives (including those financed by the World Bank), such as the Enterprise Incubator Foundation (EIF) and the Armenia Development Agency (ADA). We suggest that implementation problems could be fixed by strengthening or replacing the management of these organizations and significantly increasing the presence of the business sector and the diaspora in their governing bodies. Improvements in the performance of ADA/EIF could then be used as a trigger for donor support for future enterprise and innovation support initiatives.

Such initiatives could include the following:

- Create a private-public National Innovation Council to bring together education, R&D organizations, and industry.
- Realign and strengthen the incentive structure to attract FDI.
- Implement a series of pilot initiatives to raise the demand for business R&D and enhance education-industry linkages. For example, introduce a competitive grants scheme for business R&D; introduce a system of support for productivity improvement, implement a distance education pilot; reform and expand the system of quality support to firms; and improve the system of technology transfer by a “teaching company” scheme.
- Improve growth statistics to permit better measurement of the development of the KE.

The meaningful participation of Armenia’s highly successful business and R&D diaspora will be vital for the success of these initiatives and for Armenia’s transformation to a knowledge-based economy in general. However, the way in which the diaspora engages in the Armenian economy has to change very dramatically. Rather than being merely a

source of donations, it needs to become a bridge to FDI (foreign direct investment) and other technical and managerial knowledge (as in India), and eventually a source of FDI (as in China). Clues on how the diaspora can contribute in a more substantive manner are already emerging, albeit slowly. The diaspora played a key role in articulating the Armenia 2020 vision (McKinsey and Company 2003), although again the government showed insufficient commitment in this initiative.

To change the current situation, (that is, to make the diaspora a source of expertise and FDI rather than a source of philanthropy and poverty relief), we propose the following:

- *Go after “low-hanging fruit”*: design and implement relatively low-cost private sector projects in higher education, innovation, and ICT. A distance education pilot is one example of such projects.
- *Once these pilot projects demonstrate signs of success, scale them into specific organizations*. This would require more substantial commitments from successful and influential businessmen of Armenian origin. Higher education is particularly ripe with these opportunities.
- *Organize a top-level leadership conference to start transforming diaspora interest so that it becomes involved in specific investment projects in Armenia*. Once pilot projects start to show results, we propose to organize a high-level leadership conference in California.

The objective of assembling a group of “overachievers” of Armenian origin to attend the leadership conference would be to translate general benevolence into productive action. It is a complex and subtle process, and the essential element is that this group must believe that they are not being hit upon for money. Instead, they are usually asked to participate in the vision-building exercise—the design of a new direction for the country or an important part of it. In the course of discussing the existing problem and its possible solutions, the group comes to a shared understanding of real development priorities and becomes personally committed to the implementation of the recommendations that were set up with their direct participation. It is natural that having become a part of the “design team” they would support the agreed recommendations with their resources and influence. Such a participatory process also helps to convince major donors to refrain from pushing their individual vanity projects.

The new role of the Armenian diaspora will bring not only critical managerial and technical expertise. It will be a litmus test of how well Armenia is progressing toward knowledge-based competitiveness. By this benchmark, Armenia’s progress is very disappointing, as diaspora involvement is overwhelmingly philanthropic in nature.

### Issues for Future Analysis

Many issues in this report were merely outlined here and deserve future analysis.

For the second section of this report (the way forward), two issues deserve detailed empirical analysis:

- *From the labor market perspective*, the nature of the demand for new and different skills and knowledge needs to be better understood. It is likely that demand from enterprises is low, since most are in sectors with low productivity and are focused on local markets. High unemployment and major industry restructuring have meant low incentives for investments in new skills and knowledge. Another issue that needs to be better understood is where workers might get their skills and knowledge upgraded, whether through public or private providers, and what incentives or disincentives exist for individuals and enterprises to use these providers. A skills survey (in collaboration with the Armenia education team) will need to be undertaken to this end.
- *From the enterprise sector perspective*, there is a need for a survey of sources and forms of innovation in firms. Such a survey (with a fairly standardized methodology) was undertaken in most transition economies but not in Armenia. This survey would shed some light on how to accelerate the emerging pockets of excellence and vitality in the Armenian economy.

For the third section of this report (the “how to” of recommendations), a survey of the business diaspora and of emerging new means of diaspora involvement would be helpful. For example, a discussion of the results of such a survey in Argentina proved critical in changing the attitude of the government toward the country’s business environment and the R&D diaspora.

### WHY KNOWLEDGE? ARMENIA’S GROWTH PARADOX

This section sets the stage by establishing the case for a knowledge-based economy in Armenia. The subsection immediately below deals with the vulnerability of the current sources of growth. The next subsection outlines stylized scenarios of a model in the light of experienced comparator countries including Croatia, Latvia, Chile, Singapore, and Israel. The following two subsections introduce the notion of a KE and benchmarks of Armenia’s performance. The concluding subsection returns to the scenario analysis for Armenia and introduces Armenia’s growth paradox.

### Peculiar Structure of Growth

After a severe recession in the early 1990s, the Armenian economy demonstrated a strong economic recovery. Yet the sustainability and quality of Armenia's economic growth, particularly of the quality of jobs it generates, remains a concern. Growth has been concentrated mainly in sectors with limited employment opportunities. Recovery in agriculture and energy and expansion in the construction and service sectors were the main factors contributing to growth. In contrast, the manufacturing sector underperformed, although, owing to its skilled labor endowment, Armenia's strongest comparative advantage lies in this sector. As highlighted in the country study (2002a), Armenia's output growth to date has been accompanied by insufficient employment generation and poverty reduction, primarily because the business environment has not been supportive of enterprise restructuring and new entry for most of the period.

In early 2001, the government made essential adjustments to its economic strategy. It has shifted the focus of reform efforts to improving the business environment, developing consultative mechanisms with the private sector, and building capacity for export and investment promotion. The government's effort in these areas has been broadly successful as reflected in the major outcomes of the ongoing reform programs. Recent enterprise surveys also show increased private sector satisfaction with the government's economic policy. The strong economic growth of 2001–02 was for the first time driven by a high rate of export expansion. Manufacturing exports grew by more than 50 percent in two years, with a positive impact on employment and household incomes.

However, as can be seen from Tables 14.3 and 14.4, the sectoral decomposition of GDP and export growth suggests that skill-intensive and knowledge-intensive sectors continue to underperform. The primary sources of economic growth in Armenia relate to such sectors as jewelry and diamond cutting, food processing, textiles, construction (to a large extent driven by donor funding of major investment projects in public infrastructure), and low-end services. However, the domestic demand for qualified labor remains depressed.<sup>3</sup> The situation in the machinery sector remains mostly stagnant.

The significant increase in the volume of exports and the overall acceleration in GDP annual growth over the past four to five years (3.3 percent in 1999 and 12.9 percent in 2002) has not had a substantial impact on employment, which, at 1.28 million population in early 2003 (having stagnated over the past four years) was still about 10 percent lower than in 1997 (*Economist* 2003). According to official estimates, total registered unemployment in 2002 was around 9.5 percent,

TABLE 14.3 GROSS DOMESTIC PRODUCT BY SECTOR, 1998–2003  
(US\$ MILLION)

<i>Sector</i>	1998	1999	2000	2001	2002	2003	<i>Growth between 1998 and 2003 (%)</i>
Agriculture and forestry	30.8	27.0	23.2	25.0	23.1	21.5	-43
Construction	8.0	8.3	10.3	10.7	13.9	15.8	49
Industry	19.9	21.2	21.9	20.2	20.5	21.5	7
Services	31.8	34.9	35.5	34.4	32.0	30.8	-3
Trade & catering	8.7	9.0	9.4	9.8	10.0	10.4	16
Transport & communications	6.9	7.6	7.2	7.5	7.2	6.3	-10

*Source:* Armenian Ministry of Trade and Economic Development.

TABLE 14.4 SECTOR CONTRIBUTIONS TO EXPORT GROWTH, 2000–02 (PERCENT)

<i>Sector</i>	<i>Growth contribution</i>
Total export growth	100.0
Total of five leading sectors (below)	96.6
Diamonds and jewelry	57.8
Prepared food products	14.1
Machinery, equipment, and mechanisms	9.4
Instruments and apparatus	8.9
Textile articles	6.4

*Source:* Author's own elaboration.

but the inclusion of nonregistered unemployment could raise the rate to over 30 percent.

High-tech exports, as a percentage of manufactured exports, are minimal (1.7 percent in 2002 and 4 percent in 2000); the average for the lower-middle-income group is several times higher. Manufacturing exports as a percentage of total exports are not particularly low<sup>4</sup> but they are concentrated in natural-resource-based products and traditional industries, such as precious stones, metals, foodstuffs, base metals, mineral products, textiles, and machinery. Overall, total revenue from exports of goods and services has been on an upward trend, rising by 50 percent between the years 2001 and 2002 and accounting for 30 percent of GDP in 2002, the highest share since 1994. Growth has been driven mainly by the processing of diamonds and stones whose exports accounted for more than 50 percent of total export revenue

in 2002, up from 35 percent in 2001. Exports of prepared foodstuffs, Armenia's second largest export commodity, posted their third successive year of growth in 2002, indicating strong competencies in the domestic food-processing industry.

FDI has not remained at consistent levels throughout the past years. FDI was close to 5 percent of GDP in 2002 and lower than in the period 1998–2000. It is also interesting to note that in the CIS group Armenia has the highest inflows of foreign assistance per head (*Economist* 2003) and that foreign remittances have accounted for 20 percent of GDP on average for the last five years. This extra volume of inflows, in conjunction with the volume of FDI, should provide a good base for business development and entrepreneurship in the country.

Nevertheless, according to a very recent survey there are significant constraints on business development and operation in Armenia (FIAS 2004). The companies surveyed indicated, in the order evaluated, that taxes and tax administration/regulation, policy instability, infrastructure, financing, and corruption are the top five constraints affecting the operations and growth of private Armenian businesses. The same survey indicates that there is some improvement in the business start-up process in Armenia with the simplification of company registration and some reduction in registration costs (from US\$88 in 2002 down to US\$75 in 2003). Overall, however, the total cost of starting a business and conducting some key activities (that is, equipment and product certification) has increased since 1999. In 2002 the average cost to Armenian companies incurred for registration and organizing some operations was equivalent to around US\$5,200, while in 1999 it was around US\$3,970. The higher costs for registration and operation occurred in the manufacturing sector and in larger companies. However, small companies pay substantially higher costs for import/export operations. Furthermore, the survey strongly indicates that there has been a substantial worsening of the situation related to business operations, mainly due to taxation and tax administration, customs regulations, and inspections.

McKinsey and Company (2003) estimate that this growth pattern will encounter difficulties by 2005–06. The issue is what the sources of further growth will be in the medium and long terms. The factor advantages that Armenia possesses are an educated labor force, low labor cost, and the presence of the diaspora. However, these are not drivers of growth per se. It is difficult to generalize about drivers of growth across different countries. Growth is always an idiosyncratic process that is driven by a variety of very specific and complementary factors that jointly generate a virtuous circle of growth. Nevertheless, initial spurs of a growth such as Armenia's could be initiated through coordinated policy actions to remove key constraints. The gap between

the potential for growth and the very low current income levels is of such magnitude that coordinated policy actions, that would remove a variety of sectoral obstacles, would produce a marginal long-term spur in growth. This would be a sound basis for building sustainable long-term growth anchored in knowledge-based activities.

### **Toward Growth Scenarios for Armenia**

To derive policy lessons, throughout this report we compare Armenia with two types of countries: “role models” and what we call “realistic comparators.” Role models are small, open economies such as Israel, Ireland, Chile, and Slovenia that have managed to thrive in innovation and knowledge-intensive industries and to develop competitive clusters. Armenia is also compared with economies such as Russia, Latvia, Croatia, and Costa Rica. Russia is a large economy with significant trade and political affiliations with Armenia. Latvia, Croatia, and Costa Rica have good foundations and have made substantial progress but have also encountered significant difficulties.

Tables 14.5 and 14.6 summarize the main features of Armenia’s growth versus selected role models and other comparators.

To analyze the growth factors in more detail, we now turn to define the main generic factors of growth: knowledge and the capability to transform it into wealth.

### **Knowledge Economy and Knowledge Revolution**

Knowledge has always been a critical factor in economic development. In today’s global economy, knowledge has become an even more important factor for competitiveness, growth, and increased welfare. We are in the midst of what could be called a “knowledge revolution,” triggered by rapid scientific and technological progress in many fields such as biotechnology and ITC and by increased speed in the dissemination and application of knowledge. Reduced transportation and communications costs and the fact that knowledge seeks larger markets for its application are all features of increased globalization and competition.

The result of this very dynamic process is a constant state of restructuring, at global, country, sector, and firm levels. While this raises tremendous possibilities for improvement, it also carries risks that countries or firms and organizations will fall behind.

The term “knowledge economy” has been coined to reflect this increased importance of knowledge as a critical factor for economic performance (see Box 14.1 for some of the key trends in the KE).

TABLE 14.5 COUNTRIES THAT HAVE SUCCESSFULLY ALIGNED KEY DRIVERS OF GROWTH AND DEVELOPED INNOVATION CLUSTERS

<i>Drivers</i>	<i>Ireland</i>	<i>Israel</i>	<i>Armenia</i>
Leverage country advantages.	English speaking talent pool close to EU market.	High-quality talent, partly immigrants. Strong assistance by diaspora but which inhibits regional integration.	High-quality talent, particularly in engineering and mathematics. Highly successful and entrepreneurial diaspora.
Attract “brand name” FDI.	Dell	Microsoft	Should be a priority. Crucially important as trigger for future growth.
Focus on highly specific market niches.	Off-shore business processes.	Defense industry. Security software.	ITC cluster. Diamonds and jewelry. Future possibilities: — fine chemicals — precision machine building.
Provide government support.	Irish Development Agency. Fiscal incentives.	Developed support to firms’ growth.	Strengthen enterprise incubator and ADA. Create high-level innovation council.

Source: Adapted from McKinsey and Company (2003).

TABLE 14.6 COUNTRIES WITH OBSTACLES TO ALIGNING KEY DRIVERS OF GROWTH

<i>Driver</i>	<i>Croatia</i>	<i>Russia</i>	<i>Latvia</i>	<i>Costa Rica</i>
Leverage country advantages.	A close proximity to EU market has not yet been leveraged with specific country advantages.	Educated labor (particularly engineering and R&D talent) has not been leveraged.  Natural resources are not transformed into high value-added clusters as in Finland, Norway, or Chile.	A close proximity to developed EU markets and skilled labor force has not yet been converted into an asset.	Substantial progress in transforming two main assets—nature and educated labor force—into sustained advantages.  Costa Rica as a widely recognized tourism brand and Intel semiconductor plant as a flagship of manufacturing industry.
Attract “brand name” FDI.	High unit-labor costs have attracted only local market-seeking FDI (banks, telecoms).	Failure to attract brand-name FDI, yet there are important exceptions both on high-end (R&D and design—Boeing) and low end (oil and gas).	Limited FDI in manufacturing sector. Mainly market-seeking FDI.	Intel investment has not been followed by wave of other investors.
Focus on highly specific market niches.	Country competitive advantages have not yet been differentiated.	With the exception of the advantages inherited from the Soviet era (arms exports to Asia high-performers, capital goods for atomic power stations), country competitive advantages have not been differentiated.	General awareness that knowledge-based activities are far ahead has not been matched by specific actions.	High-brand and nature tourism has been successful as a niche. Other knowledge-based services have not.
Provide government support.	Government has not yet taken seriously knowledge-based economy agenda.	Many programs and declarations. No coherent vision of Russia as knowledge-based economy and monitorable program of concerted action.	Tax support to high-tech activities including software.	Tax support to certain manufacturing activities; variety of SME programs.

Source: Adapted from McKinsey and Company (2003).

### BOX 14.1 THE GROWING IMPORTANCE OF KNOWLEDGE: GLOBAL TRENDS

The OECD uses the term “knowledge economy” to draw attention to the importance of knowledge in all economic activities. The definition has been evolving from focusing just on manufacturing industries that make intensive use of technology to including services that are also heavily knowledge based. The KE now accounts, on average, for roughly half of nongovernment economic activity in the OECD.

#### *More investment and trade in intangibles*

Investment in intangibles has been skyrocketing. In OECD countries, public investment in intangibles (such as education, R&D, and software) has now reached almost the same level as that for machinery and equipment—8.6 percent of GDP compared to 9.0 percent. This estimate almost certainly understates the level of investment in “intangibles,” since it does not include private investment in education, public and private investment in skills training, or investment in design, marketing, advertising, brand development, engineering, publishing, and the arts.

#### *More importance for education and training*

In OECD countries the proportion of adults with at least a secondary education has risen from 44 percent to 72 percent; and tertiary education has doubled, from 22 percent to 44 percent over the last generation. According to UNESCO the number of students enrolled in postsecondary institutions worldwide increased from 28 million in 1970 to 88 million in 1997. But the gap between developing countries and developed countries widened from 21 million to 45 million, even though the population of developing countries is larger and growing faster. Developed countries have also been up-skilling labor through extensive continuing education both in universities and in firms. Developing countries lag in this respect as their educational attainments are low, and the workforce needs retraining to be competitive in a new economy.

#### *More foreign investment*

Foreign investment, one of the key agents of globalization, is moved mainly by the desire to exploit knowledge assets on a global scale—assets that include technology, management, access to markets, and access to such special resources as finance, labor, and natural resources. FDI inflows increased 15 times between 1982 and 1999. And FDI’s share in world gross fixed capital formation increased from 2.6 percent to 14.3 percent.

#### *More R&D*

Of global R&D, 88 percent is undertaken by high-income countries, with 31 percent of global R&D centered in one single country: the United States. Multinational companies, now carrying out R&D in countries

other than their home countries, are establishing more strategic alliances—even mergers and acquisitions—to collaborate on technology and acquire technological assets. Also on the rise is the number of international collaborations in patenting and technical publications. In the OECD, the share of foreign co-inventors rose from 5 percent in the mid-1980s to 9 percent eight years later. And the share of scientific publications with foreign co-authors more than doubled for many OECD countries, to an average of 26 percent for 1995–97.

*Source:* Knowledge for Development (K4D) Program. <http://www.worldbank.org/wbi/knowledgefordevelopment>.

A knowledge-based economy is one where organizations and people acquire, create, disseminate, and use knowledge more effectively for greater economic and social development. This requires the following:

- an economic and institutional regime that provides incentives for the efficient creation, dissemination, and use of existing knowledge
- an educated and skilled population that can create and use knowledge
- a system of research centers, universities, think tanks, consultants, firms, and other organizations that can tap into the growing stock of global knowledge, and assimilate and adapt it to local needs
- a dynamic information infrastructure that can facilitate the effective communication, dissemination, and processing of information

Underpinning the above is the need to coordinate actions across these four pillars, because there are strong interdependencies among them.

### *A New Economic Incentive and Institutional Regime*

Taking advantage of the potential offered by the knowledge revolution requires a flexible society and economy, able to cope with the need for constant change. This, in turn, requires: (i) effective economic incentive regimes and institutions to facilitate the redeployment of resources from less efficient to more efficient uses; (ii) conditions conducive to entrepreneurship, risk-taking, and the expansion of small enterprises; (iii) sufficiently flexible labor markets to facilitate the redeployment of labor, appropriate social safety nets to facilitate the relocation and retraining of people for new jobs, and assistance to

those adversely affected by restructuring; and (iv) legal governance systems to cope with the many demands emanating from such restructuring and redeployment.

### *Skilled and Creative Human Resources for the KE*

Education is the basis for creating, acquiring, adapting, disseminating, and using knowledge. Basic education increases peoples' capacity to learn and to use information, as does technical secondary education. Higher education in engineering and scientific areas is needed to monitor technological trends, assess what is relevant for the firm or the economy, and use new technologies. The production of new knowledge and its adaptation to a particular economic setting is generally associated with higher-level teaching and research. Creating a culture of continuous learning and openness to new ideas is critical for a knowledge-based economy.

### *An Effective Innovation System*

An innovation system consists of the network of institutions, rules, and procedures that affect how a country acquires, creates, disseminates, and uses knowledge. Some of the key organizations for the creation of knowledge include universities, public and private research centers, and policy think tanks, as well as firms, nongovernmental organizations, and the government. Some of the key institutions for the dissemination of knowledge include agricultural and industrial extension services, engineering consulting firms, and economic and management consulting firms. What is important is how effective they are in creating, adapting, and disseminating knowledge to the firms, government, and other organizations or people who put it to use. Therefore, networking and interaction among the different organizations, firms, and individuals is essential.

### *A Dynamic Information Infrastructure*

The rapid advances in ICT are dramatically affecting economic and social activities, as well as the acquisition, creation, dissemination, and use of knowledge. As knowledge becomes more important for competitiveness, the effective use of ICT reduces transaction costs, time and space barriers, and allows the mass production of customized goods and services, substituting for limited factors of production. ICT has now become a pervasive and essential infrastructure for the knowledge-based economy. To support Internet-based economic activities, countries need to ensure the competitive pricing of Internet services and provide an appropriate legal infrastructure to deal with

online transactions. It is also essential to assess the knowledge and skills required to design, implement, and use the new ICT.

### **Armenia and the KE: Benchmarking the Country's Position**

The Knowledge for Development program (K4D) of the World Bank Institute (WBI)<sup>5</sup> has developed a knowledge benchmarking methodology built on an interactive Web-based tool—the Knowledge Assessment Methodology (KAM).<sup>6</sup> The KAM includes a wide range of quantitative and qualitative variables that help to benchmark how an economy compares with neighbors, competitors, or countries it wishes to emulate on the four pillars of the KE (see Box 14.2). The KAM helps to identify the problems and opportunities that a country faces in making the transition to the KE, and where it may need to focus policy attention or future investments.<sup>7</sup> The KAM assesses a country's or region's knowledge readiness in relative terms, meaning relative to the available country sample (currently 121 countries).

The figures in this subsection illustrate a preliminary picture of Armenia's knowledge readiness from the mid-1990s to the early years of this decade. Figure 14.1 demonstrates the relative performance of countries and regions in the Knowledge Economy Index (KEI), a composite index that measures the preparedness of the country for a knowledge-based development framework. The KEI is calculated by computing the average of the performance scores of a country or region in all four pillars of the KE (see Box 14.2).

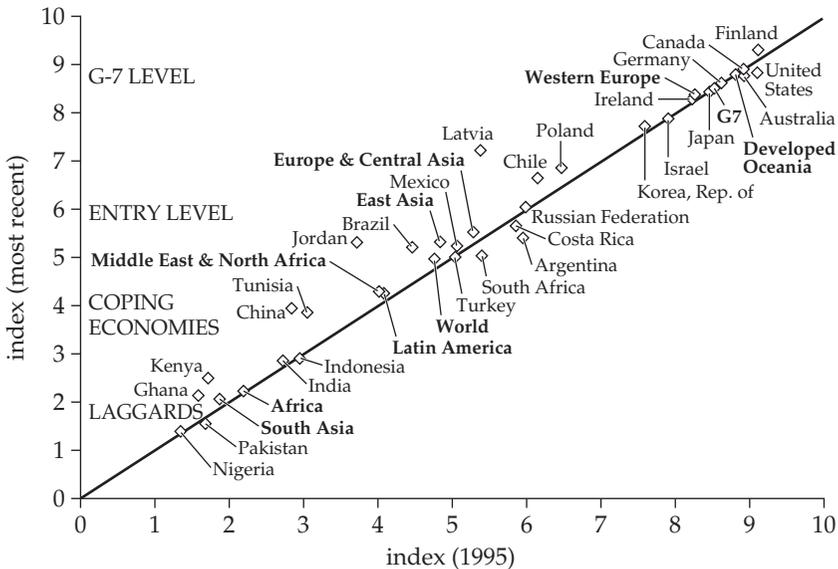
#### **BOX 14.2 THE FOUR PILLARS OF THE KE**

The following variables are chosen as proxies for each of the four pillars of the KE:

- *Economic and institutional regime*: tariff and nontariff barriers, regulatory quality, and rule of law
- *Education and human resources*: adult literacy rate (percent age 15 and above), secondary enrollment, and tertiary enrollment
- *Innovation system*: researchers in R&D, patent applications granted by the USPTO, and scientific and technical journal articles (weighted by per million population)
- *Information infrastructure*: telephones per 1,000 people, computers per 1,000 people, and Internet users per 10,000 people

Source: K4D.

