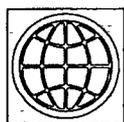


Report No. 25848-IRN

Iran
Medium Term Framework for Transition
Converting Oil Wealth to Development
A Country Economic Memorandum

April 30, 2003

Social and Economic Development Group
Middle East and North Africa Region



Document of the World Bank

ABBREVIATIONS

BMJII	Bimeh Markzai
CES	Constant Elasticity of Substitution
CGE	Computable General Equilibrium
CPI	Consumer Price Index
CPPO	Consumer and Producer Protection Organization
EDBI	Export Development Bank of Iran
FDI	Foreign Direct Investment
FSAP	Financial Sector Assessment Program
FTZs	Free Trade Zones
FYDP	Five-Year Development Plan
GDP	Gross Domestic Product
HES	Household Expenditure Survey
IAS	International Accounting Standard
ICOR	Incremental Capital Output Ratio
IDF	Institutional Development Fund
IO	Input Output
MENA	Middle East and North Africa
MIGA	Multilateral Investment Guarantee Agency
NGO	Non Governmental Organization
NIOC	National Iranian Oil Company
NTBs	Non-Tariff Barriers
OIETAI	Organization for Investment, Economic and Technical Assistance of Iran
OPEC	Organization of Petroleum Exporting Countries
SSN	Social Safety Net
OSIF	Oil Stabilization and Investment Fund
PDV	Present Discounted Value
PSD	Private Sector Development
RLs	Rials
SOE	State Owned Enterprises
TSE	Tehran Stock Exchange
US	United States
VAT	Value Added Taxation
WTO	World Trade Organization

Vice President:	Jean-Louis Sarbib
Country Director:	Joseph Saba
Chief Economist and Sector Director :	Mustapha K. Nabli
Team Leader:	Habib Fetini

Iran
Medium Term Framework for Transition
Converting Oil Wealth to Development

Table of Contents

Executive Summary	i
Part 1: The Challenges.....	1
Chapter 1: Growth and Social Achievements Since the Revolution.....	2
Chapter 2: The Challenges.....	13
Part 2: Meeting the Challenges: Resource Mobilization Through Optimal Use of Energy Wealth.....	25
Chapter 3: Real Balances of the Consolidated Energy Sector.....	26
Chapter 4: Towards a New Fiscal Framework	32
Chapter 5: Fiscal Adjustment: The Domestic Energy Price Reform	60
Chapter 6: Phasing the Energy Price Reform.....	73
Chapter 7: Setting Up An Oil Savings-Investment Fund	85
Part 3: Meeting the Challenges: Pricing Reforms.....	91
Chapter 8: Trade and Foreign Exchange Reform	92
Chapter 9: Reforming Other Subsidies	110
Chapter 10: Quantifying the Benefits of Reforms and Sequencing Them:	121
Chapter 11: Financial Sector Liberalization	136
Chapter 12: Private Sector Development.....	149

Index Of Tables

Table 1.1:	Key Economic Indicators for 1991-2002.....	9
Table 1.2:	Selected Social Indicators.....	10
Table 1.3:	Iran And Its Comparators.....	10
Table 1.4:	Subsidies for Selected Items 1996 (Shares of Income Deciles in Benefits).....	12
Table 2.1:	Total And Working Age Population, 1966-2010.....	14
Table 2.2:	Growth, Labor Participation, Productivity Growth, and unemployment (Simulation Results)	20
Table 2.3:	Women’s Share of Employment In Private and Public Sectors	21
Table 2.4:	Men’s and Women’s Shares Of Service Employment in Subsectors, 1996.....	23
Table 3.1:	Iran’s Proven Oil and Gas Reserves	26
Table 3.2:	Iran: Real Balances Of The Consolidated Energy Sector (In Million Barrels Of Oil Equivalent, Unless Otherwise Specified)	29
Table 4.1:	Adjusted And Unadjusted Central Government Budget.....	34
Table 4.2:	Adjusted and Unadjusted Central Government Budget (Averages over 1991-2000, In Percent of GDP)	38
Table 4.3:	Example Of The Rule On The Optimal Use Of Revenues From The Oil Wealth (In Billions of US Dollars, Unless Otherwise Specified).....	43
Table 4.3a:	Estimated Present Discounted Value of Iran’s Energy Wealth And Optimal Level Of Consumption	48
Table 4.4:	Sensitivity Analysis Around The Estimates.....	51
Table 4.5:	Present Discounted Value Of Energy Wealth And Optimal Per Capita Consumption For Scenarios Starting in 1990 and 2002.....	53
Table 4.6:	Actual And Optimal Fiscal Policy During The 1990’s (In Percent of GDP)	54
Table 4.7:	Adjusted And Optimal Central Government Budget	55
Table 4.8a:	Iran: Medium-Term Optimal Fiscal Strategy	58
Table 4.8b:	Iran: Medium-Term Optimal Fiscal Strategy	59
Table 5.1:	Iran: Estimated Domestic And International Prices For Energy Products	62
Table 5.2:	Demands For Energy Products And Estimated Energy Subsidy	63

Table 5.3:	Energy Efficiency in Iran and “Best Practices”	65
Table 5.4:	Incremental Sector And Consumer Price Increases Due To Energy Price Changes Implemented At The Start Of The Reform	66
Table 5.5:	Share Of Expenditure On Energy Products In Total Expenditure By Quintile Of Rural Households.....	71
Table 5.6:	Share Of Expenditure On Energy Products In Total Expenditure By Quintile Of Urban Households	71
Table 5.7:	Estimated Percentage Loss Of Consumer Surplus For Different Expenditure Groups	72
Table 6.1:	Simulation Of Dynamic Inflationary Impact Of Energy Price Adjustment.....	75
Table 6.2:	Advantages And Disadvantages Of Alternative Compensation Schemes	78
Table 6.3:	Impact Of Energy Prices Increases On Households Under Various Flat Compensation Schemes Rural Quintile Groups	78
Table 6.4:	Costs And Benefits Of Alternative Compensation Schemes (Billion Rials).....	81
Table 6.5:	Phased Energy Price Increase And Energy Resource Allocation (Billion Rials)	82
Table 8.1:	Average Unweighted Tariff Rates For Countries With The Highest Tariffs And Selected Other Countries, 1996-1998 (Percent).....	93
Table 8.2:	Progress In Removing Restrictive Licensing Requirements, 2000-2002	96
Table 8.3:	Average Collected Import Tax Rates, 1999-2000	97
Table 8.4:	Estimated Unweighted Average Rates Of The Commercial Benefit Tax Needed To Compensate Producers For Tariffication Of Items Subject To Ministry Of Industry and Mines Licensing Requirements, November 2000	99
Table 8.5:	Estimated Minimum And Maximum Rates Of The Commercial Benefit Tax Needed To Compensate Producers For Tariffication Of Items Subject To Ministry Of Industry And Mines Licensing Requirements (Percent)	99
Table 9.1:	Allocations Of Foreign Exchange At The Official Rate, 2001/2002	111
Table 10.1:	Impact Of Trade And Exchange Rate Reforms: Welfare And Macroeconomic Effects.....	131

Table 10.2:	Impact Of Trade And Exchange Rate Reforms On Domestic Output And Prices, By Sector (Percentage Change From Initial Equilibrium)	132
Table 10.3:	Impact Of Trade, Exchange Rate, And Energy Pricing Reforms (Percentage Change From Initial Equilibrium)	133
Table 10.4:	Impact Of Trade, Exchange Rate, And Energy Pricing Reforms On Domestic Output And Prices, By Sector (Percentage Change From Initial Equilibrium)	135
Table 11.1:	Inflation And The Regulated Rates Of Return On Deposits By Maturity	139
Table 11.2:	Controlled Interest Rate Ceilings On Bank Lending	139
Table 11.3:	Lending Rates in Unregulated Money Markets, March 2001	144
Table 12.1:	Industrial Sector Production	151
Table 12.2:	Industrial Concentration.....	151
Table 12.3:	Value Added Per Worker In Private Firms.....	153
Table 12.4:	Employment In Public Sector Firms.....	153

Index of Figures

Figure 1.1:	GDP And Population.....	3
Figure 1.2:	The Oil Sector	3
Figure 1.3:	GDP Growth	4
Figure 1.4:	Gross Domestic Investments, % Of GDP.....	5
Figure 1.5:	Current Account.....	5
Figure 1.6:	Saving Balances	5
Figure 1.7:	External Debt	6
Figure 1.8:	Inflation	7
Figure 1.9:	Closing The Gender Gaps.....	11
Figure 2.1:	Total Fertility Rate	14
Figure 2.2:	Female Labor Force.....	15
Figure 2.3:	Male And Female University Graduates.....	16
Figure 2.4:	Male Labor Force.....	16
Figure 2.5:	Labor Supply Drivers	17
Figure 2.6:	Unemployment Simulation	19
Figure 2.7:	Composition Of Labor Supply Change	20
Figure 4.1:	Main Budgetary Aggregates According To Official Data.....	33
Figure 4.2:	Revealed Size Of The Budget (In Percent Of GDP).....	38
Figure 4.3:	Real Oil Prices In The Baseline Scenario (2000 Dollars A Barrel).....	45
Figure 4.4:	Oil Annual Extraction And Cumulative Completion.....	46
Figure 4.5:	Natural Gas Annual Extraction And Cumulative Depletion	47
Figure 4.6:	Actual And Optimal Use Of Revenues From The Energy Wealth.....	54
Figure 4.7:	Revenues From The Sales Of Energy (In Percent Of GDP)	57
Figure 4.8:	Actual And Optimal Use Of Revenues From Energy Wealth (In percent Of GDP).....	57
Figure 5.1:	Ratio Of Retail Prices To Border Prices.....	63
Figure 7.1:	Real Return Oil Vs Bonds	87
Figure 7.2:	Return On Oil Vs Petroleum Fund	87
Figure 7.3:	Return On Oil Vs Petroleum Fund	87
Figure 9.1:	Wheat Subsidies	112
Figure 9.2:	Estimated Cost Of A USD 200 Demogrant In Iran.....	120

Index of Boxes

Box 2.1:	Estimation Of Required Investment-Ouptut Ratio For Different GDP Growth Rates Using The ICOR Approach.....	21
Box 3.1:	Building The Real Balances Of The Consolidated Energy Sector: Methodological Considerations.....	28
Box 4.1:	The Shadow Exchange Rate Under Iran’s Multiple Exchange Rate System.....	37
Box 4.2:	A Two-Period Inter-Temporal Optimization Problem.....	41
Box 4.3:	An Illustrative Numerical Example Of How To Derive The Optimal Split Of Revenues From A Resource Wealth Between Consumption And Investment.....	42
Box 5.1:	International Experience Of The Impact Of Energy Price Increases On Subsequent Inflation	70
Box 7.1:	The Norwegian State Petroleum Fund	90
Box 8.1:	Increasing export and Employment Through Free Trade Zones.....	105
Box 11.1:	FSAP (2000) Recommendations On Financial Sector Reform	148
Box 12.1:	Concentrated Structure And Monopolistic Behavior	152
Box 12.2:	Article 44 of The Iranian Constitution	155
Box 12.3:	Balancing Efficiency, Effective Corporate Control, And Widespread Ownership.....	162
Box 12.4:	Improving The Governance Of State Enterprises	163
Box 12.5:	The Need To Restructure State Enterprise Debts Before Privatization.....	166

Annexes

Annex 4.1:	Optimal Consumption Path Of Oil Reserves.....	170
Appendix 5.1:	The Calculation Of The Effect of Energy Sector Price Increases On The Aggregate Cost of Living	174
Appendix 5.2:	Constructing Of Quintile Expenditure Levels From Household Survey And Input Output Table.....	180
Appendix 5.3:	Shares in Total Expenditure By Quintile Groups	182
Appendix 5.4:	Inefficiency Of Energy Subsidies: A Staggering Deadweight Loss.....	184

Contributors:

The report was written by Habib Fetini with contributions from: Claus Astrup, George Fane (consultant), Patrick Honahan, Omer Karasapan, Lili Mottaghi and Hamid Alavi, Mary-Lou Gomez was responsible for the processing of the report. The report benefited from helpful comments from Shahrokh Fardoust and Jeffrey D. Lewis, peer reviewers.

Executive Summary

1. Iran is about 10 percent of GDP off an economic equilibrium that would reduce unemployment and improve significantly people's welfare by converting oil wealth into sustainable development. First, it is about 10 percent of GDP short in the additional savings and investment needed to attain growth that will reduce unemployment. Second, optimal management of Iran's (exhaustible) oil—to provide the above needed savings and achieve an optimal balance between consumption and savings that would sustain the benefits from oil after it is exhausted—requires that it allocate about 10 percent of GDP more for savings and investment and less to consumption from its oil wealth. Third, that 10 percent adjustment can come from the reform of Iran's inefficient energy subsidy system, which also happens to average about 10 percent of GDP a year.

2. Iran is thus in a rare position. The identifiable slacks, if mobilized and well used, could finance its adjustment to a much higher and more sustainable growth path, all from within the country. These slacks could be transformed into budget surpluses that would provide ample credit to the private sector to grow. This adjustment—at the core of Iran's medium and long-term fiscal strategy—is a main pillar of Iran's transition to a market economy led by the private sector.

3. Making that adjustment hinges on two other supportive pillars. One is to liberalize the pricing system to enhance market signaling and efficient resource allocation. This requires more liberalization of trade and foreign exchange, abandoning inefficient subsidies and administered prices, and creating a more efficient and targeted social safety net system to support this transition. The other is to promote a more favorable environment for private sector development.

4. Private sector was a "residual" sector in the past. The large size of the Government, and of the public and para-public sectors and their quasi monopolistic privileges (of economic and political origin) left little space for the private sector to grow. One of the major constraints to private sector development was its lack of access to credit and foreign exchange as these were essentially allocated in priority to the public sector. Hence the critical importance of the alternative management strategy of oil wealth in providing the needed additional savings to enable private sector financing and promote the transition to a private sector-led economy while gradually retrenching public enterprises. Gradually, because of social (unemployment) and economic constraints and to give time to advance in the reform of the financial sector toward more competition and diversification and in liberalizing the pricing system.

5. What makes urgent and critical these reforms is Iran's daunting unemployment challenge. Unless the country moves quickly to a faster path of growth with employment, discontent and disenchantment could threaten its economic, social, and political system. The Iranian authorities are well aware of this threat: "For me, as well as for supreme leader Aytatollah Ali Khamenei, said President Khatami lately, the question of unemployment is the greatest worry."¹

6. Iran already has a high unemployment stock of about 16 percent. More worrisome is the explosive labor supply growth in Iran, now at a high of 5 percent a year and driven by a demographic bulge that can be traced to the higher fertility in the early 1980s. Even when the demographic hump passes, this growth in labor supply will be sustained by the rising labor participation of women. To meet the flow of new job seekers and make a dent in the stock of unemployment, Iran must sustain a much higher GDP growth rate—more than 8 percent a year. This will require about 10 percent of GDP in additional investment, the recurring theme. And only from the private sector can this investment produce the needed growth and employment. In the public sector, the buildup of overemployment, as a result of active labor market policy in the past, has weakened capital productivity and the potential for growth to create employment.

7. Iran can and should mobilize this 10 percent of savings for investment through more efficient and effective management of its oil wealth. First, because oil is exhaustible, Iran should direct part of the flow of revenues to financial and productive assets to strengthen the non-oil economy and generate growth with employment. Second, the most direct and efficient way to do this is to reduce energy subsidies. Thus Iran has a double transition: from a state driven by the public sector to one driven by the private sector, and from an oil-based economy to a more diversified non-oil economy. Iran starts this transition on a good footing. Its macro fundamentals are more stable. It has no debt. And the slacks in the economy, if used well, could finance reform and other investment from within.

The end of the 1990s debt crisis

8. The different shocks that marked the history of Iran over the past two decades, including the disruptions linked to the revolutionary process, the massive destructions caused by the war with Iraq, the costly external embargo that blocked the reconstruction of Iran's oil and gas production and commercialization capacity, have contributed to deep macroeconomic instability, important capital stock destruction and institutional disruptions. An economy-of-war style management prevailed implying large distortions affecting trade, foreign exchange, prices of goods and direct state control of the financial sector and most of the production system.

9. In 1990s, at the end of the war with Iraq, Iran had engaged in a serious reform program aiming at removing these distortions and engaged on a wide privatization program. It was the mismanagement of its ambitious reconstruction program (shortsidedly financed through heavy short term external borrowing) that started a process of economic instability that dominated all the 1990s. By 1993, indeed, the hump of debt repayment combined with both a trough in oil

¹ Iranmania.com citing AFP, September 23, 2002.

receipts triggered a debt crisis. The tightening of Iran's international isolation and external embargo rendered difficult access to debt refinancing and left no other option, apart from defaulting, than to adjust to these shocks through deep cuts on imports as a means to mobilize large enough current account surplus to repay this debt. Such large cuts in imports were not possible without a massive recourse again to distortive trade and foreign exchange control, including reinstating non-tariff trade barriers that covered two third of the of the harmonized tariff system, and reverting to multiple exchange rates and queuing. These price distortions added to the accumulation of layers of heavy subsidy system under the declared objective of protecting the poor, including the large and inefficient energy consumption subsidy which amounted to a staggering average of more than 10 percent of GDP per year.

10. The forced adjustment of paying short-term debt without contracting new debt left Iran with a low indebtedness—of about 7 percent of GDP at the end of the 1990s. Aided by the necessitated fiscal discipline of these difficult years, Iran has regained by 2000-01 its internal and external balances and strengthened its sustainability, as the end of the debt crisis freed about \$4 billion a year in external resources which used to be allocated to debt service payments during the second half of the 1990s.

11. Iran's social agenda has been given an absolute priority since the revolution. Despite all the financial difficulties, Iran's achievements have been impressive in education, health, and poverty reduction. Poverty has fallen from an estimated 40 percent before the revolution to close to 20 percent now—through an active government-led income distribution policy based on cash and direct support to the poor, delivered through a sophisticated social safety net system. However, while Iran's social programs were effective in reaching the poor, Iran's indirect subsidy system, in particular energy subsidies benefited the rich far more than the poor, sometimes by a 12 to 1 ratio. These subsidies, as mentioned, correspond to the excess consumption from oil over what would be optimal. And yes, the forgone savings (estimated at about US\$90 billion during the 1990s), if invested, would have generated more growth and have empowered and supported the poor through employment rather than direct assistance, the more so because 40 percent of the poorest in Iran are unemployed. Iran's "distribution-before-growth" is proving unsustainable, exhausting the growth prospects for a growing labor supply. Iran needs to shift from "distribution before growth" to "distribution with growth development strategy".

Reducing unemployment

12. More than ever, Iran faces major unemployment. If not contained and addressed, it could threaten social and economic stability. The challenge is to ensure economic growth, in enough quantity and quality, to reverse the growth of unemployment and reduce the stock of unemployment, now at 16 percent, to an acceptable level.

13. Principal factors underlining the challenging nature of the dynamic of the unemployment problem are: (i) an unusually high rate of growth of labor supply driven by a high, but falling growth of the population at age of work (reflecting the demographic hump of the early 1980s), and sustained by low, but increasing women participation in the labor force; (ii) a shift in the composition in the supply of labor towards younger, higher skilled with higher share of women

workers in total labor supply that will require a shift in labor demand and the sectoral structure of the economy to match it; and (iii) a potentially higher growth of the productivity of labor that usually accompany economic transition, compelling for even higher growth to enable meeting the additional labor supply.

14. Women participation now at a low 14.8 percent should be expected to increase significantly in the near future and put more pressure on the labor market given the record schooling of girls as a result of the Iranian Government gender inclusive human resource development effort since the Revolution. The result of this is now a reversing of the proportion of school graduation in favor of women. Other factors favoring increased women participation in the future include the increase in age of marriage and the drop in family dependency rates, and the low level of wage, all factors usually associated with higher female participation in the labor market.

15. Looking ahead, the average growth of the labor supply will decline from its 2000 level, but it will still average about 3.6 percent a year until 2010, bringing an average of 800,000 more job-seekers each year. To meet this growth with labor productivity gains of 2.4 percent a year, or higher than the 2.1 percent average for the last 20 years, Iran needs to ensure an average annual GDP growth of 6.5 percent until 2010 simply to maintain unemployment at 16 percent. To bring unemployment to 10 percent between now and 2010, it would need average GDP growth of 8 percent a year.

16. If Iran's GDP growth only averages historical levels of 4.5 percent—with labor productivity growth of 2.4 percent and a gradual increase in women labor participation to 25 percent by 2010 (the same level as Tunisia nowadays)—the average unemployment rate would then be 23 percent. And if structural reforms boost the productivity of labor, the growth required to keep unemployment at the current level will have to be even higher. With an increase of productivity growth to 3.5 percent, unemployment would rise to 21.6 percent on average until 2010. To stabilize unemployment at 16 percent, Iran would need average annual GDP growth of 7.5 percent until 2010. To bring it down to 10 percent, in 2010, annual GDP growth would need to average 9.1 percent in 2010.

17. There is also a demand side to this challenge of job creation, for jobs must also match the changing labor force composition in two main ways. First, the share of women is going to increase. And second, the skills mix of the labor force is going to shift toward higher and more sophisticated skills.

18. Women's employment is fairly equally distributed across sectors, according to the latest available figures from 1996. Their share is lowest in agriculture, where women make up only 9 percent of total employment. In industry and services the average share hovers around 13-14 percent, but with large variation among subsectors. In industry women are employed mainly in manufacturing, where their share of total employment was 30 percent in 1996. In services women make up around 40 percent of total employment in education and health, but their share is less than 10 percent in the financial sector, and less than 2 percent in transport, communications, and commerce. Demand for labor in such sectors as education will fall as education is likely to fall with declining fertility and the passing of the population bulge. So jobs

will have to be created in the new-economy subsectors, such as telecommunications, software development, and other knowledge-intensive activities.

19. If Iran is to reduce unemployment, it also needs to mobilize and invest more savings. Starting from an average GDP growth rate of about 5 percent, Iran needs to mobilize another 10 percent of GDP. At the heart of this is Iran's medium-term transition from a public-sector-led economy to one led by the private sector and from an oil-based economy to one that is more diversified and sustainable. Making this transition requires, in addition to this higher savings mobilization, improving the private sector environment and reforming the public sector.

Table 1. Growth, Labor Participation, Productivity Growth, and Unemployment

Projected change in labor market characteristics	Average unemployment rate until 2010 for a 6 % annual GDP Growth	Average GDP growth needed to stabilize unemployment at 16 % on average until 2010-11	Average GDP growth needed to stabilize unemployment at 10 % on average until 2010-11
Base case Labor productivity growth = 2.4 Female participation: 25 by 2010; Male participation constant at 78	17.8 percent	6.5 percent	8.1 percent
Scenario 1 Labor productivity growth = 2.4 Female participation: 35 by 2010, Male participation constant at 78	22 percent	7.75 percent	9.3 percent
Scenario 2 Labor productivity growth = 3.5 Female participation: 25 by 2010; Male participation constant at 78	21.6 percent	7.6 percent	9.2 percent
Scenario 3 Labor productivity growth = 3.5 Female participation: 35 by 2010; Male participation constant at 78	25.6 percent	8.9 percent	10.4 percent

Source: World Bank Staff estimates

Using oil wealth to finance economic diversification: trading "wealth" for "development"

20. A major pillar for Iran's transition reform is an alternative fiscal strategy framework focusing on an optimal management of oil resources that meets the dual objective of: (i) providing the necessary increase in savings mobilization to meet the required financing for the investment necessary to meet the challenges of growth and employment; and (ii) ensuring the optimal balance in the use of oil and gas wealth between consumption and savings/investment so as to sustain the same welfare level flowing from oil wealth for the present and coming generations beyond the time of the exhaustion of these oil and gas resources. In other words, a balance between savings and consumption from oil wealth, that transforms the exhaustible stock of hydrocarbons wealth into a sustainable non-oil economic development. Iran's oil resources will, indeed, be exhausted in the next forty years or so only.

21. An assessment of Iran's fiscal policy during the decade of the 1990s by comparing the official presentation with a presentation that explicit the hidden subsidies and a with what would have been the fiscal situation if an optimal management of oil wealth was followed reveals three characteristics:

22. First, the revealed Government size when we explicit subsidies is about 42 percent of GDP distinctly bigger compared to 23.5 percent of GDP as the official budget presentation shows. It is not only nearly double the average size of a Middle income country Government (22 percent of GDP), but is also bigger than the average High Income Countries' government (30 percent), and compares only with European average Government size (38 percent of GDP)².

23. Second, the revealed fiscal policy is essentially of a balanced budget policy³ around a large inflow to the budget of oil and gas revenues of about 34 percent of GDP. The premise of the policy was to extract as much as possible of the energy resources, and to use these revenue in the provision of a reasonably high amount of public goods and highly subsidized energy products and imported essential goods, while maintaining a low rate of overall taxation of about 8 percent of GDP.

24. Third, compared to what a fiscal policy based on an optimal management of hydrocarbons wealth reveals, revenues from the oil and gas wealth used to finance budgetary outlays amounted to an average of 9.5 percent of GDP per year higher than optimal. A fiscal policy in line with the optimal management of oil and gas wealth would have led to an accumulation of capital (financial wealth and investment) of about US\$95 billion by the end of the decade, which would have yielded, if invested in physical or financial assets, additional revenues (in potential interests or dividends) of some 2 percent of GDP annually. This would have resulted in an average capital accumulation (savings/investment) of 11.5 percent of GDP. Incidentally, and quite revealing of both the cause and the cure, this is very close to the average annual 11.1 percent of GDP fiscal spending on energy subsidies alone during the same period.

25. Looking forward, it will be difficult for Iran to continue on the same fiscal stance of a combination of high fiscal expenditures of close to 40 percent of GDP (based on expliciting hidden subsidies) and low taxes of less than 10 percent of GDP, and it will be less and less possible to afford it in the future as the non oil economy and population continue to expand. Past stance has already led to a depletion of part of the initial stock of energy wealth and would accelerate in the future unless a larger reform of fiscal policy is implemented soon. This reform has to meet the challenge of a declining trend of the share of oil revenues in GDP, which is mainly driven by the restricted 2 percent growth on average of oil extraction and sale in the face of higher non oil GDP growth). As a result, oil and gas revenues in percent of total GDP are

² See Government Finance Statistics Yearbook, International Monetary Fund, 1999.

³ On average, Iran has finished the decade of the 1990s with an annual balanced budget (an average annual surplus of 0.2 percent of GDP). Iran has only a small external debt now, and except for the period of the 1990s, during the reconstruction from the war with Iraq, it has always, throughout its modern history, maintained a minimal external indebtedness level.

projected to decline from an average of 32 percent of GDP in 2000-2002 to about 22 by the end of the decade.

Iran: Actual and Optimal Fiscal Policy During the 1990s

	Average during 1991-2000 (in percent of GDP)		
	Official data	Adjusted	Optimal policy
Total revenues	23.5	42.4	44.4
Energy revenues	13.4	34.7	34.7
Interest receipts		0.0	2.0
Tax and nontax revenues	10.1	7.7	7.7
Total expenditures	23.7	42.4	32.9
Financed by tax and nontax		7.7	7.7
Financed by energy wealth		34.7	25.2
Current budget balance	-0.2	0.0	11.5
Memorandum item: Stock of financial wealth and end-2000 (in percent of GDP)	0.0	0.0	94.6

Source: World Bank Staff Calculation

26. An optimal oil wealth management strategy would require restricting consumption from oil revenues to about 17 percent of GDP a year on average over the next decade, and channeling an average of 6 percent GDP per annum to Iran's to-be-created Oil Savings and Investment Fund (OSIF), which is, thus, different from an only stabilization fund, as it combines stabilization, that addresses the volatility aspect of oil resources, with savings and investment that address the exhaustibility aspect of energy wealth. Maintaining the actual level of fiscal expenditure of 38.8 percent (average 2000-2002 based on explicated subsidies in expenditures and GDP) would require a fiscal adjustment of about 11 percent GDP a year. Iran has different choices to reduce public consumption levels, and to increase taxes to meet this fiscal adjustment. These choices need to be based on a serious effort of rationalization of public expenditures on the basis of efficiency, and effectiveness, i.e., reducing costs and getting the best outcomes from these expenditures in terms of growth, distribution, and quality of service delivery.

Fiscal Adjustment through the energy subsidy system reform

27. Reforming the energy subsidy system as priority area of fiscal adjustment (from the expenditure side) to meet the requirement for higher savings/investment and also as a means to achieve an optimal management of oil wealth can be founded on several justifications. Chief among them are: (i) the huge deadweight loss attached to domestic energy consumption subsidy estimated at between 3.5 and 4.3 percent to of GDP (Table 2 and Annex); (ii) the inequitable and regressive distribution (subsidies for some energy products benefit twelve times more the highest decile than the lowest decile of the population). An equitable distribution of these subsidies would have permitted an increase in the expenditure of the poorest quintile of the population by 60 percent (112 percent for the poorest rural quintile), and would have eliminated poverty; and (iii) the high cost in term of missed opportunity of exports of oil lost in wasted over consumption due to cheap energy prices.

**Table 2. Deadweight loss associated with energy subsidies in Iran
 (in percent of GDP) 1/**

	Energy demand elasticity				
	-0.1	-0.2	-0.3	-0.4	-0.5
Share of oil sector in total GDP 2/	-0.1	-0.2	-0.3	-0.4	-0.5
20%	3.7	3.9	4	4.2	4.3
25%	3.5	3.7	3.9	4.1	4.2
30%	3.4	3.6	3.8	3.9	4.1

1/ Assumes a share of energy spending equal to 1 percent of total households' spending, energy cost equal to 2.6 percent of total firms' costs, and average domestic prices equal 25 percent of international prices.

2/ Share of oil sector in total GDP assuming that all oil is valued at international prices.
 Source

28. Confirming these figures is the huge energy inefficiencies in the Iranian industry in comparison with best practices in the world. Indeed, it is estimated that cement plants in Iran use about 35% more energy than those in Japan, Iron and steel mills (Isfahan) use 58% more than comparator mills in Japan, refrigerators made in Iran use 70 percent more energy than imported refrigerators, and domestic cars 37 percent more than imported ones'

Price distortions and size of subsidies

29. Energy prices have for long time been below opportunity costs as measured by the border price of the traded items and the production costs of the non-traded items. Such a divergence between domestic prices and opportunity costs creates a welfare loss for the economy⁵.

30. In recent years the Government has increased energy prices somewhat, but because of the very low starting point they remain far below opportunity costs. The estimated energy subsidy in 2001/2002, based on the rolling average oil price would be of the order of 10 percent of the country's Gross Domestic Product, the highest level of energy subsidy in absolute and relative terms in the world. Energy subsidies annual average was about 11 percent of GDP over the past decade.

31. Among OPEC countries (and in fact among all countries), Iran is the one with the highest subsidized prices for an array of energy products (figure 1). But the situation could also be

⁴ World Bank: "An End-Use Energy Efficiency Strategy for Iran". Technical report, 1994

⁵ Consumers value a marginal barrel of oil (say) priced at existing levels equally to the amount of other goods that such a sum of money would buy. If the marginal barrel of oil were exported (which is possible since Iran has a production quota and not an export quota and a barrel that is not consumed domestically could be exported) then the higher price received would enable more of these other goods to be purchased and given to consumers, thus increasing welfare. Hence the domestic price should be equal to the border price, rather than set equal to production costs or some other value below the border price. The actual allocation of the difference between a sale price based on opportunity costs and the production cost should be determined by the government so as to maximize the overall benefits to the economy.

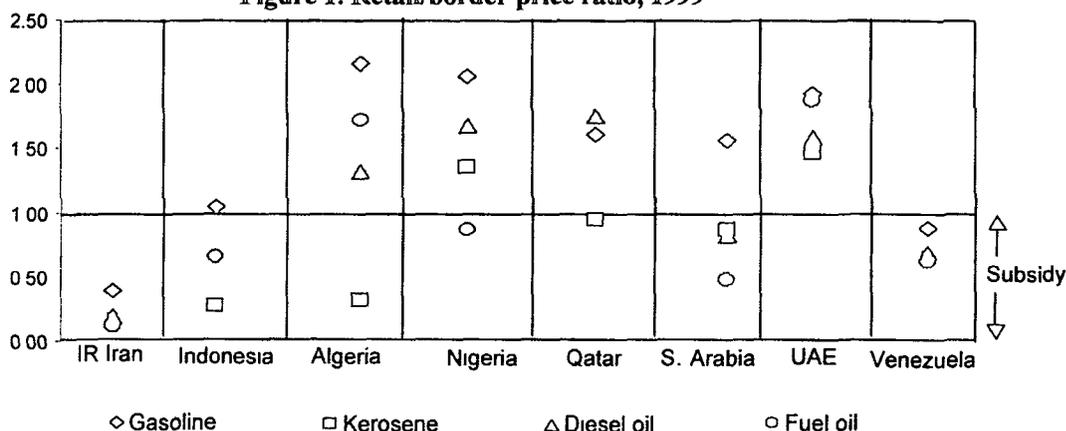
interpreted positively. Other countries have increased their energy prices as part of their adjustment policies. Some of them, such as Algeria, Nigeria, Qatar, and others have shifted to taxing these products (particularly gasoline) by almost 100 percent. For Iran, the slack is still intact and could be tapped for better use—a hidden reserve and an opportunity that is still there and that should not be wasted

Table 3. Price distortions and size of subsidies (2001-02)

	Domestic sales prices (in RIs)	Border prices (in RIs at market ER)	Rapport Border/Domestic Prices (times)	Total subsidy (in trillion RIs)	Total subsidy (in percent of GDP)
				70	10
Kerosene (rial/liter)	120	831.3	6.9	6.7	0.9
Fuel oil (rial/liter)	64	498.8	7.8	3.1	0.4
Gasoline (rial/liter)	450	1247.0	2.8	13.2	1.8
Gas oil (rial/liter)	120	831.3	6.9	16.0	2.2
Electricity (rial/kwh)	96.8	307.6	3.2	20.8	2.9
Natural gas (rial/m3)	59	299.3	5.1	10.1	1.4

Source

Figure 1. Retail/border price ratio, 1999



Estimated impact of removing energy subsidies on prices

32. A price adjustment of such an amplitude is obviously difficult and risky because it carries large and complex implications for the economy. There would be substantial macroeconomic effects and varying effects on different economic activities. There would also be effects on income distribution affecting with varying intensity different social groups according to the energy intensity of their expenditures, henceforth varying political reactions and expected

political costs facing the policy makers. The design of a management strategy of this price reform requires, thus, first a thorough gauging of these economic and social effects.

33. To estimate the economic and social implications of bringing energy prices to the 10-year moving average of border prices for the same products, we combine the use of the real balances of the consolidated energy sector with the inter-industrial input output matrix, and household expenditure surveys.

34. The most immediate and publicly visible impact of the proposed increases in energy prices would be on the general level of prices, and on the cost of living for households, which would now face higher expenditures on energy goods and on non-energy goods whose prices increased to offset the increase in their costs of energy and other inputs. These effects would take time (two to three years) to filter through the economy, with the consumers noticing initially the effect of the change in energy goods that they purchase (such as electricity). This would be followed by the first-round effects of the price rises of goods using energy as an input (for example transport costs affected by fuel price increases). The initial impact and first round effects on the final prices are together known as the “direct” effect.

35. There would also follow “indirect” effects, with the prices of goods reflecting higher costs for the inputs of other goods affected by energy prices (such as processed foodstuffs affected by the increase in transport costs). The prices of all goods could be expected to rise to a greater or lesser extent – the smaller the share of energy used in the production of a consumer good (directly and indirectly) the less the proportionate increase in final prices.

36. Bringing domestic energy prices to their 10 years moving average border levels translates into a total increase of about 30.5 percentage point increase in the price level above the base line. This general price increase represents an upper bound or a ceiling for the expected impact because it does not take into account the price and income elasticities effects which we show elsewhere to be important. If the price increase triggers a shift toward a more efficient energy use at the production level (more energy efficient technology) and more rational consumption use at the level of the consumer, This could lead to gains of between a third and half of the total domestic energy consumption, reducing by as much the increase in the general price level due to energy price adjustment.

37. The effects as measured presuppose that there is full transmission by sectors of their increased energy costs to the consumers, so that the full impact is absorbed by the final demand. In the more open trade system to which Iran is moving, this will imply competitiveness pressure on many industries. A mitigating factor may be in that most of the affected sectors are of a non-tradable nature. But the potential for de-protection of many industries is large as in sectors like steel, cars and cement, protection was essentially through low energy cost. This highlights two policy elements; (i) the need to factor the reform of the energy prices in the design of the ongoing tariff reform and shift towards tariff protection rather than cost based protection; and (ii) the need to design a strategy for technology upgrade of the energy consuming sectors so that over the next few years a shift toward a more energy efficient technology be made. Such a technological shift should lower the cost of these industries by as much efficiency gain as it

could be made, and contribute, henceforth to lower the overall price impact by as much over the medium term.

38. Apart from the energy sectors, 12 of the 43 sectors would experience price increases of more than 30 percent (the weighted average price increase based on no quantity adjustment). They are: load transport (88.3%), brick (83.2%), gypsum (82.9%), cement (79%), water (73%), other materials and chemicals (59.4%), passenger transport (55.6%), other transport and storage (54.6%), glass (32%), copper, aluminum, and other metals (31.1%), metal products (30.7%), and other nonmetal products (30.5%). Four of these are construction materials which are not purchased directly in substantial quantities by households but are important in housing. Except chemicals and copper, aluminum, and metal products, these are all highly non-tradable. So the balance of trade is unlikely to be directly affected either by loss of their export markets or by import competition from abroad. The large impact on transport is expected, given its heavy use of various fuels. Water and transport costs enter directly into household budgets, so these effects will be easily visible.

39. Almost without exception, the sectors with the highest incremental price increases also have the largest proportion of direct to indirect cost impacts. For the transport and construction materials and construction sectors, between 60% and 90% of the impact comes directly from their own use of energy. This contrasts with textiles and clothing, where only 20% of the final impact of the energy price rise would be felt as a direct impact—or agriculture, where the direct impact is only 11% of the total effect. This suggests that the industries most affected will also be the quickest to feel the effects, since so much comes from their direct purchases of energy.

40. The impact on the welfare of households of this price increase can be set as an upper limit. With no substitution between goods (zero price elasticity of demand for all goods) the increment in expenditure to purchase the same bundle is exactly the increment in money income to leave households no worse off than they were before the price increases (30.5 of total household expenditure). This loss of “consumer surplus” would be reduced if consumers actually switched their expenditure patterns to cheaper goods, and away from those whose prices had risen most rapidly. If the deadweight loss is excluded, the increase in prices could be reduced by as much as one third.