FIGURE 14.1 ARMENIA AND THE WORLD: KEI



Source: KAM 2005 ([www.worldbank.org/kam](http://www.worldbank.org/kam)).

Overall, during the last five to seven years Armenia improved, rather marginally, its performance in the KEI. In the knowledge map (Figure 14.1), as defined by countries' performance in the index, Armenia stands within the medium performers group, yet noticeably below the average of the ECA region. Armenia falls further behind OECD and EU members, and the performance gap between Armenia and its selected comparators is significant.<sup>8</sup> In particular, Armenia trails Israel and Ireland alarmingly. These elements should signal the sense of urgency for Armenia, which despite its well-documented, large potential and impressive economic growth trends does not seem to be maximizing the benefits from its competencies. Armenia is also falling behind other former socialist economies which have managed to compete more successfully in a fast-changing, knowledge-based environment.

Following the KAM methodology, the figures below divide the world's knowledge performance into four broad classes:

- Very low endowments—laggards.
- Relatively low endowments—coping economies.
- "Accession club"—entry-level to KE—a class that is characteristic of upper middle-income economies starting to compete in

knowledge and innovation, not low labor costs alone. These are more advanced ECA and Asian countries.

- G-7 levels of knowledge endowments.

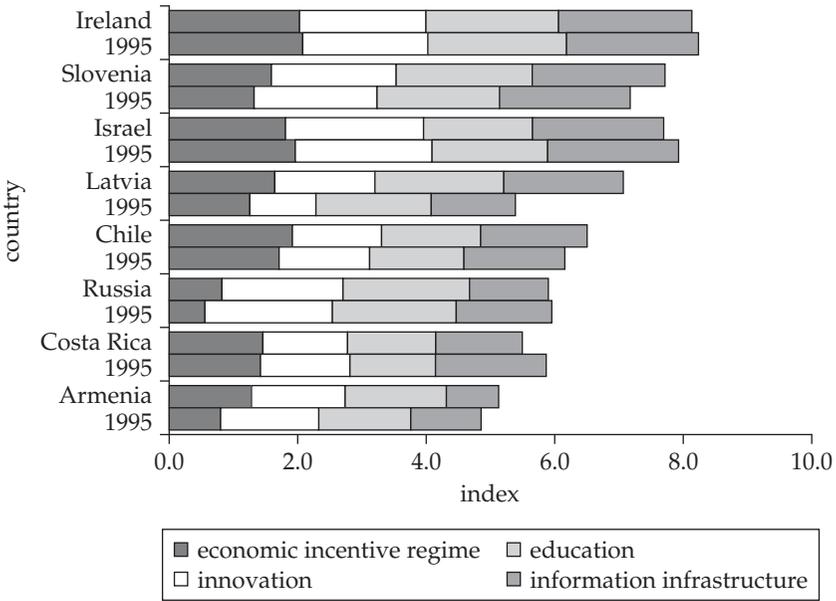
While the criteria distinguishing one class from another are necessarily arbitrary, the messages for Armenia are quite clear:

- On the overall KE score, Armenia is among the coping economies: it is within the same league as Russia, Ukraine, and Costa Rica and within the healthy distance from both laggards and entry-level economies.
- Yet Armenia's performance across the four KE pillars (economic incentive regime, education, innovation, and ICTs) is unusually unbalanced. On economic and institutional regime Armenia performs very well, on a par with recent EU entrants. In contrast, the ICT pillar is shockingly underdeveloped. Not only is Armenia squarely among laggards (the worst category, occupied by Sub-Saharan Africa, Albania, and the Central Asian republics of the FSU), but its relative position actually has worsened significantly since 1995. This is all the more worrisome given its geographical isolation. Because of its landlocked status and unfriendly neighbors it should have at least ranked in the accession club on ICT.
- On education, Armenia still performs reasonably although lagging behind many Eastern European economies. However, the relatively good human capital is a heritage of Soviet times that has not translated into adequate innovation performance. The innovation pillar remains weak.

Using the KAM, it is also possible to isolate Armenia and its comparators and illustrate their relative performance in the four pillars that comprise the KEI.<sup>9</sup> In Figure 14.2, the two bars per country represent the aggregate KEI score for that country for the most recent year (upper bar) and for 1995 (lower bar), split into the four KE pillars. Each shaded band represents the contribution of a particular pillar to a country's overall knowledge readiness.

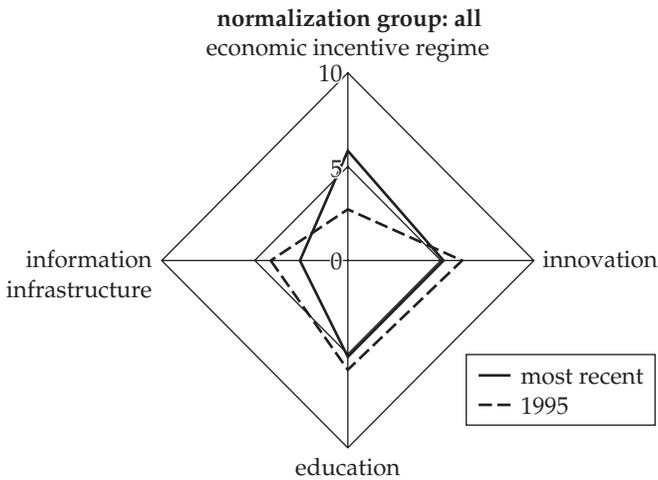
An examination of performance in the four KE pillars (economic incentive regime, education, innovation, and ICT) that define the aggregate KEI (Figure 14.3) indicates that Armenia performs poorly in the ICT pillar, an area in which it lost significant ground relative to the world. In absolute terms, Armenia did improve its ICT indicators (explicitly shown in Figure 14.4), but the world on average (defined by the 121 countries in the KAM sample) made a significantly larger improvement. Armenia's strongest pillar is its economic incentive regime (EIR), which was the weakest in the mid-1990s, an area in which the country demonstrated significant improvement and has

FIGURE 14.2 ARMENIA AND COMPARATORS: DISAGGREGATED PERFORMANCE IN THE KE



Source: KAM 2005 ([www.worldbank.org/kam](http://www.worldbank.org/kam)).

FIGURE 14.3 ARMENIA: PERFORMANCE IN THE FOUR KE PILLARS (MOST RECENT AND 1995)



Source: KAM 2005 ([www.worldbank.org/kam](http://www.worldbank.org/kam)).

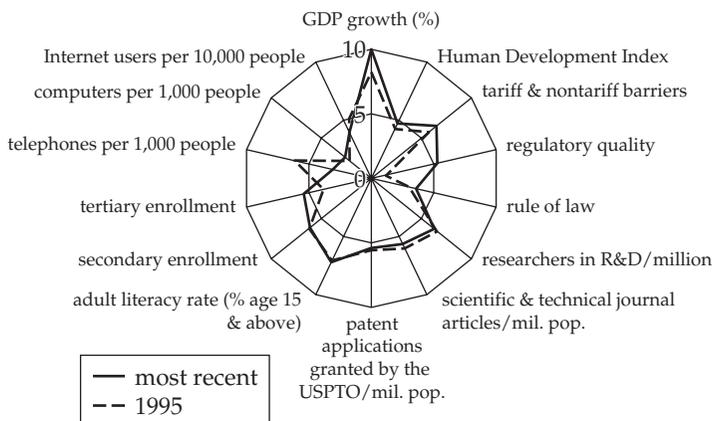
remained particularly competitive in the ECA region. In the education pillar, a traditionally strong area for the country, Armenia lost some ground, while in the innovation pillar the country regressed even more.

In Figure 14.4 we illustrate how Armenia performed throughout in each of the 12 variables that describe the four KE pillars, and therefore the aggregate KEI, plus 2 performance variables (GDP growth and Human Development Index—HDI).

In the EIR pillar, the country demonstrated the largest improvement in the ECA region, currently performing well above the regional average, behind Latvia and Hungary (Figure 14.5). Armenia significantly improved its terms of trade by reducing tariff and nontariff barriers<sup>10</sup> and also managed to significantly improve (relative to the world) its regulatory quality indicators by implementing policies friendly to markets and business. Rule of law indicators did not improve significantly and they are below the regional average levels, but still the country showed more improvement than the average of the KAM country sample; therefore it demonstrates improvement relative to the world. Armenia lags behind all of its selected comparators in this pillar with the exception of Russia, which is moving particularly slowly toward a modernized institutional phase.

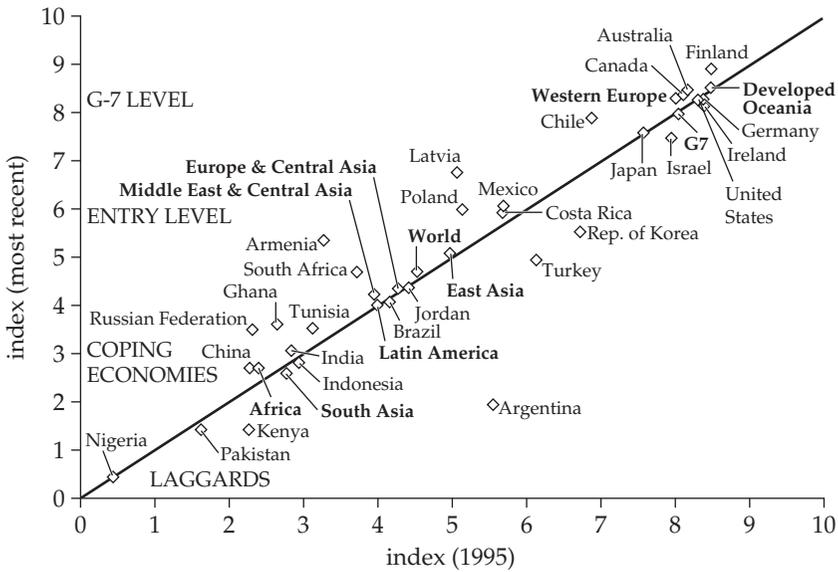
Figure 14.6 shows several additional KAM indicators that describe performance in the EIR pillar. The scorecard indicates that Armenia is characterized by low levels of gross domestic investment, the lowest among its comparators. On average for the years 1995–2002, Armenia

FIGURE 14.4 ARMENIA KE INDEX VARIABLES, BASIC SCORECARD (1995 AND MOST RECENT)



Source: KAM 2005 ([www.worldbank.org/kam](http://www.worldbank.org/kam)).

FIGURE 14.5 ECONOMIC INCENTIVE REGIME: ARMENIA AND THE WORLD



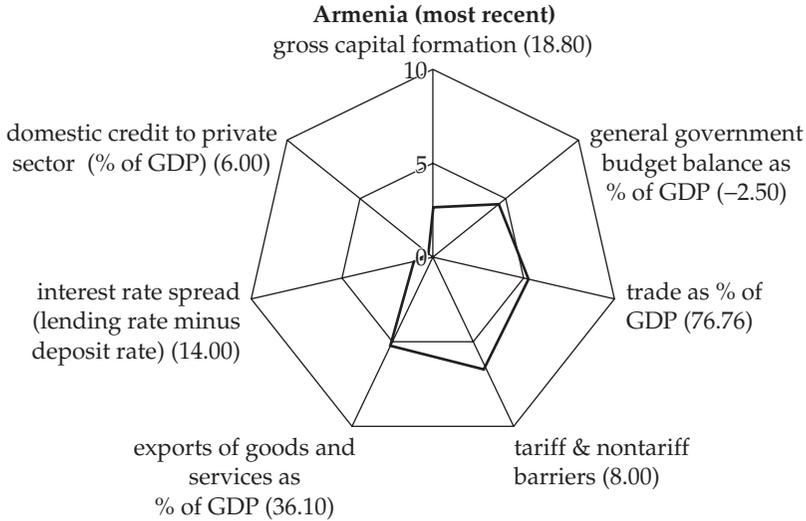
Source: KAM 2005 ([www.worldbank.org/kam](http://www.worldbank.org/kam)).

spent around 19 percent of GDP on domestic investments—the lowest share with Costa Rica—while the closest, Russia, spent 20 percent, and Latvia and Slovenia topped the list with 25 percent. Armenia on average for the same time period (1995–2002) spent significantly less on domestic investments (see Table 14A.3.1 in Annex 14.3) than was spent, on average, by the groups in the low and low and middle income countries.

Armenia is an open economy with total trade representing currently 75 percent of GDP, which is still below the average for the ECA region. Armenia’s exports of goods and services as a share of GDP—a solid indication of international competitiveness—is significantly lower than all comparator countries (Table 14.7) and the same income group average. In Armenia in 2002, despite the fact that exports of goods and services had increased significantly since 1995 and accounted for almost 30 percent of GDP, imports accounted for 47 percent of GDP, causing Armenia to carry over a significant trade deficit, much larger than any of its comparator countries.

In the governance and institutional quality variables presented in Table 14A.3.3 in Annex 14.3, Armenia performs significantly worse (with the exception of Russia in rule of law, and Israel in voice and

FIGURE 14.6 ARMENIA'S SCORECARD IN THE EIR (MOST RECENT)



Source: KAM 2005 ([www.worldbank.org/kam](http://www.worldbank.org/kam)).

Note: Data for gross capital formation shown in the figure above is the average for the period.

accountability indicators) than all other comparators and the average of the region. In particular, despite a national campaign against corruption, the high incidence of corruption continues to affect business and the attraction of foreign investment. The Heritage Foundation (2004) states in its analysis that "bribery is widespread and is the most common form of corruption, especially in the areas of government procurement, all types of transfers and approvals, and such business-related services as company registration, licensing, and land or space allocation." The Bleyzer Foundation,<sup>11</sup> in a benchmarking analysis of 15 FSU countries on FDI driving conditions, ranks Armenia thirteenth in the corruption level index, while in the overall composite index Armenia is ranked sixth, behind Estonia, Latvia, Lithuania, Kazakhstan, and Russia.

Furthermore, the shadow economy in Armenia, which equals 45 percent of GDP, is significantly larger than that in some of its comparator economies and the average of the region (Table 14.8). This reveals the poor institutional capacity and high incidence of corruption in Armenia, combined with the increasing tax burden and social security payments. The size of the shadow economy in Armenia is a prohibitive factor for fiscal revenue generation which could create a vicious cycle with tax base erosion, resulting in higher taxes, the worsening of fiscal

TABLE 14.7 EXPORTS OF GOODS AND SERVICES, 1995–2002  
(PERCENT OF GDP)

	1995	1996	1997	1998	1999	2000	2001	2002	Trade account Avg. 1995–2002
Armenia	23.9	23.2	20.3	19	20.8	23.4	25.5	29.6	–30
Israel	30.6	29.8	30.7	31.7	36.2	40.4	35.5	37.2	–9
Slovenia	55.2	55.8	57.4	56.6	52.5	56.5	57.9	57.9	–2
Russian Federation	29.3	26.1	24.7	31.2	43.2	44.1	36.3	34.7	10
Ireland	76.4	77.5	79.7	86.1	88	98	98.2	—	13
Chile	30.5	28.7	28.1	26.7	26.9	29.8	34.7	35.9	0
Costa Rica	37.6	39.3	40.7	47.4	51.6	48.5	41.6	42.4	–2
Latvia	47.3	51.3	51.1	51.3	43.9	45.6	44.4	45.5	–9
Low income	19.9	19.6	20.5	26	22.4	26.6	26	25	–1
Low & middle income	23.7	23.3	24	25.3	26.7	29.7	29.2	30.6	1
Middle income	24.4	24	24.7	25.2	27.5	30.3	29.8	31.7	1

Source: SIMA, World Bank (<http://sima/datasite/sima-web/default.htm>).

TABLE 14.8 THE SIZE OF THE SHADOW ECONOMY  
(AS PERCENT OF GDP)

Country	1990–1993	2000–01
Armenia	40.1	45.3
Estonia	34.3	39.1
Ireland	15.4*	15.7**
Russian Federation	27.8	45.1
Slovenia	22.9	26.7
Average Central & Eastern Europe	23.4	29.2
Average FSU	32.9	44.8
Average of 21 OECD countries	15.7*	16.7**

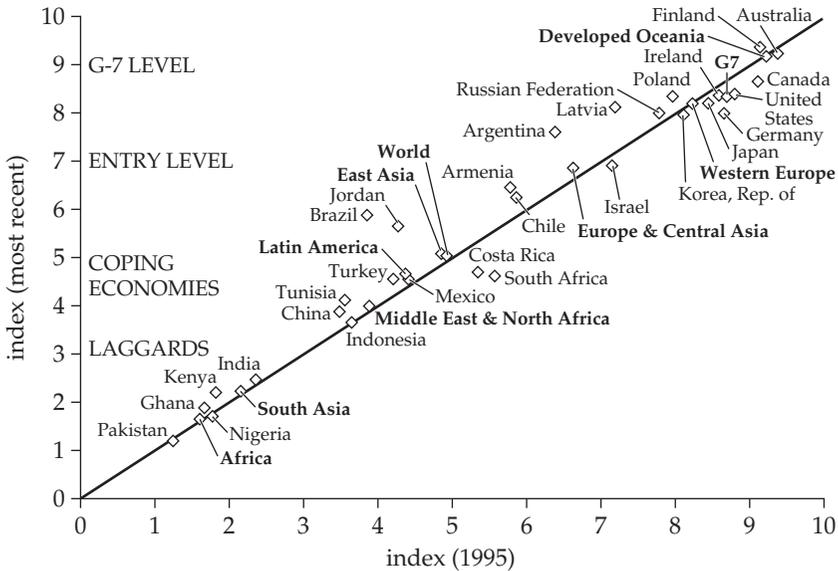
Source: Schneider (2002).

\*1994–95; \*\* 2001–02.

constraints (*Economist* 2003) and ambiguous effects on private sector development and the quality of products and services. Unless urgent and radical reforms transform the effectiveness of the governance and institutional capacity of the country, Armenia will face competitiveness challenges that will be hard to meet.

In education, a pillar in which Armenia has a strong tradition, the country has lost some ground relative to the world, and remains weak

FIGURE 14.7 EDUCATION: ARMENIA AND THE WORLD



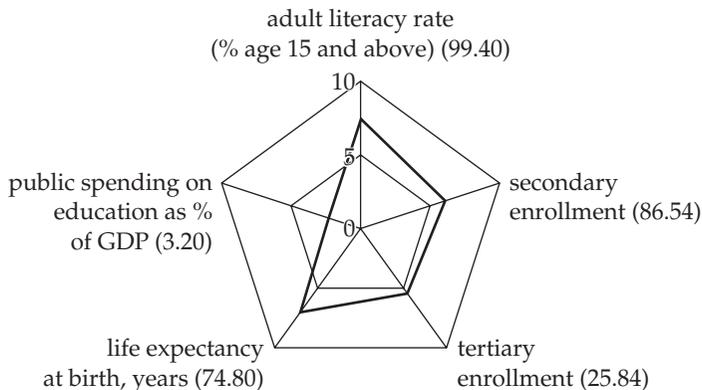
Source: KAM 2005 ([www.worldbank.org/kam](http://www.worldbank.org/kam)).

relative to the regional ECA average (Figure 14.7). With adult literacy rates lower than the vast majority of other countries of the region,<sup>12</sup> enrollments in secondary education fell significantly and remain well below the (ECA) regional average. On the other hand, enrollments in tertiary education improved significantly but still remain at very low levels by regional standards.<sup>13</sup> The vast majority of ECA economies, and all selected comparators (with the exception of Costa Rica), outperform Armenia in the KAM variables used to define aggregate performance in the education pillar (see Table 14A.3.5 in Annex 14.3).

In Figure 14.8 we isolate Armenia and present the available set of variables that are used in the KAM to define performance in the education pillar. It is striking to realize, relative to the large availability and potential of educated human capital in the country, how little Armenia spends on education—less than 3 percent of GDP (2000 data). The significant gap in education spending between the ECA regional average (4.6 percent of GDP) and Armenia is particularly alarming.

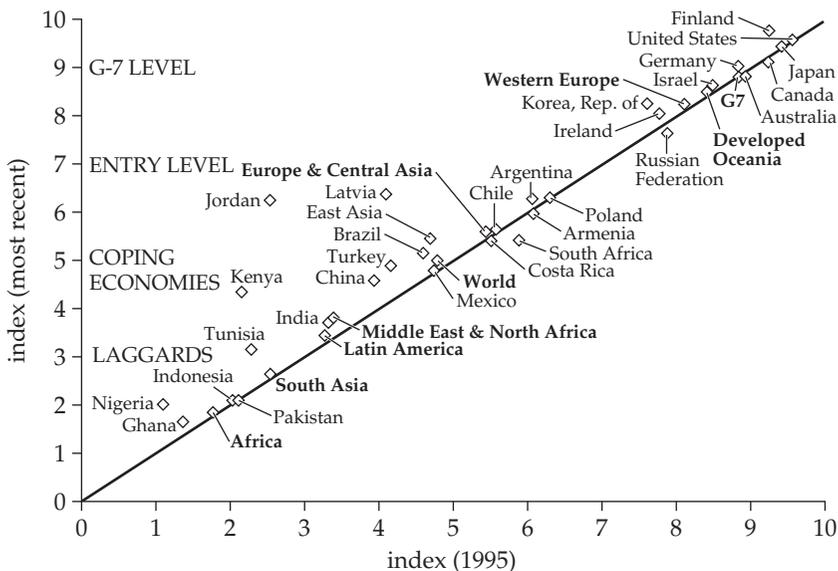
Based on the KAM variables that define the innovation pillar, which in the mid-1990s was the strongest pillar of the country, Armenia has lost significant ground relative to the world, and its performance currently falls below the ECA regional average (Figure 14.9). Considering

FIGURE 14.8 ARMENIA'S SCORECARD ON EDUCATION (MOST RECENT)



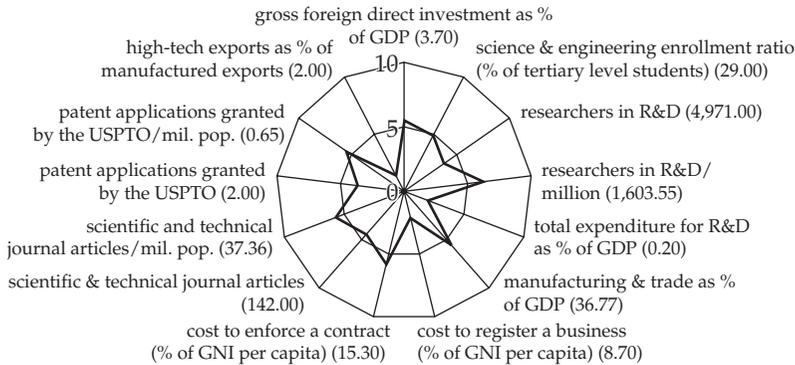
Source: KAM 2005 (www.worldbank.org/kam).

FIGURE 14.9 INNOVATION: ARMENIA AND THE WORLD



Source: KAM 2005 (www.worldbank.org/kam).

FIGURE 14.10 ARMENIA'S SCORECARD ON INNOVATION  
(MOST RECENT)



Source: KAM 2005 ([www.worldbank.org/kam](http://www.worldbank.org/kam)).

the large diaspora, it is evident that Armenia has lost a significant part of its stock of researchers (“brain drain”), while the amount of scientific and technical publications has been falling throughout the years. Patent activity is minimal and has remained fairly stagnant throughout the years. Armenia, even though close behind Costa Rica and Chile, lags behind all selected comparators.

In Figure 14.10, basic KAM indicators using the most recent available data are presented that describe the performance of Armenia in the innovation pillar. One of the weakest indicators for Armenia is spending on R&D (0.2 percent of GDP), when the average for the lower middle income group is close to 0.9 percent (see Table 14.9).

Looking into the financing situation in Armenia, we see that lending rates remain high even in comparison with other transition economies, preventing the banking system from fulfilling its financial intermediation capacity (*Economist* 2003). Between 1998 and February 2003 the annual refinancing rate fell from 39 percent to 10 percent, while the average lending rate fell from 48.5 percent to almost 21 percent. Evidence from the banking sector suggests that one of the reasons that lending rates remain high is the poor quality of financial management between banks and enterprises. A further reason is the underdeveloped and corrupt judiciary, which keeps business risk high. Weighted average deposit rates fell from 25 percent in 1998 to 9.6 percent in 2002. The interest rate spread in Armenia, as shown in Table 14.10, is currently significantly higher than that in all its comparators.

In the information communication technology (ICT) pillar, in the variables that describe the availability and penetration ratios of these

TABLE 14.9 KEY INNOVATION INDICATORS, 1997–2004

	1997	1998	1999	2000	2001	2002	2003	2004
<b>Research and development expenditure (% of GDP)</b>								
Armenia	0.2	0.2	0.2	0.2	0.3	0.3	..	..
Slovenia	1.4	1.5	1.4	1.4	1.6	1.5	1.5	1.6
Russian Federation	1.0	1.0	1.0	1.0	1.2	1.2	1.3	1.2
Israel	3.1	3.3	3.8	4.7	5.0	5.0	4.7	4.5
Ireland	1.3	1.3	1.2	1.1	1.1	1.1	1.2	1.2
Chile	0.5	0.5	0.5	0.5	0.5	0.7	0.6	..
<b>Manufactures exports (% of merchandise exports)</b>								
Armenia	54.5	..	62.6	61.1	..	60.7	67.2	62.1
Slovenia	89.3	89.9	90.2	89.7	89.6	90.1	90.0	90.2
Russian Federation	23.2	28.7	24.7	22.1	21.6	20.3	21.1	20.9
Israel	92.1	92.4	93.2	94.1	94.5	92.9	92.5	94.4
Ireland	80.8	83.6	85.1	86.3	87.7	88.0	86.0	85.7
Chile	15.6	17.3	16.8	16.2	18.0	17.0	16.4	13.4
<b>High-technology exports (% of manufactured exports)</b>								
Armenia	5.4	..	2.1	2.2	..	1.6	1.3	1.1
Slovenia	4.1	4.3	3.9	4.7	5.1	5.2	6.3	5.5
Russian Federation	9.0	11.8	14.9	13.5	14.3	13.3	18.9	9.1
Israel	18.3	19.6	19.1	25.1	24.5	19.7	18.1	18.8
Ireland	46.2	44.1	46.7	47.5	47.3	40.6	34.5	33.8
Chile	3.3	3.7	3.2	3.4	3.2	3.8	3.4	4.8
Middle income	14.8	16.4	18.8	19.4	18.5	18.6	20.2	19.6
Lower middle income	15.1	16.6	18.3	19.3	18.8	19.3	21.9	23.0
<b>Foreign direct investment, net inflows (% of GDP)</b>								
Armenia	3.2	11.7	6.6	5.4	3.3	4.7	4.3	6.1
Slovenia	1.7	1.0	0.5	0.7	2.5	7.3	1.2	2.5
Russian Federation	1.2	1.0	1.7	1.0	0.9	1.0	1.8	2.1
Israel	1.6	1.7	3.0	4.4	3.2	1.7	3.5	1.4
Ireland	3.4	12.7	19.2	26.9	9.3	24.5	14.7	6.1
Chile	6.4	5.8	12.0	6.4	6.1	3.8	6.0	8.0
Middle income	3.1	3.3	3.7	3.1	3.1	2.7	2.4	2.7
Lower middle income	3.1	3.7	3.5	3.0	3.0	2.9	2.7	2.6

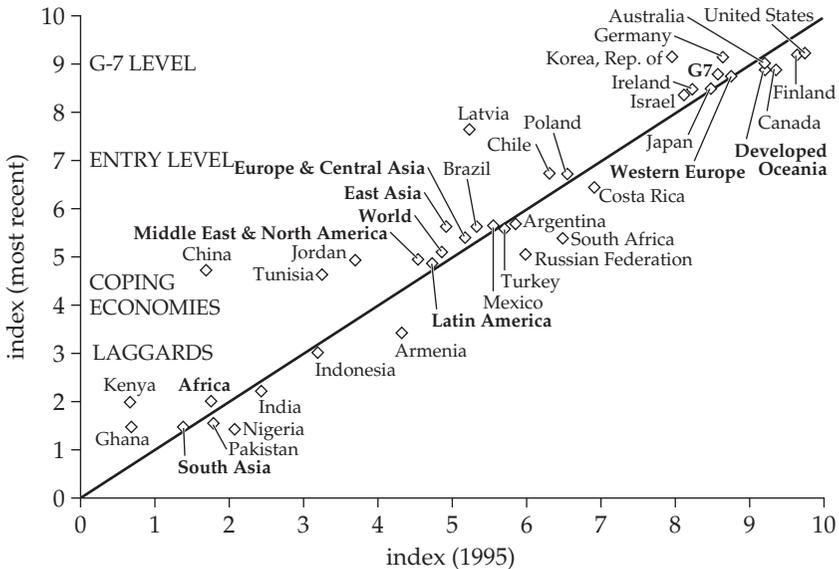
Source: SIMA, World Bank.

TABLE 14.10 INTEREST RATE SPREAD, 1996–2002:  
ARMENIA AND COMPARATORS

	1996	1997	1998	1999	2000	2001	2002
Armenia	34.17	28.15	23.55	11.5	13.49	11.79	11.54
Estonia	8.82	5.57	6.99	6.9	3.67	3.75	3.96
Slovenia	7.51	6.84	5.55	5.14	5.72	5.24	4.93
Russian Federation	91.76	15.27	24.74	26.03	17.92	13.06	10.75
Israel	6.2	5.64	5.19	5.02	4.24	3.86	3.86
Chile	3.89	3.65	5.25	4.06	5.64	5.7	3.96
Ireland	5.56	6.11	5.79	3.24	4.67	4.74	3.73

Source: SIMA, World Bank.

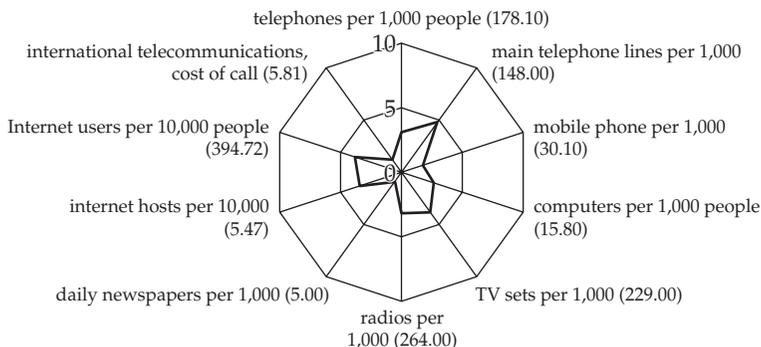
FIGURE 14.11 ICT: ARMENIA AND THE WORLD



Source: KAM 2005 ([www.worldbank.org/kam](http://www.worldbank.org/kam)).

technologies, Armenia scores dramatically below the world and the ECA regional average, indicating the country's weakness in keeping up with regional and global technology penetration and usage trends (see Figure 14.11). ICT is the country's weakest pillar. In absolute terms, however, some improvement in Internet usage and computer penetration ratios was achieved, but the volume of those improvements was much less significant than those occurring globally. In

FIGURE 14.12 ARMENIA'S SCORECARD ON ICT VARIABLES (MOST RECENT)



Source: KAM 2005 ([www.worldbank.org/kam](http://www.worldbank.org/kam)).

Armenia the current levels of Internet users per 10,000 people and computers available per 1,000 people are among the lowest in the region and globally. The availability of telephones and mobile phones per 1,000 people is also very limited, an additional element that indicates the profound weaknesses and state of emergency in the telecommunications infrastructure of the country. The gap in performance between Armenia and its selected comparators is tremendous and is apparently widening.

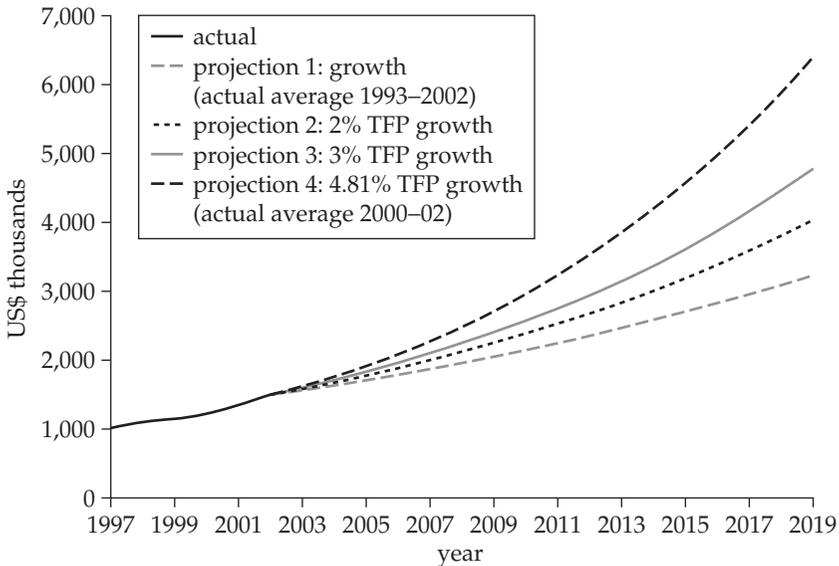
Figure 14.12 shows Armenia's performance relative to the world in ICT variables.

### Armenia's Growth Paradox

Armenia's growth paradox is a high potential of knowledge utilization that shows tantalizing promise (for example, in software and certain enterprises of heavy industry) but remains largely untapped. Box 14.3 gives the gist of how the growth paradox is seen at the micro level. It is manifested also as a shortage of skilled labor coexisting with major difficulties employing the highly skilled people returning, for example, from the United States.

On a macro level, the growth paradox is led by a performance of total factor productivity (TFP). TFP is a proxy for the national capability to adopt, adapt, and create knowledge—a residual in the production function that cannot be explained by factor inputs.<sup>14</sup> To illustrate formally Armenia's growth paradox, we produce projections for real GDP per capita for Armenia for the years 2003 to 2020 using different assumptions for the growth rate of TFP.

FIGURE 14.13 ARMENIA: REAL GDP PER CAPITA:  
ALTERNATIVE PROJECTIONS, 2003–20



Source: Calculated by Derek Chen (WBIKD).

TFP = total factor productivity.

With reference to Figure 14.13, *Projection 1* plots the path Armenia's real GDP per capita would take if the TFP growth rate were to take its 1993–2002 average value (that is, 0.66 percent per year). *Projection 2* plots the path Armenia's real GDP per capita would take if the TFP growth rate were to take 2 percent per year (which was characteristic for such countries as Korea). *Projection 3* plots the path Armenia's real GDP per capita would take if the TFP growth rate were to take 3 percent per year (Finland and Ireland). Lastly, *Projection 4* plots the path that Armenia's real GDP per capita would take if the TFP growth rate were to take 4.81 percent per year, which is the actual value of the 2000–02 average for Armenia.<sup>15</sup>

The last projection, based on Armenia's TFP performance in 2000–02, is exceptionally good but it is clear that such high TFP rates are clearly not sustainable; yet, it is an indication of Armenia's potential. The growth projection based on the 1993–2002 TFP performance is more realistic but it promises a lackluster performance of slow growth. The big question is whether, over the next 10–15 years, Armenia would be able to catch up with role model countries and "realistic comparators"

**BOX 14.3 ARMENIA'S GROWTH PARADOX, ILLUSTRATED  
BY PRIVATE COMPANIES****MSHAK**

Mshak is an Armenian company specializing in the modernization and retrofit of industrial equipment with computer controllers. It has a unique market for equipment automation projects that require the design and implementation of automation pilots, particularly for the machine tool manufacturers of the CIS region. The company was established in 1990 by highly skilled engineers with long-term experience in the design and production of control systems in the Ministry of Aviation Industry of the FSU. Fourteen specialists of Mshak engaged in the design of CNC (computer numerical control) systems. From 1994 Mshak started an exploration of the export markets. To demonstrate the advantages of its CNC systems, Mshak focused on the provision of complex engineering solutions to customers. This enabled the company to gain brand recognition and a good image in the CIS, Middle East (Iran), and Western markets.

Today, Mshak, with its staff of 140 people, of which 90 are design engineers, is listed among the top five suppliers of complex management and engineering management systems for the Russian market. Mshak also offers state-of-the-art design and testing of industrial software as well as integrating unique machine and production-line automation solutions for international clients requiring specialized design and manufacturing of key high-precision components. The international clients of Mshak include companies such as National Semiconductor, Delta Tau Data Systems, and others. Only a few companies in the region are ready to provide solutions based on the advantages of state-of-the-art technological improvements. Mshak is one of those companies. Nowadays, in close partnership with the Russian Staknoimport company, Mshak performs advanced research and implementation of new technologies, and has established a Processing Technologies Development Center. This is a facility focused not only on extensively promoting Mshak's production in Russia, but it also acts as a platform for the development of competitive technologies to be implemented in CIS and other foreign markets. The company is a "first mover" that demonstrates Armenia's promise as a knowledge-based economy. Yet the firm remains relatively small and far below the potential of engineering and design talent of Armenia. It illustrates Armenia's growth paradox on a micro level.

**NAIRIT**

Armenia's giant chemical factory, Nairit, is an example of large company restructuring. The company's ownership has changed several times during recent years.

In Soviet times it had a monopoly and was the only factory in the Soviet Union making these products. It is still one of only five factories around the world producing synthetic rubber and exports in more than 20 countries. As a result of the most recent ownership “battle,” all company shares were acquired by a new and little-known Russian owner, in a sale welcomed by both government and company employees. The latest takeover of Nairit—one of Armenia’s prime assets—follows the acrimonious departure last year of Ransat, the British-based company that tried to turn the factory around but ended up quarreling with the Armenian government after a row over responsibility for the factory’s energy debts. A provisional deal was made with the help of the Armenian Development Agency and exercised by Armenia’s Central Bank, which was in de facto control of the company, to sell Nairit to the Volgaburmash company, based in the Russian city of Samara.

The new owner believes that Nairit is now undergoing a revival. According to the new management, about US\$3.5 million had already been invested in the factory over the past 10 months and Nairit has recently crossed the profit threshold. The company started operating at full capacity, and obviously there are no more problems with production and sales. Almost 2,000 workers were receiving their wages regularly. Moreover, the company management was able to clear salary arrears of about US\$350,000. The company now has a strong foundation, built on secure property rights and an educated labor force. But it has yet to show how these foundations can be transformed into sustained export-led growth. The same challenge applies to Armenia as a whole.

*Source:* World Bank staff.

and demonstrate 2–3 percent of TFP growth that countries as diverse as Korea, Ireland, and Finland show is feasible. One can see a threefold difference in per capita income by 2020 between the inertial scenario and the high potential scenario. Knowledge, quite literally, makes a difference between poverty and wealth. Annex 14.1 provides more details on the theoretical framework for these growth projections.

### **WHICH WAY FORWARD? TOWARD A NATIONAL AGENDA OF KNOWLEDGE-BASED COMPETITIVENESS**

This section discusses the actions required for Armenia’s transition to a knowledge-based economy. The subsection immediately below introduces an overall strategy and discusses how this strategy can be

sequenced. The remaining sections identify key constraints—the fundamental weaknesses of innovation, ICT, and education systems—and discusses how to alleviate them.

### **Overall Strategy and its Sequencing**

To move forward, Armenia needs to implement major reforms. The reform agenda is as challenging as the institutional impediments to reforms. A pragmatic agenda for change often implies focusing on bottom-up entry points (immediate policy agenda), then scaling them up to assure coordination and concerted action (medium-term policy agenda), and then moving to major reforms (long-term policy agenda). The art and craft of policy making is about sequencing various horizons of the policy agenda in a virtuous circle of growth and reforms.

Finland, Ireland, and Korea are the best-known, best-practice exemplars of concerted action; they are countries that have engineered successful transitions to knowledge-based economies. In all these cases, national economic crises compelled diverse actors to define and implement a new agenda through explicit or implicit national agreements on goals and mechanisms to move forward. The crises also prompted policy makers and private sector leaders to lengthen the time horizon of the policies adopted. Thus, Nokia—Finland's first mover toward an innovation-based economy—dramatically increased R&D investments. Finland responded by increasing public R&D and transforming the innovation system to fit business needs. Members of parliament took courses and went on study tours demonstrating the need for the new agenda. National public innovation organizations played a crucial role, by transforming technology into businesses and assuring a critical mass of demonstration cases.

Ireland also exemplifies a successful combination of top-down and bottom-up policies. It invested in education and R&D infrastructure in the 1980s, followed by drastic policy changes beginning in 1987. To complement its top-down policies, Ireland instituted pragmatic bottom-up programs, including regional partnerships to mitigate high unemployment and a program to expand national supplier linkages from FDI. Korea's powerful and shared national vision—and impetus which led to a private sector champion—was followed by effective government coordination (see Box 14.4).

Three lessons are relevant for Armenia. First, simple institutional recipes do not exist for concerted action. Armenia will need to devise its own recipe for a KE. Given its great regional diversity, Armenia's regional and state-level policy initiatives would be a key entry point for a knowledge-based economy. Armenia has already advanced somewhat in that direction.

#### BOX 14.4 KOREA'S TRANSITION TO A KE: BOTTOM-UP INITIATIVE LEADS TO GOVERNMENT ACTION

In 1998, Korea officially launched a national strategy to move to a knowledge-based economy in the wake of a financial crisis. The initial impetus came from the private sector—the *Maeil Business Newspaper*—which concluded in 1996, even before the crisis, that there was an urgent need for a more coherent vision of the future of the Korean economy. This newspaper launched the “Vision Korea Project” as a national campaign in February 1997, and developed the first *Vision Korea Report*.

Eventually, the government—the Ministry of Finance and Economy—became the main champion of the KE policy agenda. The Korean Development Institute was a so-called system integrator and coordinated the work of a dozen think tanks. A joint World Bank and OECD report provided a framework, outlining concrete steps for reforms in the various policy domains.

Progress was monitored closely. This was a crucial step in identifying and addressing any inertia or resistance, as, for example, with education. Korea's knowledge strategy of April 2000 evolved into a three-year action plan for five main areas: information infrastructure, human resources, knowledge-based industry, science and technology, and elimination of the digital divide. To implement the action plan, Korea established five working groups involving 19 ministries and 17 research institutes, with the Ministry of Finance and Economy coordinating the implementation. Every quarter, each ministry submits a self-monitoring report to the Ministry of Finance and Economy, which puts out an integrated report detailing progress. The midterm results and adjustments to the plan are sent to the executive director of the National Economic Advisory Council, which reports on the progress of the implementation and gives an appraisal of the three-year action plan to its advisory members.

*Source:* Author's own elaboration.

Second, the experiences of Korea and Finland teach us that even when major crises call for urgent economic transitions, countries must “prepare the bases.” This essential preparatory stage is seen in the initial *Vision Korea Report* (see Box 14.4). It is seen in Finland's major effort to facilitate and accelerate business R&D.

Third, although major reform efforts from the top are vital, they may not provide the all-important impetus for transformation. Concerted effort must evolve. Bottom-up experiments in Armenia, some of which are already under way, must mature. These transitional stages then proceed to *concerted efforts* (the Korean knowledge strategy is

one example). Drawing on a diversity of best practices, we suggest that Armenia constructs and implements a strategy to move toward knowledge-based competitiveness in three stages:

- Immediate agenda: Begin massive awareness-building and initiate pilot/demonstration projects.
- Medium-term agenda (2005–08): Create a springboard for major reforms by assuring major improvements in the investment climate, strengthening stakeholders for reforms, and proceeding with a private sector-led shared vision process.
- Long-term agenda (2008 onwards): Enact major reforms that would transform and create world-class innovation, education systems, and ICT infrastructure (see Table 14.11).

Table 14.11 outlines a medium-term agenda (establishing a springboard for KE) and a long-term agenda (major reforms, including creating world-class KE infrastructure). We view the years from 1995 to 2003 as a stage of building foundations. Armenia's accession to the WTO in 2003 was an important event signaling that Armenia had a certain macroeconomic and socioeconomic stability and had created the basic institutional foundations for a market economy. We argue that the time has come for a new stage of policy: assuring a critical mass of stakeholders for reforms. That, in turn, would imply a two-pronged strategy:

- Top-down approach: Dramatically reduce the administrative barriers to growth and improve in the investment climate.
- Bottom-up approach: Facilitate private sector-driven centers of excellence in innovation, enterprise upgrading, education, and ICT.

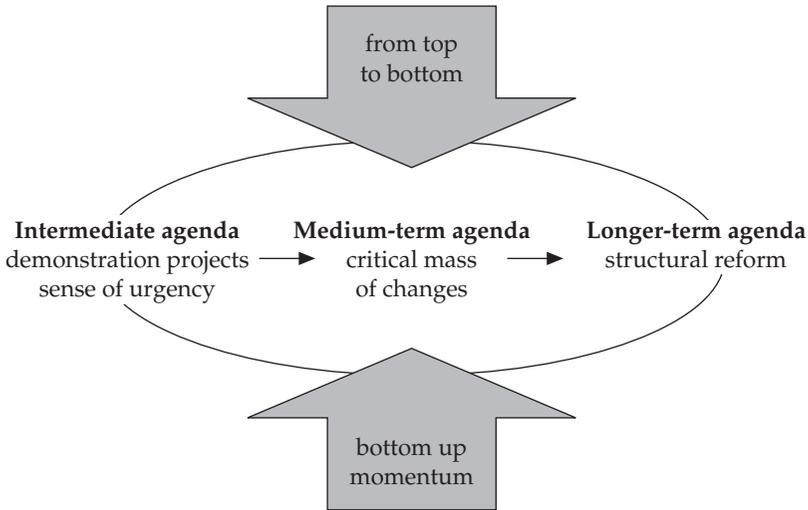
To summarize, the sequencing of the transition to a knowledge-based economy in Armenia can be conceptualized as focusing on bottom-up entry points (the immediate policy agenda), then scaling them up to ensure coordination and concerted action (the medium-term policy agenda), and then moving to major reforms (the long-term policy agenda). The art of policy making is about sequencing the various horizons of a policy agenda in a virtuous circle of growth and reforms. A pragmatic agenda for circumventing the institutional rigidities that Armenia faces would be to (i) create momentum for change by fostering stakeholder awareness, in order to (ii) gain consensus on tackling some of the key obstacles at the national level (to enhance the demand for an institutional change), and then to (iii) move ahead with concrete, manageable, bottom-up approaches that can serve as demonstration projects to move the larger agenda (Figure 14.14).