**Table 4. Sector and consumer price increases
from energy price changes at the start of reform**

Sectors	Incremental sector price increase	Share in total household Expenditure	Consumer- weighted price increase	Direct price impact	Share of direct impact in total increase
Farming	8.3	4.5	0.38	2.7	33
Livestock	9.3	2.3	0.21	1.8	20
Other agriculture activities	5.3	0.2	0.01	0.6	12
Mining	15.9	0.0	0.00	9.3	59
Crude petroleum and natural gas	1.9	0.0	0.00	1.3	69
Sugar	14.9	1.0	0.14	5.9	39
Other food industries	15.6	14.9	2.33	5.0	32
Paper, printing, and publishing	18.7	0.9	0.17	4.9	26
Cement	79.0	0.0	0.00	70.3	89
Brick	83.2	0.0	0.00	67.4	81
Gypsum and other minerals	82.9	0.0	0.00	68.0	82
Glass and glassware	32.0	0.2	0.05	21.9	68
Other non-metal products	29.1	0.0	0.00	13.3	46
Textile	18.1	0.7	0.14	3.7	20
Clothings	17.6	5.5	0.97	4.0	23
Weaving and leather products	18.6	2.7	0.50	5.1	28
Rubber and plastic products	30.5	0.4	0.12	3.8	13
Pharmaceutical products	18.0	0.5	0.10	3.0	16
Kerosene	906.3	0.4	3.81	906.3	100
Fuel oil	1021.3	0.0	0.00	1021.3	100
Gasoline	292.4	0.2	0.71	292.4	100
Gas oil	906.3	0.0	0.44	906.3	100
Liquid gas	23.1	0.1	0.03	15.0	65
Other materials and chemical products	59.4	1.4	0.83	33.6	57
Basic metal and steel products	25.3	0.0	0.00	7.5	30
Copper, aluminum, and other basic products	31.1	0.0	0.00	13.5	43
Metal products in construction and manufacturing	30.7	0.1	0.04	8.6	28
Industrial machinery	19.4	0.0	0.00	3.8	20
Radio, Television, and					
Other communications equipment	14.6	0.4	0.06	3.6	25
Motor vehicle equipment	27.9	1.9	0.52	11.5	41
Other industrial products	14.0	0.4	0.05	1.3	10
Electricity	308.8	0.9	2.75	308.8	100
Water	73.0	0.3	0.25	62.5	86
Natural gas	627.9	0.2	1.06	627.9	100
Construction	27.6	0.3	0.08	11.4	41
Trade	18.2	21.0	3.82	13.1	72
Restaurant	10.7	1.9	0.20	1.6	15
Hotel and motels	23.4	0.4	0.10	14.5	62
Load transport	88.3	7.1	6.31	78.9	89
Passenger transport	55.6	2.2	1.24	44.0	79
Post and telecommunications	18.0	1.0	0.19	12.6	70
Other transport and storage	54.6	0.0	0.00	44.5	82
Other services	11.4	25.7	2.92	4.3	38
Inflation Increment			30.53		

Source: World Bank staff calculations

**Table 5. Estimated loss of consumer surplus
 for different expenditure groups (percent)**

	Total	Q1	Q2	Q3	Q4	Q5
Rural	36	47.6	45.2	42.8	40.6	29.6
Urban	29	33.0	33.8	31.2	30.6	25.2

Source: World Bank staff estimates

Impact on different income groups

41. For both rural and urban households, the proportionate loss in welfare due to the higher prices declines as the expenditure level rises (table 5). The proportionate burden will be heavier on rural households, both because of their general expenditure level being lower and because of the nature of the goods that they purchase. The impact on the poorest rural group would be about twice that of the best-off urban quintile.

Phasing of energy price reform

42. How to phase out the adjustment to smooth down its social and economic effects? There are two possible phasing strategies in question. One is how to phase out the price adjustment process itself as a way to smooth down the adjustment impact. The other is, given a full one time adjustment (one shot adjustment of prices), how to smooth down its impact through forms of timed and transitory support or transfers to those affected.

43. Each of the adjustment paths carries its advantages and disadvantages and there is no straight answer as to what is the preferred solution. The policy maker has to weigh the constraints and advantages according to the prevailing circumstances and make a decision. What could be said though, is that a quick adjustment (say in one or two years) has the advantage of a quick elimination of the subsidies, with economic agents adjusting their inflation expectations, and the energy cost component of their projects quickly. Their investment planning is based on more sure information. The policy maker, once the energy price adjustment is quickly made, can devote all his efforts to the management of the effects of this adjustment and the implementation of a transitory strategy of smoothing out the social and economic impact as we will discuss later. Obviously, the amplitude of the price jump is high and, if made in one year will bring a jump in the general level of prices to a level that reminds of Iran's difficult macroeconomic days of the mid 1990s when Iran has experienced inflationary tension with even higher amplitude than 40 percent per year. The perception of such a situation could be destabilizing, even though in the past these were the effects of an underlining increasingly instable macroeconomic situation and severe foreign exchange crisis as well as depressed expectations (see Chapter 1XX), while the case here is of a limited in time jump in price level, which is different of inflation.

44. However, one should be reminded that Iran has just went through a major unification of its multiple exchange rate system (a byproduct of the lost control of the macro economic situation in 1994) and time is required to consolidate the foreign exchange system reform and ensure that all its own social and economic effects are resolved and well mastered before moving

with a potentially destabilizing price shock of this amplitude. Moreover, the Middle East Region is going through difficult and instable political situation heightening uncertainties that need not be amplified by other risky undertakings. A careful evaluation of the domestic and international situation and the risks it involve is thus needed to start the implementation of the energy reform and decide on what phasing strategy to chose. In any case, any waiting time should be fully used to further the preparation of the necessary institutional and social safety net measures to cushion it and the understanding of its economic implications and the preparation for countering them.

45. What Iran should avoid is to get into the adjustment process without a clearly defined road map of how to phase this process and how to use the realized savings. One pitfall to avoid is to engage in price increase and use it's proceeds in consumption and unplanned public expenditure increases that it will be even harder later on to identify and rationalize. Other OPEC countries went through this way and lost the opportunity to transform the slacks that energy subsidies represent into a development opportunity. Iran needs to clearly define its wealth management strategy and institute ahead of the reform, an Oil Savings and Investment Fund with clear rules of management.

Case of phasing through incremental price adjustment

46. We quantified, first, the inflationary impact of four alternative scenarios to bring domestic energy prices to their border prices. The scenarios spread the adjustment over three years and over five years. Two of them spread the adjustment through equal yearly incremental adjustments of 1/3 and 1/5 of gap between domestic and border prices. The remaining two consider frontloaded adjustments: (i) for the three years adjustment by closing half of the gap the first year, bringing prices to two thirds of their border price level the second year, and closing the gap the third year; (ii) for the five years adjustment, by closing the gap by 30 percent, 25 percent, 20 percent, 15 percent, and 10 percent successively each year.

47. In these scenarios, the uniform incremental rise in energy prices by a third each year for the three years adjustment and by a fifth each year for the five years adjustment plan implies an incremental inflation impact of about 9.5 percent a year for the first and 6.5 a year for the second, for a cumulative increase of 31 percent for the first and 37 percent for the second. The frontloaded adjustments, imply a decreasing impact but a higher total effect of 32 percent for the three years frontloaded adjustment and 38.4 percent for the frontloaded five years adjustment scenario.

⁶ A concern with any scheme of pre-announced changes in prices stretching over a substantial period is whether it would encourage substantial speculative hoarding towards the end of the first period (say) followed by black-market sales in the second period at a price below the official price for that period but above the price of the first period. Individuals will of course advance their own purchases at the end of the first period in order to stock up, but their capacity to store is not likely to be great. The impact of such speculation would be to shift purchases from official suppliers from the second period to the first period, thus reducing the total revenue take of the government, as well as shifting it towards the earlier period. The impact on inflation would actually be to soften the impacts on prices, although this would not be recorded by official statistics.

Case of price adjustment with phased compensation:

48. As has been shown, in the absence of any offsetting action by the government, households would experience a 30.5 percent loss in consumer surplus. Even those not economically vulnerable may react to such a reform and voice discontent, which could be destabilizing. There would also be destabilizing economic effects, macroeconomic management (in particular monetary) effects that should be given all due attention. The government, thus, needs to establish an accompanying reform scheme to ease these effects.

49. The essence of the reform is to move from the current system of an income distribution policy based on direct assistance to the poor, whose poverty is largely due to unemployment, to a growth-supported distribution that limits vulnerability to people who can't work. This requires that the consumption of oil, in particular the energy subsidy, be invested to create jobs, while developing a well-targeted and efficient social safety net system that could replace the transitory transfer system.

50. The design of the scheme whereby, *for a certain period of time, part* of the subsidy money is returned to households can be adjusted to achieve a combination of goals. A first scheme could have as its aim to exactly compensate a certain proportion of "losers" for the loss in consumer surplus. Typically these will exclude the richer households in society. The scheme would return different amounts to the poorer households, depending on the extent to which they had lost from the price rise, and nothing to households above some cut-off point. Such a method has lower expenditure than others; but achieves income redistribution only through the lowering of the welfare of the richer groups – it does nothing to alleviate poverty. The scheme also requires an effective and low-cost operational cost scheme of identifying the poorer households.

51. A second scheme would be to return a fixed amount to all households. Depending on the amount of this flat rate compensation, some households would be no worse off than before, and the poorest would indeed be better off. The scheme is the simplest to operate since it requires no means testing. It also redistributes income, making the poor better off than before, and the rich somewhat worse off. But this would be expensive because of the payments to all households. Reducing the costs by reducing the flat rate would lower the number of households that would be fully compensated. It would also reduce the income redistribution and poverty reduction.

52. A third scheme would combine elements of the first two. Flat compensation would be used for all households up to a certain income level, thus ensuring that they were all at least as well off as before the price rise. But above this there would be no compensation. Such a scheme would, in relative terms, achieve more redistribution at the same flat rate, because of the reduction of the incomes of the richer groups, and would have considerably lower direct costs. It would also tend to have higher administrative costs through the need to target the lower income groups.

53. Table 6. summarizes the advantages and dis-advantages of the alternative schemes. The social benefits arise from the redistribution of income and the reduction of poverty. The economic benefits accrue generally to the economy from the use of the extra government revenue not returned directly to households to compensate them for part of the energy price rise

(some of this could be used for further redistribution through a targeted social safety net). The political support identifies groups that gain or lose under the different schemes. And the ease of implementation considers the feasibility and costs of operating each scheme.

Table 6. Advantages and disadvantages of alternative compensation schemes

	Social benefits	Economic benefits (savings)	Political support	Ease of technical implementation
Exact compensation for lowest 3 quintiles	Neutral	Largest	Poorest neutral Middle neutral Richer against	Low
Flat rate compensation for lowest 3 quintiles	Moderately positive	Large	Poorest supportive Middle neutral Richer against	Medium
Flat rate compensation for all groups	Moderately positive	Small	Poorest supportive Middle neutral to supportive Richer moderately against	High

Source

Table 7. Impact of energy prices increases under various flat compensation schemes

Quintile Groups	Quintile's benefit from energy subsidies before reform (billion rials)	Quintile benefit from a flat rate redistribution of 100% of subsidies (billion rials)	Net gain to quintile group from a flat rate redistribution of 100% of subsidies (billion rials)	Net gain as of group total expenditure from flat compensation of 100% of subsidies	Net gain as % of group total expenditure from flat compensation of 2/3 of subsidies	Net gain as % of group total expenditure from flat compensation of half of subsidies
Rural						
Q1	1,820	6,122	+4,302	112	59	32
Q2	3,046	6,122	+3,076	46	15	0
Q3	4,156	6,122	+1,966	20	-1	-11
Q4	5,043	6,122	+1,080	9	-8	-16
Q5	12,218	6,122	-6,095	-15	-20	-22
Total	26,283	26,283	+4,328	6	-8	-15
Urban						
Q1	4,195	9,989	+5,794	46	19	6
Q2	6,999	9,989	+2,990	14	-2	-10
Q3	8,336	9,989	+1,653	6	-6	-12
Q4	11,594	9,989	-1,605	-4	-13	-17
Q5	23,150	9,989	-13,161	-14	-18	-20
Total	54,273	54,273	-4,328	-2	-11	-15
Total						
Q1	6,014	16,111	+10,097	61	29	12
Q2	10,045	16,111	+6,066	22	3	-7
Q3	12,492	16,111	+3,619	10	-5	-12
Q4	16,639	16,111	-525	-1	-12	-17
Q5	35,367	16,111	-19,256	-14	-18	-21
Total	80,555	80,555	0	0	-10	-15

Source World Bank staff calculation

54. Table.7 illustrates a calculation of possible effects based on different schemes of flat compensation. The urban population is some 62 percent of the total population of 65 million, so that each quintile contains about 8.060 million people, while each quintile of the rural population contains about 4.940 million people (assuming that household size is equal for urban and rural groups).

55. As a reference, we used the case of flat compensation based on the return to consumers of 100 percent of the subsidies (we are abstracting from the gains of deadweight loss in our calculations). For the rural households, the richest quintile's benefits from subsidies are 6.7 times more than those of the poorest one. Flat compensation would yield a consumer surplus gain to the poorest quintile equivalent to 112 percent of his current expenditure. All other quintiles realize substantial, but declining gains, and only the richest quintile loses 15 percent equivalent of his current expenditure. Rural households would see a gain of 6 percent of their overall total expenditures at the expense of urban households. Two scenarios are also run, based on the return of two thirds and a half of the subsidies. The first one leaves the third quintile indifferent and benefits a great deal to the two first quintiles, the second one leaves the second quintile indifferent, benefit to the poorest quintile and results on a 15% percent loss for the whole rural households. The amplitude and directions of impact is comparable but less dramatic for the urban and total households.

56. Table.8 shows the results of the three schemes of compensation. The first scheme is chosen so as to exactly compensate the lowest 3 quintiles of both the rural and urban groups (some 39 million people) for the estimated loss of consumer surplus. Scheme 2 is chosen to give a flat rate compensation to all people, regardless of income level, while scheme 3 is designed to give the same flat rate compensation to just the lowest 3 quintiles of both the rural and urban populations. The flat rate of compensation is chosen so that the third richest quintile is fully compensated, and hence benefits the two first ones.

57. A scheme of giving each individual an annual sum of about 826,000 rials would return 20,407 billion rials to the rural area and 33,296 billion rials to the urban area. This would in total compensate for two thirds of the total household loss of surplus, leaving 26,852 billion rials for other purposes. A scheme of non-means-tested compensation would have strong effects on income redistribution and poverty alleviation. The poorest quintile in the urban areas and the poorest two quintiles in the rural areas would be better off than before the rise in energy prices. The richest two quintiles in both urban and rural areas would be noticeably worse off even with the compensation.

58. The scheme of exact compensation for the poorest three quintiles of total households would cost the Government a sum equal to the households' loss of consumer surplus. This would cost the much smaller sum of 28,551 billion rials, leaving the Government 54,146 billion rials for other purposes. Such a scheme would leave 60 percent of the population unchanged as regards the rise in energy prices, and 40 percent worse off. The impracticalities of such a means-tested scheme (contingent on income or total expenditure levels) means that a compromise between the two approaches might need to be sought. Such a scheme could give the same flat rate payment (960,915 rials) to each person in the lowest three quintiles of the population. This would have a

total cost of 37,476 billion rials, leaving 43,079 billion rials to the Government. The poorest receive more than the loss in consumer surplus while those at the upper end of the third quintile will receive less than their loss in consumer surplus. Table.8 summarizes the alternatives. The flat rate schemes do more to reduce the severity of than exact compensation, and would reduce the incidence of poverty by pulling some people over the poverty threshold by more than compensating those near the threshold for their loss of surplus.

Table 8. Costs and benefits of alternative compensation schemes (billion rials)

	Exact compensation to lowest three quintiles	Non-means-tested flat rate compensation	Flat rate compensation that meets full compensation of third quintile
Cost of compensation	28,551	53,703	37,476
Share of compensation in loss of surplus	35	66.6	47
Revenue remaining to government	52,000	26,852	43,079

Source: World Bank staff estimates

59. The scheme of using a flat rate for the lowest three quintiles requires some method of identifying the members of such groups, which probably does not exist at present. Exact compensation, with its requirement to means-test all members of society and to return varying amounts to the different members, is probably infeasible. The scheme proposed has three stages:

60. In the first stage, for a period of two years, all persons would receive a flat rate sum. This would be the easiest to administer since there is already a food (rice, sugar, etc..) voucher scheme for all population already in use. A coupon, redeemable for cash (see below) at a bank, for the sum indicated, would be sent to individuals at regular intervals, perhaps quarterly.

61. After two years, in which time a method of targeting those in the lower three quintiles could be developed, the flat rate sum would be restricted just to the targeted needy groups. This would free a substantial sum for other purposes.

62. After two more years the compensation specifically related to the impact of energy price rises would be completely removed, but would be replaced by transfers to the social safety net. This period would give time to design such a scheme and to identify the individuals in need.

Detailed possible phasing scheme

63. The phasing of either the increase of the energy prices, or the compensation or both is critical for the efficiency of the reform of the energy price system, for political and social acceptance, and for feasibility of implementation.

64. A preferable combination would be of a quick adjustment of prices (two to three years) and a phased compensation process over a period of 5-to-7 years. This would permit time for defining the targeting mechanisms and refining the institutional structure for the delivery mechanisms of the alternative social safety net structure the government intends to undertake,

and would also provide a critical mass of revenues accumulation for its financing. This would lower the cost shock and, at the same time, allow for more progress in the reform of the exchange rate and trade reforms to take place, so as to lessen the effect of the de-protection of the economy, and smooth the transition from an input-subsidy-based protection system to a tariff and competitive exchange regime based one. This would allow enterprises to adjust their output prices and inventories to the new costs. Finally, this could also allow enterprises to undertake adjustment measures ranging from more efficient energy use to technological substitution and conservation measures.

Table 9. Phased energy price increase and energy resource allocation (billion rials)

Year/1	Revenue (billion rials)	Type of compensation scheme Used	Compensation	Transfer to other SSN schemes	Support for economic costs of reforms (to be specified)	Fiscal savings (billion rials)	Fiscal savings (of subsidies)
2003-04/1	81,000	Flat compensation for all	53,703		2,000	25,300	31
2004-05	92,000	Flat compensation for all	53,703		2000	36,300	39
2005-06	105,000	Flat compensation for low 3 Q	53,703		2000	49,300	47
2006-07	120,000	Transfer to consolidated SSN		15,000	1000	104,000	87
2007-08	137,000	Transfer to consolidated SSN	0	15,000	1000	121,000	88
2008-09	157,000	Transfer to consolidated SSN	0	15,000	0	142,000	90
2009-10	199,000	Transfer to consolidated SSN	0	15,000	0	184,000	92

Source: World Bank Staff estimates

1/ The year 2003 is chosen indicatively as the starting year of the reform so that we have a base year for the calculations. The calculations should be adjusted to the starting year chosen by the authorities

65. We present an indicative scheme based on one time price adjustment and seven years phased compensation. This could be transformed into any combination of price adjustment length and different phasing and intensity of compensation. The indicative scheme shown here allows for a flat compensation for energy prices of about 826,000 rials for each Iranian citizen in the first three years (table 9). This corresponds to a flat compensation (making it technically feasible) that meets full compensation of the third quintile. It improves the welfare of the two first quintiles, meeting the criteria of savings, technical feasibility and social redistribution and fairness. It satisfies more than the median voter, meeting the criterion of political feasibility. By the end of the third year, Iran could finish its reform of the social safety net system to permit a more targeted transfer.

66. Over the first three years of the reform, Iran would also have made progress in improving its public transport system and in adjusting to a more efficient use of energy. This could happen through improvements in technology or (and more importantly) through the expected rational adjustment in consumption by individuals and industries (price and income elasticity effects). So, starting in the fourth year, Iran could shift away from direct compensation toward transferring a reduced amount to a consolidated social safety net system that it targets the poor.

The energy-price specific compensation scheme should therefore be consolidated with the general SSN structure. Up to 15,000 billions rials could therefore be assigned to this SSN, to be gradually reduced as growth and employment pick up.

67. This reduction should gradually bring back the level of government savings from oil to the optimal level calculated earlier—and bring back the use of oil and gas wealth to its sustainable level. The drop in compensation should be also partially met by the rationalization of other government expenditures. The fiscal savings should be directed to investment that could gradually shift away Iran's system of income distribution from charity and direct transfer based to employment and growth based one.

68. The perceived advantages of this proposed scheme are several: (i) it is easy to implement this scheme in a short period of time through a voucher system equivalent to what has been used before, piggybacking on the institutional structures of past voucher experiences and minimizing the otherwise high institution building transaction cost; (ii) it is an income re-distributive scheme because it favors the poor; (iii) it has the advantage to deflect the potential discontent of those in the upper classes for whom voice and political weight is generally higher; (iv) it allows for enough time to build and refine the SSN structure; (v) to further improve the targeting, the authorities could also make an appeal to those in the richer quintiles to voluntarily forego the collection of these vouchers in the benefit of the rest of the SSN.

69. **A suggestion of how to withdraw out from the phased adjustment itself:** A very critical issue is how to withdraw from this compensation scheme itself? Experience shows that it is always easier to create a compensation scheme than to withdraw out of it. Iran will gain to have a coherent withdrawal strategy and to announce it upfront. The most feasible one in our point of view is to fix the phased compensation amount in nominal terms, i.e., in a defined amount of cash in nominal rials, and not in real values, like the case of food vouchers denominated in fixed quantities of rice and other staples. The reason is that by fixing the compensation in nominal terms it allows for an automatic gradual phasing out through inflation and also through the fact that we avoid the growth in subsidies through higher domestic demand. -This is generally easier to implement both technically and politically than an announced further reduction. It should be emphasized, however, that this exit strategy should be announced and explained upfront. A public relations strategy to explain the reform is central to its success, including explaining the inefficiency and equity of the actual system, the rationale for the reform, the phasing mechanisms, the compensation rationale and mechanism and the exit strategy.

70. **Monitoring the reform:** It is critical that the reform implementation and the price transmission mechanism of the costs related to the energy price reform be closely monitored. The compensation mechanisms are based on the fact that consumers are compensated on direct and indirect effects of energy price adjustment. This supposes that enterprises that use energy as input transmit fully the cost of the energy price adjustment in the final price of the goods they produce. Some of these enterprises, under the pressure of competition, will be pushed to rationalize better the use of energy, be it through change in technology or rational use. Public enterprises may have less incentives to do so. In such a case, their loss may accumulate as arrears and budget liabilities that will end up being paid by the budget anyway. In such a case, the

elimination of subsidies is doubly compensated both at the level of the consumer and as arrears to public enterprises. Dis-savings rather than savings may result. It is therefore critical to build a monitoring system for public enterprises to ensure that their prices reflect the energy price increase.⁷

Fostering trade and investment

71. Iran's trade barriers have generally risen when foreign exchange has become scarce, and fallen when it has been abundant. Before the implementation of reforms that are part of the third plans, Iran's nontariff barriers to trade were among the most extensive in the world. But in the last two years, higher oil prices have allowed the government to pay off arrears of debt, and the availability of foreign exchange has greatly increased. So the government has once again eased controls.

72. Much progress has been made in converting NTBs into tariffs. In March 2002 only about 350 items (in a classification of Iran's six-digit code, which contains 5,113 items altogether) will remain subject to restrictive licensing requirements, compared with almost 4,000 in March 2000. Some of the remaining licensing requirements are for religious, genetic, security, and quarantine purposes and will not be removed. And some protect domestic producers of garments, textiles, and automobiles.

73. The Ministry of Industry and Mines has estimated that the tariff equivalent of the tariff and nontariff barriers in place in March 2000 on the items then under its control is 37 percent. Since the process of removing NTBs has so far merely involved their replacement by equivalent import taxes, the average for March 2000 is probably a fairly good approximation of the total tariff and nontariff barriers still in place in March 2002.

74. We strongly support the government's policy of replacing nontariff barriers by their tariff equivalents, except in the case of goods banned for non-economic reasons. We therefore recommend that this process be completed as quickly as possible. The model that the World Bank has constructed for analyzing policy options in Iran predicts that this reform would increase aggregate real consumption by 3.4 percent. Most of these gains are due to the fact that the revenue from tariffs accrues to the government and can be put to good uses, whereas the value of import licenses is dissipated in wasteful competition for the licenses.

75. We also strongly recommend removing technical regulations or sanitary and phytosanitary standards that discriminate between domestic products and imports. Adopting best practice regulatory procedures in these cases is urged because of the large inefficiencies caused by high trade barriers. It would align Iran's practices with WTO principles for the Technical Barriers to Trade Agreement and the Agreement on Sanitary and Phytosanitary Standards.

⁷ World Bank Staff has initiated work on this area with the Research Department of the Central Bank involving 30 largest public enterprises, that could be the basis for such a monitoring system.

76. There is also a strong case for reducing import taxes, rather than merely replacing nontariff barriers by their import tax equivalents. Iran's foreign exchange reserves situation has eased significantly and its external balances improved on a more structural way helped by the significant lowering of its indebtedness and its repayments requirement. This provides a favourable ground for moving forward with its trade liberalization agenda by harmonizing and lowering and reversing the trade restrictions that the foreign exchange crisis in the mid 1990s has triggered. Accelerated trade liberalization will also ease the reported pressure toward an appreciation of the Rial. According to our CGE model, the aggregate real consumption gain due to replacing existing NTBs by a uniform tariff of 15 percent would be 5.5 percent of GDP. Since Iran's NTBs produced no revenue for the government, reducing tariffs would still leave revenue from trade taxes higher than before the reform, though lower than immediately after the replacement of NTBs by equivalent tariffs.

77. We recommend that the government announce a timetable for progressively reducing import taxes to achieve a uniform import tax of 15 percent by March 2005, as implied by the third plan's objectives of preparedness for joining the WTO. Deciding which import taxes will be reduced when is likely to involve much lobbying and uncertainty. To minimize these problems the government could announce that, beginning in March 2003, only (say) four import tax bands will exist, and it could announce the proportion of all items that must be in each band. This would truncate the period in which industry lobby groups could plead for special treatment. It could also help the government resist lobbying by making it impossible to raise the protective tariffs for one industry without lowering them for others.

Liberalizing the finance sector

78. Rigid controls and state ownership of financial institutions make Iran one of the few remaining examples of the financial repression. All the major Iranian banks are state-owned and collectively they hold 99 percent of the assets of the banking system. The direct controls of the central bank over the commercial banks have removed most of their autonomy. They are subject to interest rate ceilings for both deposits and loans and to direct controls on the allocation of loans among sectors. In addition, the central bank must approve every individual large loan. The insurance sector is also monopolized by state-owned firms whose rates are regulated.

79. Under the third plan, financial repression is being gradually lifted. Some important changes have already occurred, and others are planned. To make the financial sector more competitive and efficient, it will be necessary to allow foreign and private banks to compete on equal terms with Iranian banks and to remove the ceilings on deposit and lending rates and the direct controls on the allocation of bank loans by sector. The removal of ceilings and credit allocation controls would also enhance monetary policy—by allowing it to change credit conditions evenly across all sectors of the economy. Despite having been recently reduced, reserve requirements remain excessive, imposing a heavy implicit tax on bank intermediation. Similar, market-oriented reforms are needed in the insurance sector, and new legislation needs to improve the regulation of the stock market.

80. The liberalization of the financial sector is a prerequisite for the successful development of the private sector, and therefore for Iran's prosperity. But it also poses serious risks, as the experience of newly emerging market economies makes obvious. Bank supervisors now focus on making sure that banks comply with the regulations on credit allocation by sector. In the future, they should focus on bank capacity to evaluate and manage risk.

81. In Iran's repressed financial system, low interest rate ceilings and directives on credit allocation have greatly inhibited the banks' ability to operate efficiently, and state ownership has reduced the incentives for them to do so. Over the past five years, the reported pre-tax profitability of the main commercial banks has been only about 0.2 percent of their total assets. The real situation is even worse than the reported situation because current accounting practices are too much lenient for classifying and making provisions for bad and doubtful loans. Depending on the assumptions about impairment of loans, the injection of taxpayer money needed to raise bank capital to the international norm of 8 percent of risk-weighted assets is estimated to be between Rls 5 trillion and 12 trillion.

82. In addition to the losses that have already been acknowledged—or that would have to be acknowledged if rigorous accounting standards were followed—the banks face the problem that many of the state-controlled firms that dominate their loan portfolios depend on energy subsidies and access to capital goods imported at the old official exchange rate, which used to be only a small fraction of the real cost of foreign exchange.

83. The risks of financial liberalization would be reduced by allowing foreign banks to operate in Iran and to buy state banks when privatization occurs. A first step towards encouraging entry by foreign banks is a proposed joint-venture Saudi-Iranian investment bank—to be established abroad but with an office in one of the Free Trade Zones.

84. The banks and other large SOEs that are not immediately privatized should be audited to determine their net worth in the new environment of gradually diminishing subsidies and freer trade. When the audits have been completed, the government should take-over part of SOE debts to banks. SOE managers cannot be blamed for losses incurred as a result of the government's removal of energy and other input subsidies. And bank managers cannot be blamed for following the regulations that forced them to lend to SOEs at interest rates that did not reflect the true risks.

85. Measures are already in place to use tax revenue to boost bank capital by Rls 5 trillion. The danger in bank bailouts is that one bailout may lead to expectations of another. If banks are sold to new owners, the market value of banks that are initially technically insolvent can be made positive by having the government take over the bad debts of SOEs before their privatization. Since this does not involve bailing out the new owners, no moral hazard is created, and the primary responsibility for improving governance rests with the new owners. In contrast, if banks are recapitalized without any change in ownership or management, there is a great danger of creating moral hazard. To reduce this danger, it is necessary to set defined performance targets for bank managers and to audit their performance regularly. Iran has made progress in setting up and implementing a capacity development program for banking supervision.

86. The non-bank financial sector, though much smaller than the banking sector, is also experiencing rapid change. The Tehran Stock Exchange (TSE) has grown rapidly but total equity market capitalization is still well below many relevant comparators. Excessively restrictive regulation of the banks, responsible for the rapid growth of unregulated investment companies, has boosted informal finance—described as bazaar finance, but not confined to the traditional markets.

87. The present underdeveloped state of financial services and non-bank finance will have to be corrected for the Iranian economy to realize its full potential. Even-handed regulation of institutions that perform similar functions is necessary to ensure the efficient development of the whole financial sector. This will be achieved in part by liberalizing the banking sector and in part by extending prudential regulation to the non-bank financial sector. In addition to protecting small or gullible investors in unregulated collective savings scheme, there is also a need to expand the range of collective savings media by removing impediments to establishing open-end mutual funds, which have proved to be excellent instruments for pooling small savings for investment in stock exchanges around the world.

Improving the environment for private sector development

88. The Public sector has been the backbone of the Iranian economic growth, and employment provision over the past. Promoted by the import substitution drive and financed by oil wealth in the 1950s and 1960s and sustained by the logic of war economy and revolution after, it is showing increasingly its limits in terms of growth and employment. To meet the challenge of unemployment, the additional growth required in intensity and quality need to come from the private sector. Public sector has already an excessive over-employment and productivity of labor is low.

89. Iran has chosen the path of a step-by-step path for its transition by opposition to a big bang transition model like in the former soviet bloc. More like China, Iran is operating its economic transition within the continuation of the same political and institutional system with a high weight put on the minimization of the political and economic costs and the integrity of its social achievement and the priority given to “social justice” as a major pillar of its political ideology.

90. There are also other objective factors that render a massive privatization of the public sector problematic: (i) Iran’s public sector has one of the highest concentration rates consisting of very large enterprises making it difficult to find demand for their privatization in particular in light of the absence of foreign investors, as Iran is still a closed economy with a high perceived risk by foreign investors; (iii) Iran has not yet sorted out all the distortions plugging its economy. For example, high input subsidies like energy subsidies, when eliminated will impact dramatically on the profitability potential and cost profile of many enterprises in various sectors. This sheds uncertainty on the value and valuation of these enterprises; (iv) unemployment is high and is at an ascending phase given the pressure from the supply side, elevating privatization’s social and political costs. For these reasons among others, it is rather unlikely that private sector

development will be build on the vestiges of the public sector, rather, the two sectors will have to coexist for a while.

91. How then the development of the private sector within this paradigm of the coexistence of public and private sector can be conceived? A two-fold strategy:

92. For Public Sector Enterprises, the strategy is: (i) to improve their governance; catalogue them, and start privatization on a step by step basis starting with those companies that are profitable, have potential buyers domestically, the privatization of which will not need a high labor shedding at the start .

93. For Private sector development: ensure a level playing field between public and private sectors by instituting and enforcing fair access to credit and foreign exchange allocation, fair tax treatment and elimination of privileges, fair access to markets in particular to public administration markets (public enterprises have a priority now in providing for public sector and administration purchases); institute and enforce a new anti-trust legislation that shields private sector from monopolistic (economic and political) power of the public sector and Bonyads, further trade reform, and competitive financial sector, and reform the labor law.

94. Since the announcement of the privatization program in the third plan, a new privatization agency has been set up in the Ministry of Finance and the parliament has promulgated regulations governing privatization. Note 35 of the 1998–99 Budget Law enjoins the government to reduce its direct role in productive activities and to promote private investment through the dissolution, transfer, and direct sale of shares of public enterprises and governmental organizations. The privatization committee, under the supervision of the President, has reviewed 1,039 public sector enterprises for privatization: 217 are to remain public, 87 will be liquidated, and 735 are slated for privatization.

95. In the first half of the year 2000–01, the government sold shares of public enterprises worth Rls 2,040 billion (about 0.5% of GDP) in the Tehran Stock Exchange. It has ceded to workers shares worth Rls 100 billion. Shares worth Rls 1,800 billion are being put up for sale for the next fiscal year. The Oil Ministry announced that it will privatize 23 of its oil sector subsidiaries during the third plan, including the National Iranian Tanker Company and the liquefied gas distribution centers.

96. For large-scale privatization to be successful in the future, the government must move forcefully on a broad front to implement the economic reforms identified in this report: phasing out subsidies, ending financial repression, reforming labor market regulations, and creating an economic environment favorable to the private sector.

97. But before undertaking large-scale privatization, the government should start with a more limited small-scale privatization using the mandate already available to it. Successful small-scale privatization would generate investor and public confidence and help build a momentum for large-scale privatization and the remainder of the government's plans for broad economic reform. In this first phase, small firms and those in which the state does not have a controlling

share would be sold at competitive auctions to strategic investors. Managers and employees could be given the right to buy, if they can match the highest bids.

98. While small-scale privatization is occurring, and while more basic reforms are progressing, the government should put in place the prerequisites for successful large-scale privatization. One prerequisite is a comprehensive catalog, by type of ownership structure, of all the enterprises owned or partly owned by the government or by bodies wholly or partly controlled by it. Such a catalog would need to remove existing ambiguities in the definitions of 'public' and 'private' companies. We recommend a narrow definition of a private company that would exclude those owned by the foundations or by holding companies controlled by government entities. To be successful, privatization must transfer managerial control to the private sector, not merely sell off minority shareholdings in companies that remain under the control of the government. The removal of licensing and exchange control restrictions on foreign direct and portfolio investment is needed both to allow foreign investors to buy SOEs, and as a means of increasing the TSE's liquidity.

99. Before large-scale privatization, the government should do everything it can to reduce the uncertainties facing potential new buyers. One way of doing this is for it to make an explicit announcement that it, and its agencies, will not undertake any fresh investments in certain identified sectors. That would assuage concerns of private buyers about having to face future competition from subsidized public enterprises.

100. A second way of reducing uncertainties is for the government to restructure SOE debts to the banks before privatization. Many SOEs have debts to the commercial banks that would be classified as non-performing under best-practice accounting procedures.

101. Also important for private sector development is to protect the private sector from past public sector predatory behavior and to ensure a level playing field for the two sectors. That means:

- Fair access to credit (credit allocation, foreign exchange allocation).
- Fair tax treatment and the elimination of privileges.
- Fair access to markets, particularly to public administration markets (public enterprises now have a priority in public sector and administration purchases).
- New anti-trust legislation to shield the private sector from monopolistic (economic and political) power of the public sector and foundations.

102. Reforms to the environment for private sector companies that are needed specifically to facilitate privatization are the liberalization of the financial sector and of the labor law. The labor law prevents firms making workers. For private enterprise to be able to operate efficiently, this must be changed, and the amended laws on redundancy provisions should be set out before large scale privatization occurs, so that potential buyers know what liabilities to former employees they are taking on. If the labor law is amended to allow workers to be made redundant, and if firms that make workers redundant must then give them one month's pay for every year of service (as we recommend below), it is likely that average retrenchment costs per worker will be

slightly less than \$2,000. If 100,000 of Iran's 1.5 million SOE employees were retrenched, the cost would be \$200 million, or between 2 and 4 percent of the likely proceeds from privatization.

103. To sum up, then, Iran is facing a daunting challenge of a high and growing unemployment problem fueled by the coming to working age of more skilled younger people with high expectation and impatience. To meet this challenge Iran needs a much higher growth that is gender inclusive. For this Iran needs much higher investment and savings and a more market and private sector oriented economy. Iran is an oil wealthy developing economy. It has used in the past this wealth more in consumption than in capital accumulation. Most of this wealth has been distributed in the form of energy subsidies that are inefficient and ineffective both in terms of growth and distribution. Iran's model of distribution before growth has exhausted growth potential and is no longer sustainable. It needs to shift to a growth-with-distribution strategy where growth drives social distribution and higher welfare. Using judiciously its exhaustible oil wealth would provide the needed financing of the required investment needed to meet its growth and employment challenges. Iran's distortions, such as energy subsidies which account for more than 10 percent of GDP, are in the same time unused slacks for an auto-financed transition to a market economy led by the private sector.

104. To do this, however, it will have to liberalize the pricing system—freeing trade and foreign exchange, and making the social safety net more efficient. It will also have to promote a more favorable environment for the private sector—gradually retrenching public enterprises, preventing them from preying on private firms, and making the financial sector more diverse and competitive.

105. Will this be easy? No. Coming up with solutions that are technically feasible and politically and socially palatable will be very demanding—especially with the goals of reducing unemployment and poverty. Will it be possible? Yes. Iran's external debt is only about 7 percent of GDP. Its external balances are stable and improved structurally. It has a good human capital stock that it managed to develop in spite of the dramatic shocks that marred its recent history. And poverty, estimated at 40 percent of the populace before the revolution, is now down to around 20 percent. If the country can stay the course of reform, without backtracking, it can move from a controlled oil-based economy to a modern developed economy—in little more than a generation.

Part 1. The Challenges

Chapter 1. Growth and Social Achievements Since the Revolution

1.1 The shocks that marred Iran over the past 25 years—including the revolutionary disruptions, the war with Iraq, the costly embargo that blocked the reconstruction of Iran’s oil and gas production and commercialization capacity—have deepened macroeconomic instability, destroyed capital stock, and disrupted institutions.

1.2 In the mid-1990s, economic mismanagement and difficult access to refinancing forced Iran to finance the repayment of its debt through deep cuts in imports. That required massive recourse to trade restrictions and foreign exchange controls, including multiple exchange rates and nontariff barriers covering two-thirds of the of the harmonized tariff system. These distortions added to the heavy subsidy system under the declared agenda of protecting the poor, including the large and inefficient energy consumption subsidy, which averaged more than 10 percent of GDP.

1.3 With this forced external finance adjustment that went on over five years, Iran ended up with low indebtedness of about 7 percent of GDP at the end of the 1990s. Aided by the fiscal discipline imposed in the difficult years, Iran has restored its external balances and strengthened its debt sustainability, freeing about \$4 billion a year of external resources of what it used to pay yearly to service its debts in the second half of the 1990s.

1.4 Iran’s social agenda has had priority since the revolution, and in spite of all the external and internal financial difficulties, Iran’s achievements in education, health, and poverty reduction have been impressive. Social programs were effective in reaching the poor, but Iran’s indirect subsidies—particularly the huge energy subsidies—benefited the richest decile times more than the poorest. These subsidies, in addition to their inefficiencies and large deadweight losses, came from excess consumption from oil wealth. The forgone savings, if invested, would have generated much higher growth than realized—and would have supported the poor through employment rather than direct assistance. This is even more so because of the link between unemployment and poverty: 40 percent of heads of the poorest decile of household are unemployed.