TABLE 14.11 SEQUENCING OF THE ARMENIA KE POLICY AGENDA

<i>Stages of economic reform and growth</i>	<i>Major constraints</i>	<i>Drivers of growth</i>	<i>Thrust of government policy</i>	<i>Examples of policy initiatives</i>	<i>Benchmarks</i>
Building foundations 1995–2003	Sustainability of macroeconomic stability and market reforms	Remittances and other transfers from abroad  Infrastructure and services	<b>Assuring macro and social stability</b>  Some initiatives to improve innovation climate	Infrastructure projects  Creation of business council	Signaling event: Accession to WTO (2003)  Other indicators: Investment share in GDP, private investment in GDP (reasonably high)  Level of knowledge-based exports (very low)  Business share in innovation (practically nil)
Establishing a springboard for KE, 2005–8	Dearth of role models and stakeholders for reforms (self-made start-up and spin-off entrepreneurs)	Increasing share of merchandise exports; growing role of services	<b>Assuring a critical mass of stakeholders for reforms</b> through a two pronged strategy:  Top-down: dramatic reduction of administrative barriers to growth  Bottom-up: facilitation of private sector-driven “centers of excellence”	Competitive grant schemes to enhance business innovation  Creation of innovation council	Signaling events: A multinational establishes knowledge-intensive operations in Armenia  Elimination of ArmenTel monopoly  Some skilled emigrants come back and become successful entrepreneurs  Rising share of business R&D and merchandise exports
Major reforms: creating world-class KE infrastructure, 2008–15	Human capital constraint: inadequate stock and flow of technical skills  Inadequate ICT infrastructure	Skill-intensive exports Robust internal demand	Major overhaul of education, ICT infrastructure, and innovation systems	Wide-scale introduction of income-contingent scheme to finance private higher education	Significant return migration of highly skilled  Robust knowledge-intensive clusters are established

Source: Elaboration by the author.

FIGURE 14.14 VIRTUOUS CIRCLE OF GROWTH AND REFORMS



Source: World Bank staff.

### Medium-Term Agenda: Alleviation of Critical Constraints

The arguments about the sequencing of reforms discussed in the previous section have been confirmed by experienced policy observers. For example, Dani Rodrik (2004) argues that the key to growth is not getting all or most institutions right at once, but rather overcoming the chief bottleneck to raising growth by, say, 2 percentage points a year, and using the proceeds of this improvement to overcome the next bottleneck—and so on. There is a kind of “bootstrapping reform” strategy that provides useful insight into the “how to” of reforms.

As is evident from the analysis in Section 1, two major immediate constraints from the perspective of knowledge-based competitiveness are the following:

- An extremely weak and fragmented innovation system: lack of linkages between the productive sector, universities, and research institutes.
- The low quality and high prices of ITC infrastructure.

From a longer-term perspective, human capital (particularly technical and managerial skills) is a major constraint.

Table 14.12 summarizes critical constraints from the perspective of the KE and the relevant medium-term policy agenda (to be discussed below) to alleviate constraints.

TABLE 14.12 SPECIFIC POLICY INITIATIVES AS ENTRY POINTS TO ADDRESS SYSTEMIC CONSTRAINTS

<i>System</i>	<i>Main objectives</i>	<i>Specific initiatives</i>	<i>Relevant best practices (discussed in Section 3)</i>
<b>Innovation system</b>	Enhance linkages between productive sector, universities, and science organizations.	Competitive grant scheme to promote business R&D and training.  Seed support to venture capital fund.	U.K. Teaching Company Scheme.
<b>Education system</b>	Reform curriculum of basic, secondary, and higher education.	Technology/design facility on the basis of major university.  Distant education project collaboration with diaspora.  Establish National Innovation Council to bring together education, R&D organizations, and industry.	Competence center models (in design stage in Estonia).
<b>ICT infrastructure</b>	Improve quality of ICT services and reduce its costs.	Institutional strengthening of public utility regulator.	Liberalization policies in ICT infrastructure in some central European countries.

Source: Author's own elaboration.

### **Innovation System: Making Innovation Relevant for Business**

An innovation system consists of a network of organizations, rules, and procedures that affect how a country acquires, creates, disseminates, and uses knowledge. Key organizations for the creation of knowledge include universities, public and private research centers, and policy think tanks. Private firms are at the center of the innovation system. If the private sector has little demand for knowledge, the innovation system cannot be effective. Effective R&D-industry linkages are vital to transform knowledge into wealth. Therefore, networking and interactions among the different organizations, firms, and individuals are critically important. The intensity of these networks, as well as the incentives for acquiring, creating, and sharing knowledge, are influenced by the economic incentive regime in general.

The innovation system framework, as it has been applied to a variety of studies of OECD countries, relies excessively on innovation in the sense of the development of radical or incrementally new knowledge. Traditional measurements for an innovation system include indicators of expenditure on R&D, activity in high-technology sectors (biotechnology, ICT), patenting activity (number, intensity), and researchers per 10,000 population. These indicators proxy the ability to generate new knowledge. However, they are not particularly helpful in understanding how a traditional, low-tech manufacturing firm can learn to upgrade its capabilities to compete in a more knowledge-based economy. Rather, these indicators are very often just the tip of the iceberg (see Figure 14.15), which conceals a layer of firms, mostly SMEs, for which the major issue is the acquisition of basic skills in marketing, design, engineering, and other operational areas rather than technology upgrading and R&D.

Because of this, the traditional innovation system approach might be applicable to a very limited subset of the economy, such as firms in export-oriented sectors. It might also be useful for setting long-term goals and objectives in terms of creating the elements missing in the traditional approach. Table 14.13 flags a range of policy interventions, which should be considered as a menu of options, not all of them immediately relevant for Armenia.

Armenian policy has a narrow view of technological development which is equated with R&D. The underlying model of technology development describes firms only as the demand side, relative to the supply side that is provided in R&D institutes and universities. The policy considers that the key to reducing the technology gap is not in the technology activities of enterprises themselves but through the expansion of intermediary institutions like technology centers and S&T parks. The problem of technology development is reduced to the issue of the commercialization of R&D results.

FIGURE 14.15 THE PYRAMID OF THE LEARNING CAPABILITIES OF FIRMS

**Research and technology development:  
advanced firms**

*Very rarely present, mostly large firms*

**Design and engineering:  
technologically competent firms**

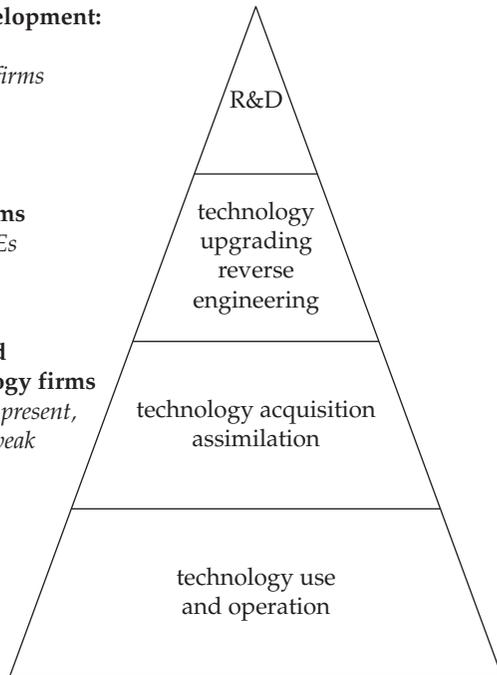
*Capabilities rarely present in SMEs*

**Technician and craft skills and  
capabilities: minimal technology firms**

*In SMEs, strong skills sometimes present,  
though key skills often absent or weak*

**Basic operating skills and  
capabilities: survival-oriented  
enterprises**

*In SMEs, often weak, with  
limited and irregular upgrading*



Source: Adapted from Intarakumnerd et al (2002).

Treating industry as purely **demand side** is quite misleading, because industrial firms not only generate the demand for industrial technology but they account for a very large part of the **supply side** as well. In fact, the generating capabilities of most technologies are located in industry (that is, in firms themselves), not in extramural organizations, whether S&T parks or R&D institutes. Business enterprises fund between 50 and 60 percent of the GERD in North America, the EU, and the Nordic countries and they perform between 60 and 70 percent of GERD. Thus, the issue for Armenia is how to increase R&D **in** the business sector, **not outside of** it. In addition, using only R&D can be misleading, as a large contribution to technology development is made by types of technical change that do not involve formally organized R&D at all.

Innovation surveys from EU and Central European economies show that the key source of important information for innovation comes from enterprises themselves or from partners in value chains (such as suppliers and buyers). Infrastructure institutions are actually marginal

TABLE 14.13 MATCHING POLICIES TO CAPABILITIES: A RANGE OF INSTRUMENTS TO SUPPORT INNOVATION

<i>Type of enterprise</i>	<i>Policy objectives</i>	<i>Instruments and interventions</i>
<b>Survival-oriented enterprises</b>	To build basic competitive capabilities by fostering awareness of scope and benefits of innovation	<ul style="list-style-type: none"> <li>• business advisory and support services—SME and micro-enterprise support agencies</li> <li>• facilitation of access to finance (including micro-finance)</li> <li>• management and skills development</li> </ul>
<b>Minimum technology firms</b>	To foster competitiveness by introducing basic innovation skills and encouraging adoption and application of new ideas	<ul style="list-style-type: none"> <li>• support for business development, diversifying customer base</li> <li>• product diversification and quality improvement</li> <li>• management and skills development</li> <li>• Internet-based information services</li> <li>• technology awareness and marketing</li> <li>• support for technology adoption and adaptation projects</li> <li>• cluster-based approaches to stimulating innovation</li> </ul>
<b>Technologically competent enterprises</b>	To support market development and entry into global value chains by fostering strategic alliances and certain in-house innovation capabilities	<ul style="list-style-type: none"> <li>• business development, exports market support</li> <li>• Internet-based information services</li> <li>• technology transfer support</li> <li>• incubators and technology parks</li> <li>• linkages with academic researchers</li> <li>• laboratory services and metrology services</li> <li>• consultancy and technical assistance support, such as on commercialization, intellectual property rights, licensing, patenting</li> <li>• supplier development and linkage promotion programs</li> </ul>
<b>Advanced enterprises</b>	To facilitate moving up global value chains by upgrading in-house innovation capabilities and strategic alliances  Diffuse experience of innovation leaders as role models for the rest of the economy	<ul style="list-style-type: none"> <li>• support for participation in international R&amp;D networks (such as the EU 6th Framework Program)</li> <li>• technology and other innovation-based spin-offs</li> <li>• university-industry collaboration</li> <li>• support for commercialization</li> <li>• development of vibrant venture capital industry</li> <li>• encourage participation of national innovation leaders in national advisory bodies, technology foresight, and cluster processes</li> </ul>

Source: Elaboration by the author.

as a direct source of information for innovation. The importance of non-R&D technology development suggests that it is inappropriate to narrow down innovation policy to R&D policy and to bridging institutions alone. In fact, infrastructure institutions are much more important as sources of knowledge and skills carried by people who move between universities, R&D institutes, and firms. Information services, training and standard services, as well as problem solving and R&D, are all forms of people-centric types of outputs and are the key function of extramural technology institutes. One of the most important roles played by R&D in public technology institutes is to contribute the flow of people into the technological activities of industry.

In Armenia, as in many Eastern European and CIS countries, there seems to be a dearth of measures that seek to stimulate firms to undertake their own technology development. Policy is much more focused on measures that support institutions in undertaking S&T activities on behalf of industrial firms. Within the innovation policy, there are no policy measures that support and facilitate actions by firms themselves.

In a nutshell, Armenia should avoid an exclusive focus on supporting technology institutions in a supply-driven approach, with support to extramural institutions rather than to firms. The balance between those aspects concerned directly with strengthening the technology development capabilities and activities of firms, and those concerned with building and strengthening various kinds of technology development and transfer institutions, should be corrected. Currently, there is no system that would support firms to move upwards in technological activities, from technology use and maintenance to technology development and creation.

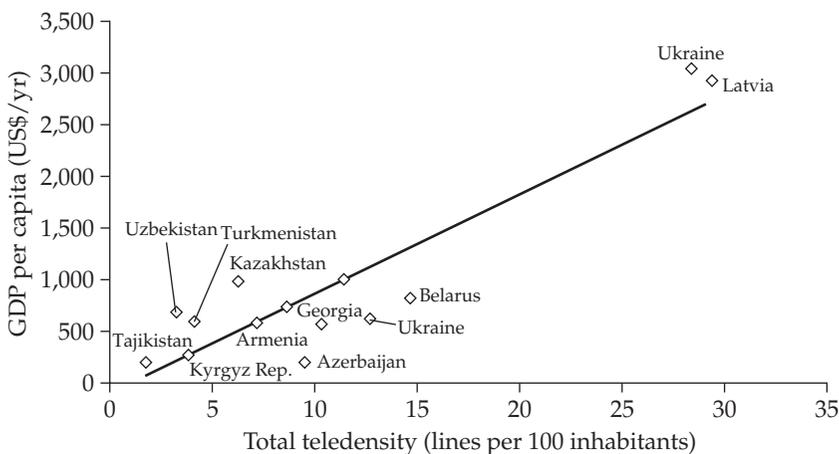
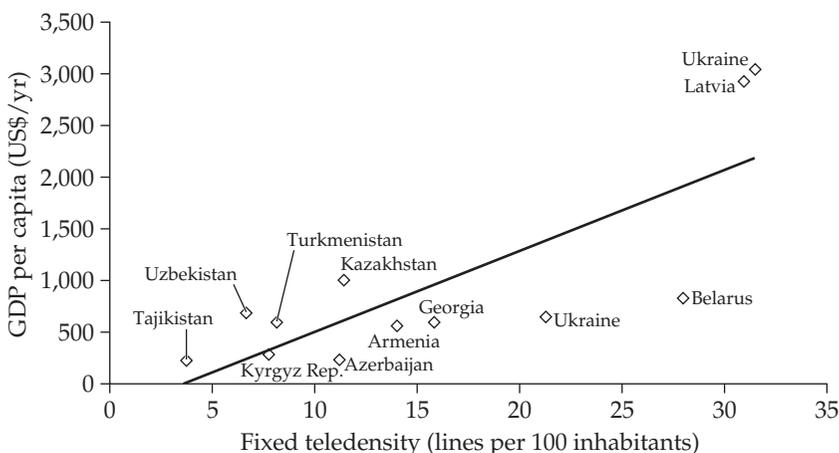
Mechanisms to support technology transfer institutions (S&T parks) are an important component of the policy system. However, a major emphasis in policy development should be on mechanisms that assist and empower firms to make their own investments in technology absorption and development. Within that firm-centered approach to policy, increasing emphasis has to be given to stimulating and facilitating various forms of collective activity involving groups of firms. These groups may be established industry associations or less formally structured groups organized around value chains or clusters of firms in related industries.

Among the instruments of innovation policy in Armenia, grant-based mechanisms are notably absent. These mechanisms commonly provide grants to firms that undertake particular kinds of technological activity (for example, R&D, design, technological or managerial training, engagement of consultants, employment of qualified scientists and engineers, and many others). In most cases the grants cover a defined proportion of the costs of the specific activity.

**ICT Infrastructure: Assuring the Entry of New Service Providers**

Section 1 documents a very low level of development for ICT infrastructure. Figure 14.16 shows that Armenia performs just below the average for the economies of the former USSR, which is hardly satisfactory given Armenia's peculiar geographical position and its aspirations to develop a competitive ICT cluster.<sup>16</sup> This is mainly attributable to one single problem: the ArmenTel monopoly. As this issue is discussed extensively in an earlier chapter, here it is simply noted that

**FIGURE 14.16 COMPARATIVE PERFORMANCE OF ARMENIA'S ICT INFRASTRUCTURE**



Source: Author's own elaboration.

a full liberalization of the market and the institution of an appropriate regulatory framework are essential if the economy is to benefit from the low costs produced through genuine competition.

### **Formation of Human Capital: Enhancing Education-Industry Linkages**

Many problems of the education sector, especially in the school system, are well-understood and are being addressed through existing and planned reforms (many under various World Bank operations). In this section we will focus in more detail on the education-industry linkages.

#### *Major Issues Covered by the Current Dialogue with the Government*

*Chronic underspending.* Armenian public spending on education is 2.8 percent of GDP, well below the OECD average of 5 percent and the rate in other transition economies. Private spending is also low (less than 0.5 percent), as is education as a proportion of public spending (11 percent).

*Inefficiency.* A dramatic fall in the school-age population since independence, together with only modest reductions in staffing levels, has resulted in staffing ratios that are low in international terms and, more important, unsustainable in the Armenian context. For example, there are only about 11 pupils for every full-time equivalent teacher. The Multi-Task Expenditure Framework proposes increasing these overall ratios to 1 teacher for every 16 students. This major rationalization is being supported by the Structural Adjustment Credit (SAC) V and the Education Quality and Relevance (EQ&R) project.

*Lack of relevance.* There has been little reform of the curriculum, the assessment methods, or teacher training since independence. The main challenge is the transition from a teacher-centered to a student-centered learning approach. Reforms supported under the EQ&R project will be a major step toward meeting this challenge.

*Equity.* Enrollment in basic education continues to fall, and is now below 85 percent. The low levels of public spending have resulted in increasing levels of informal payments in “free” basic education. In higher education, expansion has been mainly in private institutions and fee-paying places at public institutions. While this has increased access—though still for only 16 percent of the cohort—public spending overwhelmingly favors the rich, since state scholarships are given mainly to those who score highest on the entrance examination.

*Governance and management.* One of the biggest, and most difficult, challenges Armenia faces is to move away from the top-down system

of management, in which the Ministry of Education passes directives that are then uniformly applied to all institutions, and in which the flow of information is one way and is used to control rather than empower local actors.

*Tertiary education.* A major stakeholder conference was held in November 2002, organized during the preparation of SAC V. The equity concerns have been mentioned.

The lack of quality assurance mechanisms (such as accreditation and inspection) means that students and other stakeholders cannot choose better institutions and courses, and good-quality private institutions are undermined by a small number of fly-by-night operators. Investment is low or nonexistent, resulting in poor quality, an outdated teaching environment, and an almost complete absence of international-level research.

### *Education-Industry Linkages*

Historically, Armenia has had a highly educated population, and educational attainment figures have remained remarkably high since independence despite the low levels of spending. However, the skills and knowledge that individuals have acquired have become increasingly obsolete in the labor market. Much of the education would have been fact-based information learned through rote; and, even if the education were more relevant to the labor market, high levels of unemployed, underemployment, and informal employment would have eroded skills and knowledge. Older adults, though they are more likely to be employed, would also have worked for longer periods in state-owned, static industries.

The story of a private company, Lycos, illustrates the main issues and options to enhance education-industry linkages. Lycos is a fully owned subsidiary of the German-based Lycos Europe. Lycos Armenia is integrated into Lycos Europe's network of competence centers in Gutersloh, Copenhagen, Hamburg, Munich, Paris, and Stockholm for the development of its core services: search, communication, communities, and shopping. Lycos Armenia is in the software development business (Web posting, e-mail, chat room communities, e-commerce) and provides technical support to the Lycos Europe portal. Importantly, the company works closely with two universities in Yerevan and provides grant funding of about US\$500,000 for a two-year bachelor's program on Internet computing designed primarily by Lycos staff. Sixty to 70 percent of the lectures is also given by Lycos staff. Throughout the program internships are also offered in the Lycos offices in Armenia and elsewhere in Europe. The top graduates of the program are usually hired by the company.

The fact that a private company establishes its own training programs, and, more important, does this in collaboration with major Armenian universities is promising. This indication of the effective demand of private sector and private sector initiative is a foundation on which a coherent private-sector-led system of lifelong learning can be built. The following options for expanding and accelerating the existing education-industry linkages could be considered:

- Distance learning as a pilot project (Box 14.5). The advantage of this potential distance learning project is that it would bring together ICT and education dimensions. As Box 14.5 outlines, the Armenian diaspora can become involved in a new and productive way. In addition, as world-wide experience of distance learning indicates, these projects are easily scaled up and expanded when successful.
- Establishment of a Skills Development Fund to encourage enterprise sector training (Box 14.6).
- Creation of a National Innovation Council to bring together three major stakeholders: the productive sector, university and other educational organizations, and R&D organizations. Such an innovation council consisting of 13–19 influential members representing the three major stakeholders would take major decisions on innovation, enterprise upgrading, and education-industry linkages. Companies such as Lycos, representing national best practice, would become members of the Council and would have a platform to share and scale up their initiatives.

### **HOW TO IMPLEMENT THE STRATEGY? FROM VISION TO ACTION**

This section focuses on the implementation of policies and projects outlined in the previous section. Implementation capabilities are a critical constraint not only in Armenia but in many semi-industrialized economies. This is due to the simultaneous weakness of both government and market institutions. Given this weakness, many projects and initiatives that worked well in a well-developed institutional environment show only mediocre results. This section discusses the kinds of incentives, governance, and management that will, given Armenia's difficult institutional environment, best implement the policies and projects of the KE. The section is structured as follows. The subsection immediately below introduces a key notion of pragmatic policies and institutions. The next two sections consider factors in the success of policies and programs and relevant lessons for Armenia. The section that follows considers new mechanisms to

#### BOX 14.5 DISTANCE LEARNING AS A POTENTIAL PILOT PROJECT TO ENHANCE EDUCATION-INDUSTRY LINKAGES

Distance learning could be a low-cost opportunity for Armenia to accelerate the transfer of global knowledge and drastically upgrade the quality of teaching in its universities. For a landlocked, remotely located country, modern technology could provide the following group of primary benefits:

- Access to high caliber professors and lecturers, who would initially demonstrate how the core modern curricula should be delivered to students and therefore greatly contribute to the training and retraining of the trainers (local professors). The availability of various professional talents in the diaspora and the existence of an established professional diaspora network would simplify the future mobilization of potential participants and could further reduce project costs (many diaspora members may be ready to provide such lecturing on a pro bono basis). Recent examples from Turkey and Thailand confirm the feasibility of such an approach.
- Online access to modern experimental facilities and academic libraries.
- Economies of scale, including low-cost dissemination/sharing of popular courses among various local universities and training centers.

As with many other collective diaspora initiatives, the distance learning project, especially in the area of engineering, is likely to lead rather quickly to the second generation of (indirect) benefits. As experience from other countries suggests, professionals participating in advanced educational projects abroad tend to be eager to launch new business ventures with their local partners and frequently with their former students. On the parallel track, the collective efforts of diaspora activists in the area of university education has a potential to evolve gradually toward more business-oriented projects, undertaken basically by the same group of initial diaspora sponsors (for example, those associated with university business incubators).

*Source:* Author's own elaboration.

make the Armenian diaspora an entry point of Armenia's transition to knowledge-based competitiveness. The concluding section outlines specific proposals to enhance the innovation and enterprise upgrading system in Armenia.

## BOX 14.6 TOWARD A NATIONAL SYSTEM OF SUPPORT FOR CONTINUOUS VOCATIONAL TRAINING

The innovation policy should offset as far as possible the “market failures” facing firms’ investments in skills and technological capabilities. Building a knowledge-based economy requires that much greater national effort should be given to investments in the skills of the working-age population. Steps should be taken to move forward as fast as possible with defining and implementing the details of a broad and comprehensive training support system within the framework of a Skill Development Fund. More specifically, the government could introduce a levy-grant system by which firms contribute a levy to a central fund from which they can secure a grant to reimburse costs incurred in undertaking training. The levy thus operates as a disincentive; if the firm does not invest in training it will not reimburse these costs. The levy rate should be defined as a proportion of the wage bill that can be set at  $x$  percent (2 percent, for example) on average. It can vary across the size of firms, with large firms paying more than small. Reimbursement of funds should be administered by the Skill Development Fund.

Firms below a certain size should be exempt. For example, the mandatory training requirements should be specified only for firms with more than 100 employees. Firms below 100 employees would be excluded from this system owing to high administrative costs and the large number of low-value contributions from those firms. Reimbursement available to a firm could be capped at the level of its contribution to the Skill Development Fund. Alternatively, firms that contribute disproportionately to the system could be allowed to secure reimbursement above the level of the levies that they have paid.

Providers of training should come from a wide range of sources. These could include local training organizations and institutions, in-house training, and specialized instruction by overseas providers, including suppliers and parent companies. Eligible forms of training should be specialized and should be for higher-level skills. In addition, groups of firms should collaborate in engaging training providers to run specific training programs for them on a joint basis. This should help to match training provision more closely to firms’ needs while reducing costs per trainee.

Routine training should not be 100 percent eligible for reimbursement, while high reimbursement should be allowed for training that develops high-level skills. For instance, reimbursable training would promote core skills for operating and using industrial technologies, intermediate-level technicians, engineering and managerial capabilities, and high-level R&D and management skills. Training that will not be reimbursed, such as basic operating skills and general management skills, should also be specified.

Eligible firms should be entitled to vouchers to cover the proportion of the costs of training provided by supplier organizations. Where firms by explicit design and agreement could operate as training suppliers for any industry, its suppliers or its customers should be entitled to higher levels of grant payment.

*Source:* Author’s own elaboration.

### Pragmatism: Adopting and Adapting What Works

Following the 1997 *World Development Report* (World Bank 1997), we adopt a two-pronged strategy to address the weakness of the implementation capabilities:

- In the short run, match institutional design to the existing capabilities.
- In the long run, invigorate the institutional capabilities.

Pragmatism—adopting and adapting what works, even though it may result in idiosyncratic institutions—is a hallmark of the proposed strategy. For instance, there have been several attempts to commercialize the intellectual property and human capital of hard sciences. The International Finance Corporation (IFC) has considered a venture capital fund to be funded, at least partially, with diaspora contributions. It was generally viewed that the project was restricted to deal flow.<sup>17</sup> But the problem of insufficient deal flow and lack of private financing for business innovation is a chicken-and-egg situation, which can be resolved by focusing simultaneously on investing in the project pipeline and funding the resulting projects. Organizations that perform all of these functions are quite idiosyncratic in the sense that they are innovation systems under one roof. Yet they work. Box 14.7 discusses one such organization—Fundación Chile—and the relevance of the Fundación Chile model for Armenia.

#### BOX 14.7 THE FUNDACIÓN CHILE MODEL AND ITS RELEVANCE FOR ARMENIA

One of the most successful attempts in the Latin American region was to establish national “antennae” for new technologies via Fundación Chile. The Fundación originally was a joint effort between the Chilean government and the U.S. firm ITT, but now largely autonomous. Fundación Chile uses four main techniques in its technology transfer and dissemination work: (i) it captures and disseminates technologies to multiple users through seminars, specialized magazines, and project assistance; (ii) it develops, adapts, and sells technologies to clients in the productive and public sectors, both in the country and abroad; (iii) it fosters institutional innovations and incorporates new transfer mechanisms; and (iv) it creates innovative enterprises, almost always in association with companies or individuals.

The creation of demonstration companies by Fundación Chile has undergone successes and failures, but overall has proved effective as a

method for disseminating new technologies. The companies are transferred to the private sector once the technologies have been proven in practice and their economic profitability has been established. One of the most successful cases, which exhibits many elements of the successful development of a knowledge cluster, is that of the salmon industry, which in a period of 10 years grew to become a dynamic export sector. By 2004, Fundación Chile had launched 61 such ventures, three-quarters of which have been sold to private investors. The six leading companies have generated more revenues than the total cost of the Fundación during its existence.

The systemic technology focus of Fundación Chile includes biotechnology, management, environment, financial engineering, and information. Recent focus areas include forestry genetics and DNA vaccines for aquaculture. Fundación Chile has also developed the identification of missing links for developing clusters with comparative advantage into a business practice. The clusters include the agribusiness, marine, tourism (agro/eco), forestry, and wood processing sectors.

Fundación Chile is a powerful private organization that performs all the functions of the project cycle, from the identification of market niches to the creation of firms to take advantage of opportunities. It is an innovation system, as it should be, all under one roof. One can think of a possible Foundation Armenia focused on the transformation of Armenia's considerable human capital prowess into innovation projects valued at a marketplace as a reinvention of Fundación Chile in the Armenian context. Below we outline certain key features of Fundación Chile's success, and the availability of these features in Armenia.

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*Factors of Success of the  
Fundación Chile Model*

*Relevance for Armenia*

<ol style="list-style-type: none"> <li>1. An entrepreneurial, highly paid, and highly professional management team (which takes years to establish).</li> <li>2. Arm's length relationship with the government; operates as a business, not as a public sector organization.</li> <li>3. Private shareholders that do not expect an immediate return and tolerate risks (businessmen oligarchs with a strategic agenda).</li> </ol>	<ol style="list-style-type: none"> <li>1. Professional management is critical. Given the shortage of top-notch managerial teams, this would be a challenge, but a challenge that can be met.</li> <li>2. Such independence could be a litmus test for diaspora leaders that could leverage diaspora investments into the Foundation's endowments.</li> <li>3. Risk tolerance and long-term goals could be a litmus test for the new generation of private-sector champions.</li> </ol>
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*Source:* World Bank staff.

Given that most knowledge-based activities are concentrated in the capital city of Yerevan, Armenia is tantamount to a city-state. It can become a laboratory for pragmatic institutions to enhance the transformation of knowledge to wealth. For that to happen, policy makers would need to focus on two issues:

- *First mover problem: building credibility by focusing on a few entry points such as relatively low-cost pilot initiatives.* Change begins with *first movers*; that is, firms and other organizations that capture new opportunities first. In general, they are exceptions. The issue is how to move from exceptions to the mainstream.
- *Collective action problem: achieving critical mass by building constituencies for reform and change.* Modern management concepts such as clusters and value chains shed light on how to use collective action to build constituencies and work for change.

Many pilot solutions can be adopted starting from Armenia's two nascent clusters: the jewelry and diamond cluster and the software cluster (see Box 14.8 on the notion of clusters and value chains).

#### BOX 14.8 CLUSTERS AND VALUE CHAINS

Two analytical constructs drawn from management science have proved useful: clusters and supply chains (also known as value-added chains). The two concepts share the view that economic activity is not coordinated solely by means of signals generated by an impersonal marketplace, but that such activity also involves direct coordination through face-to-face communication.

Clusters are groups of firms, research centers, and universities that cooperate in a specific area of business in order to achieve economies of scale and scope. Innovation clusters are formed to conduct knowledge-intensive activities. A value-added chain is one of vertical linkages. It describes the full range of activities required to bring a product or service from conception and design, through the different phases of production (involving a combination of physical transformation and the input of various producer services), marketing, and delivery to final consumers. A value-added chain is usually defined for particular products (such as automobiles, electronics, garments, or pharmaceuticals), but it typically crosses different industries; and each stage of production is much more closely linked with the upstream and downstream industries in the chain rather than with other producers in the same industry.

*Source:* Author's own elaboration.

The jewelry and diamond sector could be a much more significant driver of growth than it has been so far. The double-digit growth potential of this sector is still faced with several major external, internal, and industry-specific obstacles. Low domestic purchasing power depresses the demand for jewelry, which makes Armenian producers excessively dependent on export. Low costs of labor do not stimulate producers to enhance productivity and diversify, and they face tough competition in downstream jewelry. The lack of a collective brand is compounded by a lack of direct access to consumers and an outdated product mix. The removal of major constraints to productivity growth in this sector would increase its output from the current US\$45 million to US\$150 million in 2010 (McKinsey and Company 2003).

A full liberalization of the jewelry-trading regime, which would include the replacement of customs duties by retail sales taxes and negotiation of favorable access to consuming countries, would give a much-needed boost to the sector. Access to consumer markets abroad would be greatly facilitated if the industry could attract one or two global gem certification agencies and international banks and ensure a long-term diamond supply agreement with Russia. The removal of constraints could then be followed by investments in education and infrastructure, which should ensure the sustainability of industry upgrading and that could be generated through the first—liberalization—step. A design center for the jewelry and diamond cluster could be a pilot initiative to move the cluster up the value chain. It is important, however, that such a design center is a private-public initiative, with some investments made by sector associations and/or by leading companies rather than by the public sector alone.

A nascent software cluster is already in the limelight and looks promising. It demonstrates double-digit rates of export growth in spite of the recent ITC slowdown in the United States. Outsourcing from the business diaspora, mainly from California, is a main factor in the cluster's dynamism. Companies such as Virage Logic and others were first movers and role models. Importantly, joint programs between universities and companies, such as programs established by Lycos, indicate that these companies understand the importance of and promote concerted action. The recently established Enterprise Incubator Foundation is slowly starting to play the role of a catalyst for concerted action by clusters' companies. Building on these positive trends, the main challenge is the deepening of the current outsourcing model from the outsourcing of relatively simple operations to the outsourcing of knowledge processes (such as corporate R&D and other knowledge-intensive operations). All companies in the sector need to strengthen their marketing and managerial capabilities, which are currently quite weak. These challenges were articulated in a number

of studies such as the McKinsey *Armenia 2020* study (McKinsey and Company 2003). The challenge now is effective implementation.

The discussion that follows focuses on the factors in the success of innovation and enterprise upgrading programs and discusses some recent interventions.

### **Factors in the Success of Policies and Programs**

World experience shows that to be effective in promoting knowledge-based linkages and networks, interventions need to be customer-oriented, collective, and cumulative (Triple-C approach):

- *Customer-oriented* efforts must be driven by the needs and demands of the customer. This forces firms to face up to underlying problems of competitiveness. The most successful interventions are those that help firms to learn about their customers and then introduce the changes and innovations needed for them to meet market demands.
- *Collective* refers to outside assistance that is directed at groups of enterprises rather than at individual firms. This means working with business associations, producer groups, and other industry alliances. Where these do not exist, support can be linked to the formation of such groups. Collective assistance has two advantages: it is more cost-effective than assisting enterprises individually, and it helps to develop constructive relationships among firms, which can improve their efficiency and increase the potential for learning from each other.
- *Cumulative* means that one-off improvements are not enough; if firms are to remain competitive, they need to be able to change and develop in response to new market conditions and new opportunities. The objective should be to help generate this capacity within groups of firms, so that, in the longer term, public support is no longer needed.

Other factors in the success and acceleration of linkages and enterprise upgrading include the following:

- *Development of a standard set of metrics* to measure the performance of programs.
- *Performance orientation*. The successful programs are loaded and driven by incentives and induce self-selection among firms, helping those that help themselves, illustrating how they can and should help themselves, and suggesting exit to those that are not capable, because of internal or external factors, of improving themselves.

- *Critical importance of entrepreneurial management.* Successful organizations supporting technology and SMEs are often initiated by social entrepreneurs—individuals with unusual problem-solving and management skills and the motivation for enterprise adjustment. The success of a support agency is predicated on such an entrepreneurial manager at the top of the organization. Successful organizations tend to evolve from the reliance on a key top individual to a robust organization with efficient corporate governance.
- *Cost recovery.* A successful support organization should aim for eventual full cost recovery.
- *Extensive use of follow-up techniques (benchmarking).* Successful programs help, through benchmarking indicators, to diagnose where firms are, what they need to do to improve, and what the alternatives are for those unlikely to survive.
- *Leveraging their effectiveness with the use of ICT.* Develop Internet portals and Internet immersion institutes, improve access to the Internet, provide access to ICT instruments, train firms accordingly, and inform them about the benefits. A number of these initiatives should be developed at the state level and coordinated at the federal level.
- *Participation of clients in the design of the programs.* Clients not only need to pay for the services of the support organization; they also need to participate in the design and evaluation of programs. To ensure that they do, SME programs should never be run by governments (whether federal or subnational) but rather by an autonomous private management contractor working in cooperation with the government but independently of it.
- *Gradualism and assistance linked to performance.* Successful programs link assistance with performance as firms improve themselves. For SMEs, in particular, a touch of realism in assisting SMEs to identify their possibilities and potential is essential, as is assistance with exit for firms that are not viable.

### **Building on Lessons from Enterprise Development and Investment Promotion Programs**

The best-practice principles outlined above were the guiding principles for the design of the Enterprise Incubator Foundation (EIF) to support the nascent ITC cluster and the Armenia Development Agency (ADA) to market Armenia as a prime location for FDI. Yet the outcomes to date have not fulfilled stakeholders' expectations, including Armenian stakeholders, the international business community, and the government. Both initiatives were financed by the World Bank through learning and innovation loans (LILs). The problems of the ADA and

EIF are characteristic of other enterprise and investment promotion programs and organizations. This is why it is paramount to learn their implementation lessons before proceeding to a new program or project. Three factors appear important in explaining this somewhat disappointing performance.

1. *Difficulties in matching local talent with global expertise to form a stellar managerial team.* Given the daunting challenges of carrying out the job, these organizations must have exceptional managerial teams with outstanding technical capabilities. The relevant expertise, however does not exist in-house almost by definition. It would have been advisable to hire management through international recruitment (targeting particularly the diaspora) with a mandate that the expatriate manager would nourish a local managerial team. Of the two projects, ADA is performing better, not only because it is a smaller project but because it is more conservative in its objectives. ADA has an Irish manager (number two in the organization), and through various grant schemes ADA has managed to gain regular access to international consultants, some from the diaspora.
2. *Government rent-seeking and insufficient strategic commitment from the government.* The government should have maintained strategic commitments to the projects by *critically* reviewing performance and resorting to personnel and other organizational challenges if necessary. In contrast, even simple measures such as endowing EIF with adequate real estate in an attractive location turned out to be a major problem. Although there is insufficient strategic commitment, the government desires to control the day-to-day management of the organizations. High salaries sometime raise stakes in rent-seeking rather than leading to the selection of the best and brightest.
3. *Slow learning curve.* Given the organizational challenges, the learning curve is inevitably slow and more so in Armenia's difficult institutional environment. Given the slow learning curve, one should have encouraged low expectations from stakeholders and the organizations should have been focused on "low-hanging fruits"—really simple projects with visible and tangible results. To the extent that EIF follows this strategy of focusing on tangible entry points (in organizing technical and managerial training, for instance), it could gradually build its credibility in the eyes of its private sector clients and other stakeholders.

In general, external funding should be used to support programs, not new organizations. Rodrik (2004) gives a very persuasive explanation of why international organizations should only exceptionally aim

to support the building of new organizations. He argues that there are no noncontext-specific ways of achieving desirable institutional outcomes (that is, institutional outcomes are always context specific). This means that any transfer of ready organizational models from elsewhere will be faced with the problem that there is no unique mapping of functions that organizations should undertake for their own forms (that is, effective institutional outcomes do not map into unique institutional designs). From this it follows that institutional forms will always be different from their designed institutional functions. This hints at serious problems with the transfer of organizational models, which would require not only transfers of organizational functions and organizational forms but also should ensure their matching. However, this strategy would face the constraints of context specificity, which will always block one-to-one mapping of forms and functions.

Instead, we suggest that external assistance be based on funding a variety of programs that should be undertaken by existing organizations. If organizations are to be created then they should be created based on programs (functions) rather than on forms. In fact, forms of programs implementers should be secondary as long as they enable the effective implementation of programs. For example, the establishment of a Skills Development Fund should be secondary to its key function, which is the funding of vocational training programs (see below).

Another example is the establishment of technoparks where form has been given preference over functions. The example of French technopoles shows how the reality may be very far from the model. The S&T parks in the United Kingdom, attached to universities, represent a huge variety of local situations. Analysis of the Taiwanese Hsinchu Park shows how the model can develop as an outcome of a variety of very specific conditions. The lesson learned from these cases is that the form has been given preference over function. This explains why in the real world it is difficult to distinguish any clear national model, as all parks differ with respect to the functions they fulfill. In this respect, *opting for just one organizational form seems to us to be futile. We would suggest that priority be given to the support of the functions of technoparks, rather than the organizational form of the technopark.*

Supporting technology transfer and the emergence of new-technology-based businesses via the formation of new organizations such as technology business incubators (technoparks) is quite risky. Unlike funding projects for existing organizations, building new organizations is a demanding task, fraught with difficulties. New organizations are heavily reliant on entrepreneurs, and on the acceptance of organizations on which they depend. Managers of technoparks have to combine a range of personal traits, and their success is dependent on a variety of external factors outside their control. Very often, the

bulk of the money going into technoparks is invested in buildings, while other tasks—such as generating synergies among parks, bringing in innovative projects, and developing incubation services—are relegated to secondary status or not supported at all. The whole process takes several years, and the failure rate is very high.

The key point is to distinguish between support for technopark/business incubator *activities* (such as cooperation with R&D and higher education institutions, active management of technology transfer, and support for technology-intensive activities) and support for technoparks as *organizations*. Instead of being focused on technoparks as organizations, the government should focus its support, first, on innovation projects, second, on the people who will be involved in the management of innovation projects, and, third, on supporting technoparks as organizations. The ranking of support functions would be as follows:

- activities (innovation projects)
- people (training for technology transfer)
- organizations (technoparks and enterprise incubators)

What we often find is that the reality is exactly the opposite: the primary focus is on organizations, with the focus on activities being relegated to the background. The policy lesson is that the focus should be on supporting functions (that is, linkages and technology-based activities) rather than only on organizational forms (technoparks, incubators, etc.), as very often these forms are empty shells where close proximity gives the illusion of technological synergies, while in reality not much happens.

### The Diaspora Role

It is evident from the previous discussion that stakeholders in Armenia (and in developing economies in general) must have the capacity to acquire new knowledge if they are to compete in the world economy.<sup>18</sup> Learning, in turn, supposes, and contributes to, the ability to search out and recombine usefully scattered information about production methods, markets, and resources. And because development depends on learning and learning on searching, development almost invariably depends on linking the domestic economy to the larger, foreign world—for even the strongest economies quickly rediscover (if they ever forget) that they cannot generate world-class ideas in isolation. Historically, contact with the outside world was often established through skilled immigrants and the ethnic communities they founded in the host country: think of the contribution of the

Huguenots in France; the Jews in Monterrey, Mexico; the Chinese in the Philippines, Indonesia, or Malaysia; or the Indians in East Africa, then Great Britain. During much of the twentieth century, multinational firms have facilitated knowledge transfers by establishing facilities—usually for the manufacture or assembly of mature products—in developing countries, often with the assistance of local elites. Viewed in this long, historical perspective, network diasporas are but the latest bridge institutions connecting the developing economy insiders, with their risk-mitigating knowledge and connections, to the outsiders in command of technical know-how and investment capital.

At least for the developing economies the attraction of diaspora networks as compared to immigrant communities and multinational firms is that diaspora networks help depoliticize relations between the domestic and foreign actors from whom they learn. Thus they can transform a volatile, often irrational struggle for power into a mutually beneficial economic exchange. That learning is often connected to ugly frictions is a commonplace: Economically powerful ethnic minorities are traditionally suspected of having greater loyalty to their own community than to the host country and therefore of being tempted to exploit the latter to the profit of the former. Powerfully autonomous, and often footloose, multinational firms are easily seen as the agents, even the masters, of economic imperialism more than partners in development.

The actors in diaspora networks, in contrast, are native sons and daughters. Even if they are personally wealthy, or connected to wealthy families or important multinationals, they seldom command anything like the resources attributed to economically potent minorities (whose riches, though real enough, are often magnified by envy) or to the world's largest companies. They are therefore, in prospect at least, a connection to the indispensable world of foreign knowledge, but a connection that can be domesticated and then used to discipline the behavior of ethnic communities and multinationals. That the members of network diasporas are likely to be suspected in their host countries of putting personal gain or ethnic ties above managerial professionalism makes them (from the point of view of the sending country) more pliant, and more willing to cooperate on a truly equal footing. Diaspora networks seem to form spontaneously as the result of the shortcomings as well as the successes of the mesh of individual and national strategies for economic advancement; this spontaneity only completes the picture of the diaspora network as the solution to a crucial problem of coordinated learning too long fraught with political passions.

The diasporas of India and China have demonstrated that expatriates can play a very productive role in development. Armenia, however, presents quite a different case. The Armenian diaspora is massive: more than 1 million Armenians live in the United States, and at

least another million in Europe, the Middle East, and Latin America. This diaspora is famously successful both economically and professionally; and it is also well organized politically and socially. Another 1.5 million Russian Armenians, traditionally quite influential in the Kremlin, could be counted on as well. Finally, the territorial conflict in Karabakh has mobilized Armenians worldwide, greatly strengthened ethnic identity, and advanced national consolidation. While Armenia has also had serious economic disadvantages—its landlocked location, the impact of the 1988 earthquake, and loss of markets in the Soviet Union—on balance the country has great potential for development.

“Despite their outspoken support for investments, the Armenian government has been mostly interested in receiving humanitarian aid and long-term unrestricted loans—sources of funding they can control much more easily than direct investments” (Bremmer 2001). The hostility of insiders has thwarted many of the diaspora’s attempts to invest. And compounding the problem, major diaspora organizations have never systematically tried to protect their members from the elite’s abuse. Rather, the diaspora tends to limit its public criticism out of concern for the government’s reputation. Nor has it attempted to evaluate rigorously the results of the massive assistance it has provided in the last decade. For this diaspora, as for others in similar situations, the act of giving seems more important than the actual effect. The diaspora did not use this reliance to secure a more active role in Armenia’s development process. Quite the opposite is the case: the diaspora gave unconditional financial and political support to a regime that has actually been blocking the diaspora’s attempts to expand productive investments. At best, the diaspora’s support relieves pressure on the government and therefore undermines the demand for further reforms, especially for improvements in the business environment.

This situation is starting to change, albeit quite slowly. The diaspora played a key role in articulating the *Armenia 2020* vision (summarized in McKinsey and Company 2003), although again the government did not participate fully in this initiative. To make a diaspora a source of expertise and FDI, we propose proceeding in the following manner:

- *Go after “low-hanging fruit”*: design and implement relatively low-cost private sector projects in higher education, innovation, and ICT. The distance education pilot is one example of such a project (see Box 14.5).
- *Once these pilot projects demonstrate signs of success, scale them into specific organizations*. This would require more substantial commitments from successful and influential businessmen of Armenian origin. Higher education is particularly ripe with these opportunities (see Box 14.9 on relevant best practices from a neighbor country).