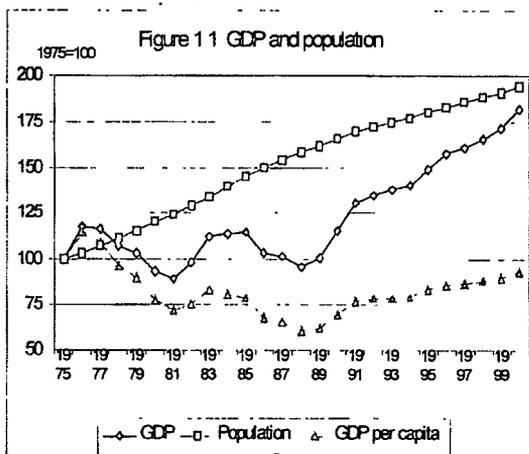
1.5 Iran’s “distribution before growth” is proving unsustainable. By exhausting growth prospects, the demand for welfare assistance will bypass the capacity to provide it. Iran needs to shift from a “distribution before growth model” to a “distribution with growth model.”

1.6 More than ever, Iran faces a major unemployment problem. If not contained and addressed soon, it could threaten social and economic stability. Not only does Iran face a *high labor supply growth* driven by the demographic boom of the 1980s and before but

the growth of this labor supply will be maintained beyond the demographic hump. driven by the increase in women's labor market participation. The success of Iran's drive for universal education, is changing the structure of the labor market: increasing labor supply, higher skills, and larger share of women in the labor force. Meeting these challenges requires; from the labor demand side, growth that is faster, more capital-intensive, and in sectors accessible to women participation.

1.7 The needed growth to respond to these challenges is even higher than the ambitious 6 percent projected in the third five-year development plan for 2000-2005. Reaching it requires transforming the economy in three ways:

- o Pricing reforms to eliminate distortions and reestablish a market-based signaling system for more efficient resource allocation.
- o Structural reforms, particularly for the financial sector, the public sector, and the private sector development environment.
- o Major saving mobilization effort to finance growth, based on optimal management of the oil wealth.

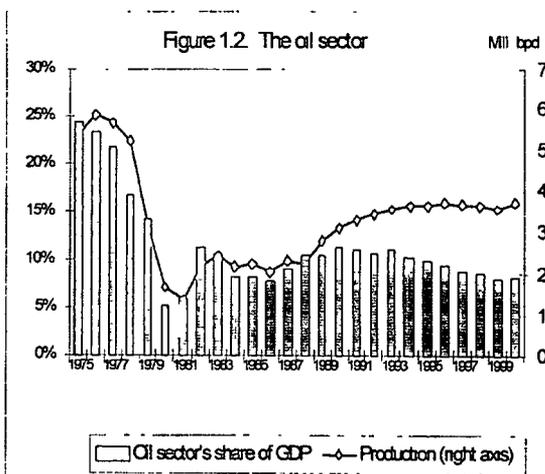


1977-1980: The revolution and the destructive war with Iraq

1.8 Economic activity began to decline in 1977 as the turmoil of the revolution started. The war with Iraq deepened this decline and increased instability. By the end of the war in 1988 real GDP was about the same as in 1975, while population had increased by about 60 percent, reducing GDP per capita by 40 percent (figure 1.1).

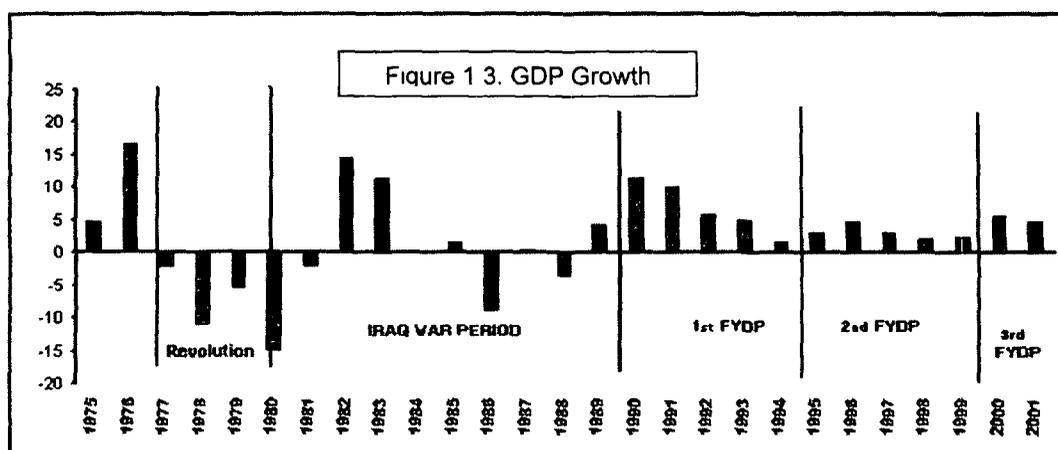
1.9 The steep decline in GDP was caused in large part by a collapse of the oil sector, with the destruction of its production facilities and the obstruction of its commercialization. By 1981 oil production had plummeted to about 1.4 million barrels a day, down from 5.8 million five years earlier (figure 1.2). The oil sectors' share of GDP declined in parallel, from about 25 percent in 1976 to a low of 5 percent in 1981.

Oil production has subsequently



recovered to about 3.5 million barrels a day, but oil development remains constrained by the US embargo imposed in 1987 and tightened in 1996.

1.10 The non-oil sector was setback by the start of the revolution and then the Iraq war. Capital flight increased and investment dried up. The non-oil capital stock declined by 27 percent during the war (1980 -1988), on top of the 22 percent decline for the oil capital stock. The destruction of infrastructure and productive assets and the massive relocation of people away from zones affected by the war hurt production capacity. Foreign trade also suffered, having to be re-routed through Turkey and the Soviet Union. The purchase of military equipment, coupled with sharply lower foreign exchange earnings, was managed through extensive restrictions on imports.



1.11 During the war, the state stepped up direct management of the economy through price-setting, rationing, and trade and foreign exchange controls. It also took on more direct management of production. The rial was pegged to the SDR at a basic official rate of 92.3 to 1, or about 70 to the dollar. By 1988 this rate has diverged from the free market rate and was 15 to 20 times more depreciated. To deal with foreign exchange shortages, several other rates were introduced in 1985. The bulk of transactions were licensed at the overvalued basic official rate, and local prices were controlled, leading to distorted prices and rationing.

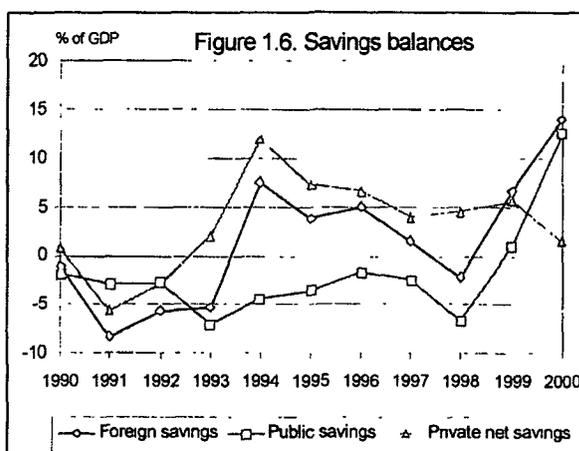
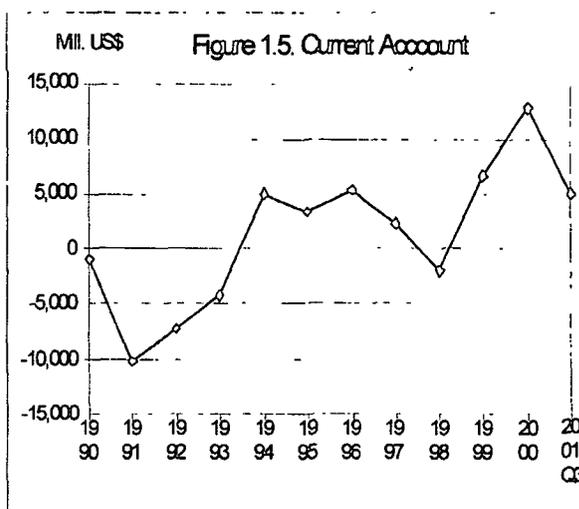
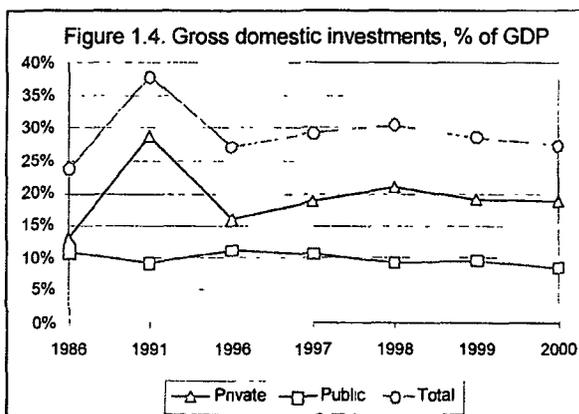
Bucking the worldwide marketization trend of the 1980s, the state's role in the economy expanded greatly. The shaky private banking system, the depressed industry, and the radical economic restructuring resulted in the wholesale takeover of private banks and large manufacturing firms, putting 60 percent of manufacturing in public hands. Hundreds of private companies, farms, hotels, and other properties were confiscated from wealthy pro-Pahlavi businessmen and incorporated in bonyads (foundations).

1989-94: mismanaged reconstruction, macro economic imbalances, and aborted attempts to reform

1.12 Iran's first five-year plan for 1989-94 outlined an ambitious reconstruction program and the pursuit of liberalization based on reinvigorating the private sector, rehabilitating markets and correcting the distortions that accumulated over the 1980s. Policy reforms included gradually eliminating multiple exchange rates, removing many nontariff barriers, decontrolling most domestic prices, lowering income tax rates, eliminating bank credit ceilings, and engaging on a program to divest public enterprises.

1.13 Investment surged from around 25 percent of GDP in 1986 to more than 35 percent in 1991 (figure 1.4). But serious macroeconomic imbalances emerged. The fiscal expansion brought large fiscal deficits: 9 percent of GDP in 1988, 4 percent in 1989, 6 percent in 1993 and 5 percent in 1994, far from the balanced budgets planned. The current account deficit rose from less than \$1 billion in 1990, to an accumulated deficit of \$21.8 billion in 1991-93 (figure 1.5).

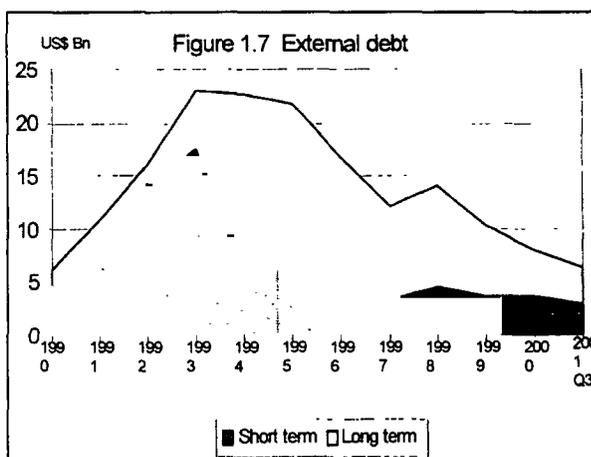
1.14 The deterioration of the current account in 1989-94 was influenced largely by the substantial growth in imports, up by an average of 26 percent a year in 1990-93. Fuelling the rise were reconstruction-driven demand and the previous unmet demand for consumer goods. The overvalued exchange rate kept the rial



price of imported goods low, and the expectation of a drastic devaluation – which eventually came in March 1993 – bunched imports in 1991 and 1992. Lower oil receipts, from lower prices, compounded the difficulties.

1.15 The current account deficit rapidly built up external debt to \$23 billion in 1993 (at the free market exchange rate) about 50 percent of GDP. Although not excessive by international standards, the debt was short in maturity with commercial borrowing as the only option, short-term debt made up 76 percent Iran's total external debt (figures 1.6 and 1.7). The willingness of the creditor's to lend was based on Iran's record of debt service even during the war and its initially low levels of debt. Financing long-term reconstruction investment projects with short-term borrowing was a mistake that would strain the macroeconomic situation for all of the 1990s.

1.16 The short maturities carried large refinancing requirements, compared with export revenues and foreign reserves, and eventually, under the circumstances, were not to be met. Foreign exchange earnings from oil exports were declining, and imports were depleting foreign reserves. By the end of 1993 the accumulated arrears stood at \$12.1 billion. Despite some relief from negotiated rescheduling, Iran was on the verge of a full-blown debt crisis.



1.17 The prospect of a default led the government to reverse most of the reforms implemented in previous years. In December 1993, it abandoned the floating exchange rate regime, fixing the official rate at Rsl1,750 to the dollar. By March 1994 the spread between the offshore market rate and the official rate exceeded 40 percent. To support the fixed official rate, foreign exchange regulation was tightened, and central allocation of foreign exchange reintroduced. In May 1994 a second official exchange rate, the export rate, was introduced, applying to all non-oil exports and to imports on a "positive list." Concurrently, administratively allocating foreign exchange for imports was reintroduced, and other improvements in the trade regime were reversed.

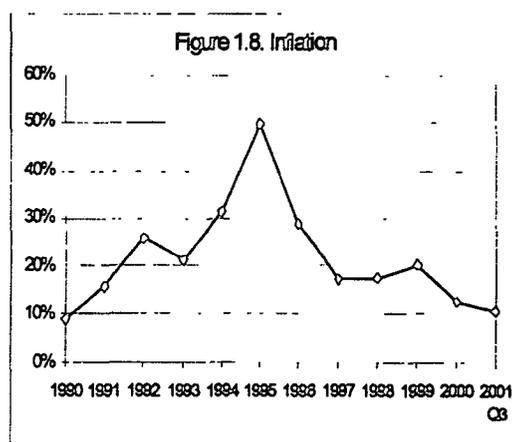
1.18 The restrictions on foreign trade and the exchange rate drastically compressed imports, from US\$19.2 billion in 1993 to US\$12.6 billion in 1994, a drop of 35 percent. True, the change in policy kept a debt default at bay, but it had large costs to the economy: GDP per capita declined in 1994 for the first year since the end of the war.

1995-2000: debt crisis management, delayed reforms, and stalled growth

1.19 Managing the debt crisis marred the whole period of the second plan, leaving little room for moving ahead with the announced reform. The economy entered into a “muddle through” phase, with growth averaging 2.7 percent a year, well below the 5.1 percent projected. In addition to the structural impediments, growth was constrained mostly by the compression of imports (up to 50 percent in some years) to make room for external debt repayments.

1.20 The unstable macroeconomic situation left little leeway to address structural reforms. Macroeconomic instability was further heightened with the economic and financial sanctions on Iran, culminating with the Iran Libya Sanction Act in 1996. This dampened expectations and triggered a run on foreign exchange and consumption goods markets, inducing a sharp depreciation of the free exchange rate to Rls 6,200 per dollar (about 50 percent), and a surge in consumer prices of 14 percent in April-May 1996, bringing inflation for the year to 50 percent. In yet another attempt to control the foreign exchange crisis, the authorities raised the export repatriation and surrender requirement to 100 percent, and ordered all foreign exchange transactions to go through the banking system, effectively ending the non-bank foreign exchange market. In later years of the plan, the bunching of repayments of the rescheduled debt was again exacerbated by a sharp drop in oil prices in 1998/99, inducing a second external payment crisis and another bilateral rescheduling. The collapse in oil revenues also led to a fiscal deficit of 6.7 percent of GDP in 1998/99, despite drastic cuts in capital expenditures and delays in public investment projects.

1.21 Iran ended up paying its debt by the end of the 1990s. Aided by the fiscal restraint in the difficult years and by the recovery of oil prices, Iran has restored external and internal balances. More important, the recovered stability has strengthened by the fall in debt (now at 7 percent of GDP) and debt repayment (now \$4 billion a year less than the average of the second part of the 1990s). That has freed more external resources for other uses and given more room to move ahead with the long-awaited reforms.



2000-2005: Regain macroeconomic stability and resume the reforms

1.22 The Iranian economy is its most stable since the end of the 1970s. External and internal balances have improved significantly with large surpluses, inflation below 15 percent, and economic growth of more than 5 percent—not experienced since the short period after the war (table 1.1).

1.23 The surge in oil prices in 1999 and 2000 facilitated much of this recovery. Cumulative current account surpluses in 1999-2002 amounted to \$26 billion, or 26 percent of GDP. Gross official foreign reserves were \$19 billion, compared with external debt of about \$7 billion.

1.24 The fiscal position has also improved mainly because of higher oil revenues but, more importantly, because of a more prudent fiscal stance. Iran adopted indeed a balanced fiscal rule based on balancing the budget around projected oil receipts over the years of the plan. Oil revenues in excess of those projected went into an oil stabilization fund. The plan's revenue projections were based on oil prices of \$15-17 a barrel. By the end of 2001-02, the fund accumulated about \$7.7 billion.

1.25 Another sign of stabilization in the Iranian economy is the gradual decline in inflation rate. Having hovered around 20 percent from 1997 to 1999, it dropped to 12.6 percent in 2000/01, then declined to 11.6 percent at the end of 2001/02 (figure 1.8).

Shifting from distribution-before-growth to distribution-with-growth

1.26 Since the revolution, Iran has given strong and special emphasis to human development, social protection, and “social justice.” And it has made significant progress. With near universal education, extensive health coverage, and an active redistribution strategy through direct transfers and indirect subsidies, the proportion of the population living under the poverty line has fallen from 47 percent in 1978 to 19 percent today. Almost all social indicators have improved to the point where Iran now ranks at or near the top of its comparators (tables 1.2 and 1.3). Of note is the closing of the gender gap in education: with only small differences in enrollment rates for boys and girls, in literacy, and in political representation (figure 1.9).

MEDIUM TERM FRAMEWORK FOR TRANSITION
CONVERTING OIL WEALTH TO DEVELOPMENT

Table 1.1. Key economic indicators for 1991-2002

	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03
	Annual percentage change											
Real GDP at factor	101	59	49	16	32	47	31	21	36	57	48	53
Inflation												
CPI (averag)	20.7	24.4	22.9	35.2	49.4	23.2	17.3	18.1	20.1	12.6	11.4	15.0
GDP deflator at factor	23.6	24.9	38.4	35.8	39.9	24.5	15.3	11.8	27.4	25.4	11.3	21.9
Broad	25.0	24.7	34.8	29.4	36.8	36.8	10.1	19.6	20.2	30.5	25.8	22.9
	(n percent of GDP)											
Oil GDP	10.8	11.9	17.7	18.9	16.1	15.2	10.8	6.5	8.4	13.4	11.6	11.3
Nonoil GDP	89.2	88.1	82.3	81.1	83.9	84.8	89.2	93.5	91.6	86.6	88.4	88.7
Agricultur	22.4	23.2	20.7	21.1	22.2	20.3	20.1	22.1	20.9	18.9	19.1	19.2
Industr	19.5	19.5	18.7	18.6	19.7	21.0	22.3	23.3	22.8	22.3	23.1	23.2
Service	47.3	45.5	42.8	41.4	42.1	43.5	46.8	48.1	47.8	45.4	46.2	46.3
	(n percent of GDP)											
Investment & Total	33.2	35.4	29.2	24.2	19.6	20.9	21.4	30.4	30.7	30.3	31.1	30.9
Gross national	24.9	29.8	23.6	32.0	23.4	26.0	23.6	28.1	37.1	43.7	35.9	34.1
Public	6.2	7.9	3.4	5.9	5.7	5.8	4.4	2.0	9.4	1.7	7.6	5.5
Private	18.6	21.9	20.2	26.0	17.8	20.2	19.2	26.1	27.7	26.6	28.3	28.6
	(In percent of GDP)											
Government Revenue	16.7	18.5	31.0	26.1	25.2	26.4	25.4	19.9	24.3	33.5	26.7	26.9
Oil & -oil	7.1	7.7	23.1	18.6	16.5	16.2	13.6	7.5	10.4	22.6	15.3	15.7
-oil	9.6	10.8	7.9	7.5	8.8	10.2	11.8	12.4	13.9	10.9	11.4	11.1
Total expenditure and lending	18.9	19.7	38.2	30.5	28.8	28.0	27.9	26.0	24.8	24.6	25.8	32.2
Earmarked	12.1	13.3	26.6	22.1	14.4	15.6	16.2	16.4	15.9	15.5	1.7	18.5
Foreign exchange	5.0	4.4	7.7	7.0	7.2	7.4	6.9	5.4	5.8	5.3	4.1	6.2
Net Extrabudgetary	1.8	1.9	1.9	1.4	2.0	2.0	2.3	2.7	2.7	2.9	3.4	3.4
Coverage of Overall (deficit-))	-2.2	-1.2	-7.2	-4.5	-3.6	-1.6	-2.5	-6.7	-0.6	8.8	0.9	-5.2
Excluding									0.6	-0.9	-8.1	
	(In millions of US dollars)											
External Current	-10248	-7304	-4215	4957	3358	5232	2213	-2140	6589	12634	5432	3486
Trade	-6529	-3406	-1207	6818	5586	7402	4258	-1168	7597	13375	5578	3937
Exports, o.b.	18661	19868	18080	19435	18360	22391	18381	13118	21030	28461	23716	25761
Imports, o.b.	-25190	-23274	-19287	-12617	-12774	-14989	-14123	-14286	-13433	-15086	-18138	-21824
Services and Capital	-3719	-3898	-3008	-1861	-2228	-2170	-2045	-972	-1008	-741	-146	-451
Overall	5460	3734	-7512	-6918	-2559	-6490	-3015	293	-4811	-4897	-552	1981
Gross (months of import)	-2099	-2340	-11727	-1961	411	2761	-4004	-1527	2086	6880	4941	5466
Current account (% of)	3036	2860	2939	3861	6748	9433	5263	3730	5647	12527	17468	22934
	(In millions of US dollars)											
Total External Debt	10880	15977	23039	22737	21879	16703	11823	13999	10815	7952	7214	7345
Medium & Long	2065	1716	5423	16030	15430	11948	8469	9496	6811	4274	4562	5693
Short	8815	14261	17616	6707	64494	4755	3354	4503	4004	3678	2652	1652
Debt to GDP (%)	8.9	12.2	28.7	34.5	25.0	16.0	10.2	12.4	10.5	8.4	6.3	6.8
Debt to Exports (%)	58.3	80.4	127.4	117.0	119.2	74.6	64.3	106.7	51.4	27.9	30.4	28.5
Debt Service (%)	1.2	1.4	3.2	13.7	28.1	26.9	31.1	19.3	10.5	8.4	6.3	6.8

Source: World Bank Data

Source: Central Bank of the Islamic Republic of Iran, and World Bank staff estimates

Table 1.2. Selected social indicators

Indicator	1980	2000
Female illiteracy rate		
Iran	60.7	30.1
Middle East & North Africa	72.2	45.5
Male illiteracy rate		
Iran	38.3	16.5
Middle East & North Africa	43.8	24.4
Infant mortality rate		
Iran	86.8	25.5
Middle East & North Africa	95.1	44.3
Immunization rate, measles		
Iran, Islamic Rep	39.0	99.0
Middle East & North Africa	43.7	91.1
Rural population with access to improved water source		
Iran	33.0	89.0
Middle East & North Africa	41.8	79.7
Urban population with access to improved water source		
Iran	70.0	99.0
Middle East & North Africa	82.4	96.2

Source: World Bank data

Table 1.3. Iran and its comparators

Indicator	Iran		MNA	LMI
	1990	1997	Region	Countries
Population growth rate (%)	2.2	1.4	2.1	1.6
Infant mortality (per 1,000)	47	26	54	60
Illiteracy rate	36	27	34	26
Female illiteracy (% of age 15-24)	18	10	22	20
Gross primary school enrollment (%)	112	98.4	92	101
Male	118	102*	103	n/a
Female	106	95*	89	n/a
Gross secondary school enrollment (%)	55	77	60	64
Male	64	81	69	70
Female	46	73	59	n/a
Access to safe water (%)	50	95	87	75

Sources: Data provided by the Iranian authorities, World Development Indicators 1999, UNESCO, and World Bank staff estimates.

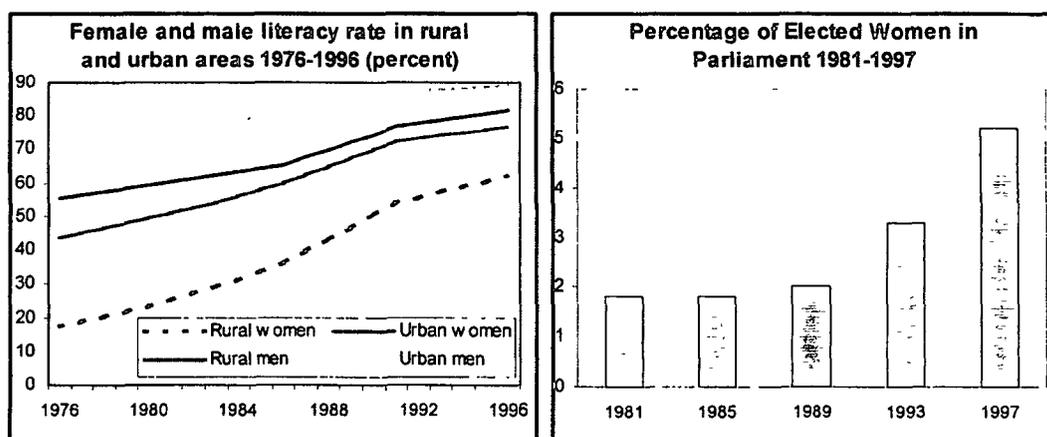
* The drop in the rate of enrollment could be explained by the increase in private schooling. The statistics on enrollment capture only attendees of public schools.

1.27 Notwithstanding these achievements, Iran still faces three major challenges. It still has a significant prevalence of poverty. It has dealt with poverty more through handouts and charitable transfers than through employment and empowerment. And while these explicit subsidies and transfers have the merit of reaching the poor, it also maintains,

often in the name of the poor, an expensive and excessively large implicit subsidy system that is untargeted and distortionary.

1.28 Poverty declined significantly after the revolution. The proportion of people below the poverty line was reportedly around 40 percent on the eve of the revolution. Recent poverty analysis, based on yearly household expenditure surveys, shows a further drop 27.3 percent in 1986 to 20.9 in 1998.¹ In the bottom decile, 40 percent of household heads are unemployed. For the second decile, this falls to less than 20 percent, underscoring what growth and productive employment can do to reduce poverty.

Figure 1.9. Closing the gender gaps



Source: Plan and Budget Organization, UNDP, *Human Development Report of the Islamic Republic of Iran, 1999*

1.29 Iran's extensive social safety net and transfer system reaches many of the poor. Half the poor, about 4.5 million persons or 1.47 million households, benefit from social coverage by government social safety net programs, charity institutions, and other non-profit organizations. These programs include direct cash transfers, housing provision, education scholarships, and health and social security coverage. What makes this possible is the networks of mosques and other non-governmental institutions. The country also has rich experience in rationing during the long war with Iraq. Most of the beneficiaries have access to bank accounts, for regular direct cash transfers.

1.30 Iran also maintains extensive implicit subsidies: for energy, for the exchange rate, and for credit, all excessive (the energy subsidy alone is estimated at more than 12% of GDP). But the subsidies are untargeted and ineffective. While often justified in the name of the needy, they do not proportionately benefit the poor (table 1.4). The benefit from the bread, medicine, gas, and kerosene subsidies that goes to the richest decile is two

¹ Poverty in Iran: Trends Structure 1986-1998. World Bank Draft Report, June 2002. The poverty line considered is US\$PPP 2000-prices of 3.2 and 3.3 urban and rural per capita per day.

times, four times, thirty-two times, and three and a half times that going to the poorest decile.

**Table 1.4. Subsidies for Selected Items 1996
 (Shares of income deciles in benefits)**

Deciles	Gas	Kerosene	Medicine	Bread
Poorest	1.3	4.4	3.8	6.2
2 nd	2.1	6.7	6.8	8.4
3 rd	3.2	8.7	7.6	8.5
4 th	3.9	8.6	8.9	9.9
5 th	4.7	10.1	9.0	9.7
6 th	6.4	11.3	10.6	10.6
7 th	8.2	11.6	10.7	11.0
8 th	10.3	12.1	12.8	11.3
9 th	18.0	12.7	12.9	11.8
Richest	41.8	16.1	17.5	12.5

Source "Plan to Fight Poverty and to Raise the Income of Poor Households,"
 Management and Plan Organization, Social Affairs Bureau, September 2000

1.31 A major challenge of Iran's transition will be to find the best mechanisms to move away from the large untargeted subsidies to more targeted subsidies for the genuinely poor—and to channel the resulting public savings to augment private savings in financing private sector investment to generate productive employment and sustainable growth. Part 2 of this report discusses ways to phase out these subsidies based on criteria of social benefit (better distribution), economic efficiency (higher savings investment resulting from it), easier technical feasibility of targeting, and political cost and interest group resistance. This reorientation of the economy will also need a redefinition of the role of the government in core areas, leaving productive activities to the private sector, combined with a more competitive and efficient financial sector, fostering a better environment for private initiatives.

Chapter 2. The Challenge of Employment

"For me, as well as for supreme leader Aytatollah Ali Khamenei, the question of unemployment is the greatest worry "

President Khatami, August 2002

2.1 Among the major challenges for Iran, two stand out as daunting: First, how can growth make up for two lost decades of decline and stagnation in economic welfare. Despite the growth in the 1990s, GDP per capita in 2000 is still 30 percent below what it was in the mid 1970s, compared with a near doubling for the rest of the world. Second, and most challenging, is to ensure that this growth is enough, in quantity and quality, to reverse the dangerous trend of unemployment, now 16 percent, to bring it to an acceptable level in the face of both an explosive supply of labor driven by past demographic growth and sustained by the phenomena of increased women participation in the labor market. Unemployment is expected to be aggravated by the expected growth in labor productivity typical in all transition economies.

2.2 What underlies the dynamic of the unemployment:

- An unusually high rate of growth of labor supply driven by a high but falling growth of the population at age of work, sustained by low but increasing female participation in the labor force.
- A shift in the composition in the supply of labor toward younger, higher skilled workers with higher share of women workers in total labor supply, requiring a shift in labor demand and in the sectoral structure of the economy to match it.
- Potentially higher growth in the productivity of labor that will accompany the economic transition, translating into a need for even higher growth to enable meeting the additional labor supply.

2.3 Estimated at about 16 percent in 2002, unemployment translates into a high stock of unemployed people. Annual labor supply growth is estimated at as high as 4.5 percent, boosted by rapid growth (3.5 percent) of the population of working age (between 15 and 64), reflecting the coming of baby boomers from the early 1980s. Unemployment is high despite a female participation rate in the labor market of just 14.8 percent, one of the lowest in the MENA region, which has the lowest rates in the world. Female participation is now expected to increase significantly.

2.4 The average rate of growth of the supply of labor will decline from 2000, but it will still remain high at about 3.6 percent a year until 2010. This would bring to the labor market, on average, 800,000 more job seeker a year. To meet such growth in the labor supply, Iran needs to ensure an average annual GDP growth by 6.5 percent until 2010 to maintain unemployment at 16 percent. To bring it to 10 percent on average between now

and 2010 would need an average growth rate of 8 percent. The unemployment dynamics looks even more difficult if one considers higher labor productivity, moving from a public sector dominated economy with over-employment¹ and increasing female participation in the labor market.

2.5 Highest investment requirement of between 5 to 10 percent GDP is required along with deep structural and pricing system reforms to meet the challenge of growth and employment.

What's driving the large supply of labor employment

Demographic pressure, the first factor driving the high labor supply

2.6 Iran's population has almost doubled in the past 25 years. In 2000 the total was estimated at 64 million, up from 36 million in 1966—equivalent to an annual growth in population of 2.7 percent (table 2.1). The size of working age population—conventionally defined as persons aged 15-64 years—has expanded even faster, at an average annual rate of 3.3 percent.

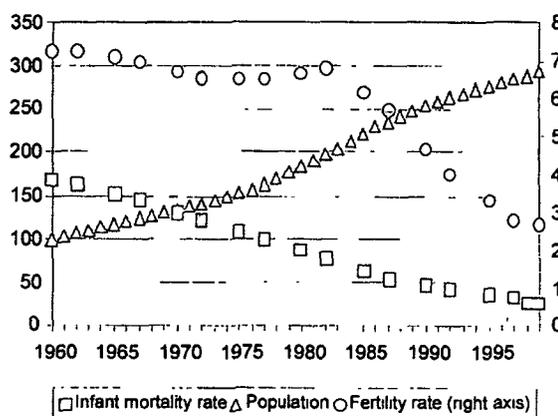
Table 2.1. Total and working age population, 1966-2010

	Total population		15-64 year-olds			Total population		15-64 year-olds	
	(million)					Average annual change %			
1966	25.7	12.9	1966-76	2.7	3.1				
1976	33.6	17.5	1976-86	3.9	3.8				
1986	49.2	25.4	1986-96	2.5	2.8				
1996	60.0	33.7	1996-2000	2.0	3.9				
2000	64.0	40.7	1966-2000	2.7	3.3				
2010	75.9	51.0	2000-2010	1.7	2.6				

Source. Statistical Center Iran, Statistical Yearbook, World Bank estimates

2.7 Today's demographic pressure comes from the exceptionally high fertility in previous decades, the result of policies pursued in the first decade after the Revolution. Family planning programs were suspended and early marriage promoted. From an average slightly less than 6 children per woman in the years before the Revolution, the total fertility rate reached 7 at its peak, in 1984 (figure 2.1). Since then, there has been a remarkable reversal in policies, and a sharp drop in fertility, with

Figure 2.1. Total Fertility Rate



¹ Available comparative data for other economies shows, for example, that a transition economy like China has a rate of productivity growth of 5 percent, Poland 2.7 percent, India 3.4 percent, Thailand 4.1 percent and Asia and the Pacific average is 3.9 percent.

the average number of children per woman down to 2.7 in 1996.

2.8 Population growth, after having declined gradually in the two decades from 1966 to 1986, jumped to 3.9 percent from 1986 to 1996; In part because of the large inflow of Afghan refugees. But even discounting this effect, average annual population growth is estimated to have exceeded 3 percent (MPO, SCI 2001). The impact of the fertility increase was compounded by a concurrent sharp decline in child mortality, from 90 per 1,000 live births in 1980 to about 30 in 1998.

2.9 The effects of higher fertility on the working age population is now materializing as the baby boomers of the 1980s reach working age. The number of 15-64-year-olds is estimated to have increased at an annual rate of 3.9 percent from 1996 to 2000. The demographically induced pressure on the labor market will remain acute at least until 2005. The average annual growth rate of working age population is estimated at around 3.5 percent from 2000-2005. In the longer term, declining fertility rates will gradually reduce the growth in working age population, which is estimated to drop to 1.7 percent by 2010.

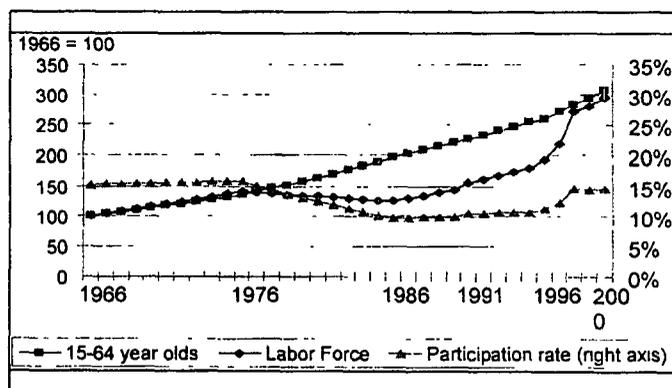
Greater female participation in the labor force

2.10 Although demographic pressure is expected to ease, overall pressure on the labor supply will continue unabated as the demographic deceleration is out-weighted by greater female labor participation. The average labor force participation rate of 46 percent in 2000, is quite low by international standards. One of the main reasons is the very low female participation rate, at 15 percent in 2000. The rate for men is 78 percent, around the average for the MENA region and not much below that of industrialized countries.

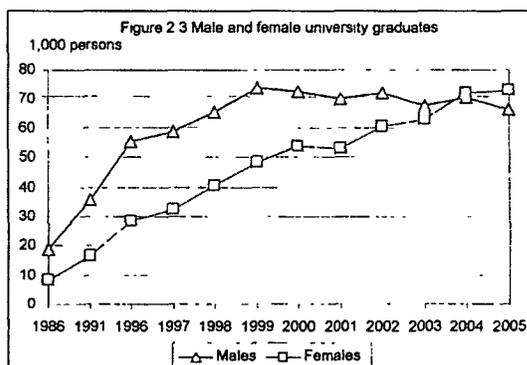
2.11 Female labor force participation has varied, if at low levels over the last 35 years. In the decade leading up to the Revolution, female labor force participation rate was roughly constant, and the

2.12 female labor force expanded in step with that demographic trend (figure 2.2). This changed between 1976 and 1986, when the number of women in the labor market declined at about 1 percent a year, even with rapid growth in the female working age population. By 1986 the female labor force participation rate had dropped to about 9 percent. It has picked up, reaching about 11 percent in 1996 and 14.8 percent in 2000, about the level in 1966.

Figure 2.2. Female labor force

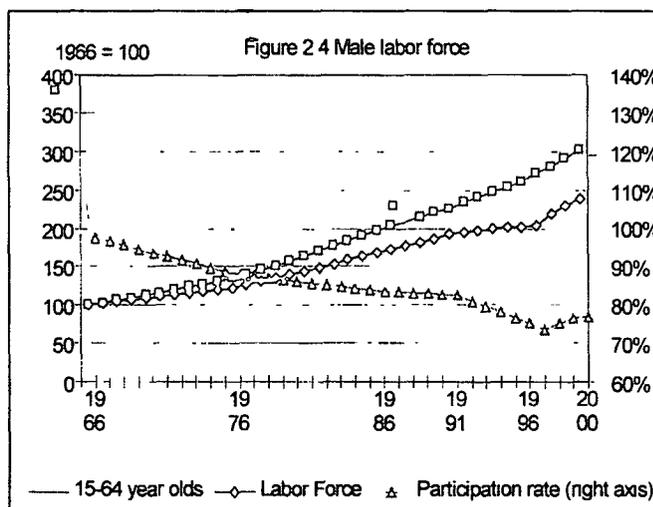


2.13 Why has female labor force participation picked up over the last decade? For several reasons. First, rapid fertility declines are usually associated with higher labor market participation of women. Smaller family sizes give more room for women to engage in the job market. There has also been an increase in the average age of marriage, from 19.8 years in 1986 to 22.4 years in 1996, opening the way to women participation in the labor market before marriage and after.



2.14 Second, the educational achievement of women has risen significantly, increasing the incentives to engage in the labor market. Female enrolment rates in primary education jumped from 40 percent in 1965 to almost 100 percent in 1995.

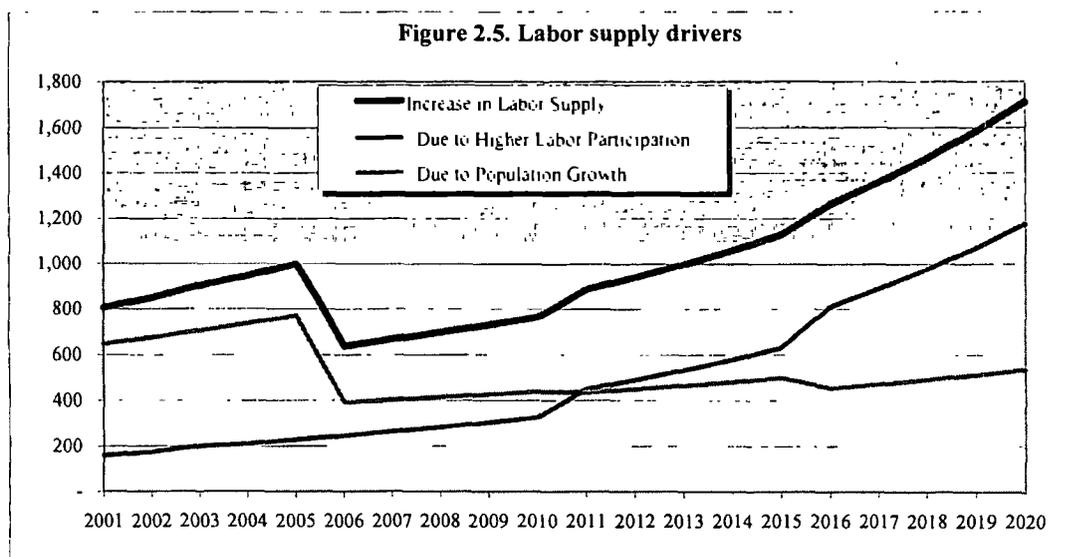
2.15 And female enrollment in universities has been fast catching up with that of males. The academic year 2000/2001 marked the first year with more female than male students admitted to universities. In 2000, the number of males completing university education exceeded that of females by a 74,000 to 49,000. But that will change within the coming few years. If the last five years' trend in university enrollment continues, the number of female university graduates will exceed that of male university graduates by 2005 (figure 2.3).²



² The projection assumes that the average length of study is 4 years, that 80 percent of those enrolled eventually graduates, and that the male admittance rate (defined as the number of admitted divided by the number of 15-19 year-old) decline 5 percent annually in line with the trend since 1996, while that females admittance rate increase 1 percent annually. Historical data are from *Iran Statistical Yearbook 2000*, Statistic Center of Iran (2001). Data include both universities and other higher education institutes. There are some difference in the area of study between men and women. Women dominate medicine, sciences and humanities, while men constitute the vast majority of students in engineering.

2.16 Unlike women's labor force participation, male labor force participation rates have declined persistently in the last three decades (figure 2.4). In 2000 almost all males aged 15-64 were in the labor force. By 1996 it was only 75 percent of all working age males. The main reason for this decline seems to be the expansion of education, as the steadily higher share of younger people (aged 15-24 years) enrolled in education is not available for the labor market. Only limited data are available to underpin this suggestion, but the student share of population aged 10 and above increased from 11 percent in 1966 to 28 percent in 1996. Another explanation for declining male participation rates is the expansion of social protection schemes since the revolution. During the last five years there has been a turnaround in male labor force participation, to about 78 percent in 2000.

2.17 If both male and female participation rates remain unchanged at their 2000 level, the labor force can be expected to grow at 2.6 percent a year until 2010, faster in the first years and then slower. But this is unlikely, given the educational revolution that brought girls outside homes and gave them the expectations that comes with years in schools, and school achievement. Demographers in Iran believe that female labor force participation will increase significantly. A rate of 25 percent rate of participation by 2010, while significantly higher than today's rate, would be equal to *today's* level in Tunisia, which has similar features in human development and female education. In such a case the average annual labor force growth would average 3.6 percent until 2010, and the labor force (male and female) would reach 26.2 million by 2010, an increase of 8.6 million over 2000, of which 3.5 million would be women



Source: World Bank Staff estimates

2.18 An increase of the female participation rate to 35 percent in 2010—midway between Tunisia and Malaysia in 2000—would bring the labor supply in Iran to about 28.8 million, 8.9 million women, or about a third, compared with a sixth today.

Measuring the challenge—speeding up and engendering growth

2.19 The Iranian economy's ability to create enough jobs to match the expected increase in job-seekers depends on economic growth, and the labor intensity of growth. From 1966 to 1996 annual growth in real GDP averaged 4.5 percent. Total employment growth was 2.4 percent on average, implying an average annual growth in labor productivity of 2.1 percent. In 2000, GDP growth was buoyant at 5.8 percent, while labor productivity growth was close to its historical 2.4 percent. The projections in the third plan assumes ambitious average GDP growth of 6 percent from 1999 to 2004, coupled with very low growth in labor productivity (less than 2 percent). Iran has yet to meet the projected growth level, and unemployment has increased since the start of the Plan.

2.20 The third plan's growth target of 6 percent was projected to be consistent with a reduction of the unemployment rate to about 12 percent. If Iran only manages GDP growth at average historical levels 4.5 percent—and assuming labor productivity growth of 2.4 percent and a gradual increase in women labor participation to reach 25 percent by 2010—the average unemployment rate would reach 23 percent in 2010.

2.21 Several factors indicate, however, that Iran will need even faster growth than the projected 6 percent to stabilize unemployment, let alone make inroads on the unemployed. First, female labor force participation rates can be expected to increase. Second, as Iran moves along a transition toward market economy and away from public sector dominated activities (where there is overemployment needs), labor productivity can be expected to increase as well. Indeed, comparative data for other economies show average productivity growth rates at 5 percent in China, 4.1 percent in Thailand, 3.4 percent in India, and 2.7 percent in Poland. So, while the increase in labor productivity will increase average incomes and living standards, it will also raise the bar for job creation to keep up with a growing labor force.

2.22 With targeted growth of 6 percent, 2.4 percent growth in labor productivity and a gradual increase in female labor force participation to 25 percent in 2010 (our base scenario), average unemployment rate would increase to 17.8 percent by 2010. Equivalently, an average of 6.5 percent GDP growth over the same period would be needed to stabilize it at 16 percent, and 8.1 percent GDP growth to stabilize at 10 percent. Everything else being equal, for a 35 percent female participation rate in 2010, unemployment would rise to an average of 18 percent, Iran would need 7.75 percent average GDP growth to maintain unemployment at 16 percent, and 9.3 percent average GDP growth to stabilize unemployment at 10 percent (table 2.1).

2.23 If structural reforms boost labor productivity, the growth required to keep unemployment at its current level will be further amplified. For an increase in productivity growth by one percentage point to 3.5, unemployment would rise to 21.6 percent (annual average) until 2010. Iran would need 7.5 percent annual GDP growth on average until 2010 to stabilize unemployment at 16 percent, and 9.1 percent average annual GDP growth to bring unemployment to 10 percent in 2010 (figure 2.6).

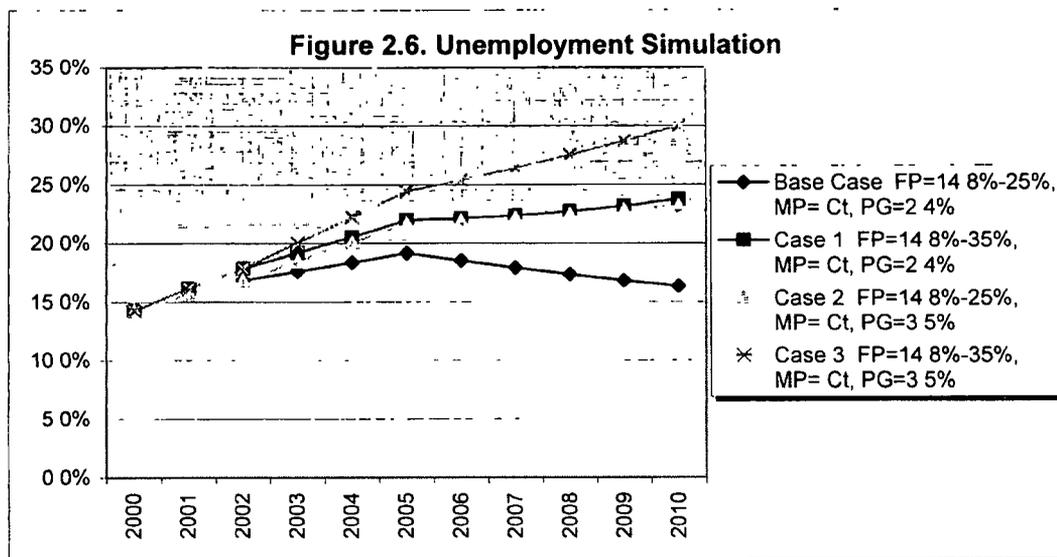


Table 2.2. Growth, Labor Participation, Productivity Growth, and Unemployment (simulation results)

Projected change in labor market characteristics	Average unemployment rate until 2010 for a 6% annual GDP Growth	Average GDP Growth needed to stabilize unemployment at 16% on average until 2011	Needed average GDP Growth need to stabilize unemployment at 10% on average until 2011
Base Case Labor productivity growth = 2.4 % Female participation. 25% by 2010 Male participation constant at 78%	17.8 percent	6.5 percent	8.1 percent
Scenario 1 Labor productivity growth = 2.4 % Female participation: 35% by 2010 Male participation constant at 78%	22 percent	7.75 percent	9.3 percent
Scenario 2 Labor productivity growth = 3.5 % Female participation. 25% by 2010. Male participation constant at 78%	21.6 percent	7.6 percent	9.2 percent
Scenario 3 Labor productivity growth = 3.5 % Female participation. 35% by 2010. Male participation constant at 78%	25.6 percent	8.9 percent	10.4 percent

Source: World Bank staff estimates

2.24 It is not only a matter of creating enough jobs—these jobs must also match a changing composition of the labor force. First, the share of women is going to increase, and second, the skill mix of the labor force is going to shift toward higher and more sophisticated skills.

2.25 Until now, the considerable expansion of public sector employment, which traditionally tended to be gender-neutral, has absorbed a large number of female job seekers and facilitated higher female labor force participation. From 1991 to 1999 the number of public sector employees increased 6.6 percent, but the number of women increased about 30 percent. By 1999 almost a third of all public sector employees were women. By comparison, only about 10 percent of private sector employees were women in 1996. But the potential for continued high growth of employment for women as well as for men is limited as the public sector in Iran is already rather large and there is large over-employment in this sector. Women's share in employment in the two largest public subsectors, education and health, are 57 percent and 15 percent. Growth in these sectors is also limited. Iran has reached full schooling. And the quick fall in fertility will even render large numbers of teachers and education workers redundant. If female employment is to keep up with the growth in female labor force, most of the demand will have to be generated in the private sector, and in sectors (like services) that are least gender discriminating.

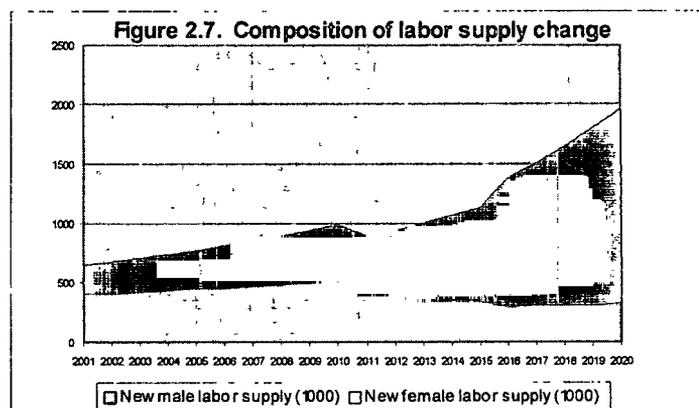


Table 2.3. Women's share of employment in private and public sectors

	1966	1976	1986	1996
Public	6%	20%	41%	40%
Private (employee)	47%	27%	10%	14%
Private (independent)	22%	11%	20%	21%
Private (family worker)	24%	42%	29%	25%

Box 2.1. Estimation of required investment-output ratio for different GDP growth rates using the ICOR approach

The ICOR is the increase in a country's capital stock, over a period of years, divided by the increase in the country's productive capacity, expressed as output per year, during the same period. Figure 1 portrays the behavior of the ICOR in Iran in the last few decades. For each year the ICOR measures the change in the stock of capital during the previous five years divided by the change in potential output during the same period. Potential output which is derived from a Hodrick-Prescott filter of actual non-oil GDP, is taken as a measure of the country's productive capacity in the non-oil sector. During the 1980s the behavior of the ICOR has been disrupted by the impact of the revolution and the Iran-Iraq war. We focus instead on the behavior of the ICOR in the most recent period and we find that the ICOR has hovered in around 3 ½ in the last few years. Assuming a constant ICOR

Estimating the investment requirement while assuming a constant ICOR overestimates somewhat those investment needs since technical progress and the increase in the labor force both reduce the need for investment to achieve the same growth rate of output.

$$ICOR = \frac{\Delta K}{\Delta Y} = \frac{I - \delta K}{\Delta Y} = \frac{(I/Y) - \delta(K/Y)}{(\Delta Y/Y)}$$

This implies that the investment ratio is equal to:

$$\frac{I}{Y} = ICOR * \frac{\Delta Y}{Y} + \delta \frac{K}{Y}$$

Assuming an ICOR equal to 3.5 percent, and a rate of depreciation of 5 percent and an initial capital output ratio of 1.8 the formula shows that an investment ratio of 30 percent would be needed to achieve a growth rate of 6 percent. After 10 years the capital to output ratio would go up to 2.5¹ and the investment ratio needed to be equal to 32 percent to sustain the same growth rate.

	year1	year2	year3	year4	year5	year6	year7	year8	year9	year10
ICOR=deltaK/deltaY	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
GDP Growth rate	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Capital Stock K	180	201.0	223.3	246.9	271.9	298.4	326.5	356.3	387.8	421.3
GDP Y	100	106.0	112.4	119.1	126.2	133.8	141.9	150.4	159.4	168.9
Delta Y		6.0	6.4	6.7	7.1	7.6	8.0	8.5	9.0	9.6
Delta K		21.0	22.3	23.6	25.0	26.5	28.1	29.8	31.6	33.5
I=ICOR*DeltaY+Capital depreciation		31.1	33.4	35.9	38.6	41.4	44.4	47.6	51.0	54.5
I/Y		0.29	0.30	0.30	0.31	0.31	0.31	0.32	0.32	0.32
K/Y		1.9	2.0	2.1	2.2	2.2	2.3	2.4	2.4	2.5
Capital Depreciation	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%

Source: Bank staff estimation

Required investment for meeting the unemployment challenge

GDP Growth rate to meet unemployment/1	6%	6.5%	7%	7.60%	7.8%	8.9%	9%	9.2%	9.3%
Average Required Invest/Output Ratio/2	31%	33%	34%	36%	37%	40%	41%	41%	42%

Source: Bank staff estimation

¹The simulated growth rates correspond to those implied in the different scenarios in the unemployment challenges' section.

² Calculated according to the formula

Table 2.4. Men's and women's shares of service employment in subsectors, 1996

	Men	Women
Sales	2.8	4.6
Restaurant-hotel	0.3	0.3
Transport-communication	7.5	2.1
Financial	4.8	1.7
Housing	1.3	1.3
Public affairs	54.7	12.1
Education	20.1	57.5
Health	5.6	14.7
Other public	2.0	4.9
Servant	1.0	0.7
Foreign	0.0	0.0
Office	0.9	0.3

2.26 While the demand for labor in service subsectors as education is likely to fall along the trend in drop in fertility and the passing of the demographic hump, there is potential in such "new-economy" sub-sectors, as telecommunications, software development, and other high knowledge-intensive branches. Growth in manufacturing could be also a vehicle for job creation for males and females. In other newly industrializing countries, manufacturing exports was highly labor-intensive, and with textiles, also female labor intensive. Demand for labor in the construction sector could be large, given the huge housing deficit in Iran and the backwardness of urban infrastructure.

Investment/savings requirement

2.27 Iran needs higher savings to realize the higher economic growth needed to stop the spiral of growing unemployment and to make a dent in the stock of unemployment. It is difficult to estimate with much precision the required increase in investment needed to meet these challenges. Rough estimates, using the incremental-capital-output ratio method described in box 2.1—show that a one percentage point increase in GDP growth requires an increase in investment/savings of 3 percent.

2.28 Starting from an average growth of about 4.1 percent and an investment-output ratio of 24 percent of GDP (1995-2001), Iran needs to mobilize additional investment in the range of 10 percent of GDP to meet the challenges of unemployment. This requires also a shift toward a more productive and employment-generating market strategy—with improvements to the private sector environment and reforms of the public production and financial sectors. As the switch from public sector to private sector dominance happens, investment will become more efficient and higher growth and employment should require

lower capital investment.³ However, as we will argue later, such a switch will take time as Iran is opting for a gradual transition by opposition to a “big-bang” transition. Indeed, while additional growth will essentially come from the private sector and from new private sector investment---made possible by the availability of credit to the economy through higher savings from the oil wealth, public sector is not expected to shrink suddenly. The gradual transition strategy followed by Iran focuses essentially on private sector development while holding public sector from impeding on its growth, by limiting its monopolistic dominance and political and economic privileges.

³ Between 1995-2001, China had realized an average GDP growth rate of 8.4 percent. Gross fixed capital formation has averaged 38.6 percent of GDP during the same period.

*Part 2. Meeting the Challenges:
Resource Mobilization Through
Optimal Use of Energy Wealth*

Part 2. Meeting the Challenges: Resource Mobilization Through Optimal Use of Energy Wealth

A major pillar for Iran's transition reform is an alternative fiscal strategy framework focusing on an optimal management of oil resources that meets the dual objective of: (i) providing the necessary increase in savings mobilization to meet the required financing for the investment necessary to meet the challenges of growth and employment; and (ii) ensuring the optimal balance in the use of oil and gas wealth between consumption and savings/investment so as to sustain the same welfare level flowing from oil wealth for the present and coming generations beyond the time of the exhaustion of these oil and gas resources. In other words, a balance between savings and consumption from oil wealth, that transforms the exhaustible stock of hydrocarbons wealth into a sustainable non-oil economic development. Iran's oil resources will, indeed, be exhausted in the next forty years or so only.

This part of the report looks first at building the real balance of the consolidated energy sector of Iran as the first building bloc of the analysis. It then assesses the current fiscal framework and its composition, revealing the true size of the budget (including energy and exchange rate subsidies) and the dominance of energy wealth in the budget. This true fiscal picture is compared with the official picture to reveal the heavier than expected reliance of the budget on oil revenues and the unsustainability of such a stance. Fiscal sustainability is thus dependent on the sustainability of this energy wealth and its optimal management.

A review of the theory of fiscal management of nonrenewable resources is next used to build an optimal management policy for Iran's energy wealth and to estimate the present discounted value of Iran's energy wealth and the optimal level of per capita consumption. Applying this theory to the past we show the extent to which policies have deviated from the optimal policy, while applying the theory to the future reveals ways to realign existing policies with the optimal policy. Reform of the energy subsidies is the foundation of this fiscal adjustment and its most obvious venue. We measure the social and economic implications of alternative adjustment paths of energy pricing, and propose and discuss a possible reform phasing scheme.

Chapter 3. Real Balances of the Consolidated Energy Sector

3.1. Iran, the second largest OPEC oil producer, holds 100 billion barrels of proven oil reserves, about 10 percent of the world's total, after Saudi Arabia and Iraq (table 3.1). Iran's current oil production capacity is estimated at 3.9 million barrels a day, slightly higher than its latest OPEC production quota established at 3.6 million in July 2001. Iran's production, which has not surpassed 3.8 million barrels a day since the revolution, is today only 60 percent of its 5.8 million barrels a day average in 1972-76. Production has declined since the early days of the revolution in 1977-78 and particularly during the war with Iraq, when many facilities were damaged, some permanently. Production started to increase in 1988, rising 50 percent by 1992/93. But it has since stagnated.

Table 3.1. Iran's proven oil and gas reserves

	Proven reserves 1/				Share in world total
	Oil in billion barrels	Natural gas		Total	
		Trillion cubic feet	Billion barrels oil equivalent	Billion barrels oil equivalent	
World	1,017	5,150	927	1,944	
Iran	100	940	169	269	13.8
(Iran estimated undiscovered)	53	314	57	110	
Algeria	9	160	29	38	2.0
Iraq	113	110	20	132	6.8
Indonesia	5				
Mexico	28	30	5	34	1.7
Norway	11	41	7	18	0.9
Russia					
Saudi Arabia	264	205	37	300	15.5
Venezuela	73	143	26	98	5.1

Source: Oil and Gas Journal

1/ estimates as of January 1, 2000. For Iran, these are NIOC's estimates as of January 2002.

3.2. Iran could increase its production significantly, and plans are for oil production to reach close to 8 million barrels a day by 2020. This will be helped by foreign investment now that many international oil companies have reengaged with Iran. The authorities project foreign investment of \$25 billion over 2000-2005, the period of the third five year development plan. Granting petroleum rights on a concessionary or direct equity basis is forbidden by the Iranian constitution, but the 1987 Petroleum Law opened the way for contracts between foreign persons and legal entities and the Ministry of Petroleum and Iranian state companies. One scheme is the buyback contract, under which the contractor funds all investments and receives, as remuneration, an allocated

production share during an agreed period, after which operations are transferred to the Iranian Oil Company (NIOC). Since 1997, 12 major buyback arrangements worth \$20 billion have been contracted. This has involved TotalFinaElf, Malaysia's Petronas, Canada's Bow Valley, ENI, Agip, Norwegian Statoil, and others. Officials at NIOC estimate that this will increase production capacity to about 5 million barrels a day by 2005.

3.3. Iran also possesses an estimated 940 trillion cubic feet of proven natural gas reserves, about 18 percent of the world's natural gas reserves, second only to Russia. Most of these reserves are in non-associated fields, yet to be developed. Most production is destined for domestic consumption, to free oil products for export. While the potential for development and export is considerable, the prospects remain uncertain, entangled in complex international political considerations. Here it is assumed that the rate of extraction will be driven mainly by domestic demand.

Calculating consolidated real balances

3.4. With no real balance for the consolidated energy sector available, it was necessary to build one. Understanding the true situation of the sector enables us to projections of future energy demand and supply, with their implications for the medium-term framework. The real balances are important because of the large substitutability between energy components at the consumption level (particularly between natural gas and oil products) and the intersectoral relationship between these components at the production level (use of gas in the production of oil, use of gas and oil in the production of electricity).

3.5. The method of building the consolidated real balances is presented to enable checking up and rectifying, if needed, by interested counterparts in the different services of the government. Box 3.1 explains the procedure followed, and table 3.2 presents the real balances for 1989/90-2001/02.

3.6. The next chapter projects domestic energy demands. These projections—combined with the projections of world energy demand, Iran's OPEC quota evolution, and projected energy prices—are used to determine the optimal path of oil and gas wealth management to underpin Iran's fiscal strategy for the future.

**Box 3.1. Building the Real Balances of the Consolidated Energy Sector:
Methodological Considerations**

Oil

Let P_o be total crude oil output, P_{LNG} be total LNG output, M_{op} be imports of oil products, X_{op} be exports of oil products, X_o be exports of crude oil, C_{op} be total final consumption of oil products, I_{op}^e be oil products used in the production of electricity, and W_o be waste which includes waste in oil production as well as errors and omissions in the compilations of the above aggregates. Let all these aggregates be measured in million of barrels of oil equivalent per year. Usually oil products are expressed in thousand liters. The following conversion table was used to convert the original data into barrels of oil equivalent.

Based on these notations the real balances in the oil sector is expressed by the following identity

$$P_o + P_{LNG} + M_{op} - X_{op} - X_o = C_{op} + I_{op}^e + W_o$$

which says that total output plus net imports has to be equal to final consumption plus the use of oil as an input in the production of electricity plus waste and errors.

Natural gas

Let P_g be total natural gas output, F_g be the total amount of natural gas which is flared in the process of extraction, M_g be imports of natural gas, X_g be exports of natural gas, C_g be total final consumption of natural gas, I_g^e be natural gas used in the production of electricity, I_g^{op} be natural gas used in the production of oil products, I_g^k be natural gas used in the production of natural gas, and W_g be waste which includes waste in natural gas production as well as errors and omissions. We also measure all these aggregate in millions of barrels of oil equivalent per year. Usually natural gas quantities are expressed in million cubic meters. We used the following conversion factor to convert the figures into barrels of oil equivalent: 1000 cubic meter equal 6 2898 barrels of oil equivalent.

Based on these notations the real balances of the natural gas sector is expressed by the following identity

$$P_g - F_g + M_g - X_g = C_g + I_g^e + I_g^{op} + I_g^k + W_g$$

which says that net production of natural gas plus net imports is equal to final consumption plus natural gas used as an input in the production of electricity, oil, and natural gas itself, plus waste and errors.

Electricity

Electricity is generated in Iran either in hydropower plants or in thermal plants, which are fired, used either oil products or natural gas. In these thermal power plants we assume normal efficiency levels whereby 1 million barrels of oil equivalent natural gas gives rise to 0.5 million barrels of oil equivalent electricity and 1 million barrels of oil equivalent oil products gives rise to 350,000 barrels of oil equivalent electricity.

Hence if we let P_e be the total electricity produced and if we let P_{he} be the quantity of hydroelectric electricity and P_{te} be the quantity of thermal electricity then

$$P_e = P_{he} + P_{te} = P_{he} + .5 * I_g^e + .35 * I_{op}^e$$

If we let C_e be the final consumption of electricity and W_e be waste in electricity production and other errors and omissions, then the real balances in the electricity sector can be expressed as

$$P_{he} + .5 * I_g^e + .35 * I_{op}^e = C_e + W_e$$

We converted quantities of electricity expressed in kWh into barrels of oil equivalent by using the following conversion factor: 1 million of kWh equal 610.8 thousands of barrels of oil equivalent.

The consolidated energy sector:

Adding up the three equations representing the real balances of each sector we get.

$$(P_o + P_{LNG} + P_g + P_{he}) - (5 * I_g^e + 65 * I_{op}^e + I_g^k + I_g^{op}) - F_g + (M_{op} + M_g - X_{op} - X_o - X_g) - C_{op} - C_g - C_e + W_o + W_g + W_e$$

The first bracket in this identity is the gross production of energy and the second bracket represents the intra-sector input: gross production minus intra-sector input minus flaring in gas production is what we call net total production of energy. So the real balances of the consolidated sector simply says, as it should, that total net productions plus net imports is equal to total final domestic consumption of energy plus the waste in the production of the three sectors.

MEDIUM TERM FRAMEWORK FOR TRANSITION
CONVERTING OIL WEALTH TO DEVELOPMENT

Table 3.2. Iran: Real Balances of the Consolidated Energy Sector
(in million barrels of oil equivalent, unless otherwise specified)

	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02
	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380
The oil sector													
Production	1,078	1,195	1,248	1,3a22	1,321	1,317	1,316	1,321	1,326	1,358	1,251	1,374	1,374
Crude oil	1,075	1,192	1,245	1,318	1,318	1,315	1,314	1,318	1,322	1,355	1,248	1,369	1,369
(in million barrels per day)	2.95	3.27	3.41	3.61	3.61	3.60	3.60	3.61	3.62	3.71	3.42	3.75	3.75
LPG	3	3	3	4	3	2	2	3	3	3	3	5	5
Net imports of refined products	32	23	4	24	8	-11	-38	-42	-64	-93	-131	-102	-142
Imports	32	23	4	24	8	0	0	0	0	0	0	0	0
Exports	0	0	0	0	0	11	38	42	64	93	131	102	142
Exports of Crude oil	660	861	952	975	899	810	836	891	876	840	759	829	807
Domestic use	450	356	300	371	430	496	442	388	385	426	362	443	425
Final consumption	263	268	285	312	325	339	322	339	342	351	339	354	368
Kerozene	52	49	51	63	64	64	62	66	62	59	56	55	59
Fuel oil	54	51	51	57	56	62	54	54	55	58	48	50	45
Gasoline	43	46	50	55	60	64	64	68	72	77	80	87	104
Gas oil	103	110	120	124	131	135	128	137	138	141	138	145	142
LPG	11	11	12	13	14	14	14	15	16	16	17	18	18
Input into electricity production	35	39	40	39	45	46	53	55	54	37	46	53	51
Gas oil	8	7	6	7	7	7	9	6	7	5	7	8	10
Fuel oil	27	32	34	32	38	39	44	49	46	32	39	44	41
Waste & Errors	152	50	-25	20	60	111	67	-7	-11	37	-23	36	6
The natural gas sector													
Production	315	408	470	498	515	487	499	538	577	613	660	685	786.2
Net imports of natural gas	0	0	-13	-17	-3	-1	0	0	0	0	0	0	0
Imports	0	0	0	0	0	0	0	0	0	0	0	0	0
Exports	0	0	13	17	3	1	0	0	0	0	0	0	0
Waste in flaring	220	290	315	315	322	270	260	273	278	289	289	277	318
Available for domestic use	95	118	143	166	189	216	238	265	299	324	370	408	467.8
Final consumption	46	56	75	83	101	119	138	160	180	181	206	231	265
As input	49	59	65	70	85	96	104	113	129	157	171	171	187
crude oil	0	0	0	0	2	3	7	12	14	20	16	7	7
refinery	0	0	0	0	0	3	3	4	3	3	5	6	6
electricity	43	52	56	61	71	78	82	83	98	120	132	141	159
natural gas	7	7	9	9	12	12	13	14	14	15	18	18	21

MEDIUM TERM FRAMEWORK FOR TRANSITION
CONVERTING OIL WEALTH TO DEVELOPMENT

	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02
	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380
Waste & Errors	0	3	3	3	4	2	-3	-8	-9	-15	-9	5	16
Electricity													
Production	90	101	109	116	133	137	148	152	163	170	186	200	210
Hydraulic	13	11	12	16	17	13	13	13	12	12	9	7	7
Thermal	77	90	96	100	116	124	135	139	151	157	178	193	204
Oil products	35	39	40	39	45	46	53	55	54	37	46	53	51
Natural gas	43	52	56	61	71	78	82	83	98	120	132	141	153
<i>ratio of gas to oil</i>	1.2	1.3	1.4	1.6	1.6	1.7	1.5	1.5	1.8	3.2	2.9	2.7	3.0
Domestic use	90	101	109	116	133	137	148	152	163	170	186	200	210
Final consumption	24.4	27.5	30.1	31.9	35.5	38.8	40.3	42.6	44.8	47.4	51.7	55.2	60.2
<i>[in billion of Kwh]</i>	40.0	45.1	49.2	52.3	58.1	63.6	65.9	69.7	73.4	77.6	84.7	90.4	
Waste & Errors	66.1	73.4	78.5	84.2	97.7	97.8	107.4	109.0	118.5	122.1	134.4	144.4	150.1
Consolidated Energy Sector													
Gross Production	1,406	1,613	1,731	1,836	1,853	1,817	1,827	1,872	1,915	1,983	1,920	2,065	2,167
Crude oil	1,075	1,192	1,245	1,318	1,318	1,315	1,314	1,318	1,322	1,355	1,248	1,369	1,369
LPG	3	3	3	4	3	2	2	3	3	3	3	5	5
Natural gas	315	408	470	498	515	487	499	538	577	613	660	685	786
Hydroelectricity	13	11	12	16	17	13	13	13	12	12	9	7	7
Natural gas flared	220	290	315	315	322	270	260	273	278	289	289	277	318
Intra-sector inputs	7	7	9	9	14	18	22	29	31	37	39	31	33
Net production	1,179	1,316	1,408	1,512	1,517	1,529	1,545	1,570	1,606	1,657	1,591	1,757	1,815
Net imports	-628	-839	-962	-968	-894	-821	-874	-933	-940	-933	-890	-931	-948
Imports	32	23	4	24	8	0	0	0	0	0	0	0	0
refined products	32	23	4	24	8	0	0	0	0	0	0	0	0
natural gas	0	0	0	0	0	0	0	0	0	0	0	0	0
Exports	660	861	965	992	903	821	874	933	940	933	890	931	948
crude oil	660	861	952	975	899	810	836	891	876	840	759	829	807
refined products	0	0	0	0	0	11	38	42	64	93	131	102	142
natural gas	0	0	13	17	3	1	0	0	0	0	0	0	0
Domestic use	551	477	446	544	622	708	671	637	665	724	702	827	866
Final consumption	334	352	390	437	461	497	499	542	567	580	600	641	694
refined products	263	268	285	312	325	339	322	339	342	351	339	354	368
natural gas	46	56	75	93	101	119	138	160	180	181	209	231	265
electricity	24	28	30	32	35	39	40	43	45	47	52	55	60
Waste & Errors	218	126	56	108	161	210	171	95	98	145	102	186	172

Source: NIOC, Management and Plan Organization, and World Bank Staff estimation

Recent trends

3.7. Gross production of energy increased by an average of 2.5 percent a year in 1999/2000 and 2000/01. There was an acceleration of LPG and natural gas growth by 5.7 percent and 5.3 percent annually—and more modest crude oil production growth of 1.4 percent. Driving the growth in gas production was domestic demand and quite dramatic shift in the composition of domestic energy use toward gas.

3.8. Some trends for the 1990s:

- Final consumption of energy (combined refined products, natural gas, and electricity) rose by an average of 6.2 percent, from 352 million barrels of oil equivalent per year in 1990/91 to 643 million in 2000/01.¹
- Final consumption of refined petroleum products increased by 2.8 percent a year, from 268 barrels of oil equivalent to 354 million.
- Final consumption of natural gas grew by 16 percent from 56 million barrels of oil equivalent to 231 million.
- Electricity consumption grew by an average 7.2 percent.

3.9. The shift in the composition of final demand from oil products to gas was the result of an active policy of the government to limit the domestic use of refined products to free up crude for exports and contain the rising imports of refined products. The strategy consists of encouraging the substitution of natural gas, which is difficult to export and monetize, for oil products. Indeed, without such an accelerated substitution, the increase in domestic demand of energy would have reduced the annual volume of Iran's oil exports by 25 percent in 2000/01.

3.10. The authorities are planning to further this shift toward natural gas. Rising from 21 percent in 1990/91 to 65 percent in 2000/01, the ratio of natural gas to refined oil products is planned to reach 80% in 2005/06 and to stabilize at around 85 percent beyond 2010/11.

3.11. What most characterizes the energy sector in Iran is the huge gap between domestic prices and the opportunity costs of all energy products: estimated average energy subsidies of 11 percent of GDP a year in the 1990s.

1. Final consumption has increased by the same growth rate of 6% since 1980.

Chapter 4. Toward a New Fiscal Framework

Assessing the current fiscal framework

4.1. What should be the guiding principle in deciding how to use the energy wealth? How much have oil revenues accrued to the budget? How much was used to finance current expenditures, and how much was saved and invested? To clear the way in answering these questions, two things were taken into account:

- First, an analysis of the structure of the Iranian budget has to look at the volatility in government revenues induced by the volatility of oil prices. This is dealt with by averaging budget figures over a period long enough to allow averaging these fluctuations and capturing the long-run trend of energy prices. Over the 1990s the average export price of oil was more or less in line with what is believed to be the long-run trend of oil prices: \$19 a barrel, in 2000 dollars.
- Second, because large fiscal and quasi-fiscal activities are left out of the official budget, and because of the multiple exchange rate system that has prevailed during the 1990s, the official figures have to be adjusted. Then, the true size of the budget can be revealed, to unveil the true extent to which revenues from energy have been used to finance public consumption and investment.

The guiding principle

4.2. Iran has used revenue from energy to benefit of current generations through the provision of generous services and cheap oil and cheap imported essential goods, while maintaining a low rate of overall taxation. Energy subsidies provided consumers and firms with as much energy as they demanded at the low subsidy price—on average no more than 30 percent of the border price. The only way to increase oil exports—and thus the revenues to finance a larger volume of other public expenditures—was to encourage a shift in domestic consumption from oil to natural gas or from domestic energy use in general. Limited prospects for natural gas exports has confined the extraction of natural gas to meeting domestic demand.

4.3. Under the current fiscal framework, two considerations influence fiscal policy in Iran:

- First, the rate of overall energy extraction is determined by the (exogenously determined) rate of oil extraction, the growth of domestic energy use, and the rate at which domestic consumption could be shifted from petroleum products to natural gas. The growth of domestic energy use is determined by the growth of the economy and the domestic pricing policy.

- Second, for the energy extracted, the split between consumption and investment was skewed by the share that went automatically to the energy subsidy. Revenues that could have financed public investment and other current expenditures—basically the revenues from oil exports—were determined as a residual after satisfying domestic energy demand. The more generous the subsidy, the greater the volume of energy sold domestically—and the lower the exports and proceeds that could finance other current expenditure and investment.

4.4. What should be the guiding principle for the future? To balance the use of exhaustible oil and gas resources between consumption and investment in a way that sustains that consumption over time.

Broad fiscal aggregates

4.5. Official budget figures show that public expenditures were on average 24 percent of GDP in the 1990s and that oil revenues were heavily relied on to finance this spending. Average oil revenues to the tune of 13.5 percent of GDP financed a non-oil budget deficit of roughly the same magnitude. The deficit reflected average budgetary expenditures of some 24 percent of GDP, coupled with average tax and non-tax revenues of about 10 percent (figure 4.1 and table 4.1).

Figure 4.1. Main Budgetary Aggregates According to Official Data

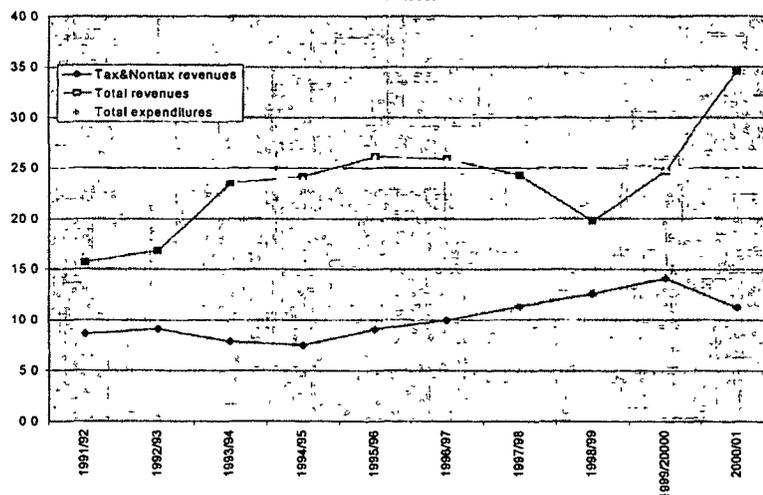


Table 4.1. Adjusted and Unadjusted Central Government Budget

	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/2000	2000/01	Average 1991-2000
<u>The Budget According to Official Data</u>											
Total revenues	15.7	16.8	23.5	24.2	26.1	25.9	24.3	19.7	24.7	34.5	23.5
Oil & gas revenues	7.1	7.7	15.7	16.7	17.1	16.0	13.0	7.1	10.6	23.3	13.4
Tax and nontax revenues	8.6	9.1	7.8	7.5	9.0	9.9	11.3	12.6	14.1	11.2	10.1
Total expenditure	18.0	18.1	24.2	23.9	26.0	25.7	25.4	25.2	24.9	25.4	23.7
of which capital expenditure	5.0	4.4	7.7	7.1	7.5	8.0	7.3	5.5	5.9	5.5	6.4
Overall balance	-2.3	-1.3	-0.7	0.3	0.1	0.1	-1.1	-5.5	-0.2	9.1	-0.2
<u>The Adjusted Budget</u>											
Total revenues	45.5	42.4	38.8	40.1	45.3	44.6	40.0	37.3	44.0	45.7	42.4
Oil & gas revenues	40.0	36.2	32.5	34.2	38.6	37.2	31.1	27.4	33.5	36.4	34.7
Tax and nontax revenues	5.5	6.3	6.3	5.9	6.7	7.4	9.0	9.8	10.5	9.3	7.7
Total expenditure	47.0	43.3	39.3	39.9	45.2	44.5	40.9	41.5	44.2	38.1	42.4
Explicit expenditures	11.6	12.5	19.4	18.9	19.3	19.2	20.1	19.7	18.5	21.1	18.0
of which capital expenditure	3.3	3.1	6.2	5.6	5.5	6.0	5.8	4.3	4.4	4.5	4.9
Energy subsidy	10.6	9.8	10.4	11.8	12.5	10.5	10.2	12.6	12.2	10.0	11.1
Other subsidy	24.7	21.0	9.6	9.2	13.4	14.8	10.6	9.3	13.5	7.0	13.3
Overall balance	-1.5	-0.9	-0.5	0.2	0.0	0.1	-0.9	-4.3	-0.1	7.5	0.0

Source: Iranian authorities and staff estimates

4.6. But these official figures do not reveal the true level of public spending and the extent to which oil wealth financed it. Why? Because major fiscal and quasi-fiscal operations have been kept out of the budget.