### BOX 14.9 PRIVATE UNIVERSITIES IN TURKEY AND THE TURKISH DIASPORA OF THE HIGHLY SKILLED

Turkey's private universities, all of which were established as nonprofit foundations, are a major strength of the country's innovation system. The first such university was established 20 years ago in Ankara, and nonprofit universities now account for 23 of Turkey's 76 universities. The following are two examples of these innovative undertakings:

**Bilgi.** Established by a young entrepreneur and graduate of Cambridge University in England, Bilgi is situated in the poor Kustepe and Dolapdere districts of Istanbul. It supports some 6,000 students, one-third of whom receive tuition scholarships of US\$6,000 per year. Bilgi focuses on the social sciences and business management. It has developed ties with the London School of Economics and notably has instituted a series of innovative programs, including an e-MBA (master's degree in business administration via the Internet); media, ITC law, and design and business courses; and a night program in computer learning for local people.

**Koc.** Created by an industrialist in 1993 and funded by the Koc Foundation, which also supports primary and secondary schools, Koc comprises three colleges for science and the arts, business, and engineering. The main university campus is in Sariyer, 30 kilometers north of Istanbul at the meeting of the Black Sea and the Bosphorus. Faculty members are graduates mainly of U.S. and European schools and include many returning Turkish scientists. The university has 12,000 students, one-third of whom are granted tuition scholarships valued at US\$11,500 per year. The engineering college has won contracts with Nokia and Mitsubishi, among others.

Turkey has a diverse diaspora of many educated professionals that became particularly populous after World War II. As these two examples demonstrate, diaspora members take initiatives to improve higher education at home—either by founding and financing private centers of excellence in higher education or by returning to work at these private centers of excellence.

*Source:* Author's own elaboration.

- *Organize a top-level leadership conference to start transforming diaspora interest to become involved in specific investment projects in Armenia.* Once pilot projects start to show results, we propose to organize a high-level leadership conference in California. This should follow a so-called alumni model (see Box 14.10) with a proven track record of results.

**BOX 14.10 TOWARD A NEW TYPE OF DIASPORA  
INVOLVEMENT IN ARMENIA'S ECONOMY:  
LESSONS OF THE UNIVERSITY ALUMNI MODEL**

One sector of modern society that has been spectacularly successful in cultivating its "diaspora" and mobilizing their skills and resources for accelerating its own development is the university sector. The private university sector in the United States, and particularly among elite universities, has perfected the craft of nurturing its dispersed alumni. A successful alumni program in such universities can return in philanthropic contributions to the university 12 times its expenditure every year. The alumni model has considerable relevance for developing countries and the organizations that support them.

The first important element is that while all alumni are asked for support, the actual support is highly concentrated. It is not unusual for 1 percent of the alumni base (often with 100,000 or more members) to provide 90 percent of contributed resources. The universities are very skilled at identifying this leadership group of alumni and maintaining contacts with them through individually crafted programs.

Universities are very careful, but still efficient, in selecting and cultivating the small number of alumni who form a group of financial and intellectual leaders for the entire alumni community and who can be critically important for the success of alumni mobilization. Universities bring these people together physically as a defined leadership group to build an exclusive community of over-achievers and the most valuable supporters. All of its members must have similar accomplishments and prestige in their own eyes and in that of the larger alumni community, which would make them proud of being affiliated with the group. Intensive personal interaction between the group members leads to major synergies: through group discussions, the members tend to acquire a better understanding of their universities' actual needs, which helps them to produce better development proposals and ultimately makes them more generous in their financial support. Internal competition within the group often generates a tendency toward an increase in the average size of individual contributions.

Formation of the leadership group according to these principles is a difficulty for many diaspora communities. The alumni model suggests that, first, the government in home countries should be proactive in building a more strategically oriented and more exclusive (than most current expatriate associations) diaspora leadership group. Second, some solution must be found to exclude the traditional type of diaspora leaders, without entirely discouraging them, from the leadership meetings. This was a critical element in the formation of the

very successful Indus Entrepreneurs (TIE) organization. Their strictly observed rule was that charter members had to bring status to the group rather than obtain it there. The alumni model, with its simple but strict requirements, provides a highly efficient way to tap into an enormously valuable development resource.

*Source:* Richard Devane, personal communication, May 2003 (business consultant).

The objective of assembling a group of “over-achievers” of Armenian origin is to translate general benevolence into productive action. The alumni model suggests that it is a complex and subtle process, and the essential element is that this group must believe that they are not being hit upon for money. Instead, they are usually asked to participate in the vision-building exercise—the design of a new direction for the country or an important part of it. In the course of discussing the existing problem and its possible solutions they come to share an understanding of real development priorities and personally commit themselves to implementing the recommendations that were set up with their direct participation. It is natural that once they are part of the “design team” they support the agreed recommendations with their resources and influence. Such a participatory process also helps to convince major donors to refrain from pushing their individual vanity projects.

The alumni model—engaging influential diaspora members—has already demonstrated its potential for Armenia. For example, the report on *Vision Armenia 2020* was undertaken by McKinsey and Company (2003) “for free,” just because influential Armenians in the top management of McKinsey decided it was important to do so. The price tag for such a report could have been about US\$2–3 million.

Building on these important starters, one should proceed to more diverse and business-oriented commitments from the Armenian diaspora.

### Proposals of Specific Projects and Policy Initiatives

Equipped with some understanding of how to build successful organizations and programs, we outline below specific proposals for Armenia. Whenever possible, we outline a relevant SWOT (strength, weakness, opportunities, threat) matrix for proposed initiatives.

*Redesign an Incentive Structure to Attract FDI*

Whether countries should rely on tax and other special incentives to attract FDI remains a controversial issue. The fact is that most developed countries rely on them very heavily, while in Armenia these incentives are mostly lacking (see Table 14.14). We would recommend considering some special incentives to attract FDI as a transitional measure. As already noted, the arrival of a brand-name FDI would boost the country’s reputation and put it on the map of other strategic investors. To trigger such a virtuous circle of “success breeds success,” some special incentives might be very helpful. Needless to say, any special incentives should go hand-in-hand with aggressive improvement in the investment climate and would make no sense whatsoever without such improvement.

*Improve Growth Statistics to Better Measure Developments of the KE*

At the moment, the state statistics are not well equipped to measure KE aggregates such as output in the ITC sector, value added in knowledge-intensive industries, export of these industries, business investment in R&D, and so forth.

*Reform and Expand the System of Quality Support to Firms*

Armenia ranks very poorly in terms of quality certification. The ISO database shows that Armenia had only 23 ISO9000 certificates registered in the period 1997–2001. This suggests that Armenian companies have not yet fully mastered production capability (that is, the capability to operate at the best practice level with the given technology). This is one of the key preconditions for expanding exports. The aim of

**SWOT of Proposed Initiative**

Focus on one key area for increased competitiveness in export	There would be no substantial weaknesses if the system is based on “vouchers,” which simplify administering
Potential for Armenia to substantially increase its export	Possibility that poor implementation leads to small number of applicants

**Criteria for assessment:** Percentage of enterprises that have registered ISO certificates at ISO.

this program should be to radically increase the number of Armenian firms that are internationally certified. The program should be heavily advertised and supported by “free phone” lines and implemented through the regional offices of the Chamber of Commerce. Its reorganization should be based on world experiences of best practice and it should involve firms in all sectors. A small feasibility study should be commissioned to design a country-wide quality support program.

*Introduce a System of Support to Productivity Enhancement Activities “20 Keys”*

The competitiveness of the Armenian economy depends crucially on the ability of its firms to increase productivity through quality, efficiency, and new processes and products. This requires the introduction of innovative behavior in companies and among employees. The Practical Program of Revolution in Factories and Other Organizations (PPORF), also known as the 20 Keys, is the program that helps organizations to increase productivity. The Slovenian Ministry of Economy has been implementing this program since 1999. The idea is for Armenia to develop a similar program and use these experiences in its design and implementation.

The aim of the program is to encourage the introduction of permanent improvements in strategy and to maintain competitive advantages in companies (for example, by introduction of permanent improvements by 20 Keys methodology and introduction of international quality standards). Initially, a project would require the systematic training of consultants to use approaches and tools—the training of groups of at least 10 consultants for knowledge transfer into companies. The trained group would ensure further development after the project ends.

Funding would be given for introducing productivity-enhancing systems into companies. Up to 50 interested companies would join the project and would receive cofinancing of consulting and training for a two-year period, after which the companies will be able to sustain quality themselves. The methodology and the license to use it should be spread to other companies that are not direct beneficiaries of the program. Target groups are large companies interested in the implementation of 20 Keys. The measure should be implemented in cooperation with an international consultancy company.

The government budget should cofinance the following activities (for no more than two years):

- consulting and mentoring with systems introduction of up to 50 percent of costs
- training of managers and internal coworkers at home and abroad of up to 75 percent of costs

TABLE 14.14 FDI INCENTIVES IN ARMENIA VERSUS COMPARATOR COUNTRIES

<i>Type of investment incentive</i>	<i>Latvia</i>	<i>Turkey</i>	<i>Poland</i>	<i>Hungary</i>	<i>Czech Rep.</i>	<i>Slovenia</i>	<i>Slovak Rep.</i>	<i>Croatia</i>	<i>Armenia</i>
<b>Tax allowances</b>									
Corporate tax allowance for 10 or 5 years		X	X	X	X		X		X
Tax allowance on the interest of the loan for investors including SMEs	X			X					
Corporate tax allowance or reduced rate for locating in priority region or in an enterprise zone	X	X	X	X		X	X	X	
Corporate tax allowance for investing in selected technology-based activities (R&D, technopark, and so forth)	X	X							
R&D-related tax allowance (R&D costs are deductible from the tax base)				X					
<b>Other exemptions</b>									
Exemption from customs duties and fund levies (for FDI from the list of machinery and equipment)	X	X							
VAT deferral for imported and locally purchased machinery and equipment for FDI (based on list of machinery and equipment)	X	X							
Exemption from certain taxes, duties, and fees for exporters	X	X							
Losses of FDI may be carried forward for 5 years	X					X			
Reduction of taxable base by $x\%$ for investments						X			
Accelerated depreciation of tangibles and intangibles (5% for premises; 50% for computers)	X					X			

TABLE 14.14 (CONTINUED)

Type of investment incentive	Latvia	Turkey	Poland	Hungary	Czech Rep.	Slovenia	Slovak Rep.	Croatia	Armenia
<b>Subsidies: explicit</b>									
The nonrepayable state grants as % of total investment costs				X					
Job creation grants ( <i>x</i> amount per employee or % of costs)	X		X		X		X		
Retraining grants ( <i>x</i> % of training costs per employee)			X		X		X		
Investment subsidies (grants) covering up to <i>x</i> % of investment outlays, often in selected industries/regions			X			X	X		
<b>Tax allowances</b>									
Investment subsidy for technology centers (innovation centers closely related to manufacturing)					X				
Grants for infrastructure development related to FDI to municipalities			X						
Investment credits from the Investment Incentives Fund for selected types of investments like R&D, technoparks, and so forth		X							
<b>Subsidies: implicit</b>									
Purchase of real estate from government estate at reduced prices	X								
Total number	10	7	6	5	5	5	5	1	1

Source: National Investment Promotion Agency

Note: Table does not state threshold levels or requirements for individual incentives.

Conclusions based on the table:

1. There are big differences across countries in the number of investment incentives.
2. Number of investment incentives is not positively related to relative size of FDI (for example, Hungary vs. Turkey).
3. All countries offer tax allowances and other exemptions but not all countries offer subsidies.
4. Central European economies that have attracted large FDI offer large number of subsidies.
5. Armenia ranks at the low end in terms of investment incentives.

**SWOT**

Directly focused on improving productivity in large enterprises	Restricted to small number of firms; administratively and organizationally demanding
Opportunity to significantly change attitude of large and medium firms toward productivity	Danger that demonstration effect may be less than expected

**Criteria for assessment:** Percentage of productivity increases in enterprise participants + number of enterprises that are implementing the 20 Keys system.

- introducing information systems to support systems and monitor results of up to 50 percent of costs
- obtaining a license to use methodology of up to 50 percent of costs.

*Introduce a System of Grants  
for Technological Activities by Enterprises*

A study should be undertaken to examine how to implement a simple and flexible grant-based mechanism to stimulate **firms to undertake technology development activities involving forms of design and engineering work that would not meet the eligibility conditions for the R&D.**<sup>19</sup> This scheme should encourage firms to deepen their technology development activities. It would be available to individual firms for a limited period of time or for a limited number of projects. Thereafter, firms would be expected to “graduate” to meet the eligibility conditions required by R&D funding.

In parallel with this, a flexible grant-based mechanism could be established in order to assist firms to invest in training and related capability-building activities concerned with strengthening their human resources for design, engineering, and R&D. The funding could be given for design/engineering projects with high levels of training/learning content. The study would consider ways of assisting investment in such activities by both individual firms and groups of enterprises with common interests.

This study may explore whether the grant mechanism should be general or specific. If specific, grants could be given for particular types of technology, or particular types of firms, or cooperation among firms, or cooperation with universities, or the adoption of technology, or particular types of training. However, given the absence of such

## SWOT

Direct focus on technological and innovation activity of enterprises	Success is highly dependent on quality of administration of program
Opportunity to stimulate enterprises on systematic technological improvement so that they become R&D active in medium term	A possible misuse of funds for nontechnological activities of enterprises

**Criteria for assessment:** Number of enterprises as users of program in relation to the respective group of enterprises + productivity and technological improvement indicators.

a mechanism, priority should be given to a scheme which is nondiscriminatory in these respects.

Consideration should be given to possible misuse of funds and ways to reduce such occurrences by contracting services to independent organizations.

*Improve the System of Technology Transfer Support  
by Creating a Teaching Company Scheme of Support*

People are the key to technology transfer and partnership between the universities/R&D institutes and business. To strengthen the competitiveness and wealth creation of Armenia by stimulating innovation in industry, we propose the introduction of a Teaching Company Scheme (TCS). This scheme is a program of subsidized employment for graduates who work on R&D projects in economy. Its design should be based on the successful British TCS. Its key objective is not employment per se but technology transfer and the building of a country's technology base.

The TCS should be applicable to PhD students and MA students and should enable them to work in companies on challenging projects central to the developmental needs of participating companies. Projects on which students should work do not have to be R&D projects but could be any technology development project for which an interest in cooperating has been expressed by an R&D institute/university. The categories of knowledge transfer that can be covered under a TCS cover a wide range of skills, from conventional technology transfer to design, process enhancement, quality issues, and management or marketing skills. The main criteria for a project to be considered are that

the proposed knowledge transfer will enable the partner company to make a strategic advance.

The objectives of the TCS are the following:

- to facilitate the transfer of technology and the spread of technical and management skills and encourage industrial investment in training, research, and development
- to provide industry-based training, supervised jointly by personnel in the science, engineering, and technology base and in business, for high-caliber graduates intending to pursue a career in industry
- to enhance the levels of research and training in the science, engineering, and technology base that is relevant to business by stimulating collaborative research and development projects and forging lasting partnerships between the science, engineering, and technology base and business

The TCS can help R&D institutes and universities to:

- extend their services to business customers
- enhance their levels of industrially relevant research
- develop their own staff

A government grant, plus the contribution from the partner company, should fully cover an R&D institute/university's costs of participating in a TCS program. Through a TCS, the research staff in an institute or a university can:

- assist strategic change in businesses by the commercialization of their research results
- stimulate innovation
- supervise and act as mentors for postgraduates working on company-based projects
- enhance their own skills and knowledge
- enhance the industrial relevance of their research

A project is agreed between an institute/university and a company. The agreed project could be for any length of time between one and three years, with the overall aim of helping the company make a change in an area that it has identified as high priority.

Businesses of all sizes in most industries and commercial sectors can take part. Limitations on the types of projects and the sectors that can be supported will be specified in the TCS program.

**SWOT**

This program would alleviate the problem of junior R&D specialists and would establish real links between enterprises and research organizations	There are no significant weaknesses as it is demand driven
Opportunity of high rate of return of funds as PhDs would work on issues that solve problems of enterprises	Possible weak interest of R&D organizations

**Criteria for assessment:** Number of enterprises beneficiaries, percent of junior R&D specialists that have secured employment in industry, and value of joint projects after program ends.

## ANNEX 14.1

# Theoretical Framework for Growth Projections

To calculate total factor productivity, we consider a neoclassical aggregate production function that accounts for the quality of labor. For simplicity, we assume a human-capital augmented version of the Cobb-Douglas production function along with perfect competition and constant returns to scale:

$$Y = AK^\alpha(HL)^{1-\alpha} \quad (14A.1.1)$$

where

- $Y$  is the level of aggregate output
- $K$  is the level of the capital stock
- $H$  is the level of the human capital stock
- $L$  is the size of the labor force
- $A$  is total factor productivity
- $\alpha$  is the share of capital in national income.

Taking logs and time derivatives and rearranging leads to the estimate of growth rate of total factor productivity with human-capital augmentation:

$$\hat{A} = \hat{Y} - \alpha\hat{K} - (1 - \alpha)(\hat{H} + \hat{L}) \quad (14A.1.2)$$

where

$\hat{X}$  represents the growth rate of variable  $X$ .

Following Woessmann (2000), we specify human capital stock to have the Mincer specification with the simplest form being

$$H = e^{rs} \quad (14A.1.3)$$

where

- $r$  is the market returns to education
- $s$  is the average years of schooling.

## DATA SOURCES

Real GDP (in constant 1995 U.S. dollars and labor force figures were taken from the World Development Indicators 2003.

The capital stock was constructed using gross capital formation (in constant 1995 U.S. dollars) obtained from the World Development Indicators 2003. The perpetual inventory method was used with an assumed depreciation rate of 5 percent. To calculate the initial value of the capital stock, we used the average growth rate of gross capital formation for the first five years and applied the formula for the sum of an infinite geometric progressive series.

Estimates for the returns to education for Ireland, Korea, and Mexico were taken from Bils and Klenow (2000). In the case of Finland, there are no available data on the returns to education. As such, we used as a proxy the average of 17 high-income countries for which there were available data provided in Psacharopoulos (1994). As for the average years of schooling, we used the simple average of the estimates obtained from Barro and Lee (2001) and Cohen and Soto (2001). It should be noted that given that data for the average years of schooling were available only on a decade basis, we used interpolation by growth rates to obtain annual estimates of the average years of schooling in order to construct the human capital stock on an annual basis.

The estimates for the labor shares in national income for Korea and Finland were taken from Gollin (2001), while those for Ireland and Mexico were taken from Bernanke and Gürkaynak (2001).<sup>20</sup>

## RESULTS

The table below presents the results of the TFP decomposition. Our annual growth rates of TFP were averaged to produce decade averages.<sup>21</sup>

TABLE 14A.1.1 ANNUAL GROWTH RATES OF TOTAL FACTOR  
PRODUCTIVITY (IN PERCENT)

<i>Years</i>	<i>Ireland</i>	<i>Finland</i>	<i>Korea, Rep of</i>	<i>Mexico</i>
1961–1970	n.a.	2.8691	0.5301	0.2922
1971–1980	2.8346	1.3350	–0.1400	0.4048
1981–1990	2.2632	0.9824	2.8704	–2.5922
1991–2000	4.2404	1.5278	1.8207	–0.1286

n.a. Not available

## ANNEX 14.2

# Knowledge Assessment Methodology (KAM)

The WBI's program on Knowledge for Development (K4D) uses an interactive Web-based tool (<http://www.worldbank.org/kam>). This tool is the knowledge assessment methodology, which consists of a set of 76 structural and qualitative variables that benchmark how an economy compares with its neighbors, competitors, or the countries it wishes to emulate. This simple benchmarking tool is a first step in helping to identify the problems and opportunities that a particular country faces in the four pillars of the KE (see below) and where it may need to focus policy attention or future investments. The comparison for the 76 variables is undertaken for a group of 121 countries that includes almost all of the OECD economies (except Luxembourg) and about 90 developing countries.

The set of 76 variables serves as proxies for the following four pillars that are critical to the development of a KE:

- an *economic and institutional regime* that provides incentives for the efficient use of existing and new knowledge and the flourishing of entrepreneurship
- an *educated and skilled population* that can create, share, and use knowledge well
- a *dynamic information infrastructure* that can facilitate the effective communication, dissemination, and processing of information
- an *efficient innovation system* of firms, research centers, universities, consultants, and other organizations that can tap into the growing stock of global knowledge, assimilate and adapt it to local needs, and create new technology

Included in the KAM also are several variables that track the *overall performance* of the economy. These variables help to illustrate how well an economy is actually using knowledge for its overall economic and social development.

## BASIC SCORECARD

As working with a large set of 76 variables can be unwieldy, a simplified “basic scorecard” consisting of 12 variables that are based on the four pillars of the KE, plus two relating to performance, has been developed. In essence, this scorecard attempts to capture a country’s preparedness for the knowledge-based economy. *This scorecard can be captured for two points in time: for 1995 (or closest available) and for the most recent available year.*

The indicators used in the basic scorecard are as follows:

### i. Performance Indicators

Two variables are used to illustrate the overall performance of a country: *annual GDP growth* and the *human development index (HDI)*. Annual GDP growth is a good indicator of a country’s overall economic development. The HDI is a composite measure of three components: longevity (measured by life expectancy), knowledge (adult literacy rate and mean years of schooling), and standard of living (real GDP per capita in purchasing power parity). The HDI provides information on the human development aspect of economic growth.

### ii. Economic Incentive and Institutional Regime

Three variables are used as proxies for this pillar. The *first, tariff and nontariff barriers* from the Heritage Foundation (<http://www.heritage.org/research/features/index/>), provides a measure of the degree of competition and is a composite of the rating on the average tariff rate, nontariff barriers, and corruption in the Customs Service. The other two variables have been chosen from WBI’s Governance Dataset (<http://www.worldbank.org/wbi/governance/wp-governance.html>). *Regulatory quality* measures the incidence of market-unfriendly policies such as price controls or inadequate bank supervision, as well as perceptions of the burdens imposed by excessive regulation in areas such as foreign trade and business development. *Rule of law* measures the extent to which agents have confidence in and abide by the rules of society. These include perceptions of the incidence of both violent and nonviolent crime, the effectiveness and predictability of the judiciary, and the enforceability of contracts.

### iii. Education and Human Resources

Three variables are used for this pillar: *the adult literacy rate (percentage of population aged 15 and above)* gives a very broad stock measure of the educated population, while *secondary and tertiary enrollment rates* provide a flow rate.

*The adult literacy rate* refers to the percentage of people aged 15 and above who can, with understanding, read and write a short, simple statement on their everyday life. The gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education indicated. *Secondary education* completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development by offering more subject-oriented or skill-oriented instruction using more specialized teachers. *Tertiary education*, whether or not to an advanced research qualification, normally requires, as a minimum condition of admission, the successful completion of education at the secondary level.

### iv. Innovation System

Three variables have been chosen to represent this pillar. As an input into the innovation system, we use *researchers in R&D per million population*. For output, we have *patent applications granted by the USPTO per million population*, and *scientific and technical journal articles per million population*. *Patents granted by the USPTO* include utility patents and other types of U.S. documents, such as design patents, plant patents, re-issues, defensive publications, and statutory inventions and registrations. The origin of the patent is determined by the residence of the first-named inventor. *Scientific and technical journal articles* refer to the number of scientific and engineering articles published in the following fields: physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences.

### v. Information Infrastructure

Three variables are used for this plank of the knowledge-based economy. *Telephones per 1,000 population* is the sum of telephone mainlines and mobile phones and provides a better indicator of connectivity than either in isolation. *Computers per 1,000 population* refers to the number of self-contained computers designed to be used by a single individual and is an indicator of personal computer penetration and the use of relatively new technology for information processing.