- *Large energy subsidies.* Almost no proceeds from the domestic sale of energy products accrue to the budget. State economic enterprises in the energy sector have operated under the implicit rules that the raw energy they use is a free good and that the sales price should cover only their operating costs, including a modest investment for replacement purposes.¹ These large energy subsidies involve a large deadweight loss.
- *Foreign exchange subsidies.* These subsidies operate through the multiple exchange rate system reintroduced in 1993 after a failed attempt at unification. They are administered either through the budget or by the central bank. Through the budget, they manifest themselves in the allocation of some oil export receipts sold at a more appreciated exchange rate to finance imports of certain essential goods. Through the central bank, they manifest themselves in purchases of foreign exchange at a lower rate than the rate than for sales of foreign exchange for certain users and activities.

4.7. In trying to record the cost of these policies explicitly in the budget, it is assumed that they are maintained and that the way they affect the system of incentives is unaltered.² Under existing policies, the equilibrium wages and prices of non-subsidized goods would be unchanged—so subsidized prices would be unchanged—so it is reasonable to assume that the nominal figures for tax and non-tax revenues and explicit expenditures would be unchanged.

4.8. *Making the energy subsidy transparent* Adjusting the official figures to make the energy subsidy transparent is conceptually easy. It involves adding to government revenues an amount equal to the volume of energy sold domestically times the difference between the market price and the subsidized price. That additional revenue would be offset on the expenditure side by a commensurate amount—the energy subsidy—leaving the deficit unchanged.

4.9. The calculation of hidden energy subsidies uses market prices based on the average international price of oil that prevailed in the 1990s. These prices are 10 U.S. cents per liter for kerosene, 6 for fuel oil, 15 for gasoline, and 10 for gas-oil. For electricity the opportunity cost is 3.7 cents per kilowatt hour, and for natural gas, 3.6 cents per cubic meter. These market prices need to be converted into rials at the exchange rate that would have prevailed if the foreign exchange market had been unified.

¹ Not only that, sometimes domestic prices did not cover these costs in which case some of the oil export proceeds were diverted from the budget and into the accounts of these SEEs to cover their operating losses

² At this stage we ignore the quasi-fiscal expenditure operated through the central bank and focus instead exclusively on the central government budget as it is likely to reflect an overwhelming share of the total public sector including the central bank. A more involved exercise would need to start by compiling the adjusted accounts of the consolidated public sector.

4.10. *Making import subsidies transparent.* Adjusting the official figures to make the foreign exchange subsidy transparent is also conceptually easy. It involves adding to government revenues an amount equal to the volume of foreign exchange sold at the more appreciated rates times the difference between these rates and the exchange rate that would have prevailed if the exchange market had been unified. Those additional revenues would be offset on the expenditure side by a commensurate amount—the foreign exchange subsidy—leaving the budget deficit unchanged.³

4.11. With energy products (both domestic sales and exports) valued at the prices at which they are sold, it is necessary to add to GDP increasingly total budgetary revenues.

4.12. *The implicit unified exchange rate.* To make energy and foreign exchange subsidies transparent in the budget, the calculation had to be based on the exchange rate that would have prevailed if the exchange market had been unified. This shadow exchange rate—all other policies being unchanged—is equal to the free market exchange rate (box 4.1).

The revealed budget

4.13. With these adjustments, the budget looks quite different from the official data (figure 4.2 and table 4.2). The true budget is almost twice the official budget. Energy subsidies, left out of the official data, account for more than 25 percent of the budget or 11 percent of GDP. And other implicit subsidies account for another 30 percent, or 13 percent of GDP. (As noted this last estimate is biased upward, and the large values of this item for 1991-92 point to possible problems in the way some budgetary transactions, related most likely to external financing, might have been recorded).⁴

4.14. So, much larger revenues from energy financed a much wider non-oil budget deficit. For the decade as a whole, the revenues from energy wealth, to the tune of 35 percent of GDP, were relied on to finance the budget. Tax and non-tax revenues were barely 8 percent of GDP.

³ One complication here is that some of the oil export proceeds valued at the official more appreciated rate is earmarked for external debt servicing. The adjustment would be to increase revenues by the difference between the official rate and the market rate times amortization payment. That increase in revenue will translate in an increase in the budget balance to match the higher negative financing item, reflecting the revaluation of the amortization payments at market exchange rate. The adjustment here did not make this correction given the paucity of data on external debt repayment. To that extent the estimate of the import subsidy is biased upward

⁴ It may be that some oil exports proceeds used for external debt repayments were not recorded as budgetary revenues. To the extent that we are adjusting budgetary revenues by the full difference between oil revenues as recorded in the budget and oil export proceeds valued at the shadow exchange rate, we would be overstating expenditures.

Box 4.1. The shadow exchange rate under Iran's multiple exchange rate system

In recent years, the multiple exchange rate system in Iran has been simplified to two exchange rates. The official exchange rate has stabilized in the last five or six years at rial 1,750 per U S dollar. The floating free market rate—the Tehran Stock Exchange rate—has hovered over the last two years around rial 8,000 per U S dollar. All non-oil export proceeds are sold on the free market, while a share of oil export receipts is sold at the official rate, with the remainder also sold on the free market. The share of oil export proceeds sold at the official rate finances subsidized imports.

Let E_o be the official rate, E be the free market rate, and \bar{E} be the shadow exchange rate. Let X_{no} be the supply of non-oil export proceeds, M_{ns} the demand for foreign exchange emanating from the imports of non-subsidized imports, and O be total oil export proceeds of which O_m is the amount sold on the free market.

The free market exchange rate is then determined by the equilibrium in the free foreign exchange market

$$M_{ns}(E) = X_{no}(E) + O_m$$

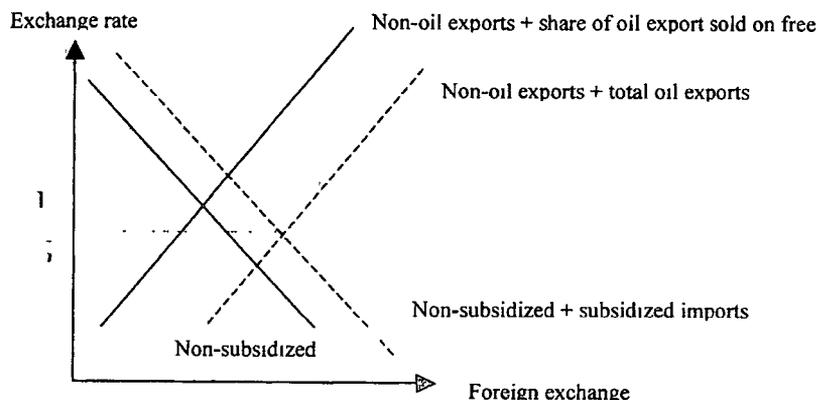
The shadow exchange rate is the rate that would prevail in the free market if all transactions were carried in that sole market. Hence the shadow exchange rate would be determined by the equilibrium condition given by

$$M_{ns}(\bar{E}) + M_s(\bar{E}) = X_{no}(\bar{E}) + O_m + (O - O_m)$$

Recognizing that $O - O_m$, the amount of oil receipts sold at the official rate is equal to $M_s(E_o)$, and replacing O_m by its value from the first equilibrium condition gives:

$M_{ns}(\bar{E}) + M_s(\bar{E}) - X_{no}(\bar{E}) = M_{ns}(E) - X_{no}(E) + M_s(E_o)$ which shows that the shadow exchange rate is a function of the free market rate, the official rate, and the exchange rate elasticities of export and import demand functions. Notice that this formula shows the shadow exchange rate, an "equilibrium" exchange rate if the market had been unified, is different from the simple weighted exchange rate compiled by the authorities and used by the IMF in calculating Iran's real effective exchange rate. The weights used there are based on estimates of shares of import transactions at the official rate and at the free market rate.

Graphically:



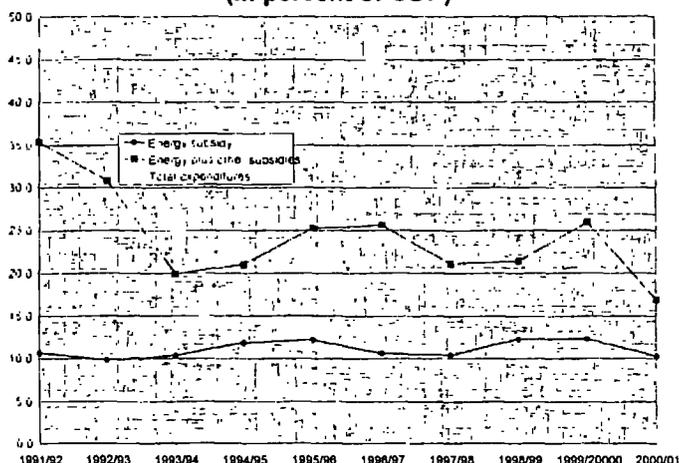
The analysis shows that the shadow price is more appreciated than the free market rate. But the shadow price is not the exchange rate that would prevail if the market had been unified with all else equal. This shadow price is consistent with a situation where the foreign exchange market is unified and the import subsidy policy is removed. If the import subsidy policy is not removed but is simply made explicit, consumers will continue to face the same price in rials as before, in which case the volume of subsidized imports would not change. If the volume of subsidized imports does not change, then both supply and demand curves would move by the same horizontal distance and the shadow exchange rate would be exactly equal to the free market rate. That is why the shadow exchange rate is the best approximation of the equilibrium exchange rate.

**Table 4.2. Adjusted and unadjusted central government budget
 (Averages over 1991-2000, in percent of GDP)**

	Unadjusted	Adjusted
Total	23.5	42.4
Oil and gas	13.4	34.7
Tax and non-tax	10.1	7.7
Total	23.7	42.4
Explicit	23.7	18.0
Explicit capital	6.4	4.9
Energy		11.1
Other		13.3
Overall	-0.2	0.0

Source: Iranian authorities and staff

**Figure 4.2. Revealed Size of the Budget
 (in percent of GDP)**



A new fiscal framework for optimal management of energy wealth

4.15. Given Iran's heavy reliance on revenues from a nonrenewable resource to finance its budget, a new fiscal framework anchored on a clear strategy for managing energy has to be developed. This section:

- Reviews the relevant theory regarding the fiscal management of nonrenewable resources to come up with a view of what might be an optimal management policy for Iran's energy wealth.
- Builds an estimate of the present discounted value of Iran's energy wealth and of the optimal level of per capita consumption.

- Applies this to the past—to establish how much past policies have deviated from the optimal policy.
- Applies the theory to the future—to derive the optimal policy, assess how much current policies are likely to trend away from this optimal policy, and propose ways to reform existing policies to realign them with the optimal policy.

Theoretical considerations for fiscal management of resources wealth

4.16. At the heart of managing resource-based wealth, such as oil and gas, is the decision on the optimal allocation of revenues between consumption and investment. That decision has to take into account two defining characteristics of energy wealth: first, the volatility of revenues stemming from fluctuations in energy prices, and second, the exhaustibility of oil and gas resources.

4.17. *Addressing volatility.* The consensus view is to shield the budget from the volatility and uncertainty of revenues by making deposits to and withdrawals from stabilization funds. Such funds usually use pre-announced deposit and withdrawal rules contingent price or revenue levels. If the focus is on short-term stabilization, additional rules may mandate deposits or withdrawals depending on the size of the fund, effectively putting a cap on the assets in the fund.

4.18. Iran's Oil Stabilization Fund (OSF), now two years old, is based on a threshold of oil revenues determined in the framework of the five-year development plan. Yearly budget revenues are built around projected oil revenues, and excess revenues are channeled to this fund.

4.19. *Addressing exhaustion.* There is much less consensus about the best way to face this second problem, and only few countries have institutional arrangements to implement whatever policy they thought most appropriate (box 4.2). Oil and gas resources are exhaustible at a fairly predictable future time. There are known estimates of proven oil and gas reserves, as well as unproven reserves, with fairly acceptable probability attached to it.⁵ The time of the exhaustion can be also predicted fairly well based on the time profile of the rate of extraction. That rate is determined by several exogenous factors: the country's technical and financial capacities, the projected ceilings on production determined by the country's arrangement within the OPEC, and the growth of domestic and foreign demand.⁶ The stream of revenues to the budget attached to these resources follows the same path, drying up when they are exhausted.

4.20. Should one consume oil revenues as long as they last and worry about finding alternatives only once these revenues dry up? Or should a time-consistent strategy be devised and implemented now? In essence the problem is to decide on what to do with a

⁵ NIOC has its estimates. See also US Geological Survey for estimates for Iran as well as validation of the method and an analysis of their validation.

⁶ It is clear in this context that the problem addressed is not a problem of an optimal extraction policy.

stock of wealth. Should it be all eaten up today? Should a cap be put on consumption by today's generations, or should it be unconstrained? Should that cap limit the overall consumption to the yield from the wealth, so that the stock of wealth remains untouched and can be passed on to future generations?

4.21. Several options have been explored in the literature (Dasgupta and Heal 1979, and Engel and Valdes 2000, to name two). The broadest approach is to embed the decision about the use of revenues from resource wealth in an entire fiscal strategy including taxes, transfers, and the provision of public goods. In such a broader context, the optimal use of revenues from resource wealth gets subsumed in broader considerations such as the possible desire of a society to subsidize current consumption by borrowing against future taxes if future generations are expected to be much better off than current generations.

4.22. A more tractable, less controversial, and in many ways acceptable approach is to restrict the policy objective to maximizing the utility of all generations from the resource wealth only. Such transfers could be though a pure cash transfer or in the form of public goods, without levying taxes to pay for them. In this approach, the objective of policymaking is to decide on a certain distribution of the benefits from the oil wealth across individuals, across time, and across generations. The decision on such distribution is independent of what other government policies may want to achieve in redistributing income from well-to-do individuals and generations to less well-to-do individuals and generations.

4.23. But what is the return at which saved oil revenues could be invested, and what is the mechanism for the government to capture those returns. If the government invests the savings from oil revenues in financial assets—be it fixed or variable income assets, in the form of equity or bonds—the government can capture the return directly, for it is simply the income generated by the assets. But if the savings were used to finance capital expenditure, the government could not capture the return directly.

4.24. Devising mechanisms for the government to capture those returns brings back the complex issues of taxation and allocative inefficiencies. Deciding not to tax away those returns and to look at them as a way of distributing benefits from the resource wealth may raise the question of the fairness of this distribution. The most straightforward policy is to invest saved oil revenues in income-earnings financial assets. Capital expenditures by the government become a part of a separate framework having to do with the optimal taxation to provide public goods.

4.25. Managing energy wealth is a classical inter-temporal optimization problem. Its solution for the optimal consumption path is a flat path in per capita terms, equal to the annuity on the present discounted value of the energy wealth.⁷ The discount rate for the

⁷ The annuity is determined by the difference between the real interest rate and the population growth rate times the present discounted value of the energy wealth.

utility of future generations is equal to the market interest rate. The market interest rate is, in fact, the revealed average of time-preference rates of all market. Box 4.2 motivates this fundamental theoretical result by looking at a simple two-period inter-temporal optimization problem. Box 4.3 illustrates the working of the model through a simple numerical example.

Box 4.2. A two-period inter-temporal optimization problem

The following simple two-period inter-temporal consumption/investment optimization problem reveals most of the insights from more complex infinite horizon inter-temporal optimization problem. Assume that there is a consumer who is to live only two periods, 1 and 2. Assume that his incomes during these two periods are known with certainty and are exogenously determined, Y_1 and Y_2 . Assume that he starts his life with no wealth and does not want to leave any wealth after his death. Assume too that he can lend or borrow freely at a market interest rate r . If he chooses to consume C_1 in period one, which can be smaller or larger than his income in period 1, his budget constraint in period 2 is given by

$$C_2 = Y_2 + (Y_1 - C_1) * (1 + r)$$

which can be rewritten as

$$C_1 + \frac{C_2}{(1+r)} = Y_1 + \frac{Y_2}{(1+r)} \quad (1)$$

Written in this form the budget constraint states that the present discounted value of consumption has to be equal to the present discounted value of income, which in this case represent the wealth of this individual.

If the consumer has a rate of time preference γ —that is, he discounts future consumption at that rate—his overall utility from consumption is given by

$$U = U(C_1) + \frac{1}{1+\gamma} U(C_2)$$

where $U(C)$ is a traditional utility function, increasing and concave.

The consumer's problem is hence to maximize U subject to the budget constraint (1).

The FOC of optimality is given by

$$\frac{U'(C_1)}{U'(C_2)} = \frac{1+r}{1+\gamma}$$

If a constant elasticity of substitution utility function is chosen

$$U(C) = \frac{C^{1-\theta}}{1-\theta}$$

where $\theta > 0$, then the FOC becomes

$$C_2 = C_1 \left(\frac{1+r}{1+\gamma} \right)^{(1/\theta)}$$

This reveals that if the consumer has the same time-preference as the market—that is if $\gamma = r$ —then $C_1 = C_2$, the consumer will choose to fully smooth out consumption through time.

If the consumer is more impatient than the market—that is $\gamma > r$ —then $C_1 > C_2$.

If the consumer is less impatient than the market, then he will choose to consume less in the first period than in the second, $C_1 < C_2$.

Such a result generalizes to a multiperiod setting, where it can be shown that consumption will be rising if the real interest rate exceeds the rate at which the household discounts future consumption, and falling if the reverse holds. The slope of the consumption path is a declining function of the intertemporal substitution coefficient θ . The higher the value of θ , the flatter the consumption path.

Box 4.3. An illustrative numerical example of how to derive the optimal split of revenues from a resource wealth between consumption and investment

If a country has oil reserves of 36,500 million barrels of oil, which it can extract at a uniform rate of 10 million barrels a day (or 365 million barrels a year) over the next 10 years—and if this extraction path is consistent with keeping the net sales price (market price net of cost of production) constant at \$12 a barrel—net oil revenues will amount to \$43.8 million a year for the next 10 years and zero thereafter.

Now assume a constant market real interest rate of 5 percent, population growth of 2 percent, and a non-oil GDP growth of 4 percent. Assume also that non-oil GDP is equal to US\$100 billion initially and that the size of the population is 50 million.

At an interest rate of 5 percent the present discounted value of the oil wealth $PDV = \sum_{t=1}^{10} O/(1+r)^t$, where O is the annual oil revenue, is \$338 billion, or \$6,900 per person, equivalent to 338 percent of the initial value of non-oil GDP.

If the objective of the government is to maximize the sum of the discounted utilities of all generations and if the discount rate is equal to the market rate, then the optimal policy is to choose a constant path of per capita consumption. That constant level of per capita consumption that could be sustained year after year forever is given by $(r - n) * PDV / P_1$, where r is the market interest rate, n is the rate of population growth, and P_1 is the size of the population in the first year. In this case, per capita consumption is \$202.9 per person.

In year one, oil revenues are \$43.8 billion of which \$10.1 billion is spent and \$33.7 is saved (box table 4.3-1). In year two, government revenue has two components: \$43.8 billion oil, and \$1.7 billion interest receipts on the new stock of financial wealth invested in financial assets or in economic activities that yield an equivalent rate of return. The government spends \$10.3 billion and thus could save \$35.1 billion allowing the stock of financial wealth to go up to \$68.8 billion by the end of the second year. The same logic continues over the following years whereby increasing budget surpluses are the mechanisms for part of the oil wealth to get converted into financial wealth. By the 11th year the oil wealth is fully depleted, there are no more oil revenues, but the government can still sustain the same per capita consumption by using some of the interest revenues it receives on its financial wealth (invested in financial assets and in economic activities). From year 11 on, budget surpluses drop sharply but they remain positive to allow the stock of financial wealth to increase at the same rate as the population.

The stock of total wealth (oil plus financial) remains constant at all times on a per capita basis at \$6,900 per person. Financial wealth is built during the first 10 years until it reaches a level in per capita terms exactly equal to the initial oil wealth.

Notice that due to growth of non-oil GDP in excess of population growth, keeping per capita public consumption constant will be consistent with a declining path of public consumption as a percent of GDP. Public consumption as a share of GDP goes down from 9.8 percent in the first year to 7.7 percent by year 13. For the same reason total wealth as a share of GDP declined from 338 percent in the initial year to 253 percent by year 13.

**Table 4.3. Example of the rule on the optimal use of revenues from the oil wealth
(in billions of US dollars, unless otherwise specified)**

Years	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Hypothesis and optimal per capita consumption														
Population (in millions)	49.02	50.00	51.00	52.02	53.06	54.12	55.20	56.31	57.43	58.58	59.75	60.95	62.17	63.41
Oil revenues 1/		43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	0.0	0.0	0.0
Interest rate	5.0													
Discount factor		0.95	0.91	0.86	0.82	0.78	0.75	0.71	0.68	0.64	0.61			
PDV of oil wealth 2/	338.2	41.7	39.7	37.8	36.0	34.3	32.7	31.1	29.6	28.2	26.9			
PDV of oil wealth per capita (in dollar per person)	6,900													
Per capita public consumption (in dollar per person)	202.9	202.9	202.9	202.9	202.9	202.9	202.9	202.9	202.9	202.9	202.9	202.9	202.9	202.9
Government Oil-budget														
Total revenues		43.8	45.5	47.2	49.1	51.0	53.0	55.1	57.3	59.5	61.9	20.6	21.0	21.4
Oil		43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	0.0	0.0	0.0
Interest receipts		0.0	1.7	3.4	5.3	7.2	9.2	11.3	13.5	15.7	18.1	20.6	21.0	21.4
Public consumption		10.1	10.3	10.6	10.8	11.0	11.2	11.4	11.7	11.9	12.1	12.4	12.6	12.9
Budget balance		33.7	35.1	36.7	38.3	40.0	41.8	43.7	45.6	47.7	49.8	8.2	8.4	8.6
Memorandum items:														
Financial wealth		33.7	68.8	105.5	143.8	183.8	225.6	269.2	314.8	362.5	412.3	420.5	428.9	437.5
Financial wealth (in dollar per person)		673	1,349	2,027	2,710	3,396	4,086	4,781	5,482	6,187	6,900	6,900	6,900	6,900
Total Wealth	338.2	345.0	351.9	358.9	366.1	373.4	380.9	388.5	396.3	404.2	412.3	420.5	428.9	437.5
Oil wealth 3/	338.2	311.3	283.1	253.4	222.3	189.6	155.3	119.3	81.4	41.7	0.0			
Financial wealth	0	33.7	68.8	105.5	143.8	183.8	225.6	269.2	314.8	362.5	412.3	420.5	428.9	437.5

MEDIUM TERM FRAMEWORK FOR TRANSITION
CONVERTING OIL WEALTH TO DEVELOPMENT

Years	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Total wealth per capita (in dollar per person)	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900
Total wealth (in percent of non-oil GDP)	338	332	325	319	313	307	301	295	290	284	279	273	268	263
Public consumption (in percent of non-oil GDP)		9.8	9.6	9.4	9.2	9.0	8.9	8.7	8.5	8.4	8.2	8.0	7.9	7.7
Non-oil GDP	100.0	104.0	108.2	112.5	117.0	121.7	126.5	131.6	136.9	142.3	148.0	153.9	160.1	166.5

1/ Assumes a production of 10 million barrels of oil equivalent per day at a net price of US\$12 per barrel

2/ Present discounted value of oil wealth is equal to the sum of the discounted stream of oil revenues shown to the right of the PDV

3/ Each year the oil wealth is calculated as the PDV of the remaining stream of oil revenues. Hence for example in year 8 it is equal to

$$43.8/(1.05) + 43.8/(1.05)^2 = 41.7 + 39.7 = 81.4$$

Estimating the present discounted value of Iran's energy wealth and the optimal level of consumption

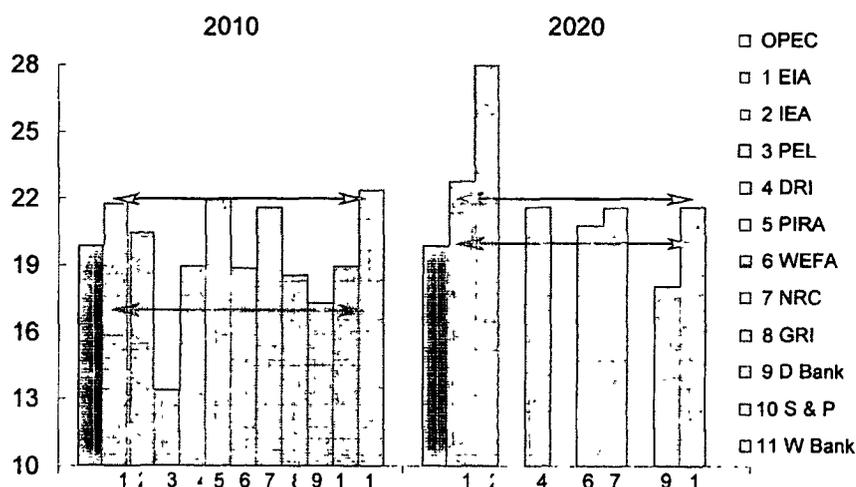
4.26. Determining the optimal path of public consumption out of energy wealth hinges critically on estimating the present discounted value of the energy wealth, a function of:

- o The rate of extraction.
- o The price of energy net of average production costs.
- o The real interest rate.

4.27. Given the host of assumptions on which this estimate depends, a baseline scenario is presented as a set of assumptions seen as being representative of average tendencies. Then some sensitivity analysis is performed around that baseline.

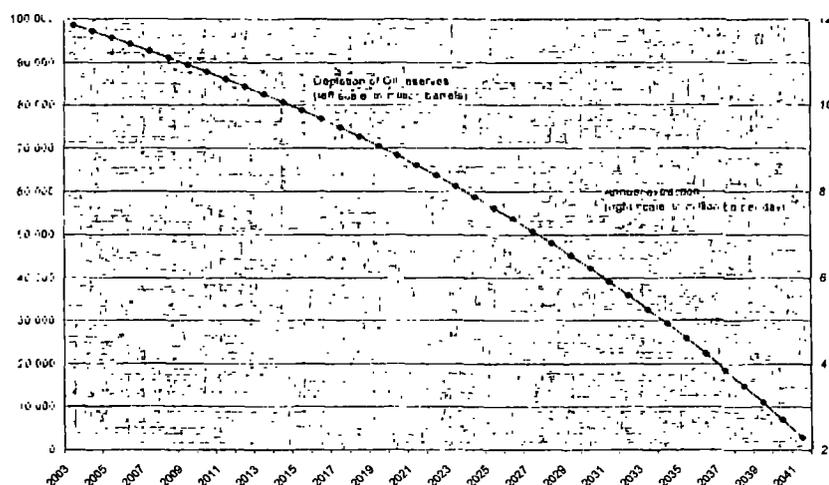
4.28. *Rates of extraction.* For oil, a good approximation of Iran's position in the oil market is that of a price-taker, even though it belongs to OPEC. As a price taker, the speed of extracting and exporting oil will be constrained by the expansion of world energy demand and by some concerted action by other OPEC members to contain overall OPEC production to prevent further erosion of oil prices in real terms. Most official and market projections of the price of crude oil in the next 20 years is that it will remain constant at about \$19.50 a barrel in 2000 dollars (figure 4.3).

Figure 4.3. Real oil prices in the baseline scenario (2000 dollars a barrel)



4.29. Beyond the normal trend increase in its OPEC quota to meet the increase in world demand, Iran might be able to renegotiate its quota of 3.5 million barrels a day to bring it closer to its 6 million barrel a day production in the early 1970s. The assumption here is that the quota will be raised to 4.5 million barrels a day by 2010 and that from that level it would increase in line with the increase in overall OPEC production. At \$19.50 a barrel, OPEC may be able to capture the entire increase in world demand for energy, because it would not be profitable for other high-cost producers to increase their production. According to the U.S. Energy Information Administration (EIA) world oil consumption is projected to grow at 2.2 percent a year—from 75 million barrels a day in 1999 to 119 million in 2020. Assuming an increase in world energy demand of 2 percent a year—reflecting higher world income and further efficiency gains in energy use—overall OPEC production could increase by 3 percent a year. Under these assumptions Iran’s stock of proven oil reserves of 100 billion barrels will be exhausted by 2040 (figure 4.4).

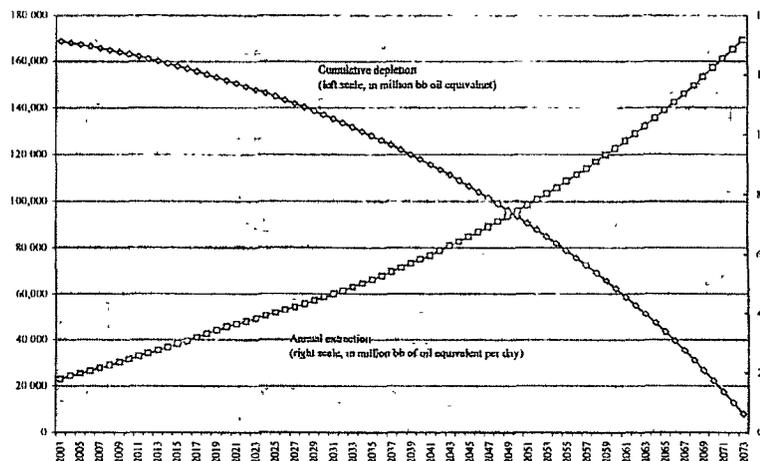
Figure 4.4. Oil Annual Extraction and Cumulative Completion



4.30. For natural gas, prospects for large-scale exports are still very uncertain and it is likely that the rate of extraction of natural gas will be driven mainly by domestic demand. That domestic demand will be determined by the growth rate of the overall demand for energy—which will depend on domestic pricing policy—and by the likely substitution among the three main components of energy: petroleum products, natural gas, and electricity. Based on projections of overall energy demand and its subcomponents, the net production of natural gas should decline by a cumulative 10 percent over 2003-2005 as price subsidies are phased out (box 4.4). Starting in 2006 demand should pick up and grow at an average of 4.5 percent a year until 2010 as the substitution from oil to natural gas continues. Once substitution possibilities from oil to gas reach their limit, the average growth rate of natural gas production will slow to 3.8 percent on average over 2010-2020 and could stabilize at 2.5 percent afterwards (5 percent growth of non-oil GDP and an income elasticity of 0.5). Under these assumptions the stock of proven gas reserves of

170 billion of barrels of oil equivalent would be exhausted by the early 2070s (figure 4.5).⁸

Figure 4.5. Natural gas annual extraction and cumulative depletion



4.31. *Net prices.* For oil prices, the assumption is that the royalty price of oil is \$15.50 a barrel in 2000 dollars (or \$16.10 a barrel in 2002 dollars). This is based on the assumption that oil prices would average \$19.50 a barrel in 2000 dollars over the long run and that the average production cost in Iran would average \$4 a barrel in 2000 dollars.

4.32. The royalty price of natural gas is assumed to be \$4.6 per barrel of oil equivalent in 2000 dollars (or \$4.80 in 2002 dollars). This assumption is based on a border price of \$5.7 a barrel of oil equivalent (or \$36 per 1,000 cubic meters) and an average production cost of \$1.1 per barrel of oil equivalent.⁹

4.33. *Real interest rates.* Given high capital mobility among industrialized countries, the behavior of real interest rates in the United States could give some benchmark for the assumption on the rate of return on foreign assets. According to the latest study on this subject (Laubach and Williams 2001) the equilibrium real interest rate in the United States peaked at nearly 4 percent in the 1960s and again in the late 1990s and dipped below 2 percent in the early 1990s. As for the rate of return on domestic assets, one

⁸ Due to a large waste in the production of natural gas due to natural gas flared in the process of extraction, the effective stock of natural gas is no more than half the actual stock.

⁹ These estimates are based on the authorities data and seem low. However as there is no global market for natural gas as yet, we have used those estimates for the moment. Should tangible export prospects materialize at some point, the export price should become the reference price for the calculation of the PDV of the natural gas wealth and indeed for setting domestic prices. Suffice it to mention at this point that reported prices are significantly higher than the authorities' estimates. For example FOB export prices of Russian gas exported to Germany have hovered around \$13-14 per barrel of oil equivalent in the recent past. US wellhead prices have been around \$12.50 per barrel of oil equivalent.

would expect, given the low stock of capital a much higher rate of return on investment in Iran than in developed countries. No clear indication from the financial markets in Iran can be gleaned as to what might be this rate. Based on these considerations a real interest rate of 4 percent is assumed, rely on sensitivity analysis to quantify the impact of a different assumption.¹⁰

4.34. *\$780 billion in energy wealth* Based on these assumptions the present discounted value of the energy wealth is \$780 billion in 2002 dollars and the optimal level of consumption out of energy wealth is \$290 per person, also in 2002 dollars (table 4.3). With an estimated GDP of \$100 billion in 2003, and a population of 66.8 million, Iran's energy wealth is 780 percent of GDP and optimal consumption is 19.5 percent of GDP (\$19.50 billion).¹¹ Assuming an average annual real GDP growth rate of 5 percent, a population growth rate of 1.5 percent, and constant real exchange rate, the optimal consumption out of the oil wealth will be to 14.8 percent of GDP ten years later, as GDP growth outstrips population growth.

Table 4.3a. Estimated present discounted value of Iran's energy wealth and optimal level of consumption

Present discounted value of energy wealth and optimal level of consumption	776.7
Total optimal consumption (in billions of U.S. dollars) ($r-n$)*PDV=(0.04-0.015)*776.7	19.4
Estimated population in 2003	66,779
Optimal consumption per capita (in U.S. dollars)	291

¹⁰ In Norway an implicit rule is used to guide the decision on how much oil revenues could be used to finance the non-oil current account. This rule uses an interest rate of 4 percent.

¹¹ The Norwegian authorities have estimated that the value of the country's oil reserves is 180 percent of GDP

Box 4.4. Projections of overall domestic demand for energy and its subcomponents

Overall demand

Assume that the overall demand for energy is given by

$$Q^d = NP^\alpha Y^\beta$$

where N is the size of the population, α the price elasticity, β the income elasticity, P the relative price of energy, and Y per capita income. Differentiating this equation gives the growth rate of the demand for energy

$$\frac{dQ}{Q} = \frac{dN}{N} + \alpha \frac{dP}{P} + \beta \frac{dY}{Y} = n + \alpha(\pi_e - \pi) + \beta(g - n)$$

where n is the population growth rate, g GDP growth, π_e the percentage increase in nominal energy prices, π CPI inflation

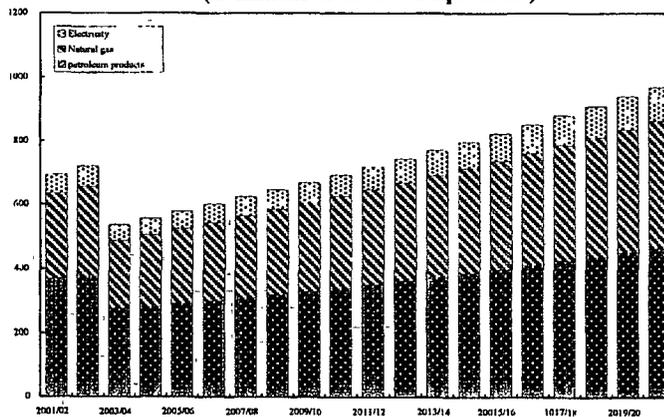
Various estimates of price elasticities of energy consumption in Iran and in other usually range from -15 to -30 depending on the particular energy products. The projections have used an elasticity of -0.07 for the overall basket. Phasing out energy subsidies in one go implies an increase in the relative price of energy products by some 450 percent. So the assumption about the price elasticity implies a decline in demand by some 30 percent.

Income elasticities are much harder to come by. A reasonable assumption seems to be an elasticity lower than one and to project some decline through time reflecting the impact of technical progress, which allows efficiency gains. In our projections we assume an income elasticity of 0.7 initially declining gradually to 0.5 by 2020. One way to judge the reasonableness of these assumptions, is to look at the implied path of energy intensity. That path shows a decline in energy intensity by about 40 percent in the next 18 years, about 1.9 percent a year. This compares reasonably well with projections by the EIA: energy intensity in the developing countries is projected to decrease by 1.2 percent a year as a result of improving living standards. The difference between the two projections reflected the additional impact of the assumed phasing out of energy subsidies.

Demand for oil products, natural gas, and electricity

Electricity consumption, now a little less than 9 percent of overall energy consumption, is expected to increase to 11 percent by 2020. Natural gas has filled an increasing share of the remaining demand for energy, with the demand for natural gas over the last 30 years increasing steadily from about 15 percent of the demand for oil products to about 70 percent. The expectation is that this share will continue to increase over the next decade, to some 85 percent, and stabilize at that level thereafter (box figure 1).

Box figure 1. Domestic demand for energy
 (in millions of bbl of oil equivalent)



Analysis around the baseline

4.35. The sensitivity analysis highlights the order of magnitude of the present discounted value and the optimal consumption from energy wealth for changes in the main parameters affecting these figures (table 4.4).

- Each additional dollar of royalty price of oil and natural gas increases the present discounted value of the energy wealth by \$68 billion and the optimal per capita consumption by \$20. This translates in an increase in permanent consumption of 1.5 percent of GDP on an aggregate basis. Conversely each additional dollar of lower royalty prices for oil and gas takes reduces the PDV of the energy wealth by \$68 billion and reduces the optimal per capita consumption by \$20 dollars. The total optimal level of consumption from the energy wealth would be reduced by 1.5 percent of GDP from 20 percent of GDP.
- Undiscovered reserves of 53 billion barrels of oil and 56 billion barrels of oil equivalent of natural gas would add about another 10 years of oil and gas revenues and raise the present discounted value of the energy wealth by US\$150 billion. This would translate in an additional \$57 of permanent per capita consumption or some 4 percent of GDP on an aggregate basis.
- If Iran can increase its OPEC quota to 5 million barrels a day by 2010, this would increase optimal consumption by 0.75 percent of GDP. Conversely if Iran can increase its quota to only 4 million barrels a day by 2010, this would subtract 0.75 percent of permanent consumption
- If the increased extraction of oil after 2010 cannot exceed 2 percent a year, this would lower optimal consumption by 0.5 percent of GDP.
- If the real interest rate is 3 percent rather than the 4 percent assumed, the permanent per capita consumption is \$76 lower, equivalent to consumption 5 percentage points of GDP lower on an aggregate basis. If instead, the real interest rate is 5 percent this optimal consumption would rise by 3 percentage points of GDP on an aggregate basis.

Table 4.4 Sensitivity Analysis Around the Estimates

	Present Discounted Value of Energy Wealth		Optimal consumption		
	(in billion U.S.dollars)	(in percent of 2003 GDP) 1/	Per capita (in U.S. dollars)	Total (in billion U.S.dollars) 2/	(in percent of 2003 GDP) 1/
Baseline scenano 3/	776.7	776.7	291	19.4	19.4
US\$1 per barrel higher prices	844.7	844.7	316	21.1	21.1
US\$1 per barrel less prices	720.6	720.6	270	18.0	18.0
Including the undiscovered reserves 4/	929.2	929.2	348	23.2	23.2
OPEC quota is adjusted to only 4 million barrels per day by 2010	757.5	757.5	284	18.9	18.9
OPEC quota is adjusted to 5 million barrels per day by 2010	812.4	812.4	304	20.3	20.3
Oil production increases at a rate of 2 percent only after 2010	766.0	766.0	287	19.1	19.1
Real interest rate equal 3 percent	959.5	959.5	216	14.4	14.4
Real interest rate equal 5 percent	649.8	649.8	341	22.7	22.7

1/ Based on an estimate of US\$100 billion for 2003 GDP

2/ Based on a total population of 66.8 million people in 2003

3/ Main assumptions

(1) oil reserves equal 100 billion barrels and gas reserves equal 170 billion barrels of oil equivalent

(2) net price of oil US\$16.1 dollars in 2002 dollars and net price of natural gas equal to US\$4.8 dollars per barrel of oil equivalent

(3) 3 percent growth of oil production from 2010 on and

(4) Iran OPEC quota is re-negotiated up to 4.5 million barrels per day by 2010

(5) Real interest rate equal 4 percent

4/ Total proven and undiscovered oil reserves amount to 153 billion and for natural gas 225.7 billion barrels of oil equivalent

How did fiscal policy in the 1990s compare with the optimal?

4.36. Determining what would have been an optimal policy during the 1990s requires estimates of the present discounted value of energy wealth in 1990 and the associated optimal per capita consumption from that wealth. This implicit policy can then be embedded in the broader context of fiscal policy in the 1990s to assess how much fiscal policy deviated from its optimal stance.

Present discounted value of energy wealth in 1990 and optimal per capita consumption

4.37. Estimating the present discounted wealth of the energy wealth in 1990 requires the same exercise as above but a step back in time to 1990:

- The path of extraction during 1991-2002 is the actual historical path. From 2003 on, the projected path of extraction is the same in real dollars as in the earlier baseline scenario.
- The net price of oil and natural gas from 2003 on is the same as the one assumed in the baseline scenario.¹² For 1991-2002 estimate of the actual average prices is used, calibrated to yield the same average energy revenues for that period as the one that actually obtained.¹³

4.38. The present discounted value of energy wealth in 1990 is slightly lower than that in 2002, a result that may look counterintuitive. It is explained by the acceleration in the overall rate of future extraction compared to the previous decade. That energy stocks depleted in the 1990s should be reflected in a decline in wealth is captured by the decline in the optimal value of consumption. Indeed the scenarios show that Iran, based on its endowment in 1990, could have sustained per capita consumption from energy of \$340 (in 2002 dollars) forever. Because of the excessive consumption in the last 12 years, Iran's endowment has been depleted. So the endowment can sustain consumption of only \$290 per person from now on (table 4.5).

¹² This assumes that the projections about energy prices for the long run are the same in 2002 as they were in 1990. This assumption is made here for convenience to make the two scenarios comparable. In the real world updated projections about long run trend in energy prices have to be taken into account in revising the estimates of the present discounted value of the wealth and in adjusting the level of sustainable consumption to guide policy making.

¹³ These net prices are \$20.80 a barrel at 2002 dollars for oil and \$4.70 a barrel of oil equivalent at 2002 dollars for natural gas. The average net price for oil during 1991-2002 is higher than the price assumed to prevail from 2003 on (\$16.10 a barrel).

Table 4.5. Present discounted value of energy wealth and optimal per capita consumption for scenarios starting in 1990 and 2002

	Scenario starting in 1990	Scenario starting in 2002
Present discounted value of energy wealth in 1990 (billions of dollars)	755	
Present discounted value of energy wealth in 1990 (billions of dollars)		777
Optimal consumption per capita (dollars)	338	291

Optimal fiscal policy in the 1990s

4.39. To build a scenario for what would have been optimal policy for the 1990s the following simple methodology is used. First estimate total revenues as equal to actual oil revenues plus actual tax and nontax revenues plus the interest receipts that would have been earned if budget surpluses had been generated.¹⁴ Then estimate optimal current expenditures as total current expenditures are equal to those that could be financed by the tax and nontax receipts plus the optimal consumption from the energy wealth. This is computed by starting from optimal per capita consumption of \$247 in 1990 dollars, an initial population of 55.8 million people, a population growth rate of 1.5 percent, and dollar inflation of 2 percent (table A4.2 shows the detailed calculations).

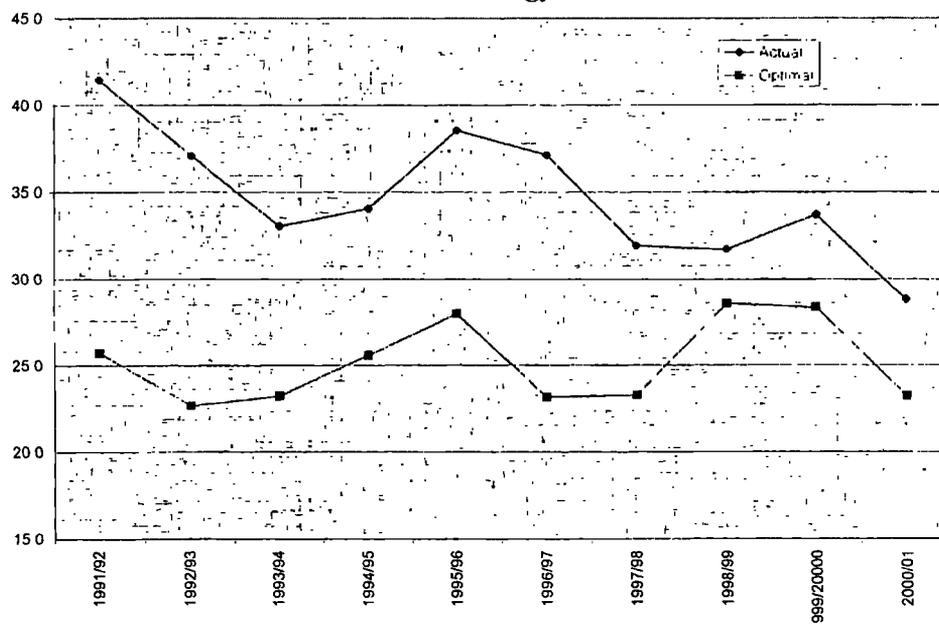
4.40. This methodology shows that the use of energy revenues was substantially higher than the optimal level in the 1990s, especially in the first seven years. The use of oil revenue to finance budgetary outlays was on average 9.5 percentage points higher than optimal (figure 4.6 and tables 4.6, 4.7, and A4.2).¹⁵ A fiscal policy in line with the optimal policy would have yielded additional revenues to the budget of some 2 percent of GDP, resulting in an average budgetary surplus of 11.5 percent of GDP. At the end 2000 the stock of accumulated financial assets would have been almost 100 percent of GDP.¹⁶

¹⁴ In calculating those interest receipts we assume a nominal dollar interests rate of 6 percent—4 percent real plus 2 percent dollar inflation—on the stock of financial wealth converted into dollar.

¹⁵ Large swings in the optimal level of consumption out of the energy wealth shown in the figure below reflect mainly large swings in the real exchange rate vis-à-vis the dollars as the value of the wealth is anchored to the dollar.

¹⁶ We use the term financial assets in a loose sense to include also accumulation of public capital goods

Figure 4.6. Actual and optimal use of revenues from the energy wealth



**Table 4.6. Actual and optimal fiscal policy during the 1990s
(in percent of GDP)**

	Average during 1991-2000 (in percent of GDP)		
	Actual policy		Optimal policy
	Official data	Adjusted	
Total revenues	23.5	42.4	44.4
Energy revenues	13.4	34.7	34.7
Interest receipts		0.0	2.0
Tax and nontax revenues	10.1	7.7	7.7
Total expenditures	23.7	42.4	32.9
Financed by tax and nontax		7.7	7.7
Financed by energy wealth		34.7	25.2
Of which energy subsidy		11.1	
Current budget balance	-0.2	0.0	11.5
<i>Memorandum item:</i>			
Stock of financial wealth at end-2000 (in percent of GDP)	0.0	0.0	94.6

MEDIUM TERM FRAMEWORK FOR TRANSITION
CONVERTING OIL WEALTH TO DEVELOPMENT

Table 4.7. Adjusted and optimal central government budget

Years	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01
	The Adjusted Budget									
Total revenues	35,295	40,758	45,321	65,248	105,422	142,952	142,096	151,238	249,435	302,501
Oil & gas revenues	30,994	34,735	37,988	55,674	89,844	119,203	110,223	111,301	190,032	240,828
Tax and nontax revenues	4,301	6,023	7,333	9,574	15,578	23,749	31,873	39,937	59,403	61,673
Total expenditure	36,452	41,630	45,957	64,916	105,325	142,613	145,155	168,582	250,280	252,516
Explicit current expenditures	6,481	9,092	15,420	21,651	32,029	42,351	50,908	62,477	79,794	109,778
Capital expenditure	2,527	2,949	7,232	9,071	12,883	19,212	20,471	17,425	24,942	30,115
Energy subsidy	8,255	9,449	12,106	19,234	29,170	33,533	36,248	50,997	69,097	65,929
Other subsidy	19,189	20,140	11,198	14,961	31,243	47,517	37,528	37,685	76,447	46,694
Overall budget balance	-1,157	-872	-636	332	97	339	-3,060	-17,345	-845	49,985
	An Optimal Budget									
Total revenues	35,295	41,224	46,529	67,742	110,200	149,513	151,368	165,771	269,424	323,276
Oil & gas revenues	30,994	34,735	37,988	55,674	89,844	119,203	110,223	111,301	190,032	240,828
Tax and nontax revenues	4,301	6,023	7,333	9,574	15,578	23,749	31,873	39,937	59,403	61,673
Interest receipts		466	1208	2494	4779	6562	9272	14534	19988	20776
Total expenditure	24,253	27,811	34,523	51,155	80,722	98,032	114,589	155,785	219,941	215,776
Financed by tax and nontax	4,301	6,023	7,333	9,574	15,578	23,749	31,873	39,937	59,403	61,673
Financed by energy wealth	19,951	21,788	27,190	41,581	65,145	74,283	82,717	115,848	160,538	154,103
per capita consp In 1990 dollars	247	247	247	247	247	247	247	247	247	247
Population in million	55.8	56.7	57.5	58.4	59.3	60.2	61.1	62.0	62.9	63.8
total consp in 1990 dollars	13,773	13,980	14,189	14,402	14,618	14,838	15,060	15,286	15,515	15,748
total consp in current dollars	14,049	14,544	15,058	15,589	16,140	16,709	17,299	17,910	18,542	18,820
Overall budget balance	11,042	13,413	12,006	16,587	29,478	51,482	36,779	9,987	49,482	107,500
Financial assets (incl. Valuation adjs.)^{2/}	11,042	25,061	42,215	78,944	148,941	215,525	268,591	373,333	549,195	626,890
Stock of financial assets in billion US\$ ^{1/}	7.8	16.7	23.4	29.6	36.9	48.5	56.2	57.7	63.4	76.6
GDP	77,551	96,052	116,915	162,576	232,946	320,235	354,850	405,766	566,480	662,452
Shadow Exchange rate (in Rials/\$)	1,420	1,498	1,806	2,667	4,036	4,446	4,782	6,468	8,658	8,188

^{1/} Assumes all savings are invested in dollar assets earning a real dollar return of 4 percent

^{2/} Valuation adjustment reflects the nominal depreciation of the Rial

A new fiscal framework for the medium term

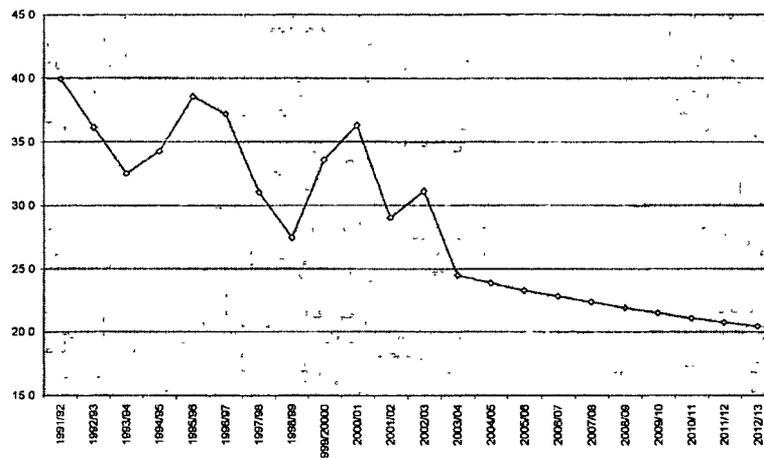
4.41. The analysis shows that Iran could ill afford the high spending and low taxes that characterized the fiscal policy stance of the past decade. And it will be less able to afford it in the future as the economy and the population expand. The stock of energy wealth has been depleted, and the rate of depletion will accelerate unless a fundamental reform of fiscal policy is initiated soon and implemented swiftly and vigorously.

4.42. Such a reform will have to meet the following challenges:

- Based on the expected rate of extraction predicted above, the rate at which stocks can be extracted and sold will be about 2 percent a year, roughly the same as in the past decade. If the non-oil economy can sustain at least the average 5 percent growth rate of the last decade, realized oil revenues as a share of GDP will continue to decline (figure 4.7).
- Second, the optimal use of energy revenues will also continue to decline as the economy continues to grow faster than the population.¹⁷
- Based on the preliminary figures for the 2001/02 budget and the projections for the 2002/03 budget, the gap between the actual use of energy revenues and the optimal level is about 10 percent of GDP (figure 4.8 and table 4).

¹⁷ Recall that the optimal use of the energy wealth keeps per capita use constant. Hence the total use of revenues from the energy wealth increases at the rate of population growth. As we said earlier, large swings in the optimal level of consumption out of the energy wealth for the past decade reflect mainly large swings in the real exchange rate vis-à-vis the dollars as the value of the wealth is anchored to the dollar

**Figure 4.7. Revenues from the sales of energy
 (in percent of GDP)**



**Figure 4.8. Actual and optimal use of revenues from energy wealth
 (in percent of GDP)**

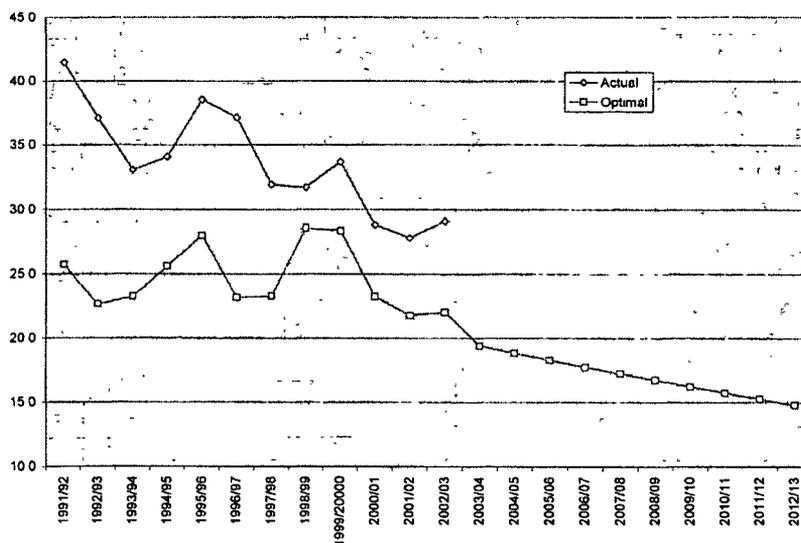


Table 4.8a. Iran: Medium-term Optimal Fiscal Strategy

	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Total revenues	436,474	495,613	562,692	642,038	732,683	828,645	928,705	1,021,704	1,106,902	1,176,320
Oil & gas revenues	308,096	345,328	386,825	436,311	492,124	550,028	609,101	662,022	709,686	746,132
[in million of U.S dollars]	24,994	25,977	26,982	28,221	29,516	30,870	32,286	33,767	35,502	37,325
Oil revenues	23,337	24,191	25,077	26,188	27,348	28,560	29,826	31,147	32,724	34,379
Volume in million barrels	1,419	1,442	1,465	1,500	1,536	1,573	1,610	1,649	1,698	1,749
Gas revenues	1,656	1,785	1,906	2,033	2,167	2,310	2,460	2,620	2,779	2,946
Net Volume in million barrels	339	358	374	392	409	428	447	466	485	504
Tax and nontax revenues	128,378	147,523	169,627	195,166	224,546	255,996	289,169	320,589	348,945	372,494
Interest receipts		2,762	6,240	10,561	16,013	22,621	30,435	39,093	48,271	57,694
Total current expenditure	372,438	420,016	473,866	534,849	603,801	675,585	749,123	815,454	871,324	913,313
Financed by tax and nontax	128,378	147,523	169,627	195,166	224,546	255,996	289,169	320,589	348,945	372,494
Financed by energy wealth	244,060	272,493	304,239	339,683	379,256	419,589	459,954	494,864	522,379	540,819
Per capita consump , in 2002 dollars	290.8	290.8	290.8	290.8	290.8	290.8	290.8	290.8	290.8	290.8
Population in million	66.8	67.8	68.8	69.8	70.9	71.9	73.0	74.1	75.2	76.3
Total consump , in 2002 dollars	19,411	19,702	19,998	20,298	20,602	20,911	21,225	21,543	21,866	22,194
Total consump , in current dollars	19,799	20,498	21,222	21,971	22,746	23,549	24,381	25,241	26,132	27,055
Overall current balance	64,035	75,597	88,826	107,189	128,882	153,060	179,582	206,250	235,578	263,008
Financial assets (incl. Valuation adjs.) 1/2/	64,035	144,654	244,826	371,217	529,214	718,592	940,444	1,183,575	1,442,360	1,705,368
Stock of financial assets in billion US\$ 1/	5.2	10.9	17.1	24.0	31.7	40.3	49.8	60.4	72.2	85.3
GDP (in trillion Rials)	1,259	1,446	1,663	1,913	2,201	2,510	2,835	3,143	3,421	3,652
Exchange rate (rials/US\$)	12,327	13,294	14,336	15,461	16,673	17,818	18,866	19,605	19,990	19,990

1/ Assumes all savings are invested in dollar assets earning a real dollar interest rate of 4 percent

2/ Valuation adjustment reflect the nominal depreciation of the Rial

MEDIUM TERM FRAMEWORK FOR TRANSITION
CONVERTING OIL WEALTH TO DEVELOPMENT

Table 4.8b. Iran: Medium-term Optimal Fiscal Strategy

	2000-2002	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Total revenues	42.4	34.7	34.3	33.8	33.6	33.3	33.0	32.8	32.5	32.4	32.2
Oil & gas revenues	32.2	24.5	23.9	23.3	22.8	22.4	21.9	21.5	21.1	20.7	20.4
[in million of U.S. dollars]		24,994	25,977	26,982	28,221	29,516	30,870	32,286	33,767	35,502	37,325
Tax and nontax revenues	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2
Interest receipts	0.0	0.0	0.2	0.4	0.6	0.7	0.9	1.1	1.2	1.4	1.6
Total expenditure	38.8	29.6	29.0	28.5	28.0	27.4	26.9	26.4	25.9	25.5	25.0
Financed by tax and nontax	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2
Financed by energy wealth	28.6	19.4	18.8	18.3	17.8	17.2	16.7	16.2	15.7	15.3	14.8
total consump. in current dollars		19,799	20,498	21,222	21,971	22,746	23,549	24,381	25,241	26,132	27,055
Overall balance	3.6	5.1	5.2	5.3	5.6	5.9	6.1	6.3	6.6	6.9	7.2
Financial assets (incl. Valuation adjs.) 1/ 2/		5.1	10.0	14.7	19.4	24.0	28.6	33.2	37.7	42.2	46.7
Stock of financial assets in billion US\$ 1/		5.2	10.9	17.1	24.0	31.7	40.3	49.8	60.4	72.2	85.3
Needed adjustment		-9.2	-9.7	-10.3	-10.8	-11.3	-11.8	-12.3	-12.8	-13.3	-13.7

1/ Assumes all savings are invested in dollar assets earning a real dollar interest rate of 4 percent

2/ Valuation adjustment reflects the nominal depreciation of the Rial.

Chapter 5. Fiscal Adjustment: The Domestic Energy Price Reform

5.1. Iran's implicit fiscal policy revealed by the foregoing analysis is essentially one of a balanced budget around a large inflow of oil and gas revenues to the budget of more than 30 percent of GDP.¹ The premise of the policy was to extract as much as possible from the energy resources—and to use the revenues to provide reasonably generous public goods, highly subsidized energy products, and imported essential goods, while maintaining a low rate of overall taxation of about 8 percent of GDP. Capital expenditure was around 5 to 6 percent of GDP, or a less than fifth of total government spending. At about 40 percent of GDP, Iran's government is not only nearly twice the average size for a middle-income country (22 percent of GDP), but also bigger than the average for a high income country (30 percent), and similar only to the average for Europe (38 percent).

5.2. Why should Iran shift toward a different fiscal policy with a sustained fiscal surplus channeled to an oil savings and investment fund? For two reasons. First, Iran's fiscal revenues come, in large part, from exhaustible resources, and optimal management of these resources to ensure a sustainable flow of income from them requires limiting consumption from this wealth and shifting the rest to investment. Second, a more aggressive growth policy, supported by strong structural reforms, is needed to contain the dangerous increase in unemployment. This policy requires much higher savings to finance the needed investment. Those savings could come from a fiscal policy that manages oil and energy better.

5.3. To make this fiscal adjustment, Iran has choices to reduce public consumption and to increase taxes. The choices need to be based on a serious rationalization of public expenditures by reducing costs and getting the best outcomes from these expenditures in terms of growth, distribution, and the quality of service delivery.

5.4. The most obvious candidate for rationalization is the gradual, but ultimate, elimination of energy subsidies. There are two reasons for this. First, because of the huge amplitude of these subsidies of about 11 percent GDP on average (see below), which if eliminated could alone provide the necessary additional savings for the reform scenario. Second, because of the large efficiency gain from the deadweight loss associated with these energy subsidies. This is the more so because the consumer loss of welfare due to

¹ On average, Iran has finished the decade of the 1990s with an annual balanced budget (an average annual surplus of 0.2 percent of GDP) Iran has only a small external debt now, and except for the period of the 1990s, during the reconstruction from the war with Iraq, it has always, throughout its modern history, maintained a minimal external indebtedness level.

the increase of prices to border levels is related not to the total amount of this compression, but to that amount minus the deadweight loss. Obviously the reform of energy subsidies is only one area of public expenditure rationalization. There should be rationalization efforts in all other areas of public expenditures. The following sections: Present an analysis of Iran's distorted domestic energy pricing and the magnitude of the corresponding subsidies. Measure and analyze the impact of adjusting energy prices on sectoral and aggregate cost of living. Examine the implication of removing these subsidies on the different income groups.

Current energy prices and magnitude of energy subsidies

5.5. Energy prices in Iran have for long time been below opportunity costs—as measured by the border price of the traded energy and the production costs of the non-traded energy products. This divergence between domestic prices and opportunity costs implies a welfare loss for the economy.²

5.6. In recent years the government has increased energy prices somewhat, but because of the very low starting point they remain far below opportunity costs (table 5.1). Even with large percentage increases, petroleum product prices have stayed very low relative to border prices. Gasoline made the largest move but still cost about the third of its border price at the beginning of fiscal 2002-03. From 1995 to 2000, these price increases were more rapid than the general price index, but since the start of the third FYDP in 2000, they have increased by only 10 percent a year, which is less than the prevailing inflation (tables 5.2 and 5.3).

5.7. Among all OPEC countries—and so presumably among all countries—Iran has the highest subsidies for a series of petroleum products (figure 5.1). Energy subsidies average about 11 percent of GDP. The estimated subsidies in 2001/2002, based on the rolling average border oil price, were 9.6 percent of GDP.

²Consumers value a marginal barrel of oil (say) priced at existing levels equally to the amount of other goods that such a sum of money could buy. If the marginal barrel of oil was exported (which is possible since Iran has a production quota and not an export quota and a barrel that is not consumed domestically could be exported) then the higher price received would enable more of these other goods to be purchased and given to consumers, thus increasing welfare. Hence the domestic price should be equal to the border price, rather than set equal to production costs or some other value below the border price. The actual allocation of the difference between a sale price based on opportunity costs and the production cost should be determined by the government so as to maximize the overall benefits to the economy.

Table 5.1. Islamic Republic of Iran: Estimated domestic and international prices for energy products

	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02
Domestic sales prices in rials													
Kerosene (rial/liter)		4	15	15	15	15	20	30	40	60	100	110	120
Fuel oil (rial/liter)		2	5	5	5	5	10	15	20	30	50	55	64
Gasoline (rial/liter)		50	50	50	50	50	100	130	160	200	350	385	450
Gas oil (rial/liter)		4	10	10	10	10	20	30	40	60	100	110	120
Electricity (rial/kwh)		6	9	11	17	29	34	41	50	60	72	88	96.8
Natural gas (rial/m ³)	3 08	3 12	3.22	6	6.3	12.4	14.9	17.9	22	36	46.7	53.8	59
Border prices in dollars													
Kerosene (cent/liter)		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.2
Fuel oil (cent/liter)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.1
Gasoline (cent/liter)		15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.3
Gas oil (cent/liter)		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.2
Electricity (cent/kwh)		3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.8
Natural gas (cent/m ³)		3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.7
Border prices in rials (at market ER)													
Kerosene (rial/liter)		141.2	142.0	149.8	180.6	266.7	403.6	444.6	478.2	646.8	865.8	818.8	831.3
Fuel oil (rial/liter)		84.7	85.2	89.9	108.3	160.0	242.2	266.7	286.9	388.1	519.5	491.3	498.8
Gasoline (rial/liter)		211.8	213.0	224.7	270.9	400.1	605.4	666.8	717.2	970.3	1298.7	1228.2	1247.0
Gas oil (rial/liter)		141.2	142.0	149.8	180.6	266.7	403.6	444.6	478.2	646.8	865.8	818.8	831.3
Electricity (rial/kwh)		52.3	52.5	55.4	66.8	98.7	149.3	164.5	176.9	239.3	320.3	303.0	307.6
Natural gas (rial/m ³)		50.8	51.1	53.9	65.0	96.0	145.3	160.0	172.1	232.9	311.7	294.8	299.3

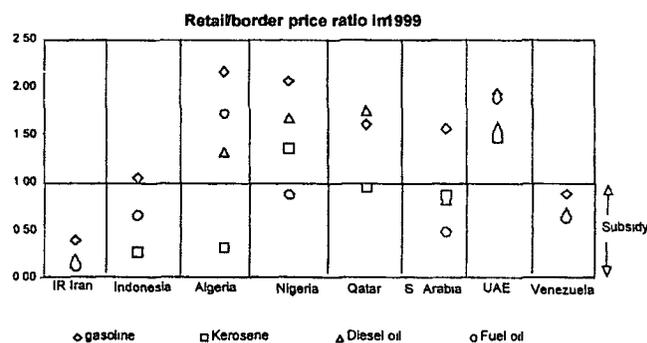
Source: Oil Ministry, MPO, and World Bank staff estimates

Table 5.2. Demands for energy products and estimated energy subsidy

	1995/96	1996/97	1997/98	1998/99	1999/2000	2000/01	2001/02
Domestic consumption							
Kerosene (billion of liters per year)	9.9	10.5	9.9	9.4	8.9	8.7	9.4
Fuel oil (billion of liters per year)	8.5	8.5	8.7	9.2	7.6	7.9	7.2
Gasoline (billion of liters per year)	10.2	10.8	11.4	12.3	12.7	13.9	16.6
Gas oil (billion of liters per year)	20.4	21.8	21.9	22.4	21.9	23.0	22.5
Electricity (billion of kwh per year)	65.9	69.7	73.4	77.6	84.7	90.4	98.5
Natural gas (billions of m ³ per year)	21.9	25.5	28.6	28.8	33.3	36.8	42.2
Total subsidy in trillion rials							
Kerosene	3.8	4.4	4.3	5.5	6.8	6.2	6.7
Fuel oil	2.0	2.1	2.3	3.3	3.6	3.5	3.1
Gasoline	5.2	5.8	6.3	9.5	12.1	11.7	13.2
Gas oil	7.8	9.0	9.6	13.2	16.8	16.3	16.0
Electricity	7.6	8.6	9.4	13.9	21.0	19.4	20.8
Natural gas	2.9	3.6	4.3	5.7	8.8	8.9	10.1
Total subsidy in percent of GDP							
Kerosene	1.6	1.4	1.2	1.3	1.2	1.0	0.9
Fuel oil	0.8	0.7	0.7	0.8	0.6	0.5	0.4
Gasoline	2.2	1.8	1.8	2.3	2.2	1.8	1.8
Gas oil	3.3	2.9	2.7	3.2	3.0	2.5	2.2
Electricity	3.2	2.7	2.7	3.4	3.7	3.0	2.9
Natural gas	1.2	1.1	1.2	1.4	1.6	1.4	1.4

Source. MPO and World Bank staff estimates.

Figure 5.1. Ratio of retail prices to border prices



Source: OPEC

Estimated impact of removing energy subsidies on prices and aggregate living costs

5.8. The most immediate and publicly visible impact of the proposed increases in energy prices would be on the cost of living for households, who would now find themselves facing increased prices for energy goods, and for non-energy goods whose prices had to increase to offset the increase in their energy costs and the other inputs whose costs in turn have been affected by energy price rises. These effects would take time to filter through the economy, with the consumers noticing first the impact effect of the change on energy goods that they themselves purchase (for example electricity). This would be followed by the first round effects of the price rises of goods reflecting their own purchases of energy (for example transport costs affected by fuel price increases). The impact and first round effects on the final prices are together known as the “direct” effect.

5.9. There will also be “indirect” effects, with prices of goods reflecting higher costs from the inputs of other goods affected by energy prices (for example processed foodstuffs affected by higher transport costs). The prices of different goods could be expected to rise to a greater or lesser extent. The smaller the share of energy used in the production of a consumer good (directly and indirectly), the less the proportionate increase in final prices.

5.10. The incremental effects on sector prices and on the overall cost of living can in principle be calculated by combining an input-output table, which shows the input structure for all final goods, and a consumer expenditure survey, which shows the amounts of each final good purchased by consumers. Ideally, that calculation would be based on an input-output table and a consumer survey for the year when the reform policy starts. Neither exist, so calculations must be on the basis of the most recent data available, injecting a degree of imprecision (appendix 5.1).

5.11. Bringing domestic energy prices to their 10 years moving average border levels translates into a total increase of about 30.5 percentage point increase in the price level above the base line. This general price increase represents an upper bound or a ceiling for the expected impact because it does not take into account the price and income elasticities effects which we show elsewhere to be important (Appendix 5.4). If the price increase triggers a shift toward a more efficient energy use at the production level (more energy efficient technology) and more rational consumption use at the level of the consumer, This could lead to gains of between a third and half of the total domestic energy consumption, reducing by as much the increase in the general price level due to energy price adjustment.

5.12. The effects as measured presuppose that there is full transmission by sectors of their increased energy costs to the consumers, so that the full impact is absorbed by the final demand. In the more open trade system to which Iran is moving, this will imply competitiveness pressure on many industries. A mitigating factor may be in that most of the affected sectors are of a non-tradable nature. But the potential for de-protection of

many industries is large as in sectors like steel, cars and cement, protection was essentially through low energy cost. This highlights two policy elements: First, the need to factor the reform of the energy prices in the design of the ongoing tariff reform and shift towards tariff protection rather than cost based protection; and (ii) the need to design a strategy for technology upgrade of the high energy consuming sectors so that over the next few years a shift toward the adoption of a more energy efficient technology be made. Such a technological shift should lower the cost of these industries by as much efficiency gain as it could be made, and contribute, henceforth, to lower the overall price impact by as much over the medium term.

Table 5.3. Energy Efficiency in Iran and "Best Practices"

Industry/Sector	Specific Energy Consumption (Iran)	Specific Energy Consumption "best practice"	Factor of Comparison
Cement Plants	Electricity consumption: 120kWh/ton Specific fuel consumption: 970 kcal/kg of clinker (TehranC)	Electricity consumption: 100 kWh/ton (Japan) Specific fuel consumption: 706 kcal/kg of clinker (Japan)	37%
Isfahan Iron and Steel Mill	Specific energy consumption: 9 Gca/ton crude steel	Specific energy consumption: 5.7 Gca/ton crude steel (Japan)	58%
Refrigerators	Domestically produced models: 46 kWh per month	Imported models: 27 kWh per month	70%
Car Transport	Domestically produced passenger cars: 12 - 14 liters of gasoline pwe 100 kms	Imported passengers cars: 7 - 12 liters of gasoline per 100kms.	37%
Thermal Power Plants	Average thermal efficiency. 31.2% Losses in transmission and distribution: 13.3%	Average thermal efficiency: 39.8% Losses in transmission and distribution: 8 1 %	

Source. World Bank, 1994 "An End-Use Energy Efficiency Strategy for Iran" Technical Report

Table 5.4. Incremental sector and consumer price increases due to energy price changes implemented at the start of the reform

Sectors	Incremental sector price increase	Share in total household expenditure	Consumer-weighted price increases	Direct price impact	Share of direct impact in total increase%
Farming	8.3%	4.5%	0.38%	2.7%	33%
Livestock	9.3%	2.3%	0.21%	1.8%	20%
Other agriculture activities	5.3%	0.2%	0.01%	0.6%	12%
Mining	15.9%	0.0%	0.00%	9.3%	59%
Crude petroleum & natural gas	1.9%	0.0%	0.00%	1.3%	69%
Sugar	14.9%	1.0%	0.14%	5.9%	39%
Other food industries	15.6%	14.9%	2.33%	5.0%	32%
Paper, printing & publishing	18.7%	0.9%	0.17%	4.9%	26%
Cement	79.0%	0.0%	0.00%	70.3%	89%
Brick	83.2%	0.0%	0.00%	67.4%	81%
Gypsum and other minerals	82.9%	0.0%	0.00%	68.0%	82%
Glass and glassware	32.0%	0.2%	0.05%	21.9%	68%
Other non-metal products	29.1%	0.0%	0.00%	13.3%	46%
Textile	18.1%	0.7%	0.14%	3.7%	20%
Clothing	17.6%	5.5%	0.97%	4.0%	23%
Weaving and leather products	18.6%	2.7%	0.50%	5.1%	28%
Rubber and plastic products	30.5%	0.4%	0.12%	3.8%	13%
Pharmaceutical products	18.0%	0.5%	0.10%	3.0%	16%
Kerosene	906.3%	0.4%	3.81%	906.3%	100%
Fuel oil	1021.3%	0.0%	0.00%	1021.3%	100%
Gasoline	292.4%	0.2%	0.71%	292.4%	100%
Gas oil	906.3%	0.0%	0.44%	906.3%	100%
Liquid gas	23.1%	0.1%	0.03%	15.0%	65%
Other materials and chemical products	59.4%	1.4%	0.83%	33.6%	57%
Basic metal & steel products	25.3%	0.0%	0.00%	7.5%	30%
Copper, aluminum and other basic products	31.1%	0.0%	0.00%	13.5%	43%
Metal products in construction and manufacturing	30.7%	0.1%	0.04%	8.6%	28%
Industrial machinery	19.4%	0.0%	0.00%	3.8%	20%
Radio, TV, and other communicative equipment	14.6%	0.4%	0.06%	3.6%	25%
Motor vehicle equipment	27.9%	1.9%	0.52%	11.5%	41%
Other industrial products	14.0%	0.4%	0.05%	1.3%	10%
Electricity	308.8%	0.9%	2.75%	308.8%	100%
Water	73.0%	0.3%	0.25%	62.5%	86%
Natural gas	627.9%	0.2%	1.06%	627.9%	100%
Construction	27.6%	0.3%	0.08%	11.4%	41%
Trade	18.2%	21.0%	3.82%	13.1%	72%
Restaurant	10.7%	1.9%	0.20%	1.6%	15%
Hotel and motels	23.4%	0.4%	0.10%	14.5%	62%
Load transport	88.3%	7.1%	6.31%	78.9%	89%
Passenger transport	55.6%	2.2%	1.24%	44.0%	79%
Post and telecommunications	18.0%	1.0%	0.19%	12.6%	70%
Other transport and storage	54.6%	0.0%	0.00%	44.5%	82%
Other services	11.4%	25.7%	2.92%	4.3%	38%
Inflation increment			30.53%		

Source: World Bank staff calculations

5.13. Apart from the energy sectors, 12 of the 43 sectors would experience price increases of more than 30 percent (table 5.4). They are, in descending order of severity of impact: load transport (88.3%), brick (83.2%), gypsum (82.9%), cement (79%), water (73%), other materials and chemicals (59.4%), passenger transport (55.6%), other transport and storage (54.6%), glass (32%), copper, aluminum and other metals (31.1%), metal products (30.7%), and other nonmetal products (30.5%). Four of these sectors are construction materials—not purchased directly in substantial quantities by households, but important as productive sectors, particularly housing. With the exception of chemicals, copper, aluminum and metal products, these are all highly non-tradable sectors—so the balance of trade is unlikely to be affected either by the loss of their export markets or by import competition from abroad. The large impact on the transport sector, given its heavy use of various fuels, is to be expected. Water and transport costs directly enter household budgets, so the effects will be visible.

5.14. The effects of the energy price increases will be passed on most rapidly to sectors that have a high direct impact. Almost without exception, the sectors with the highest incremental price increases also have the largest proportion of direct to indirect cost impacts. For the transport and construction materials and construction sectors, between 60% and 90% of the impact comes directly from their own use of energy. This contrasts with industries such as textiles and clothing, where only 20% of the final impact of energy price rises would be felt as a direct impact—or agriculture, where the direct impact is only 11% of the total effect. This suggests that the industries most impacted will also be the quickest to feel the effects, since so much comes from their direct purchases of energy.

5.15. The importance of these different price increases for consumers will depend on the relative shares in their budgets. For goods that occupy only a small share of the budget, a large price rise will have proportionately less than for goods with a larger share. To calculate the impact of these price increases on the total cost of living of households, and on their welfare, expenditure shares are needed (appendix 5.2).

5.16. The aggregate shares show that for consumers certain goods and services stand out as occupying a dominant position in the household budgets. Particularly important are other services (25.7%), trade (21%), other food (14.9%), load transport (7.1%) and clothing (5.5%). With the exception of load transport, none of these groups is estimated to face substantial price increases as a result of the energy price rises.

5.17. Combining the expenditure shares with the increases in prices gives an estimate, for the economy as a whole, of the increase in nominal consumer expenditure that would be required to purchase the same quantities of each good as before the price rise. This is, in effect, the increase in the cost of living for a representative household—and can be taken as the impact of the removal of energy subsidies on the consumer price index. The calculations show that, in aggregate, the one-time impact of the energy price rises is estimated to add 30.5% to the CPI (table 5.4). Table 5.4 shows the contributions of individual goods to this cost of living increase. For example, the expected price increase

for farming goods is 8.3%, and farming occupies 4.5% of the total budget of households, so that the contribution to the total cost of living increase of 30.5% is the product (0.38%) of the two numbers. The table shows that the combination of the two effects is large for transport (6.31%), kerosene (3.81%), trade (3.82%), services (2.92%), electricity (2.75%) and other food (2.33%). These six categories above account for 21.9 percentage points out of the 30.5% average price rise.

5.18. The impact of this price increase on the welfare of households can be set as an upper limit. With no substitution between goods (zero price elasticity of demand for all goods), the increment in expenditure that would be needed to purchase the same bundle is exactly equal to the increment in money income that would be required to leave households no worse off than they were before the price increases (30.5% of total household expenditure). This loss of “consumer surplus” would be reduced if consumers actually switched their expenditure patterns towards cheaper goods and away from those whose prices had risen most rapidly. To estimate such effects, it is necessary to have a complete set of price and income elasticities for the set of goods as classified in the input-output table. Such information is lacking at present, and it can't be inferred from the past as price increases were small and at a range where price elasticities are small.