*Internet users per 10,000 population* refers to the number of computers with active Internet Protocol (IP) addresses connected to the Internet and is used as an indication of how well a population has advanced to the level of adapting and using advanced communication channels to serve its priorities.

**Note:** While there may be more robust data describing a country's preparedness for a knowledge-based economy, the 14 variables selected and described above are generally available for a larger time series and remain regularly updated for the vast majority of the countries that are assessed by the KAM.

### KNOWLEDGE ECONOMY INDEX (KEI) AND KNOWLEDGE INDEX (KI)

The basic scorecard is used to derive the KEI as well as the KI. The KEI is calculated based on the average of the performance scores of a country or region in all four pillars related to the KE (economic incentive regime, education, innovation, and ICT). The KI is the simple average of the performance of a country or region in three KE pillars (education, innovation, and ICT). The aggregate score for each pillar is derived based on the calculation of the average normalized scores of the three variables that describe a pillar. For both the KEI and the KI, the data are shown for two points in time: 1995 and most recent.

## ANNEX 14.3

## KAM Data Used for Assessing Knowledge Preparedness— Armenia and Selected Comparators

TABLE 14A.3.1 GROSS CAPITAL FORMATION, 1995–2002  
(PERCENT OF GDP)

	1995	1996	1997	1998	1999	2000	2001	2002	<i>Average</i> 1995–2002
Armenia	18	20	19	19	18	19	20	21	19
Israel	26	26	24	23	23	21	20	18	23
Slovenia	23	23	24	26	28	27	24	23	25
Russian Federation	25	24	22	15	15	19	22	21	20
Ireland	18	20	22	24	24	25	24	n.a.	22
Chile	26	27	27	27	21	22	21	23	24
Costa Rica	18	16	18	21	17	17	20	22	19
Latvia	17	19	23	28	27	27	29	27	25
Low income	25	23	23	20	19	20	20	20	21
Low & middle income	26	25	25	23	22	23	23	23	24
Middle income	26	26	25	24	23	24	24	23	24

*Source:* SIMA, World Bank.

n.a. Not applicable.

TABLE 14A.3.2 PERFORMANCE—ECONOMIC REGIME VARIABLES

	<i>GDP (current US\$ bn) 2002*</i>	<i>Average annual GDP growth 1998–2002 (%)</i>	<i>GDP per capita 2002 (Current \$ PPP)</i>	<i>Human Development Index 2001</i>	<i>Composite ICRG Risk Rating Dec. 2002</i>	<i>Unemployment rate % of total labor force 1995–2002</i>	<i>Gross Capital Formation as % of GDP (Average) 1991–2001</i>	<i>General Gov't budget balance as % of GDP 2002</i>	<i>Trade as % of GDP 2002</i>	<i>Tariff &amp; nontariff barriers 2003**</i>
Armenia	2.4	7.80	2,957	0.73	60.30	9.60	18.80	–3.00	75.00	10.00
Latvia	8.4	5.70	8,965	0.81	76.50	13.80	24.70	–1.70	99.60	8.00
Russia	346.5	3.80	7,926	0.78	70.00	10.23	24.20	1.70	53.90	4.00
Slovenia	22	3.90	17,748	0.88	80.30	7.20	22.80	–2.60	120.54	4.00
Israel	103.7	1.80	20,055	0.91	65.30	8.30	23.20	–4.00	83.12	8.00
Ireland	121.4	8.10	32,960	0.93	88.80	7.40	19.70	–0.30	175.90	8.00
Chile	64.2	2.40	9,561	0.83	76.80	7.80	24.40	–0.70	67.30	8.00
Costa Rica	16.8	4.50	8,470	0.83	73.50	5.80	18.50	–5.40	86.42	8.00
Europe and Central Asia	46.06	4.08	7,143	0.78	70.81	9.41	22.93	–3.20	101.00	5.64

\*This variable is not included in the KAM dataset. It is included in the table above for the purposes of this report only, so as the reader can comprehend better the size and dynamics of the economy when compared to other nations. In addition, the particularly small GDP volume of America needs to be taken into consideration when translating variables calculated as share of GDP.

\*\*Variable adjusted for 0–10 normalization scale.

Source: <http://www.worldbank.org/kam>.

TABLE 14A.3.3 GOVERNANCE VARIABLES

	<i>Regulatory Quality 2002</i>	<i>Rule of Law 2002</i>	<i>Government Effectiveness 2002</i>	<i>Voice and Accountability 2002</i>	<i>Political Stability 2002</i>	<i>Control of Corruption 2002</i>	<i>Press Freedom 2003</i>
Armenia	0.13	-0.44	-0.42	-0.42	-0.53	-0.72	65.00
Latvia	0.86	0.46	0.67	0.91	0.82	0.09	18.00
Russia	-0.30	-0.78	-0.40	-0.52	-0.40	-0.90	66.00
Slovenia	0.81	1.09	0.82	1.10	1.21	0.89	19.00
Israel	1.03	0.97	1.02	0.61	-1.35	1.08	27.00
Ireland	1.64	1.72	1.62	1.40	1.31	1.67	16.00
Chile	1.50	1.30	1.19	1.12	1.04	1.55	22.00
Costa Rica	0.74	0.67	0.37	1.16	1.00	0.88	14.00
Europe and Central Asia	0.03	-0.20	-0.16	0.01	0.10	-0.34	46.77

Source: <http://www.worldbank.org/kam>.

TABLE 14A.3.4 INNOVATION SYSTEMS VARIABLES

	<i>FDI as % of GDP 1990–2000</i>	<i>Science &amp; engineering enrollment ratio 1981–1991 (% of tertiary level students)</i>	<i>Researchers in R&amp;D</i>	<i>Researchers in R&amp;D/ millions</i>	<i>Total expenditure for R&amp;D as % of GNP 2000</i>	<i>Manuf. Trade as % of GDP 2001</i>	<i>Scientific and technical journal articles 1999</i>	<i>Scientific and technical journal articles/ mil. pop. 1999</i>	<i>Patent applications granted by the USPTO 2001</i>	<i>Patent applications granted by the USPTO 2001/ mil pop.</i>	<i>High- Technology exports as % of manufactured exports 2001</i>
Armenia	3.10	29.00	4,501	1,604	0.18	30.68	142	31.36	1	0.32	4.00
Latvia	5.40	23.00	2,626	1,094	0.40	49.81	153	64.02	1	0.42	3.00
Russia	1.50	50.00	505,118	3,493	1.00	18.22	15,654	106.99	239	1.65	8.00
Slovenia	1.10	26.00	4,458	2,248	1.48	85.51	599	301.69	21	10.55	5.00
Israel	2.60	49.00	9,161	1,519	3.62	54.58	5,025	823.10	1,031	162.11	25.00
Ireland	11.80	31.00	8,211	2,191	1.21	110.34	1,231	329.69	166	43.23	48.00
Chile	1.20	42.00	6,441	419	0.56	23.10	819	58.53	15	0.91	1.00
Costa Rica	3.10	20.00	1,866	533	0.20	53.15	69	18.50	12	3.10	36.00
Europe and Central Asia	3.42	31.33	41,600	1,535	0.61	58.99	1,549	81.21	21	1.32	6.56

Source: <http://www.worldbank.org/kam>.

TABLE 14A.3.5 EDUCATION VARIABLES

	<i>Adult literacy rate (% age 15 and above) 2001 (2002 ILO)</i>	<i>Secondary Enrollment 2000</i>	<i>Tertiary Enrollment 2000</i>	<i>Primary pupil- teacher ratio, pupils per teacher, 2000</i>	<i>Life expectancy at birth, years, 2002</i>	<i>Public spending on education as % of GDP, 2000</i>
Armenia	98.50	73.28	20.18	18.80	74.80	2.90
Latvia	99.80	90.89	63.11	15.00	70.40	5.90
Russia	99.60	83.33	64.09	17.30	65.80	4.40
Slovenia	99.60	92.19	60.55	14.10	75.90	n.a.
Israel	96.20	93.25	52.67	12.20	78.70	7.30
Ireland	100.00	109.08	47.53	20.30	76.90	4.40
Chile	95.90	75.45	37.52	25.20	75.90	4.20
Costa Rica	95.70	60.19	16.04	24.90	77.60	4.40
Europe and Central Asia	97.52	86.44	38.96	18.18	70.32	4.59

Source: <http://www.worldbank.org/kam>.

n.a. Not applicable.

TABLE 14A.3.6 ICT VARIABLES

	<i>Telephones per 1,000 people 2002 (telephone mainlines + mobile phones)</i>	<i>Main telephone lines per 1,000 people, 2002</i>	<i>Mobile phones per 1,000 people, 2002</i>	<i>Computers per 1,000 people, 2002</i>	<i>TV sets per 1,000 people, 2001</i>	<i>Radios per 1,000 people, 2001</i>	<i>Daily newspapers per 1,000 people, 2000</i>	<i>Internet hosts per 10,000 people, 2002</i>	<i>Internet users per 10,000 people, 2002</i>
Armenia	152	140	12	9	230	225	5	8	184
Latvia	695	301	394	172	840	700	135	152	1,331
Russia	363	242	121	89	538	418	105	28	409
Slovenia	1,242	407	835	301	367	405	169	179	4,008
Israel	1,422	467	955	246	335	526	290	221	3,014
Ireland	1,240	485	755	391	399	695	150	347	2,709
Chile	659	230	428	119	286	759	98	80	2,014
Costa Rica	378	251	128	170	231	816	91	21	934
Europe and Central Asia	504	227	277	87	389	525	120	85	928

Source: <http://www.worldbank.org/kam>.

ANNEX 14.4

# KE Basic Scorecards: Armenia and Selected Comparators

FIGURE 14A.4.1 ARMENIA AND ECA

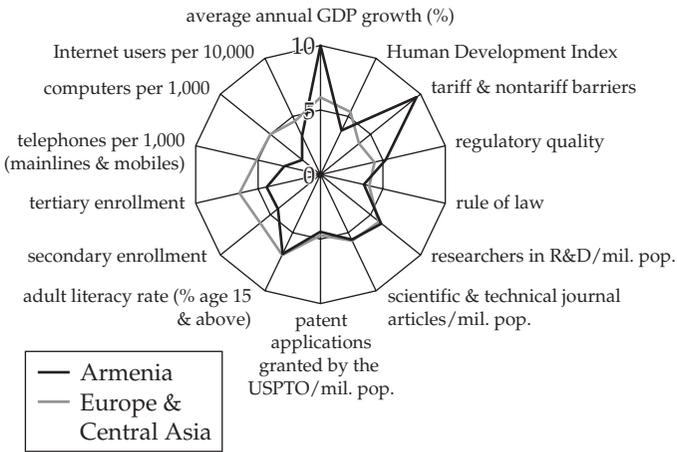


FIGURE 14A.4.2 ARMENIA AND LATVIA

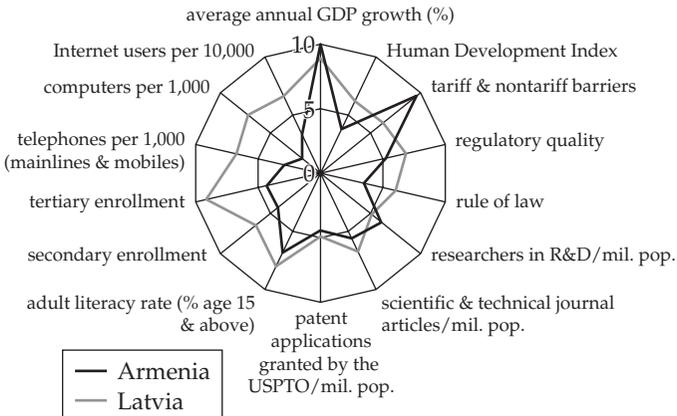


FIGURE 14A.4.3 ARMENIA AND SLOVENIA

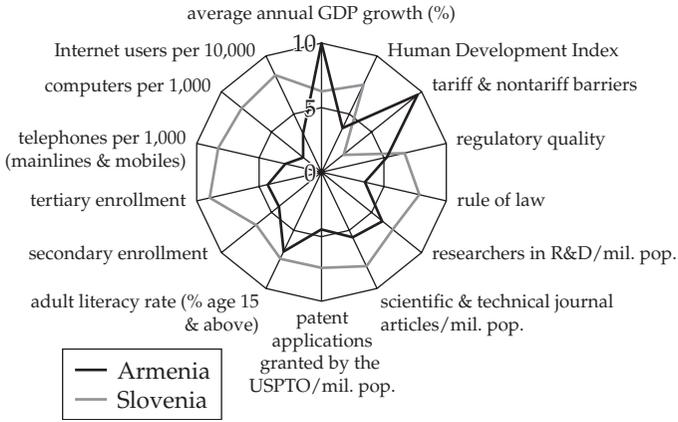


FIGURE 14A.4.4 ARMENIA AND RUSSIA

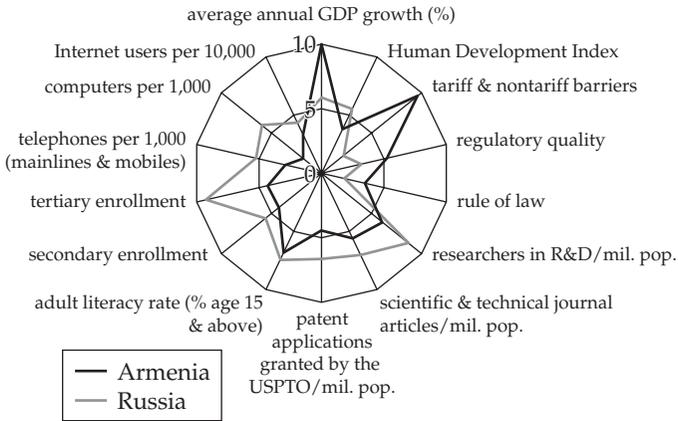


FIGURE 14A.4.5 ARMENIA AND ISRAEL

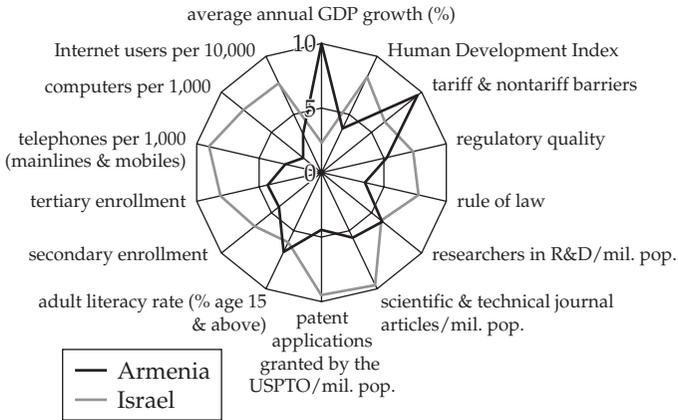


FIGURE 14A.4.6 ARMENIA AND CHILE

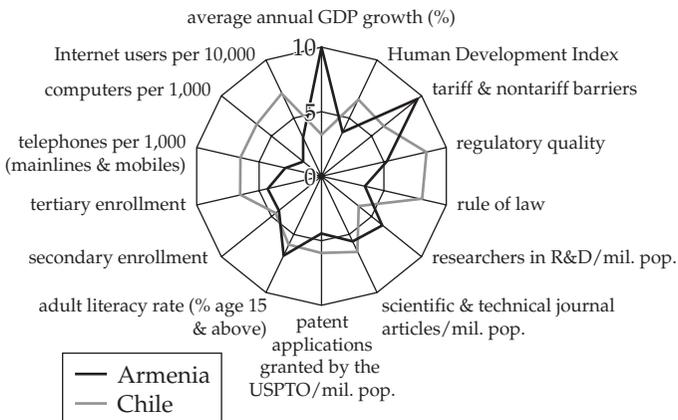


FIGURE 14A.4.7 ARMENIA AND COSTA RICA

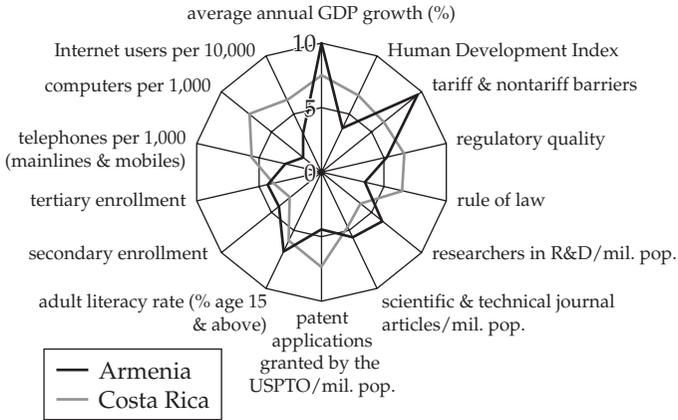
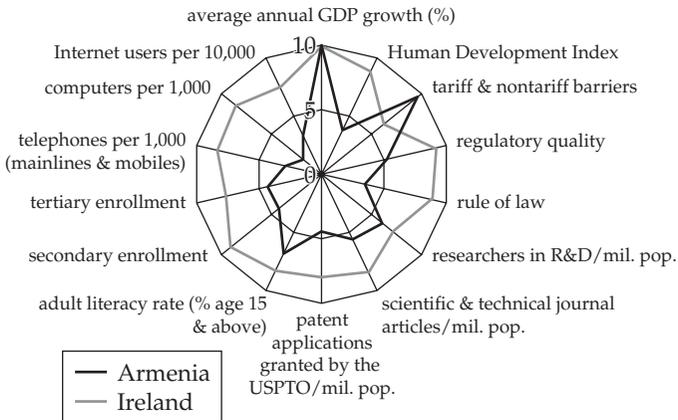


FIGURE 14A.4.8 ARMENIA AND IRELAND



## NOTES

1. This chapter was prepared by Yevgeny Kuznetsov (World Bank) with support from Aimilios Chatzinikolaou (World Bank), who wrote a significant part of Section 1, Slavo Radosevic (University of London), who made substantial inputs to Sections 2 and 3, and Lev Freinkman (who provided many inputs and much guidance in the preparation of the report). Derek Chen (WBIKD) developed growth projections of the report. Faythe Calandra provided administrative assistance.

2. There are other factors as well, such as a long record of macroeconomic stability and high rates of growth.

3. There are signs, however, that traditional sectors have gradually expanded their demand for high-skill labor. For instance, jewelry firms show more interest in getting higher-quality designers, software engineers, and so forth, as well as in upgrading their management capabilities.

4. These indicators need to be used with caution when analyzing the potential of Armenian exporters. Official export data overestimate the actual volume of value added created by Armenian exporters, since a relatively large portion of total export sales does not represent value added by local exporters.

5. <http://www.worldbank.org/wbi/knowledgefordevelopment>

6. The KAM (<http://www.worldbank.org/kam>) includes 76 quantitative and qualitative variables that help to benchmark a country's position on the key elements of the four pillars of the KE framework. The methodology consists of ranking 121 countries and 9 country groupings with respect to each of these variables and giving a score of 10 for the highest values and 0 for the lowest.

7. For more information, see Annex 14.1 and visit <http://www.worldbank.org/kam>.

8. In figures such as Figure 14.1 the reader should note the following. On the horizontal axis the 1995 KEI scores are plotted. On the vertical axis the KEI scores for the most recent year are plotted. The more advanced KE performers plot in the northeast quadrant of the graph, while the weaker ones plot in the southwest quadrant of the graph. Both the position along the 45-degree line and whether a country plots above or below the line are significant. The countries or regions that are plotted below the line indicate a regression in their performance relative to where they were in 1995. The countries or regions that are marked above the line signify an improvement in their position in the latest period compared to their position in 1995. Those countries that are plotted on the line have maintained their relative position over the two periods. Each country's performance as depicted in the figure is relative to the performance of the total country sample included in the KAM (121 countries).

9. Each country's performance as shown in the figure is relative to the performance of the total of 121 countries included in the KAM.

10. This reflects 2003 data from the Heritage Foundation. Nevertheless, the Heritage Foundation states the following in 2004 Index of Economic Freedom: "In 2001, according to the World Bank, Armenia's weighted average tariff rate was 2.5 percent, up from the 1.9 percent reported in the 2003 Index of Economic Freedom by the Heritage Foundation." The U.S. State Department reports that most imports are free of prohibitions, quotas, or licensing, but businesses complain about "cumbersome procedures [and] bribes solicited by customs officials."

11. Bleyzer (2002). In this analysis 15 FSU countries are ranked on the following FDI driving elements: liberalization and deregulation of business activities, stability and predictability of legal environment, corporate and public governance, liberalization of foreign trade and international capital movements, financial sector development, corruption level, political risk, country promotion and image, and targeted investment initiatives.

12. Based on statistical information management and analysis (SIMA) data for the year 2001, the only other countries in the KAM-defined ECA region that demonstrate lower adult literacy rates are Albania, Kazakhstan, the Kyrgyz Republic, Romania, Turkey, and Uzbekistan. <http://sima/datasite/sima-web/default.htm>.

13. Based on SIMA data for year 2000, Armenia is performing better in tertiary enrollment rates than Albania, Tajikistan, and Turkey.

14. Since this is a very imperfect proxy, Figure 14.13 is merely illustrative and serves to outline the qualitative scenarios of Armenia's development.

15. It should be noted that for all four projections, capital and labor were assumed to grow at their 2000–02 average growth rates for Armenia, which are 11.31 percent and 0.75 percent respectively.

16. This section relies on the Public-Private Infrastructure Advisory Facility (PPIAF) presentation "Sector Overview and Review of International Experience, Identification of Bottlenecks and Recommended Roadmap to Develop a Rural Telecommunications Strategy in Armenia" (April 2004).

17. While deal flow was not spectacular it was adequate to start the operations of the fund. Yet the diaspora did not give any money to cofinance the project, mostly for political reasons, thus closing any avenues to invest in future deal flow.

18. This section is based on Kuznetsov and Sabel (2004) and Freinkman (2001).

19. The WTO Agreement on Subsidies and Countervailing Measures defines maximum proportions for nonactionable, though specific, subsidies in the case of industrial research (75 percent) and precompetitive development activities (50 percent).

20. The estimates for labor shares for Ireland, Korea, Finland, and Mexico were 0.750, 0.796, 0.680, and 0.59, respectively. The capital shares were obtained by taking 1 and subtracting the respective labor shares.

21. Note that for Ireland, gross capital formation data were not available prior to 1971. As such, the average annual growth rate of TFP for the period 1971 to 1980 for Ireland in the above table is in fact the average for 1972–1980.

## References

- Abernathy, F.H., J.T. Dunlop, J.H. Hammond, and D. Weil. 1999. *A Stitch in Time. Lean Retailing and the Transformation of Manufacturing—Lessons from the Apparel and Textile Industries*. Oxford and New York: Oxford University Press.
- Adonian, Andre, Avetzik Chalabyan, and Pierre Gurdjian. 2004. "Armenia's Software Advantage." *The McKinsey Quarterly* 1: 12–14.
- Aghion, Philippe, and Peter Howitt. 1998. *Endogenous Growth Theory*. Cambridge, MA: The MIT Press.
- Aidt, Toke S. 2003. "Economic Analysis of Corruption: A Survey." *The Economic Journal* 113 (November).
- Alam, Asad, M. Murthi, R. Yemtsov, E. Murrugarra, N. Dudwick, E. Hamilton, and E. Tiongson. 2005. *Growth, Poverty, and Inequality: Eastern Europe and the Former Soviet Union*. ECAPOV2. Washington, DC: The World Bank
- American and European Union Chambers of Commerce in Armenia. 2003. *Reform of the Armenian Tax System: The Foreign Investors' Perspective*. A joint white paper. Yerevan, Armenia. August.
- Anderson, James H., David S. Bernstein, and Cheryl W. Gray. 2005. *Judicial Systems in Transition Economies: Assessing the Past, Looking to the Future*. Washington, DC: The World Bank.
- Andrew, Doug. 2005. "Armenia: Civil Aviation Policy." Unpublished report. World Bank, Washington, DC. (Chapter 13 of this book).
- Armenia, National Statistical Service (NSS). 2003a. 2002 National Accounts. Various spreadsheets included as figures in Annex. Yerevan, Armenia: NSS.
- . 2003b. *Statistical Handbook. Income, Expenditures and Food Consumption in Armenia, 1999, 2001, and 2002*. Yerevan, Armenia: NSS.
- . 2003c. *The Results of 2001 Census in the Republic of Armenia*. Yerevan, Armenia: NSS.