5.19. Over time, as consumers learn to adjust their budgets, and possibly their stock of household goods that use these goods (for example switching to a more energy-efficient car when replacement is due) the price elasticities would increase and their loss in welfare (if they do not receive any compensation) would be reduced. This adjustment period could overlap the phasing of price increases so that, by the time of the third staged increase, consumers would be reacting more vigorously to the initial increase—so that they would not feel the same welfare loss as if the full price increase were implemented in a single step.

5.20. The percentage welfare loss due to the change in the *price of a single good* can be approximated by:

$$\Delta CS/Y = b_0 * P * [1 - 0.5 * \epsilon * P]$$

(1)

where:

ΔCS	= change in consumer surplus
Y	= total initial expenditure
P	= change in product price relative to its initial level
b_0	= initial share of expenditure on the good
ϵ	= own price elasticity of demand

5.21. When the elasticity is zero, then the percentage change in welfare is equal to the increase in expenditure required to purchase the same quantities divided by the initial expenditure. As the elasticity for the good rises towards one, the loss in welfare is sharply reduced, especially for large price increases.

5.22. As shown above in table 5.4, some six goods will be important because of their substitutability, since they have the combination of a large budget share and a high price increase. Among these goods are kerosene and electricity. The price of both these products rises relative to other goods, and both occupy a substantial share in the budget. An international study of the demand for fuels³ suggested that for kerosene, which is purchased directly by households, the long-run own price elasticity may be near one, while for electricity it is on the order of 0.2. These values support the idea that for these two items—purchased directly by consumers and experiencing among the largest absolute and relative price rises—there will be some demand-switching to cheaper items.

5.23. An important consideration for the economy will be the impact of the price increases on the total demand for energy, since any reduction in domestic use will free more for export, and hence improve the balance of payments. If the government did not return any of its extra revenue to households as income support, and if wages did not rise to compensate for the price increases, the real income of households would decline by around 24%. The impact on energy demand by consumers will then depend on this income effect and on the price effects of the changes in relative prices, of which the energy prices will be the most important.

5.24. There are no reliable estimates of price and income elasticities for energy products in Iran. Prices have always been repressed at a low level, leaving little room for investigation.

Estimated impact of removing energy subsidies on different income groups

5.25. The aggregate expenditure shares and the associated cost of living increases conceal important differences in consumption patterns across income groups. The same sector price increase would have different impacts on rural and urban households, and on higher and lower income households. Using data from the original household expenditure survey, which provides detailed expenditure data for the decile groups of urban and rural households, we estimated budget shares of all the commodities included in the input output table for five quintile groups, for urban and rural population. These were combined with the estimated price increase to give a picture of the relative importance of the energy price increases to different groups in the country.

5.26. Appendix 5.3 gives the expenditure patterns for the urban and rural quintile groups. For urban households, the shares of items that are dominant in their budgets also change markedly with income class. The lowest quintile (Q1) spends 28 percent of its budget on other food, while the highest quintile (Q5) spends only 8 percent; other services decline from 39 percent to 27 percent, while trade increases from 1 to 34

³ Einar Hope and Balbir Singh: "Energy Price Increases in Developing Countries: Case Studies of Colombia, Ghana, Indonesia, Malaysia, Turkey and Zimbabwe," Policy Research Working Paper 1442, The World Bank, 1995.

percent. Shares of goods whose prices would be greatly affected by energy price rises, such as kerosene and electricity, both decline as income rises. These patterns are similar for the rural and urban populations. The shares of expenditure on direct energy use by the various quintile groups are shown in tables 5.5 and 5.60.

Box 5.1. International experience of the impact of energy price increases on subsequent inflation

Many other countries, including most of the Former Soviet Union and Eastern Europe, have found it necessary to raise energy prices substantially after a period of holding them below border prices or below production costs. For example, a survey¹ in 1994 showed that for several East European countries residential electricity prices had been between 10% (Russia, Ukraine, Bulgaria) and 40-60% (Hungary, Poland, Albania, Czech Republic, Slovakia) of cost recovery levels. Subsequently, these governments have found it necessary to raise electricity prices towards cost recovery levels as the burden of financing the losses out of the central budget became insupportable.

Experience suggests that even large energy price increases have not been associated with substantial increases in the rate of inflation. The table gives actual experience of four developing countries drawn from an *ex post* study².

Energy price increases and change in aggregate inflation in certain countries

Country	Fuel	Fuel price change (%)	Change in aggregate inflation*	Fiscal revenue impact**	Change in GDP growth rate***
Malaysia	Diesel	80.0	-3.8	2	-3.0
	Kerosene	69.5			
Indonesia	Diesel	21.8	+0.6	18	+1.9
	Kerosene	23.0			
Zimbabwe	Diesel	39.7	-3.2	6	+2.0
	Kerosene	0.0			
Turkey	Diesel	33.3	+16.0	20	+1.3
	Kerosene	23.5			

* Change in annual % inflation rate from two years before the price change to two years after the price change

** Revenue gains of governments due to energy price rises as % of total central government revenues

*** Change in aggregate annual growth rate from two years before price change to two years after price change

The experience of these very diverse developing countries shows that the impact of very substantial energy price increases did not generally lead to an acceleration of the rate of inflation, indeed in three out of the four countries the government was able to reduce or hold constant the rate of overall inflation during the period following the energy price rise. At the same time, three out of the four countries were able to experience an increase in the growth rate (with the exception of Malaysia, dropping from 6.3% to 3.3% per annum). Clearly the inflation rate following the energy price increases depends on overall macroeconomic policy, but the experience of these countries suggests that it has been possible to contain the price shocks while not dampening the rate of growth of GDP via repressive monetary contractions.

A study³ of a proposed increase in energy prices for the Egyptian economy came to a similar conclusion. The Egyptian government was considering an 800-percentage increase in energy prices. An independent set of consultants was commissioned by the Egyptian General Petroleum Corporation to make a study of the likely impact on the prices of different sectors in the economy and on various income groups, as well as on different industries. The methodology adopted in that study was similar to that used in this report, in that it fed the energy prices through an input output table and combined these with expenditure surveys to obtain impacts on the different income groups, while not allowing for any price elasticity of demand for consumers or producers. Considering a planned increase of energy prices of 800 percent, the estimated increment to the consumer price index was 44 percent.

5.27. Confirming these figures is the huge energy inefficiencies in the Iranian industry in comparison with best practices in the world. Indeed, it is estimated that cement plants in Iran use about 35% more energy than those in Japan, Iron and still mills (Isfahan) use 58% more than comparator mills in Japan, refrigerators made in Iran use 70 percent more

energy than imported refrigerators, and domestic cars 37 percent more than imported ones⁴.

Table 5.5. Share of expenditure on energy products in total expenditure by quintile of rural households

Quintile	Kerosene	Gasoline	Gas Oil	Electricity	Natural gas
Q1	1.57%	0.21%	0.06%	1.08%	0.35%
Q2	1.30%	0.21%	0.04%	1.09%	0.27%
Q3	1.02%	0.27%	0.06%	0.92%	0.41%
Q4	0.90%	0.29%	0.07%	0.93%	0.36%
Q5	0.44%	0.17%	0.06%	0.44%	0.22%
All	0.73%	0.21%	0.06%	0.68%	0.28%

Table 5.6. Share of expenditure on energy products in total expenditure by quintile of urban households

	Kerosene	Gasoline	Gas Oil	Electricity	Natural gas
Q1	0.72%	0.16%	0.02%	1.22%	0.16%
Q2	0.60%	0.20%	0.01%	1.15%	0.17%
Q3	0.47%	0.30%	0.03%	1.17%	0.18%
Q4	0.36%	0.30%	0.07%	1.19%	0.15%
Q5	0.11%	0.25%	0.05%	0.75%	0.08%
All	0.30%	0.25%	0.04%	0.97%	0.12%

5.28. The actual direct shares of energy products in household budgets are all small (households do not purchase fuel oil and transport includes most of their energy consumption). Electricity is the most important in general terms, and its share declines only slowly as income rises. Kerosene is more important than electricity for the rural poor, but in both rural and urban areas its share drops rapidly as income rises.

5.29. This information on the expenditure patterns of the different income groups can be combined with the estimated price increases to give the percentage increase in

⁴ World Bank. "An End-Use Energy Efficiency Strategy for Iran". Technical report, 1994.

expenditure that would be required to purchase the same quantities of all goods as before the price rise. This gives the maximum value of the loss of consumer surplus expressed as a percentage of total expenditure for each group. Table 5.7 gives these losses for both urban and rural quintiles.

Table 5.7. Estimated percentage loss of consumer surplus for different expenditure groups.

	Total	Q1	Q2	Q3	Q4	Q5
Rural	36%	47.6%	45.2%	42.8%	40.6%	29.6%
Urban	29%	33.0%	33.8%	31.2%	30.6%	25.2%

Source: World Bank Staff estimates

5.30. The increase in energy prices would, without compensating action from the government, be strongly regressive. For both rural and urban households, the proportionate loss in welfare due to the higher prices declines as the expenditure level rises. The proportionate burden will be heavier on rural households, both because of their general expenditure level being lower and because of the nature of the goods that they purchase. The proportionate impact on the poorest rural group would be about twice that of the best-off urban quintile.

5.31. The calculations also give an upper bound to the increase in spending that would be required for each group to purchase the same quantities of goods. This can serve as a benchmark for any policy of government assistance to counter some of the effects of the price rises. Finally, the estimation of the levels of loss for the different groups combined with estimates of the relative numbers in the rural (38 percent of total households) and urban quintiles, makes it possible to design transitory compensation schemes to ensure that specific households have a net welfare gain, or a loss no greater than a specified amount.

Chapter 6. Phasing The Energy Price Reform

6.1 How to phase out the adjustment to smooth down its social and economic effects? There are two possible phasing strategies in question. One is how to phase out the price adjustment process itself as a way to smooth down the adjustment impact. The other is, given a full one time adjustment (one shot adjustment of prices), how to smooth down its impact through forms of timed and transitory support or transfers to those affected.

6.2 Each of the adjustment paths carries its advantages and disadvantages and there is no straight answer as to what is the preferred solution. This chapter reviews alternative adjustment schemes and leaves the final decision to the policy makers who are better positioned to weigh the risks they face. We hope that the technical analysis and methodology elaborated here helps provide a basis for a more informed judgment and decision.

6.3 What could be said though, is that a quick adjustment (say in one or two years) would have the advantage of a quick elimination of the subsidies, with economic agents adjusting their inflation expectations more quickly, and valuing the energy cost component of their projects more accurately. Their investment planning could be then based on more sure information. The policy maker, once the energy price adjustment is quickly made, can devote all his efforts to the management of the effects of this adjustment and the implementation of a transitory strategy of smoothing out the social and economic impact as we will discuss later. Obviously, the amplitude of the price jump is high and, if made in one time, will bring a jump in the general level of prices to a level that reminds of Iran's difficult macroeconomic days of the mid 1990s when Iran has experienced inflationary tension with even higher amplitude than 40 percent per year. The perception of such a situation could be destabilizing, even though in the past these were the effects of an underlining increasingly instable macroeconomic situation and severe foreign exchange crisis as well as depressed expectations (see Chapter IXX), while the case here is of a limited in time jump in price level, which is different of inflation.

6.4 However, one should be reminded that Iran has just went through a major unification of its multiple exchange rate system (a byproduct of the lost control of the macro economic situation in 1994) and time is required to consolidate the foreign exchange system reform and ensure that all its own social and economic effects are resolved and well mastered before moving with a potentially destabilizing price shock of this amplitude. Moreover, as this report is written, the Middle East Region is going through a particularly difficult and instable political situation heightening uncertainties and domestic political and economic risk of Iran. A careful evaluation of the domestic

and international situation and the risks it involve is thus needed to start and gauge the implementation of the energy reform and decide on what phasing strategy to chose. In any case, any waiting time should be fully used to further the preparation of the necessary institutional and social safety net measures to cushion it and the understanding of its economic implications and the preparation for countering them.

6.5 What Iran should avoid is to get into the adjustment process without a clearly defined and widely accepted road map of how to phase this process and how to use the realized savings. One pitfall to avoid is to engage in price increase and use it's proceeds in consumption and unplanned public expenditure increases that it will be even harder later on to identify and reduce. Some of the other OPEC countries went through this way and lost the opportunity to transform the slacks that energy subsidies represent into a development opportunity. Iran needs to clearly define its wealth management strategy and institute ahead of the reform, an Oil Savings and Investment Fund with clear rules of management.

Case of phasing through incremental price adjustment: impact of alternative scenarios

6.6 Table 6.1 presents the overall impact on the general price level of four alternative scenarios to bring domestic energy prices to their border prices level. As a reference, we present also the case of a one time adjustment. The scenarios spread the adjustment over three years and over five years. Two of them spread the adjustment through equal incremental adjustments of 1/3 and 1/5 of the gap between domestic and border price. The remaining two consider front-loaded adjustments: (1) for the three year adjustment by closing half of the gap the first year, bringing prices to two-thirds of their border price the second year, and closing the gap in the third year; (2) for the five years adjustment, by closing the gap by 30 percent, 25 percent, 20 percent, 15 percent, and 10 percent in each successive year.

6.7 In the reference case, the full adjustment in one time implies an increase of the CPI of 30.5 percent above the underlying 10 percent inflation, bringing total inflation to about 40 percent. This pass-through impact should wither down over a shorter time and leave inflation at its 10 percent thereafter. In the remaining scenarios, the uniform incremental rise in energy prices—by a third each year for the three year adjustment and by a fifth each year for the five-year adjustment plan—brings down the incremental inflation impact to about 9.5 percent a year for the first and 6.5 a year for the second, for a cumulative increase of 31 percent for the first and 37 percent for the second. The frontloaded adjustments imply a decreasing impact but a higher total effect of 32 percent for the three years frontloaded adjustment, and 38.4 percent for the frontloaded five years adjustment scenario

Table 6.1. Simulation of dynamic inflationary impact of energy price adjustment

	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Reference case: Full adjustment in one step in March 2003/1							
Domestic sales prices							
Kerosene (cent/liter)	1.5	10.6	10.8	11.0	11.3	11.5	11.7
Fuel oil (cent/liter)	0.8	6.4	6.5	6.6	6.8	6.9	7.0
Gasoline (cent/liter)	5.6	15.9	16.2	16.6	16.9	17.2	17.6
Gas oil (cent/liter)	1.5	10.6	10.8	11.0	11.3	11.5	11.7
Electricity (cent/kwh)	1.3	3.9	4.0	4.1	4.2	4.3	4.3
Natural gas (cent/m ³)	0.7	3.8	3.9	4.0	4.1	4.1	4.2
Percentage annual increase.							
Weighted average price in dollars		307.9	2.0	2.0	2.0	2.0	2.0
Weighted average price in rials		461.9	10.0	10.0	10.0	10.0	9.0
Total CPI inflation	12.0	40.5	10.0	10.0	10.0	10.0	9.0
Underlying inflation	12.0	10.0	10.0	10.0	10.0	10.0	9.0
Inflationary impact	0.0	30.5	0.0	0.0	0.0	0.0	0.0
Reducing the gap between domestic and border prices by 1/2 the first year and 2/3 of the remaining distance in March 2004							
Domestic sales prices							
Kerosene (cent/liter)	1.5	6.2	9.4	11.0	11.3	11.5	11.7
Fuel oil (cent/liter)	0.8	3.7	5.7	6.6	6.8	6.9	7.0
Gasoline (cent/liter)	5.6	11.1	14.7	16.6	16.9	17.2	17.6
Gas oil (cent/liter)	1.5	6.2	9.4	11.0	11.3	11.5	11.7
Electricity (cent/kwh)	1.3	2.7	3.6	4.1	4.2	4.3	4.3
Natural gas (cent/m ³)	0.7	2.3	3.4	4.0	4.1	4.1	4.2
Percentage annual increase.							
Weighted average price in dollars	-3.6	162.2	38.5	13.8	2.0	2.0	2.0
Weighted average price in rials	15.1	219.8	61.6	29.2	10.0	10.0	9.0
Total CPI inflation	12.0	24.4	19.0	15.8	10.0	10.0	9.0
Underlying inflation	12.0	10.0	10.0	10.0	10.0	10.0	9.0
Inflationary impact	0.0	14.4	9.0	5.8	0.0	0.0	0.0
(Cumulative inflationary impact)						31.9	
Reducing the gap between domestic and border prices by 1/3 a year over three years							
Domestic sales prices							
Kerosene (cent/liter)	1.5	4.6	7.8	11.0	11.3	11.5	11.7
Fuel oil (cent/liter)	0.8	2.7	4.7	6.6	6.8	6.9	7.0

¹ A concern with any scheme of pre-announced changes in prices stretching over a substantial period is whether it would encourage substantial speculative hoarding towards the end of the first period (say) followed by black-market sales in the second period at a price below the official price for that period but above the price of the first period. Individuals will of course advance their own purchases at the end of the first period in order to stock up, but their capacity to store is not likely to be great. The impact of such speculation would be to shift purchases from official suppliers from the second period to the first period, thus reducing the total revenue take of the government, as well as shifting it towards the earlier period. The impact on inflation would actually be to soften the impacts on prices, although this would not be recorded by official statistics.

MEDIUM TERM FRAMEWORK FOR TRANSITION
CONVERTING OIL WEALTH TO DEVELOPMENT

	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Gas oil (cent/liter)	1.5	4.6	7.8	11.0	11.3	11.5	11.7
Electricity (cent/kwh)	1.3	2.2	3.2	4.1	4.2	4.3	4.3
Natural gas (cent/m ³)	0.7	1.8	2.9	4.0	4.1	4.1	4.2
Percentage annual increase.							
Weighted average price in dollars		108.1	48.3	32.2	2.0	2.0	2.0
Weighted average price in Rials		153.2	73.0	49.9	10.0	10.0	9.0
Total CPI inflation	12.0	24.1	19.0	15.7	10.0		
Underlying inflation	12.0	10.0	10.0	10.0	10.0		
Inflationary impact	0.0	9.4	9.0	9.8	0.0		
(Cumulative inflationary impact)						30.9	

Reducing the gap between domestic and border prices by 1/5 th each year over 5 years

Domestic sales prices							
Kerosene (cent/liter)	1.5	3.5	5.5	7.5	9.5	11.5	11.7
	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Fuel oil (cent/liter)	0.8	2.0	3.2	4.4	5.7	6.9	7.0
Gasoline (cent/liter)	5.6	7.9	10.2	12.6	14.9	17.2	17.6
Gas oil (cent/liter)	1.5	3.5	5.5	7.5	9.5	11.5	11.7
Electricity (cent/kwh)	1.3	1.9	2.5	3.1	3.7	4.3	4.3
Natural gas (cent/m ³)	0.7	1.4	2.1	2.8	3.5	4.1	4.2
Percentage annual increase:							
Weighted average price in dollars		68.3	37.8	26.9	21.1	17.3	2.0
Weighted average price in Rials		91.2	56.6	44.7	38.9	32.6	6.0
Total CPI inflation	12.0	15.9	15.9	16.3	17.0	15.3	6.0
Underlying inflation	12.0	10.0	10.0	10.0	10.0	8.0	6.0
Inflationary impact	0.0	5.9	5.9	6.3	7.0	7.3	0.0
(Cumulative inflationary impact)						36.9	

Reducing the gap between actual and border prices by 30%, 25%, 20%, 15%, and 10% over the five years

Domestic sales prices							
Kerosene (cent/liter)	1.5	4.5	7.0	9.0	10.5	11.5	11.7
Fuel oil (cent/liter)	0.8	2.6	4.1	5.4	6.3	6.9	7.0
Gasoline (cent/liter)	5.6	9.1	12.0	14.3	16.1	17.2	17.6
Gas oil (cent/liter)	1.5	4.5	7.0	9.0	10.5	11.5	11.7
Electricity (cent/kwh)	1.3	2.2	2.9	3.5	4.0	4.3	4.3
Natural gas (cent/m ³)	0.7	1.7	2.6	3.3	3.8	4.1	4.2
Percentage annual increase							
Weighted average price in dollars		102.5	39.3	22.3	13.6	8.0	2.0
Weighted average price in rials		136.0	60.0	39.7	29.1	21.8	9.0
Total CPI inflation	12.0	18.9	17.2	16.5	15.9	15.1	9.0
Underlying inflation	12.0	10.0	10.0	10.0	10.0	10.0	9.0
Inflationary impact	0.0	8.9	7.2	6.5	5.9	5.1	0.0
(Cumulative inflationary impact)						38.4	

Source: World Bank staff estimates.

1/ The starting year for the reform is taken here as 2003 is arbitrary as it is not yet clear when the Government will start the reform process. The choice of 2003 is only for reference and is required for calculations.

Case of a full price adjustment with phased compensation schemes

6.8 Without offsetting action by the government, households would experience a 30.5 percent loss in consumer surplus. This obviously large shock could have a severe negative impact on the vulnerable. Even those not vulnerable may react negatively to such a reform and voice their discontent. The government thus needs to establish an accompanying reform scheme to offset these effects.

6.9 The essence of the reform is to move from the current system of an income distribution policy based on direct assistance to the poor, whose poverty is largely due to unemployment, to a growth-supported redistribution that reduces the number of vulnerable people. This requires that the part of the oil revenue now used to subsidize energy consumption should instead be invested—to create jobs. At the same time, a well-targeted and efficient social safety net should be gradually introduced to take the place of the system of transfers.

6.10 A first scheme could have as its aim to exactly compensate a certain proportion of “losers” for the reduced consumer surplus. This scheme would provide less than full compensation to the richer households. It would return different amounts to the poorer households, depending on how much they could lose from the price rise—and return nothing to households above some cutoff. Such a method would have a lower fiscal cost than the others. But it would redistribute income only by lowering the welfare of the richer groups—and it would do nothing to alleviate poverty. The scheme also requires an effective and low-cost way of identifying the poorer households and the extent of their poverty.

6.11 A second scheme would be to return a fixed amount to all households. Depending on the amount of this compensation, some households would be no worse off than before, and the poorest would indeed be better off. The scheme is the simplest to operate since it requires no means testing. It also redistributes income: the poor are better off than before, while the rich would be somewhat worse off. But because of the payments to all households, this flat rate would be expensive. Reducing costs by reducing the flat rate would lower the number of households that would be fully compensated. It would also attenuate the income redistribution and poverty reduction.

6.12 A third scheme would combine elements of the first two. A flat-rate could be used for all households up to a certain income level, ensuring that they were all at least as well off as before the price rise, but above that level there would be no compensation. Such a scheme would achieve more redistribution at the same flat rate, because of the reduction of the incomes of the richer groups, and have considerably lower direct costs. But it would tend to have higher administrative costs because of the need to target the lower income groups (table 6.2).

Table 6.2. Advantages and disadvantages of alternative compensation schemes

	Social benefits	Economic benefits	Political support	Ease of implementation
Exact compensation for lowest 3 quintiles	Neutral	Large	Poorest neutral Middle neutral	Low
Flat-rate compensation for lowest 3 quintiles	Moderately positive	Large	Poorest supportive	Medium
Flat-rate compensation for all groups	Moderately positive	Small	Middle neutral Poorest supportive Middle neutral to supportive	High

**Table 6.3. Impact of energy prices increases on households under various flat compensation schemes
Rural Quintile Groups**

Rural Quintile Groups	Per capita consumer surplus due to pre-reform energy prices (rials)	Consumer surplus for quintile group (billion rials)	Flat rate compensation to quintile group (billion rials) 100% of subsidies	Net gain to quintile group (billion rials)	Net gain as % of group total expenditure case off flat compensation of 100% of subsidies	Net gain as % of group total expenditure case off flat compensation of 2/3 of subsidies	Net gain as % of group total expenditure case off flat compensation of half of subsidies
Q1	368,380	1,820	6,122	+4,302	112%	59%	32%
Q2	616,700	3,046	6,122	+3,076	46%	15%	0%
Q3	841,283	4,156	6,122	+1,966	20%	-1%	-11%
Q4	1,020,786	5,043	6,122	+1,080	9%	-8%	-16%
Q5	2,473,205	12,218	6,122	-6,095	-15%	-20%	-22%
Total	1,064,071	26,283	26,283	+4,328	6%	-8%	-15%

Urban Quintile Groups

Urban Quintile Groups	Per capita consumer surplus due to pre-reform energy prices (rials)	Consumer surplus for quintile group (billion rials)	Flat rate compensation to quintile group (billion rials) 100% of Subsidies	Net gain to quintile group (billion rials)	Net gain as % of group total expenditure case of flat compensation of 100% of subsidies	Net gain as % of group total expenditure case of flat compensation of 2/3 of subsidies	Net gain as % of group total expenditure case of flat compensation of half of subsidies
Q1	520,423	4,195	9,989	+5,794	46%	19%	6%
Q2	868,315	6,999	9,989	+2,990	14%	-2%	-10%
Q3	1,034,238	8,336	9,989	+1,653	6%	-6%	-12%
Q4	1,438,403	11,594	9,989	-1,605	-4%	-13%	-17%
Q5	2,872,184	23,150	9,989	-13,161	-14%	-18%	-20%
Total	1,346,713	54,273	54,273	-4,328	-2%	-11%	-15%

Total Population Quintile Groups

Total Quintile Groups	Per capita consumer surplus due to pre-reform energy prices (rials)	Consumer surplus for quintile group (billion rials)	Flat rate compensation to quintile group (billion rials) 100% of Subsidies	Net gain to quintile group (billion rials)	Net gain as % of group total expenditure case of flat compensation of 100% of subsidies	Net gain as % of group total expenditure case of flat compensation of 2/3 of subsidies	Net gain as % of group total expenditure case of flat compensation of half of subsidies
Q1	462,647	6,014	16,111	+10,097	61%	29%	12%
Q2	772,701	10,045	16,111	+6,066	22%	3%	-7%
Q3	960,915	12,492	16,111	+3,619	10%	-5%	-12%
Q4	1,279,709	16,639	16,111	-525	-1%	-12%	-17%
Q5	2,720,572	35,367	16,111	-19,256	-14%	-18%	-21%
Total	1,239,309	80,555	80,555	0	0%	-10%	-15%

Source: World Bank staff calculation

6.13 The urban population is 62 percent of the total of 65 million, so each urban quintile has about 8 million people, while each rural quintile contains about 5 million people (assuming that household size is equal for urban and rural groups).

6.14 As a reference, we used the case of flat compensation based on the return to consumers of 100 percent of the subsidies (abstracting from the gains of deadweight loss). For rural households, the richest quintile benefits from subsidies 6.7 times more than the poorest quintile. Flat compensation would yield a consumer surplus gain to households in the poorest quintile equal to 112 percent of their current expenditure. The

next three quintiles realize substantial, but declining gains, and only the richest quintile loses. Households in this latter quintile lose an amount equal to 15 percent of their current expenditure. Rural households overall would see a gain of 6 percent of their total expenditures at the expense of urban households.

6.15 Two other scenarios are based on the return of two thirds and a half of the subsidies. The first leaves the third quintile indifferent and benefits the two first quintiles. The second leaves the second quintile indifferent, benefits the poorest quintile, and results in a 15 percent loss for the whole rural households.

6.16 Table 6.4 shows the three schemes of compensation. Scheme 1 exactly compensates the lowest 3 quintiles of both the rural and urban groups (some 39 million people) for the estimated loss of consumer surplus. Scheme 2 gives a flat rate compensation to all people, regardless of income level. Scheme 3 gives the same flat rate compensation to just the lowest 3 quintiles of both the rural and urban populations. The flat rate of compensation is chosen so that the third richest quintile is fully compensated.

6.17 A scheme of giving each individual an annual sum of about 826,000 rials would return 20,407 billion rials to the rural areas and 33,296 billion rials to the urban. This would compensate for two-thirds of the total household loss of surplus, leaving 26,852 billion rials for other purposes. A scheme of non-means-tested compensation would have strong effects on income redistribution and poverty alleviation. The poorest quintile in the urban areas and the poorest two quintiles in the rural areas would be better off than before. The richest two quintiles in both urban and rural areas would be noticeably worse off even with the compensation (table 6.4).

6.18 The scheme of exact compensation for the poorest three quintiles of households would cost the government a sum equal to the households' loss of consumer surplus. This would cost the much smaller sum of 28,551 billion rials, leaving the government 54,146 billion rials for other purposes. Such a scheme would leave 60 percent of the population unaffected by the rise in energy prices, and 40 percent worse off. The impracticalities of such a means-tested scheme (contingent on income or total expenditure levels) mean that a compromise between the two approaches be necessary.

6.19 Such a scheme could give the same flat rate-payment (960,915 rials) to each person in the lowest three quintiles of the population. This would have a total cost of 37,476 billion rials, leaving 43,079 billion rials to the government. The poorest receive more than the loss in consumer surplus, while those at the upper end of the third quintile will receive less than their loss in consumer surplus. The flat-rate schemes do more to reduce the severity of poverty (how far the worst-off are below some poverty line) than exact compensation, and may even reduce the incidence of poverty by pulling some people over the poverty threshold by more than compensating those near the threshold for their loss of surplus.

Table 6.4. Costs and benefits of alternative compensation schemes (billion rials)

	Exact compensation to lowest three quintiles	Non-means-tested flat rate compensation	Flat rate compensation that meets full compensation of third quintile
Cost of compensation	28,551	53,703	37,476
Share of compensation in loss of surplus	35%	66.6%	47%
Revenue remaining to government	52,000	26,852	43,079

Source: World Bank Staff estimates

6.20 Using a flat rate for the lowest three quintiles requires some way of identifying the members of such groups, which probably does not exist. Exact compensation, with its requirement to means-test all members of society and to return varying amounts to the different members, is probably infeasible. The scheme proposed has three stages:

6.21 In the first stage, for two years, all persons would receive a flat rate sum. This would be the easiest to administer since all persons have already been identified through ration schemes used earlier. A coupon, redeemable for cash at a bank, for the sum indicated, would be sent to individuals at regular intervals, perhaps quarterly.

6.22 After two years, to develop a method of targeting those in the lower three quintiles, the flat rate sum would be restricted to these groups. This would free a substantial sum for other purposes. Targeting might have to be carried out on the basis of some indicator known to be strongly correlated with income, since direct income testing would be expensive to carry out.

6.23 After two more years, the compensation specifically related to the impact of energy price rises would be completely removed but replaced by an extensive social safety net which designed to explicitly help those who were poorest or had special needs (unemployed, sick). This period would give the time to design such a scheme and to identify the individuals in need.

Illustrative detailed possible phasing scheme

6.24 The phasing of either the increase of the energy prices, or the compensation is critical for the efficiency of the reform of the energy price system, for political and social acceptance, and for feasibility of implementation

6.25 A preferable combination would be of a quick adjustment of prices (two to three years) and a phased compensation process over a period of 5-to-7 years. This would permit time for defining the targeting mechanisms and refining the institutional structure for the delivery mechanisms of the alternative social safety net structure the government intends to undertake, and would also provide a critical mass of revenues accumulation for its financing. This would lower the cost shock and, at the same time, allow for more progress in the reform of the exchange rate and trade reforms to take place, so as to lessen

the effect of the de-protection of the economy, and smooth the transition from an input-subsidy-based protection system to a tariff and competitive exchange regime based one. This would allow enterprises to adjust their output prices and inventories to the new costs. Finally, this could also allow enterprises to undertake adjustment measures ranging from more efficient energy use to technological substitution and conservation measures

Table 6.5. Phased energy price increase and energy resource allocation (billion rials)

Year	Revenue (billion rials)	Type of compensation scheme Used	Compensation	Transfer to other SSN schemes	Support for economic costs of reforms (to be specified)	Fiscal savings (billion rials)	Fiscal savings (of subsidies)
2003-04	81,000	Flat compensation for all	53,703		2,000	25,300	31
2004-05	92,000	Flat compensation for all	53,703		2000	36,300	39
2005-06	105,000	Flat compensation for low 3 Q	53,703		2000	49,300	47
2006-07	120,000	Transfer to consolidated SSN		15,000	1000	104,000	87
2007-08	137,000	Transfer to consolidated SSN	0	15,000	1000	121,000	88
2008-09	157,000	Transfer to consolidated SSN	0	15,000	0	142,000	90
2009-10	199,000	Transfer to consolidated SSN	0	15,000	0	184,000	92

Source: World Bank Staff estimates

6.26 We present an indicative scheme based on one time price adjustment and seven years phased compensation. This could be transformed into any combination of price adjustment length and different phasing and intensity of compensation. The indicative scheme shown here allows for a flat compensation for energy prices of about 826,000 rials for each Iranian citizen in the first three years (table 9). This corresponds to a full compensation (making it technically feasible) that meets full compensation of the third quintile. It improves the welfare of the two first quintiles, meeting the criteria of savings technical feasibility and social redistribution and fairness. It satisfies more than the median voter, meeting the criterion of political feasibility. By the end of the third year, Iran could finish its reform of the social safety net system to permit a more targeted transfer.

6.27 Over the first three years of the reform, Iran would also have made progress in improving its public transport system and in adjusting to a more efficient use of energy. This could happen through improvements in technology or (and more importantly) through the expected rational adjustment in consumption by individuals and industries

(price and income elasticity effects). So, starting in the fourth year, Iran could shift away from direct compensation toward transferring a reduced amount to a consolidated social safety net system that it targets the poor. The energy-price specific compensation scheme should therefore be consolidated with the general SSN structure. Up to 15,000 billions rials could therefore be assigned to this SSN, to be gradually reduced as growth and employment pick up.

6.28 This reduction should gradually bring back the level of government savings from oil to the optimal level calculated earlier—and bring back the use of oil and gas wealth to its sustainable level. The drop in compensation should be also partially met by the rationalization of other government expenditures. The fiscal savings should be directed to investment that could gradually shift away Iran's system of income distribution from charity and direct transfer based to employment and growth based one.

6.29 The perceived advantages of this proposed scheme are several: (i) it is easy to implement this scheme in a short period of time through a voucher system equivalent to what has been used before, piggybacking on the institutional structures of past voucher experiences and minimizing the otherwise high institution building transaction cost; (ii) it is an income re-distributive scheme because it favors the poor; (iii) it has the advantage to deflect the potential discontent of those in the upper classes for whom voice and political weight is generally higher; (iv) it allows for enough time to build and refine the SSN structure; (v) to further improve the targeting, the authorities could also make an appeal to those in the richer quintiles to voluntarily forego the collection of these vouchers in the benefit of the rest of the SSN.

6.30 A suggestion of how to withdraw out from the phased adjustment itself: A very critical issue is how to withdraw from this compensation scheme itself? Experience shows that it is always easier to create a compensation scheme than to withdraw out of it. Iran will gain to have a coherent withdrawal strategy and to announce it upfront. The most feasible one in our point of view is to fix the phased compensation amount in nominal terms, i.e., in a defined amount of cash in nominal rials, and not in real values, like the case of food vouchers denominated in fixed quantities of rice and other staples. The reason is that by fixing the compensation in nominal terms it allows for an automatic gradual phasing out through inflation and also through the fact that we avoid the growth in subsidies through higher domestic demand. -This is generally easier to implement both technically and politically than an announced further reduction. It should be emphasized, however, that this exit strategy should be announced and explained upfront. A public relations strategy to explain the reform is central to its success, including explaining the inefficiency and equity of the actual system, the rationale for the reform, the phasing mechanisms, the compensation rationale and mechanism and the exit strategy.

6.31 Monitoring the reform: It is critical that the reform implementation and the price transmission mechanism of the costs related to the energy price reform be closely monitored. The compensation mechanisms are based on the fact that consumers are compensated on direct and indirect effects of energy price adjustment. This supposes that

enterprises that use energy as input transmit fully the cost of the energy price adjustment in the final price of the goods they produce. Some of these enterprises, under the pressure of competition, will be pushed to rationalize better the use of energy, be it through change in technology or rational use. Public enterprises may have less incentives to do so. In such a case, their loss may accumulate as arrears and budget liabilities that will end up being paid by the budget anyway. In such a case, the elimination of subsidies is doubly compensated both at the level of the consumer and as arrears to public enterprises. Dis-savings rather than savings may result. It is therefore critical to build a monitoring system for public enterprises to ensure that their prices reflect the energy price increase.²

² World Bank Staff has initiated work on this area with the Research Department of the Central Bank involving 30 largest public enterprises, that could be the basis for such a monitoring system.

Chapter 7. Setting Up An Oil Savings-Investment Fund

7.1 The strategy outlined in chapters 5 and 6 revolves around using oil revenues for both immediate spending and accumulation in savings/investment that could sustain such a level of spending per head in the future. Given the projected average price of the resources, and the other parameters pertaining to population growth, interest rate, the optimal rate of consumption from oil revenues is determined and the remaining should go to an Oil Stabilization and Investment Fund (OSIF). Stabilization because the flow of the yearly income from oil will fluctuate around the projected price and will require stabilization; and investment because, given the average price, what is saved beyond consumption needs to be invested in financial or capital assets. Setting up such fund can draw on a wide range of experiences in other countries, keeping in mind that the circumstances in those countries determined the choices.

7.2 As highlighted in chapter 4, Oil Savings Funds, apart from few countries, like Norway and Kuwait, are more concerned by stabilization, than savings/investment in the sense of inter-temporal and intergenerational optimization. We review below issues related to the two types of funds and refer to the case of Iran.

Oil savings (for stabilization) funds

7.3 An oil savings fund for stabilization requires three major decisions:

- Whether there should be a separate fund, managed and audited outside the government budget.
- How large the target fund should be.
- What the rules should be for accumulation and withdrawal.

7.4 The fund would be used solely to stabilize the pre-planned budget expenditure against unforeseen fluctuations in revenues created by the volatility of oil prices. So general practice suggests that the fund should be fully integrated with the budget and merely treated as a “nominal” fund in the budget. Its management could be from inside and outside the Government ensuring a strict enforcing of the rules. However, any attempt to create a separate fund under separate management could produce spending decisions in conflict with those of the main budget.

7.5 The size of the fund is related to the reliance of the total budget on oil revenues and the expected variability over the planning horizon—it acts like a dam, catching water when it rains and releasing when drier than normal. And just as for a dam, no fund is likely to be large enough to contain all possible adverse runs on oil prices (“years of drought”) and has to be designed to contain a high proportion of adverse situations.

7.6 The rules for withdrawal and accumulation are conventionally related to the projected medium-term oil price. Over that medium term the price is expected to fluctuate about a foreseeable value. So the rule—to accumulate when the price is higher than this average, and decumulate when the price is below the average—should leave the fund at a constant size on average. There are two difficulties associated with such a procedure.

7.7 First, the oil price is not stable over the longer run against a constant nominal or constant real price. Instead, it appears to have periods where it seems stable around some level, and then shifts in global circumstances move this to another level. Reacting to a price rule different from the new average price can lead to continual accumulation or decumulation and then to strains on the budget.

7.8 The rule should thus have some gradual adjustment mechanism to deal with a quasi-permanent shift. A weighted-moving average may be better than a simple fixed average price. Alternatives, such as hedging against future oil price variations, have been suggested as a method of stabilizing revenues. But these are largely untested and may prove to be expensive.

7.9 Second, the budget discipline, whereby the fund is run down or accumulated to hold expenditure constant, can be undone by fiscal indiscipline. For example, when prices are particularly high it would be possible to spend more and transfer less than the rule required—or alternatively spend more, while transferring the amount suggested by the rule, and finance the extra through borrowing, which the existence of the fund itself (at a time of high oil prices) would make possible.