- . 2003d. "Value Terms of the Poverty Line and the Food Line According to the Results of Household Surveys." In *Social Snapshot and Poverty in the Republic of Armenia*. Yerevan, Armenia: NSS.
- . Various years. *Social Snapshot and Poverty in the Republic of Armenia*. Statistical analytical report. Yerevan, Armenia: NSS.
- Bach, Christian F., and Will Martin. 2001. "Would the Right Tariff Aggregator for Policy Analysis Please Stand Up?" *Journal of Policy Modeling* 23 (6): 621–35.
- Barro, Robert J., and Jong-Wha Lee. 2001. "International Data on Educational Attainment: Updates and Implications." *Oxford Economic Papers* 3:541–563.
- Barro, Robert J., and Xavier Sala-i-Martin. 1995. *Economic Growth*. Boston, MA: McGraw-Hill.
- . 2003. *Economic Growth* (Second Edition). Boston, MA: The MIT Press.
- Barry, Frank. 2003. "Economic Integration and Convergence Processes in the EU Cohesion Countries." *Journal of Common Market Studies* 41(5):897–921.
- Baumol, William, John Panzar, and Robert Willig. 1982. *Contestable Markets and the Theory of Industry Structure*. New York: Harcourt Brace Jovanovich.
- BearingPoint and USAID. Armenia Tax, Fiscal, and Customs reform project. 2002. *Review of Tax Policy and Tax Legislation in the Republic of Armenia*. December.
- Bernanke, Ben S., and Refet S. Gürkaynak. 2001. "Is Growth Exogenous? Taking Mankiw, Romer and Weil Seriously." National Bureau of Economic Research (NBER) Working Paper 8365. NBER, Washington, DC. July.
- Bils, Mark, and Peter J. Klenow. 2000. "Does Schooling Cause Growth?" *American Economic Review* 90(5):1160–1183.
- Bleyzer, Sigma. 2002. *The Bleyzer Initiative: Completing the Economic Transition in FSU Countries*. With the Bleyzer Foundation. Kiev, Ukraine and Houston, TX: Bleyzer Foundation.
- Brattle Group. 2002a. "The Economic Impact of an EU-U.S. Open Aviation Area." Report prepared for the European Commission by James D. Reitzes, Dorothy Robyn, Boaz Moselle, and John Horn. The Brattle Group, London and Washington, DC. December. <http://www.brattle.com>.
- . 2002b. "The Effectiveness of Dutch Air Transport Policy." Report prepared for the Netherlands Directorate General of Civil Aviation by James D. Reitzes, Adam C. Schumacher, and John Horn. The Brattle Group, London and Washington, DC. December. <http://www.brattle.com>.
- Brattle Group. 2004. *Armenian Government Civil Aviation Policy*. Airline Aircraft Project, Consulting and Advisory Services. Unpublished report. Cambridge, MA: Brattle Group.
- Brenmer, Ian. 2001. "The Political Economy of Banal Authoritarianism. The Case of Armenia." Consultant's Report. Washington, DC: The World Bank.
- Broadman, Harry, Jim Anderson, Stijn Claessens, Randi Ryterman, Stefka Slavova, Maria Vaglasindi, and Galina Vincelette. 2004. *Institutional Reform*

- for Investment and Growth in South Eastern Europe*. Washington DC: World Bank.
- Business Environment and Enterprise Performance Survey (BEEPS). 2005. The World Bank and the European Bank for Reconstruction and Development. Available at: <http://siteresources.worldbank.org/INTECAREGTOPANTCOR/Resources/BAAGREV20060208Armenia.pdf>
- Campos, Nauro F., and Yuko Kinoshita. 2003. "Why Does FDI Go Where It Goes? New Evidence from the Transition Economies." Working Paper WP/03/228. International Monetary Fund (IMF), Washington DC. November.
- Center of Ethno-sociological Studies (CES). 2000. "Social Awareness of the Judicial Reforms—Survey Analysis." Yerevan, Armenia.
- Cohen, Daniel, and Marcelo Soto. 2001. "Growth and Human Capital: Good Data, Good Results." Technical Paper No. 179, OECD Development Centre. Paris: OECD. September.
- Crafts, N.F.R., and G. Toniolo. 1996. *Economic Growth in Europe Since 1945*. Cambridge: Cambridge University Press.
- Damijan, Joze P., Mark Knell, Boris Majcen, and Matija Rojec. 2003. "The Role of FDI, R&D Accumulation and Trade in Transferring Technology to Transition Economies: Evidence from Firm Panel Data for Eight Transition Economies." *Economic Systems* 27: 189–204.
- Datt, G., and M. Ravallion. 1992. "Growth and Redistribution Components of Changes in Poverty: A Decomposition with Application to Brazil and India." *Journal of Development Economics* 38:275–295.
- Deaton, Angus S. 2003. "Measuring Poverty in a Growing World (or Measuring Growth in a Poor World)." National Bureau of Economic Research (NBER) Working Paper No. W9822. NBER, Washington, DC. July. <http://ssrn.com/abstract=421783>
- De Soto, Hernando. 1999. *The Other Path. The Invisible Revolution in the Third World*. New York: Harper & Row Publishers.
- Dixit, Avinash. 2005. "Evaluating Recipes for Development Success." Paper presented at World Bank DEC Lectures, April 5. Washington, DC: The World Bank.
- Djankov, S., C. McLiesh, and A. Shliefer 2005. "Private Credit in 129 Countries." NBER Working Paper No. 11078. (January). Washington, DC: NBER.
- Djankov, S., R. La Porta, F. Lopez-de-Silanes, and A. Shleifer. 2000. "The Regulation of Entry." NBER Working Paper 7892. National Bureau of Economic Research, Cambridge, MA. September. (See also the 2002 update published on the World Bank Doing Business Website (<http://www.doingbusiness.org/>)).
- Doove, Samantha, Owen Gabbitas, Duc Nguyen-Hong, and Joe Owen. 2001. "Price Effects of Regulation: Telecommunications, Air Passenger Transport and Electricity Supply." Productivity Commission Staff Research Paper. AusInfo, Canberra. October.

- Easterly, William. 2001. *The Elusive Quest for Growth: Economists' Adventures and Misadventures in the Tropics*. Cambridge, MA: MIT Press.
- Economist*. 2003. Armenia Country Profile 2003. Economist Intelligence Unit.
- . 2004. "The cartel isn't forever." Special report. July 17.
- European Bank for Reconstruction and Development (EBRD). Various years. *Annual Transition Reports*. London: European Bank for Reconstruction and Development.
- . 1999. *Legal Indicators Survey 1999*. London: European Bank for Reconstruction and Development.
- European Commission (EC). 2004. "A Community Aviation Policy towards its Neighbors." Communication from the Commission. COM(2004) 74 final. EC, Brussels. February 9.
- Evans, C.L., and J. Harrigan. 2003. "Distance, Time and Specialization." Working Paper 9729. National Bureau of Economic Research (NBER), Cambridge, MA. May.
- Faye, Michael, J. McArthur, Jeffrey Sachs, and Timothy Snow. 2004. "The Challenges Facing Landlocked Developing Countries." *Journal of Human Development* 5 (1): 31–68.
- Fink, Carsten, Aaditya Mattoo, and Randeep Rathindran. 2002. "An Assessment of Telecommunications Reform in Developing Countries." World Bank Policy Research Working Paper 2909. Washington, DC: The World Bank.
- Fisher, Stanley, Ratna Sahay, and Carlos A. Vegh. 1998. "How far is Eastern Europe from Brussels?" IMF Working Paper WP/98/53. International Monetary Fund (IMF), Washington DC.
- Foreign Investment Advisory Service (FIAS). Various years. Administrative Regulatory Cost Surveys (RCSs). Washington, DC: FIAS.
- . 2003. *Armenia. Removing Administrative Barriers to Investment*. World Bank and International Finance Corporation, Washington, DC.
- . 2004. "Administrative Barriers Update—Fourth Annual Regulatory and Administrative Costs Survey: Armenia." By Development Network NGO for FIAS (March). Update to FIAS, 2003, *Armenia. Removing Administrative Barriers to Investment*. World Bank and International Finance Corporation, Washington, DC.
- Freinkman, Lev. 2001. "The Role of Diasporas in Transition Economies: Lessons from Armenia." Policy Research Working Paper 2909. Washington, DC: The World Bank.
- Gallup, J. L., and J.D. Sachs. 1998. "Geography and Economic Growth." In *Proceedings of the World Bank Annual Conference on Development Economics*, B. Pleskovic and J.E. Stiglitz, eds. Washington, DC: World Bank.
- Garibaldi, Pietro, Nada Mora, Ratna Sahay and Jeromin Zettelmeyer. 2002. "What Moves Capital to Transition Economies?" IMF Working Paper WP/02/64. IMF, Washington DC.
- George, Donald A.R., Les Oxley, and Kenneth I. Carlaw (eds.). 2004. *Surveys in Economic Growth: Theory and Empirics*. Oxford: Blackwell Publishing.

- Gillen, David W., William G. Morrison, and Christopher Stewart. 2003. "Air Travel Demand Elasticities: Concepts, Issues and Measurement." Final report. Canadian Department of Finance. <http://www.fin.gc.ca>.
- Golan, A., G.G. Judge, and D. Miller. 1996. *Maximum Entropy Econometrics: Robust Estimation with Limited Data*. New York: John Wiley & Sons.
- Gollin, Douglas. 2001. "Getting Income Shares Right." Working Paper, Department of Economics. Williams College, Williamstown, MA. January.
- Grigorian, Karen. 2005. "The Role of Exports and FDI in Promoting Competition and Advancing Economic Growth in Armenia." Unpublished manuscript. World Bank, Washington DC.
- Grossman, G.M., and E. Helpman. 1991. *Innovation and Growth in the Global Economy*. Cambridge, MA: The MIT Press.
- Gylfason, Thorvaldur. 1999. *Principles of Economic Growth*. Oxford University Press.
- Hausmann, Ricardo, L Pritchett, and D. Rodrick. 2005. "Growth Accelerations." *Journal of Economic Growth* 10(4):303–329.
- Hausmann, Ricardo, D. Rodrick, and A. Valesco. 2005 "Growth Diagnostics." Unpublished manuscript. Cambridge, MA: Harvard University.
- Heritage Foundation. 2004. 2004 Index of Economic Freedom. Available at: <http://www.heritage.org>.
- Hertel, T.W., ed. 1997. *Global Trade Analysis: Modeling and Applications*. Cambridge, MA: Cambridge University Press.
- Hodge, James. 2002. "Liberalization of Trade in Services in Developing Countries." In B. Hoekman, A. Mattoo, and P. English (eds.). *Development, Trade, and the WTO: A Handbook*. Washington, DC: The World Bank.
- Holden, Paul. 1997. "Collateral without Consequence: Some Causes and Effects of Financial Underdevelopment in Latin America." *The Financier* 4 (1 & 2): 12–21.
- Holden, Paul, and Vahe Sahakyan. 2004. "Issues Related to Promoting a Competitive Business Environment in Armenia." Unpublished manuscript. Washington DC: The Enterprise Research Institute.
- Holden, Paul, and Vassili Prokopenko. 2001. "The Financial Sector and Poverty Reduction in Developing and Transition Economies: Issues and Policy Implications." IMF Working Paper 01/160. International Monetary Fund (IMF), Washington, DC.
- International Civil Aviation Organization (ICAO). 2000. *Economic Contribution of Civil Aviation*. Montreal, Quebec: ICAO.
- International Monetary Fund (IMF). 2004. "Aide-Mémoire of the Tax Policy Mission." Unpublished. IMF, Washington, DC. April 22.
- . 2002. *Statistical Annex for the Republic of Armenia*. IMF country report #02/225. IMF, Washington, DC. October.
- Intarakumnerd, P., P. Chairatana, et al. 2002. "National Innovation System in Less Successful Developing Countries: The Case of Thailand." *Research Policy* 31(8–9):1445–1457.

- Javorcik, Beata Smarzynska, and Mariana Spatareanu. 2004a. "Disentangling FDI Spillover Effects: What Do Firm Perceptions Tell Us?" In *The Impact of Foreign Direct Investment on Development: New Measures, New Outcomes, New Policy Approaches*, ed. M. Blomstrom, E. Graham, and T. Moran. Washington, DC: Institute for International Economics.
- . 2004b. "Is Flexibility More Attractive? The Impact of Labor Market Regulations on Foreign Direct Investment." Unpublished manuscript (January). Washington, DC: The World Bank.
- Jones, Charles I. 1997. *An Introduction to Economic Growth*. New York: Norton.
- Kaminski, Bartlomiej. 2005a. "Ranking Transition Countries in Terms of Real Ease of Doing Business." Unpublished manuscript. Washington, DC: World Bank.
- Kaminski, Bartlomiej. 2005b. "Real and Formal Ease of Doing Business in Armenia in Comparative Perspective: Implications for Regulatory Reforms." Background paper for Armenia's 2005 Country Economic Memorandum. World Bank, Washington, DC. May.
- Kaminski, Bartlomiej, and Francis Ng. 2004. "Romania's Integration into European Markets: Implications for Sustainability of Current Export Boom." Policy Research Working Paper #3451. World Bank, Washington, DC. November.
- Kaufmann, Daniel, Aart Kraay, and Massimo Mastruzzi. 2003. "Governance Matters III: Governance Indicators for 1996–2002." Research Department Working Paper. Washington, DC: The World Bank.
- . 2005. "Governance Matters IV: Governance Indicators for 1996–2004." Research Department Working Paper. Washington, DC: The World Bank.
- Kuznetsov, Y., and C. Sabel. 2004. "Work Globally, Develop Locally: Diaspora Networks as Springboards of Development." Unpublished paper. World Bank, Washington, DC.
- Kessides, Ioannis, and Robert Willig. 1995. "Restructuring Regulation of Rail Industry for the Public Interest." Policy Research Working Paper #1506. World Bank, Washington, DC.
- Klundert, Theo van de. 2001. *Growth Theory in Historical Perspective: Selected Essays of Theo van de Klundert*. Edited by Sjak Smulders. Cheltenham, UK: Edward Elgar.
- Kuddo, Arvo, et al. 2006. "Armenia: Labor Market Dynamics." Unpublished manuscript. Washington, DC: The World Bank.
- Kuznetsov, Yevgeny. 2004. *Armenia: Moving Towards Knowledge-Based Competitiveness*. Washington, DC: The World Bank.
- Kuznetsov, Y., and C. Sabel. 2004. "Work Globally, Develop Locally: Diaspora Networks as Springboards of Development." Unpublished manuscript. Washington, DC: The World Bank.
- Laffont, Jean-Jacques, and Jean Tirole. 2000. *Competition in Telecommunications*. Boston, MA: MIT Press.
- Limao, N., and A.J. Venables. 2001. "Infrastructure, Geographical Disadvantage, Transport Costs and Trade." *World Bank Economic Review* 15 (3): 451–479.

- Light, M.K., and T.F. Rutherford. 2004. "Taxation and Economic Efficiency in Armenia." Technical Report. World Bank, Washington DC. October.
- Light, Miles, Ekaterine Vashakmadze, and Artsvi Khachatryan. 2005. "A Social Accounting Matrix for Armenia." Washington, DC. World Bank.
- Loukoianova, Elena, and Anna Unigovskaia. 2004. "Analysis of Recent Growth in Low-Income CIS Countries." IMF Working Paper. Washington, DC: IMF.
- Lucas, Robert E. Jr. 2002. *Lectures on Economic Growth*. Cambridge and London: Harvard University Press.
- Mathiesen, Lars. 1985. "Computation of Economic Equilibria by a Sequence of Linear Complementarity Problems." *Mathematical Programming Study* 23: 144–62.
- Mattoo, Aaditya. 2000. "Shaping Future GATS Rules for Trade in Services." Paper presented at an NBER Conference on Trade in Service, Seoul. June. NBER.
- McCombie, John, and Tony Thirlwall. 1994. *Economic Growth and the Balance of Payments Constraint*. London: Macmillan.
- McKinsey and Company. 2003. *Armenia 2020: Key Levers of Productivity Improvement and Software and IT Services Potential*. Final Report. Princeton University. McKinsey and Company.
- Micco, A., and T. Serebrisky. 2004. "Infrastructure, Competition Regime and Air Transport Costs." Policy Research Working Paper #3355. World Bank, Washington, DC.
- Michalopoulos, C. and D. Tarr. 1994. "Summary and Overview of Development Since Independence." In C. Michalopoulos and D. Tarr, eds., *Trade in the New Independent States*. Washington, DC: World Bank/UNDP.
- Miller, Marc, Peter Wehrheim, and Peter Wobst. 2003. "A 2001 Social Accounting Matrix for the Kyrgyz Republic." Technical background report. World Bank, Washington, DC. April.
- Mitra, Pradeep, and Nicholas Stern. 2003. "Tax Systems in Transition." Policy Research Working Paper 2947. World Bank, Washington, DC. January.
- Molnar, Eva, and Lauri Ojala. 2003. "Transportation and Trade Facilitation Issues in the CIS-7, Kazakhstan and Turkmenistan." Paper presented at the Lucerne Conference of the CIS-7 Initiative, Lucerne Switzerland. January.
- Productivity Commission. 1999 "International Air Services." Melbourne, Australia. <http://www.pc.gov.au>.
- Psacharopoulos, George. 1994. "Returns to Investment in Education: A Global Update." *World Development* 22(9):1325–1343.
- Public-Private Infrastructure Advisory (PPIAF). 2004. "Sector Overview and Review of International Experience, Identification of Bottlenecks and Recommended Roadmap to Develop a Rural Telecommunications Strategy in Armenia." Presentation, unpublished. PPIAF, Washington, DC.
- Roberts, B.W., and K. Banaian. 2004. "Remittances in Armenia: Size, Impacts, and Measures to Enhance Their Contribution to Development." Special report commissioned by USAID Armenia Country Office (Contract No. #PCE-I-820-98-00012-0). USAID, Washington, DC.

- Robinson, S., A. Cattaneo, and M. El-Said. 1998. "Estimating a Social Accounting Matrix Using Cross Entropy Methods," International Food Policy Research Institute Discussion Paper No. 33, Washington, D.C.
- Robinson S., A. Cattaneo, and M. El-Said. 2001. "Updating and Estimating a Social Accounting Matrix Using Cross Entropy Methods." *Economic Systems Research* 13(1).
- Rodrik, Dani. 2004. "Getting Institutions Right." Unpublished manuscript. Harvard University.
- . 2004. "Rethinking Economic Growth in Developing Countries." The Luca d'Agliano Lecture for 2004 (Turin, October). Washington, DC: The World Bank.
- Rodrik, Dani (ed.) 2003. *In Search of Prosperity: Analytic Narratives on Economic Growth*. Princeton, NJ: Princeton University Press.
- Romer, D. 1996. *Advanced Macroeconomics*. Chapters 1–3. Boston, MA: McGraw-Hill,
- Ros, Jaime. 2000. *Development Theory and the Economics of Growth*. Ann Arbor: University of Michigan Press.
- Round, J. 2003. "Constructing SAMs for Development Policy Analysis: Lessons Learned and Challenges Ahead." *Economic Systems Research* 15(2): 161–184.
- Sadoulet, E., and A. De Janvry. 1995. *Quantitative Development Policy Analysis*. Baltimore, MD: Johns Hopkins University Press.
- Schneider, F. 2002. "The Size and Development of the Shadow Economies of 22 Transition and 21 OECD Countries." Discussion Paper No. 514 (June). University of Linz (Austria) and Institute for the Study of Labor (IZA) (Bonn, Germany).
- Scott, M. Fg. 1989. *A New View of Economic Growth*. Oxford: Clarendon Press.
- Solow, Robert M. 2000. *Growth Theory: An Exposition*. 2nd edition. Oxford: Oxford University Press.
- Spulber, Daniel F. 1989. *Regulation and Markets*. Cambridge, MA: MIT Press.
- Stepanyan, Vahram 2003. "Reforming Tax Systems: Experience of the Baltics, Russia, and Other Countries of the Former Soviet Union." IMF Working paper #WP/03/173. IMF, Washington, DC. September. Contact: vstepanyan
- Tirole, Jean. 1988. *The Theory of Industrial Organization*. Cambridge, MA: MIT Press.
- Tunyan, B. 2005. "The Shadow Part of the Armenian Economy." Unpublished manuscript. Washington, DC: The World Bank.
- United Kingdom, Department of Trade and Industry. Various years. "Business Competitiveness Indicators." <http://217.154.27.195/sd/bci/index.htm>.
- United Nations Development Program (UNDP). 2001. "National Human Development Report, Armenia." Washington, DC: UNDP.
- United States Agency for International Development (USAID). 2004. *Armenia Competitiveness Assessment*. Nathan Associates, JE Austin Associates. Arlington, VA.

- United States Department of Transportation (DOT). 2000. *Transatlantic Deregulation. The Alliance Network Effect*. Second Report, International Aviation Department, U.S. DOT, Washington, D.C. <http://ostpxweb.dot.gov/aviation/>.
- Weil, David N. 2004. *Economic Growth*. Boston: Pearson, Addison-Wesley.
- Wilson, John S., Catherine Mann, and Tsunehiro Otsuki. 2004. "Assessing the Potential Benefit of Trade Facilitation: A Global Perspective." Working Paper 3224. Washington DC: The World Bank.
- Winston, Cliff, and Steve Morrison. 2003. "The Remaining Role for Government Policy in the Deregulated Airline Industry." Brookings Institution, Washington, DC.
- World Bank. 1997. *World Development Report*. Oxford University Press.
- . 2002a. *Armenia. Growth Challenges and Government Policies*. World Bank Country Study. Washington, DC: World Bank.
- . 2004. "Regulatory and Administrative Costs Survey." FIAS Report. World Bank, Washington, DC.
- . 2005a. *Doing Business in 2005: Removing Obstacles to Growth*. Washington, DC: The World Bank and Oxford University Press.
- . 2005b. *From Disintegration to Integration: Eastern Europe and the former Soviet Union in International Trade*. Washington, DC: World Bank.
- . 2005c. Financial Sector Assessment Program Update, IMF and World Bank, unpublished.
- . 2006. Social Snapshot and Poverty in Armenia (National Statistics Institute of Armenia and World Bank).
- World Trade Organization (WTO). 2002. Report of the Working Party on the Accession of the Republic of Armenia, Part 2—Schedule of Specific Commitments in Services. List of Article II MFN Exemptions. WT/ACC/ARM/23/ Add.2. December 6, 2002. Geneva.



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ISBN 0-8213-6811-7