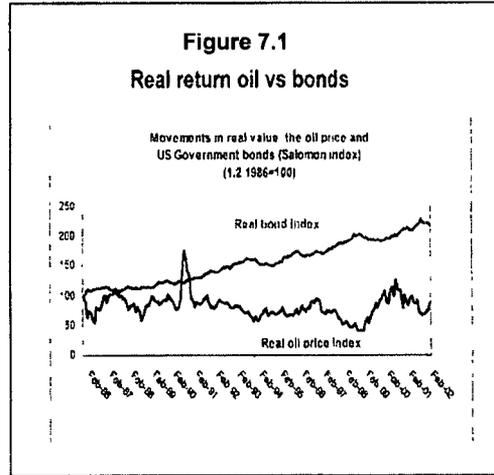
Oil savings/investment funds (inter-temporal wealth optimization case)

7.10 This type of fund is concerned by inter-temporal and inter-generational optimal management of oil wealth. The strategy is to convert oil assets to financial and non-oil wealth. This strategy effectively diversifies the assets held for future generations, once the decision about the rate of current versus future consumption has been taken. The operation of such a fund—future generations fund or oil savings and investment fund—also requires resolving several issues:

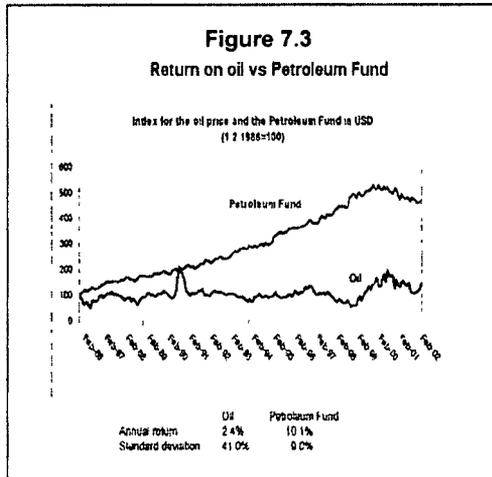
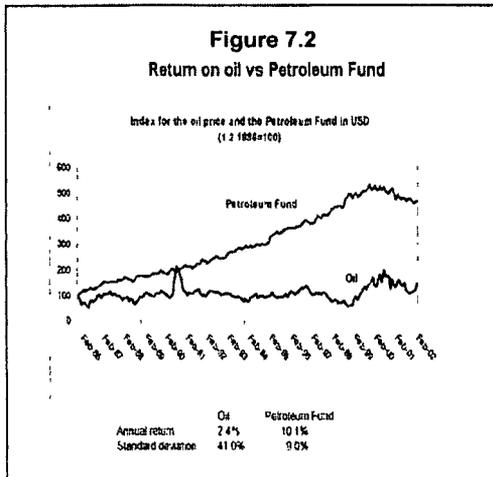
- The size of the target fund relative to the parameters just described, particularly the value of oil reserves and the objective function.
- The rules for accumulation and decumulation of the fund’s capital.

- The management of the fund's financial assets and the rules for the use of the interest and dividends from the fund's financial assets.
- The relation of the fund to the domestic economy.

7.11 The portfolio decision to hold assets in a financial form rather than as oil in the ground is justified in a number of ways. First, the price of oil in the medium to long run is less certain than the return on financial assets and carries a larger downside risk. So, a reasonable precaution would be to hold part of the oil wealth in another asset form. Second, countries can face large and unforeseen emergencies that call for abnormal spending. Financing such requirements, at a time of national emergency, on the basis of oil in the ground would require borrowing at a punitive rate (countries in distress find it more difficult to



acquire funds) and would take time to mobilize. The existence of financial assets ensures that there would be no liquidity constraint to meeting the rare but important call for extraordinary spending. Third, the return on financial assets held by other oil funds has outperformed the oil price by a considerable margin (figures 7.1, 7.2, and 7.3) This is not altogether surprising since OPEC has often acted to stabilize the price rather than to maximize it in the short term).



7.12 As well as increasing the total return, converting oil wealth into financial and investment based wealth also reduces risk: measured by the standard deviation, the risks on return to oil are four times higher than those to financial assets for the Norwegian Oil Fund.

7.13 A “ring-fenced” oil fund, once established, needs separate rules to increase or reduce its capital. The questions of when the capital should be spent (if ever) and who should make this decision are a key policy dimension. The long-term savings approach envisages that the flow of dividends and interest from the fund will provide the appropriate income for future consumption—it does not envision the capital being run down since it is “permanent income.”

7.14 Some countries have formal rules that require special agreements to spend capital, while others, such as Norway, can automatically run down the fund, by voting to increase government spending above current revenue. The mechanisms for the control of such a decision and its transparency can be designed to ensure that spending does not occur for purely short-term opportunism, seen in countries where non ring-fenced revenues have been used for heavy public works expenditures before elections. Establishing the powers needed to reduce the fund, and ensuring that this is subject to public awareness, rather than arbitrary, is a crucial element in ensuring that the use of such funds is generally acceptable. To be avoided is the recent situation in Kazakhstan, where the president revealed that he had financed some government spending from an oil fund held abroad, and whose existence had been previously unknown. Publication of the size of the fund, its dividends and disbursements has proved very positive in cases such as Norway¹ and Alberta. The sense of collective ownership and decision-making can help protect the fund from being used for opportunistic purposes. To ensure further good management, the board of managers can be separate from the government, although initially appointed by it.

7.15 The management of the fund is likely to have two separate elements. First, some of the assets should be held to maximize the return to the economy subject to certain safeguards on risk. This is conventionally achieved by defining a benchmark return (either the ministry of finance or the central bank would define the benchmark) and entrusting the fund to one or more professional financial managers with some guidelines. In Norway, in the early years the Fund was to be invested abroad solely in government bonds (which reduced the benchmark return). After a few years of experience this was broadened to permit investment in equities excluding shares in oil companies (since this sector is already covered by domestic oil assets). For Iran or any developing country with a deep enough financial market, there would be a natural tendency to confine some of the portfolio to the domestic market. Exchange rate risks and international political risks

¹ See: <http://www.norges-bank.no/english/>

would also limit the extent to which investment abroad might be permitted, although the benchmark return would have to be adjusted accordingly².

7.16 A second part of the fund could be devoted to financing domestic investment—along the lines of a development fund. The thinking is that the internal market would be a better judge than the government of profitable investment opportunities—so that increasing the funds to the internal market should present on average a good return, which would also be linked to developmental impacts. Exclusion of public enterprises sector access to this financing could be a rule in line with the new market and private sector orientation strategy of Iran. The difficulty with this model is to establish a mechanism for allocating funds to domestic projects, without attempting to “pick the winners,” which has proved very difficult in other circumstances. The fund might be used to increase the capital of some domestic private or to be privatized banks to increase their ability to lend. But there would have to be an arrangement whereby a return on this money would be repaid to the fund to ensure that oil revenues are not wasted but indeed create wealth for future generations while contributing to a shift towards a more diversified economy. The management of the macroeconomic effects linked to the use of the oil resources may also argue in favor of exporting industries. A partial sterilization policy, to limit the Dutch disease effect, would favor the use of the resources to the financing of exports with the requirement that repayment of the principal and interest be made in foreign exchange. A practice that the Central Bank of Iran is currently following in the investment of part of the existing oil stabilization fund.

7.17 The highest risk would come more from the management of the dividends and income of the fund. Populism will always push politicians, particularly when those under social difficulties and political pressures, to resort to the easy solution of financing more spending from the fund. Some countries, such as Oman and Venezuela, changed the rules of operation of their funds to meet current concerns. Norway’s fund is held to be one of the best managed (box 7.1).

7.18 Iran needs now a national strategy to manage its oil wealth and transform it into development. The institution of an Oil Savings/Investment Fund is an element of this strategy. The design and implementation of this strategy if and when it will be accepted is complex. But Iran has the internal capacity to do it. It can also tap on international technical assistance.

² Another case in favor of investing domestically is also the asymmetric risk (especially political risk) perception of the country that acts as a barrier to free access to international capital market by nationals. In a country like Norway, nationals have a “competitive” access to international financing without a specific premium. Iranian investors may have to pay a higher risk premium than that should be implied by a free market perception. The difference between returns from investing funds assets abroad and the cost of borrowing from outside by nationals may be higher than what is warranted by risk as perceived domestically. This could be a case for partially investing these funds domestically.

Box 7.1. The Norwegian State Petroleum Fund

Norway's stated policy for the management of its oil wealth, is that it should fulfill: "the requirement that future generations should inherit a national wealth per inhabitant as least as large as the one inherited by the present generation." A state petroleum fund was established in 1990 with two purposes:

Acting as a buffer to smooth short-term variation in oil revenues.

Acting as a tool for coping with the financial challenges connected to an aging population and an eventual decline in oil revenues.

The creation of the fund came as an institutional response to political pressure to spend petroleum revenues quickly. Its main goal was to avoid excessive spending of petroleum revenues and promote a gradual transformation of oil wealth into foreign assets to ensure intergenerational equity in the use of the oil wealth.

The fund's income consists of the net cash flow from petroleum activities and the return on the fund capital and net financing transactions. Its spending consists of transfers to the budget to finance the non-oil budget deficit. Over the six years to 2001 the non-oil budget deficit of Norway was on average about 3 percent of GDP—reflecting a level of non-oil revenues of 42 percent of GDP and a level of expenditure of some 45 percent of GDP. This level of the non-oil deficit therefore determined the extent to which oil revenues were used to finance current consumption. Additional oil revenues of about 8 percent of GDP were saved.

The Ministry of Finance is responsible for the strategic management of the fund, while its operational management is delegated to the Central Bank. Specifically, the ministry is responsible for the strategic investment decisions, such as selecting a benchmark portfolio and setting risk limits. The Central Bank is responsible for carrying out the investment strategy chosen by the Ministry of Finance, in managing the risk, and in accounting and reporting. Operationally, the fund is a krone-denominated account of the government at the central bank. Its counterpart is the investment by the central bank of a corresponding amount in financial instruments held abroad in the bank's name.

The law establishing the fund stipulates that the capital of the fund can be now invested only in foreign equities and bonds: 50 to 70 percent in fixed income assets and 30 to 50 percent in equities (with no holding in oil stocks).

So the fund is an integral part of government finances, an accounting device to make the spending of petroleum revenues more visible and transparent. The Ministry of Finance has hired external expertise to carry out an independent measurement of the fund's performance. So far the fund has performed very well. Money started to accumulate in the fund in 1996 and by the end of 2000 the fund had accumulated capital equivalent to 28 percent of GDP, projected to grow to 130 percent of GDP by 2010. It achieved a real rate of return of close to 30 percent.

Part 3. Meeting the Challenges: Pricing Reform

Chapter 8. Trade And Foreign Exchange Reform

8.1 Until the implementation of the reforms that are part of the third five-year development plan, Iran's non-tariff barriers to trade were among the most extensive in the world. The most important of them were import and export licensing (sometimes including outright bans), rationing foreign exchange for imports, and requiring exporters to surrender foreign exchange at an exchange rate far below the free market rate.

8.2 Iran's trade barriers have generally risen and fallen in response to shortages of foreign exchange. The war with Iraq caused a rise in military spending and a steep fall in oil production and exports. The resulting shortage of foreign exchange was met by imposing exchange controls and tightening import licensing. At the end of the war, the availability of foreign exchange increased, and controls were therefore eased. In the second half of the 1990s, falling oil prices, the bunching of debt repayments, the imposition of the US embargo, and Iran's own over-expansionary fiscal policies again created a foreign exchange shortage—a shortage again met by tightening exchange controls and licensing imports. In the last two years, higher oil prices have allowed the government to pay off its debt arrears, and the availability of foreign exchange has greatly increased, so the government has once again eased controls.

Barriers to trade at the start of the current reform period

8.3 Until the reforms of the third five-year development plan, Iran's nontariff barriers were higher and more pervasive than those of most other developing countries. One study of 43 developing countries with data for the period 1995–98 found that restrictive licensing conditions applied to just 10 percent of imports and prohibitions applied to another 2 percent (Michalopoulos 1999).¹ In contrast, even after the October 2000 replacement of many nontariff barriers by their tariff equivalents, restrictive licensing conditions still applied to 45 percent of six-digit harmonized system codes in Iran. Of the 43 countries in Michalopoulos's data set, only India (at 94 percent) had more pervasive import licensing.

8.4 The unweighted economywide average of the tariff equivalents of Iran's existing tariff and nontariff barriers is about 30 percent, according to the estimates presented below. Between 1996 and 1998 only 7 of 150 developing and industrial countries (with estimates of average tariffs were available for at least one of the years 1996–98) had average tariffs that exceeded 30 percent (table 8.1). Of course, a much larger number of countries may have had combined tariffs and nontariff barriers that exceeded 30 percent. Even so, since nontariff barriers have fallen greatly in many developing countries in the

¹ Nontariff barrier coverage in Michalopoulos's study is measured as the proportion of two-digit harmonized system codes to which nontariff barriers apply.

past decade and average tariffs in most countries have fallen further since 1996–98, the data suggest that Iran had one of the highest rates of protection in the world.²

Table 8.1. Average unweighted tariff rates for countries with the highest tariffs and selected other countries, 1996–98 (percent)

Country	1990	1996	1997	1998	Average 1996–98
<i>Countries with highest tariff rates</i>					
Pakistan	64.8	41.7	n.a.	n.a.	41.7
Morocco	n.a.	n.a.	36.7	n.a.	36.7
Cambodia	n.a.	35.0	n.a.	n.a.	35.0
India	81.8	38.7	35.0	30.0	34.6
Bahamas	n.a.	32.0			32.0
Burkina Faso	n.a.	32.2	32.2	31.1	31.8
Egypt	n.a.	n.a.	35.5	26.8	31.2
<i>Selected other countries</i>					
Algeria	n.a.	n.a.	n.a.	24.2	24.2
Argentina	20.5	11.2	11.3	13.5	12.0
Brazil	32.2	n.a.	11.8	14.6	13.2
Chile	15.0	n.a.	11.0	11.0	11.0
China	40.3	23.6	17.6	17.5	19.6
Indonesia	20.6	13.2	n.a.	9.5	11.4
Malaysia	n.a.	8.7	9.1	n.a.	8.9
Mexico	11.1	12.6	12.6	13.3	12.8
Nigeria	35.7	n.a.	24.4	23.4	23.9
Philippines	27.8	14.3	13.4	10.7	12.8
Saudi Arabia	n.a.	13.0	n.a.	n.a.	13.0
South Africa	11.0	8.8	8.7	5.6	7.7
Thailand	39.8	n.a.	n.a.	20.1	20.1
Tunisia	27.4	n.a.	n.a.	29.9	29.9
Turkey	n.a.	n.a.	13.5	12.7	13.1
Average of 127 developing countries	32.9	18.6	17.0	17.5	13.8
Average of 23 industrial countries	7.9	5.3	5.0	4.4	4.9

Import Regimes, 1994, World Bank, Trade Policy Reform in Developing Countries since 1985, WB Discussion Paper #267, 1994, The Uruguay Round Statistics on Tariffs Concessions Given and Received, 1996 and World Development Indicators, 1998-99; OECD, Indicators of Tariff and Nontariff Trade Barriers, 1996, IDB, Statistics and Quantitative Analysis data, 1998.

² Michalopoulos (1999) argues that following the 1994 Uruguay Round Agreements, the use of nonautomatic licensing, quotas, tariff quotas, voluntary export restraints and price control measures such as variable charges, minimum prices, and voluntary export price restraints is at its lowest level in more than 50 years.

8.5 Between July 1997, when a market in dollar certificates of deposit was established at the Tehran Stock Exchange (TSE), and March 2000, when the export rate was abolished, there were five foreign exchange markets.

- The official rate of 1,750 rials per dollar applied to the portion of oil and gas receipts earmarked to finance servicing of official external debts and imports by government agencies, including specified amounts of essential goods, such as wheat and pharmaceuticals, which are sold at controlled prices.
- The export rate was fixed at 3,000 rials per dollar from May 1995 until its abolition in March 2000. Initially, this was the rate received for non-oil exports. But after 1997 non-oil exporters received the full TSE rate and the 'export' rate applied mainly to some capital goods for state owned enterprises.
- The TSE rate, which fluctuated around 8,000 rials per dollar for most of 2000–02, applied to non-oil exports and to imports, other than those that could be imported at the subsidized rates listed above.
- The negotiated rate (negotiated between banks and their customers) applied to most transactions in services and was usually very close to the TSE rate because the authorities found it difficult—and pointless—to separate these two markets.
- The gray market rate, which was applied to the proceeds of smuggled exports financed capital flight and smuggled imports. While the underlying transactions were illegal, the trading of foreign exchange was not.

8.6 Before March 2000 export receipts had to be surrendered to the central bank (BMJII: Bank Markazi Jomhuri Islami Iran) at the export rate of 3,000 rials per dollar. But exporters also received import certificates that could be traded on the TSE market. Each dollar of import certificates entitled the holder both to import a dollar's worth of goods—if the importer could also obtain an import licence for the particular type of good that was to be imported—and to buy a dollar of foreign exchange from BMJII at the export rate. If, for example, the TSE rate was 8,000 rials per dollar, the price of import certificates would be 5,000 rials per dollar, and the effective price of foreign exchange to both importers and non-oil exporters using the TSE would be the full TSE rate. By surrendering their foreign exchange to BMJII at 3,000 rials per dollar, exporters also acquired the right to certificates worth 5,000 rials per dollar. Importers had to buy both certificates at the TSE for RIs 5,000 per dollar. But having done so, they were entitled to buy foreign exchange from BMJII at the export rate of 3,000 rials per dollar.

8.7 In 1998 and 1999, BMJII was not always willing to vary its supply of foreign exchange to the TSE market to meet demand at the managed rate. On these occasions, foreign exchange was rationed even to firms that held valid import licenses. Such rationing was especially important when oil prices fell in the second half of 1998 and early 1999, when prospective importers were made to wait in a queue before BMJII allowed them to open import letters of credit. As a result, the premium of the gray market

rate over the TSE rate rose to just over 20 percent for most of the period November 1998 to January 1999, jumping to almost 50 percent in February 1999.

8.8 To eliminate the queuing for foreign exchange, BMJII was forced to increase supply to the TSE market by running down its foreign exchange reserves and to raise the TSE price of certificates in two steps—by about 20 percent in March 1999 and by another 16 percent in May 1999. Together with an ongoing gradual depreciation, these step changes resulted in an overall depreciation of the TSE rate of 42 percent in 1998/99 and another 20 percent in 1999/2000.

8.9 From June 1999 until March 2000 buoyant oil prices allowed BMJII to increase the supply of foreign exchange to the TSE market while increasing its price very gradually, from just below to just above 8,000 rials per dollar. As a result, the premium of the gray market rate over the TSE rate gradually fell during this period, from just under 20 percent to almost zero.

8.10 In March 2002, the TSE rate, the negotiated rate, and the official rate were unified by the establishment of an interbank foreign exchange market, with a floating but heavily managed rate.

Progress in removing import licensing

8.11 Until 2000 the main restrictions on imports were licensing requirements and exchange controls. For each consignment of items subject to import licensing, the importer had to obtain the permission of the relevant ministry, or ministries, as specified in Iran's trade regulations. The ministry most often involved is the Ministry of Industry and Mines. One of the main criteria used in deciding whether to grant an import license is whether the good is produced locally.

8.12 Importers are normally required to finance their imports by letters of credits (L/Cs) issued by Iranian commercial banks and used to be required to deposit the full payment, in rials, when opening L/Cs. In this way, BMJII was able to limit and anticipate demands on its foreign exchange reserves and retain control over importing firms' foreign exchange liabilities, most guaranteed by the government. These restrictions were eased in 2000–02. Full payment in rials by importers is no longer required when L/Cs are opened, but only when the goods clear customs, and bank drafts can now sometimes be used in place of L/Cs.

8.13 In the last two years much progress has been made on converting these nontariff barriers into tariffs, the last of which was the conversion at the beginning of this Iranian fiscal year of 350 items (that is, classifications on Iran's six-digit HS code, which contains 5,113 items) by the parliament. This will leave only about another 350 items subject to restrictive licensing requirements. A part from those used for religious, genetic, security, and quarantine purposes, which will not be removed, the most important examples of remaining licensing requirements used to protect domestic producers are those applied to imports of garments, textile and automobiles. Senior officials from the

Ministry of Commerce estimate that these licensing requirements will probably remain in place for two to three years.

Table 8.2. Progress in removing restrictive licensing requirements, 2000–2002

Items not subject to restrictive licenses at end 1999/2000	1,228 (a)
Items liberalized in March 2000	781
Items liberalized in January and February 2001	850
Items liberalized in September 2001	1,554
Items liberalized in March 2002	350
Items to remain under restrictive licensing at end 2002/2003	350
Total	5,113

Source: Ministry of Commerce and Ministry of Industry and Mines.

Note: (a) This number is estimated residually, and is probably not exactly correct. Different officials gave slightly different estimates of the exact numbers of items liberalized in each package.

Barriers to imports

8.14 Iran has two main taxes on imports: customs duties and the commercial benefit tax, which acts just like a customs duty but has grown in importance because it can be changed by administrative decree. Both taxes are assessed on the c.i.f. value of imports, converted to rials at the official exchange rate. Before the unification of the exchange rates in March 2002, this meant that legal tariffs overstated the real tariffs by a factor of almost four.

8.15 Iran's customs duties were always low, even relative to the official rate, and could be changed only by an act of parliament. In the process of replacing nontariff barriers by their tariff equivalents, only the commercial benefit tax has been raised to compensate producers for the loss of nontariff protection—and the importance of the commercial benefit tax has greatly increased.

8.16 Data on import tax revenues for the period since the removal of most NTBs are not yet available. For the earlier period, total collected taxes on imports were very low (table 8.3). This reflects the fact that the main instruments of commercial policy were nontariff barriers and the system of multiple exchange rates rather than explicit import taxes. The average collected rate of tax on imports in 1999–2000 was only 2.7 percent, and the only sector on the positive list for which the collected rate exceeded 6 percent was garments (14.2 percent).

Table 8.3. Average collected import tax rates, 1999–2000

Sector	Total tax, collected rate (percent)	Commercial benefit tax, collected rate (percent)	Tariff, collected rate (percent)	All collected taxes on imports (billions of rials)	Imports (millions of US\$)
Agriculture	0.8	0.7	0.1	113	1,626
Petroleum products	0.1	0.1	0.0	5	510
Food, beverages, and tobacco	0.5	0.4	0.1	20	465
Mining	1.6	1.1	0.5	18	136
Chemicals	2.0	1.7	0.3	393	2,356
Furs, skins, and leather	4.1	3.6	0.6	0	1
Pulp and paper	3.0	2.4	0.7	91	367
Thread and yarn	3.8	2.8	1.1	123	393
Cloth	2.6	2.3	0.4	19	90
Garments	14.2	11.1	3.1	1	1
Nonmetal products	5.7	4.9	0.8	84	183
Iron and steel	3.5	3.1	0.4	257	901
Metal products	5.9	4.9	1.0	264	549
Machinery and non-electrical products	2.7	2.1	0.6	656	2,990
Electrical appliances	5.5	4.2	1.2	408	915
Electrical machinery	0.5	0.4	0.1	4	96
Vehicles	3.4	2.1	1.4	199	712
Boats and aircraft	0.8	0.6	0.2	4	70
Other manufactures	3.4	2.9	0.5	89	322
All imports	2.7	2.1	0.5	2,751	12,683
Unweighted average	6.1	5.1	1.0	n.a.	n.a.

n a Not applicable

Note US\$ = 8,175 rials.

Unweighted average rates are the arithmetic means of the collected tax ratios for the 3,063 harmonized system code items for which there were imports in 1999/2000.

Source Data collected by Customs Department and supplied to the mission by BMJII.

8.17 Exemptions from import duties are provided for most items of capital equipment, for imports of essential items at the official rate, for imports for public investment projects, and for exporters under the temporary admission and duty drawback schemes (see section 4). Estimating the quantitative importance of exemptions would require data on the legal rates of import taxes on the same basis as the data in table 8.3 on collected rates—that is, data on the legal rates for each item, weighted by total imports of each item. But such data are not readily available.

The Magnitude of Iran's Barriers to Imports

8.18 Since November 2000, many nontariff barriers were converted to tariffs. But since the tariffs were intended to be equivalent to the former NTBs, total barriers to trade now are about equal to those in place in November 2000.

8.19 The Ministry of Industry and Mines has quantitative estimates of the size of the average nontariff barriers to trade in November 2000 on 4,200 harmonized system codes, for which import licenses are, or were, controlled by the Ministry of Industry (table 8.4). Although almost 1,000 other harmonized system codes were never subject to the Ministry of Industry and Mines' control. Nontariff barriers on these items are widely reported to be much less important than those for which quantitative estimates were obtained.

8.20 In March 2000 licensing requirements on 781 of the items under the control of the Ministry of Industry and Mines were liberalized. Most of these items were raw materials and completely-knocked-down kits for local assembly. As of November 2000, another 2,178 items were conditionally approved for liberalization in 2001/02. In the event, liberalization has been even more extensive than planned in November 2000: 850 items were liberalized in January and February 2001, a further 1,554 items were liberalized in September 2001, and another 350 items were liberalized in March 2002.

8.21 Despite the replacement of most NTBs by tariffs, the total rates of tax on imports are not very high. According to the estimates of the Ministry of Industry and Mines (table 8.4), the unweighted average rate of the commercial benefit tax needed to compensate producers for the removal of the protection from imports provided by its licensing requirements was about 35 percent.³ This estimate is based on the assumption that the existing rate of customs duty, which averages 2 percent (relative to the free market exchange rate) for items under the Ministry of Industry and Mines' control, would remain in place. The estimated tariff equivalent of the tariff and nontariff barriers in place in March 2000 for the items then under the Ministry of Industry and Mines' control is therefore 37 percent.

8.22 Since the nontariff barriers on the 1,000 items never controlled by the Ministry of Industry and Mines are widely reported to be less stringent than those in tables 8.3 and 8.4, the economy-wide unweighted average tariff equivalent to the sum of the existing tariff and nontariff barriers to imports is less than the 37 percent for the items under the control of the Ministry of Industry and Mines. Our best guess is that the economy-wide average was about 30 percent, perhaps slightly lower. This average conceals large differences between the maximum and minimum rates: the maximum proposed commercial benefit tax rate for vehicles is the 90 percent (relative to the free market exchange rate) applied to passenger cars; the maximum for textiles and clothing (also relative to the free market rate) is the 100 percent applied to garments.

³ This estimate assumes that imports are valued at the free market exchange rate of about RIs 8000/\$. Since unification the question of the choice of exchange rate for valuation of imports does not arise, but when the estimates were provided in November 2000, imports were in fact valued at the old official rate of RIs 1750/\$.

Table 8.4. Estimated unweighted average rates of the commercial benefit tax needed to compensate producers for tariffication of items subject to Ministry of Industry and Mines licensing requirements, November 2000

Item	Items liberalized in 2000 March 2000		Items to be liberalized by end of financial year 2001/02		Items liberalized in 2000/01 and 2001/02	
	Number of items	New commercial benefit tax (percent)	Number of items	New commercial benefit tax (percent)	Number of items	New commercial benefit tax (percent)
Food and pharmaceuticals	106	24.5	21	30	127	25.4
Nonmetal products	88	19.0	29	28.7	117	21.4
Chemicals	500	8.5	60	14	560	9.3
Textiles and clothing	0	—	913	74.2	913	74.2
Metals and appliances	50	3.5	298	21.4	348	18.8
Electrical equipment	11	1.1	280	24.9	291	24.0
Vehicles	1	6.4	164	34.2	165	36.0
Machinery	25	11.3	413	15.9	438	15.2
Total	781	11.3	2,178	44.1	2959	35.4

Source: Ministry of Industry and Mines, November 2000.

Notes: Actual reforms have followed the plans set out in the table fairly closely.

The rates are based on the assumption that imports are valued for tax purposes at the free market exchange rate, not at the pre-unification official rate of RIs 1750/\$, at which imports were actually valued for tax purposes when the data were supplied

Table 8.5. Estimated minimum and maximum rates of the commercial benefit tax needed to compensate producers for tariffication of items Subject to Ministry of Industry and Mines licensing requirements (percent)

Item	Minimum rate	Maximum rate
Textiles and clothing	1	100
Vehicles	1	90
Electrical equipment	1	75
Food and pharmaceuticals	2	50
Metals and appliances	1	50
Machinery	20	50
Nonmetal products	1	40
Chemicals	1	40

Note: See note to Table 4.3

Source: Ministry of Industry and Mines

⁴ This estimate assumes that imports are valued at the free market exchange rate of about RIs 8000/\$. Since unification the question of the choice of exchange rate for valuation of imports does not arise, but when the estimates were provided in November 2000, imports were in fact valued at the old official rate of RIs 1750/\$.

Iran's export regime

8.23 Iran's third five-year development plan highlights the need to promote exports to enhance economic growth and diversify sources of foreign exchange receipts—and the government has already taken important steps to do so. It has removed the most serious direct barriers, which were bans, licensing, and in the late 1990s, requirements to surrender foreign exchange receipts at controlled exchange rates well below the free market rate. The only licensing restrictions that now remain are those that for religious, security, environmental and genetic goals. At the same time, the government is trying to provide exporters with duty-free access to imported inputs by means of duty drawbacks, duty exemptions, and tariff-free zones. It has also reinvigorated two specialized financial institutions, the Export Development Bank of Iran and the Export Guarantee Fund of Iran, which provide subsidized credits, guarantees, and insurance to exporters of manufactured products.

8.24 But exports are subject to mandatory standard certification procedures. Authorities justify this requirement on the ground that the reputation of Iranian products in world markets is a shared good that affects all exporters. In many countries, however, quality controls act as non-tax barriers by which established members of an association of exporters restrict competition from new entrants to the export trade. Such measures are subject to abuse and increase costs to producers and exporters, reducing their competitiveness. Moreover, quality improvements through standards which succeed are driven by firms close to market forces. Government-mandated standards imposed by public sector entities are often outdated, inefficient, and unnecessarily costly for exporters.

Export Finance, Insurance, and Guarantees

8.25 The Export Development Bank of Iran (EDBI) was set up during the first five-year development plan (1990/91–94/95) to help promote exports. Because of its small capital base and conservative lending practices, EDBI plays a modest role in the overall financing of Iranian exports. In 1998–99 only about 10 percent of Iran's total non-oil exports of about \$3 billion were channeled through EDBI.⁵ However, its importance has recently grown rapidly: between 1995/96 and 1998/99, the volume of EDBI's Rial-denominated loans more than quadrupled, rising from 167 billion rials to 677 billion rials, while the volume of its dollar-denominated loans more than doubled, from a very low base of \$4 million.

8.26 The Export Guarantee Fund of Iran was established in 1975, but it remained dormant and only became fully operational in 1997. The Fund is an independent legal, financial, and administrative entity managed as a private joint-stock company fully owned by the government and under the supervision of the Ministry of Commerce. It is an observer of the Berne Union (the international union of official investment and credit insurers) and hopes eventually to become a full member.

⁵ These figures were obtained from EDBI's 1998–99 annual report and from discussions with EDBI management.

8.27 The Fund is involved in both banking and insurance, and it also invests, on its own and in joint ventures, in various Iranian firms. In banking it provides working capital and loans for Iranian exporters, particularly small and medium-size enterprises and those involved in private manufacturing. Like other Iranian banks, it lends to exporters at the ceiling rate of 18 percent, offering exporters: buyers' credits, domestic underwriting, and suppliers' credit. Several exporters suggested that they do not use the Fund because it is too conservative in its insurance policy and unwilling to cover exports to risky markets, such as the countries of the Commonwealth of Independent States.

Providing exporters with duty-free access to imported inputs

8.28 Since imports must ultimately be paid for by exports, some anti-trade bias is an inevitable consequence of using import taxes to protect domestic industries and raise revenue. It is easy to see why import taxes reduce imports and exports. By protecting import-competing industries, taxes on imports raise the prices of domestic factors of production and imported inputs relative to the domestic prices of exported goods. This anti-trade bias can be reduced somewhat by schemes that grant exporting firms duty-free access to imported inputs. While usually better than nothing, these schemes are a poor substitute for free trade, since they do not provide exporting firms with access to domestic factors of production at the prices that would obtain under free trade. Moreover, if exporting firms do not use imported inputs, the schemes do nothing to mitigate the anti-trade bias of import taxes. In addition to providing only partial relief from the anti-trade bias of import taxes, schemes to provide exporters with duty-free access to imported inputs have often been plagued by administrative problems, including not monitoring costs, delays, and fraud.

8.29 Three main kinds of schemes provide Iranian exporters with access to imported inputs at free-trade prices:

- *Duty drawbacks.* Under this scheme, import duties are paid when the imported inputs enter the country but are refunded by the Customs Department when the finished products into which they have been incorporated are exported.
- *Duty exemptions, or "temporary importation."* Under this scheme, imports of inputs into products that are to be exported are exempted from duty, but the importer has to provide some guarantee that the product will eventually be exported. Usually, products that have avoided duty must be stored in bonded warehouses, which the Customs Department has the right to enter in order to check that the exempt items have not been sold to domestic buyers.
- *Free-zones.* Free zones are zones in which there are no domestic customs controls on trade between foreign countries and the factories and warehouses in the zone. Domestic customs controls apply to trade between each zone and the rest of the domestic economy. The general definition of zone given here covers not only what are called 'free trade zones' in Iran, but also what Iran calls 'special economic zones.' Both types of zone provide exemptions from import duties; Iran's free-trade zones also provide exemptions from many other taxes and regulations.

8.30 Duty drawbacks and duty exemptions are closely related and involve similar administrative problems and costs. The Customs Department has the right to insist that the importer/exporter provide a bank guarantee that the final product will be exported (in practice, it does not usually require established manufacturers to provide such guarantees). When the final product has been exported, the importer/exporter must apply to customs to release it from the guarantee. The delays and charges involved are similar to those involved in waiting for duties to be rebated under a drawback scheme, except that the importer/exporter does not forgo interest on the amount of duty that would be payable in the absence of the scheme. Free-trade and special economic zones and duty exemption schemes are also similar, because all the firms and warehouses in each zone are treated as if the zone constituted a single very large bonded warehouse.

8.31 The Republic of Korea, Taiwan (China), and Hong Kong (China) have used all three mechanisms in parallel, with considerable success. Users there prefer exemption schemes to drawbacks, because only exemptions save them the interest costs on the duties paid. But exemption schemes are more open to fraud. As a result, exemptions are restricted mainly to producers, whose factories provide de facto collateral against fraud, while traders must normally make do with drawbacks.

8.32 The disadvantage of free-trade and special economic zones relative to the other two schemes is that it is not always efficient for exporters to be located in the designated zones. The advantage of the zones comes from economies of scale in administration. For both drawbacks and exemptions, administrative problems arise when the inputs are transformed in production, because it then becomes difficult to determine exactly how much of each input was actually incorporated into the finished products that are exported. Without free zones, which can eliminate these problems, substantial administrative cost must be incurred to overcome these problems, since the Customs Department, perhaps in conjunction with the producer and the relevant line ministry, must establish technical input-output coefficients specifying the amounts of each imported input in each type of exported good.

8.33 Free-trade zones provide a way of avoiding many of the problems in administering drawbacks and exemptions that arise for indirect exports (such as the use of imported raw materials in making packaging materials, some of which are then used by exporters). These problems can also be partially overcome under drawback and exemption schemes. But the administrative costs of measuring and establishing technical coefficients usually become prohibitive once more than one step is involved.

Duty drawbacks

8.34 Article 113 of the third five-year development plan announced the government's intention to enhance the effectiveness of the duty drawback scheme, established before the 1979 revolution. The scheme works as follows. Importers pay the duties (both customs duty and commercial benefit tax) applicable to their products when they are imported and use them to produce final goods. Producers are entitled to a refund of the import duties on the portion of the imported inputs that is included in those final products that are exported, either directly or

indirectly by being sold to another domestic producer who uses them in the production of exports.

8.35 Article 25 of the Ordinance of Law on Export-Import Regulations and Article 14 of the Export-Import Regulation Act of 1993 set out the rules and explains how to calculate entitlements to refunds. Article 25 also notes that exporters who have a complaint regarding the handling and calculations of their case by the Customs Department or a ministry have recourse to an appeal committee.⁶ Article 14 of the Export-Import Regulation Act states that refunds are made by Customs on presentation by the exporter of the export certificate. To apply for a refund, an applicant must provide Customs with proof of import and export (as well as a trader's license); the technical input-output coefficients, confirmed by the relevant ministry, and the completed application form requesting duty drawback. Exporters have three years from the date of the import of the inputs to produce, export, and file for duty drawbacks.

Exemptions ("Temporary Importation")

8.36 The duty exemption scheme was enacted in Article 12 of the Export-Import Regulations (September 1993) and in Article 24 of the Executive Ordinance of Law on Export-Import Regulations (April 1994). The law provides for exemptions of duty on the temporary importation of raw materials and products needed to produce, complete, prepare, or package exported products. Indirect exporters (both importers who sell inputs to producers who export and traders who buy goods from producers and export) are entitled to exemptions. Re-export of goods that contain duty-free imports must occur within one year, unless an extension for a second year is obtained. If re-export does not occur within the allotted time, a heavy fine (about three times the value of the imported inputs plus the amount of duties) is levied on the importer.

8.37 The importer/exporter must provide a promissory note or other valid security to Customs at the time of the initial import as a guarantee that the exempted goods will be re-exported. Importers are responsible for payment of expenses, such as warehousing and transport, incurred by Customs, but Customs does not charge any additional administrative fees.

8.38 The process now under way of converting nontariff barriers into their tariff equivalents will initially increase import duties and therefore presumably increase the incentives to use the drawback scheme. To the extent that the exemption scheme provides effective exemptions from import licensing requirements as well as duties, tariffication will not affect the incentives to use it. When and if tariffs are eventually lowered below the levels of existing nontariff barriers, the incentives to use both schemes will decline.

⁶ In case of disputes regarding exemptions, drawbacks, valuations of products, mis-categorization, or other matters related to customs, two appeals committees convene at the request of exporters/importers. Disagreements regarding miscategorization of products or the amount of import taxes due must be submitted within eight months. The first committee reviews the case and makes a judgment. The second committee reviews the judgment at the request of the exporter/importer. (In practice, very few cases are taken to these review courts: according to Customs authorities, there have been only about 10 cases in the past eight years. The lack of cases may reflect that fact that disputes have almost always been decided in favor of the Customs Administration.) If necessary, the Customs Department may pursue those who do not comply in national courts.

8.39 The implementation of the Automated System for Customs Data is progressing. Regulations are being implemented by hand in all customs offices, and some desktop computers have already been equipped with the automated system. In the next year, more than half of all customs offices are expected to be equipped with the computerized program. Within two to three years, all customs offices are expected to be computerized. The Automated System of Customs Data will greatly facilitate the administration of both the duty drawback and exemption schemes. It will reduce paperwork and delays in processing applications and transmitting documents from central and border customs offices.

Free-trade zones

8.40 In Iran, as in some other developing countries, free-trade zones provide two loopholes in the import licensing procedures. First, firms in the zones can export some of their output to the mainland without obtaining import licenses. Second, the import regulations allow small but often commercially viable quantities of any goods (other than the very small number subject to outright bans) to be imported by travelers from the zones into the customs territory of Iran. We did not obtain detailed information on these procedures from the officials who actually administer them. We were informed, however, that even goods loaded onto trucks can sometimes be imported from the zones, provided that they are accompanied by groups of workers or other passengers—each of whom is entitled to import up to \$80 of goods a year—on whose behalf they are supposedly being imported. Passengers and workers often import goods for their own use, and they are also regularly hired to import the kinds of appliances that are light enough to be carried by an individual, checked in as passenger baggage at a port or airport, or transported in the back of an automobile.

8.41 All three free-trade zones are on the Persian Gulf. They thus have easy access to the Indian Ocean as well as to the regional markets of the Commonwealth of Independent States (by air, road, or rail through Iran) and the Gulf states. But they also face stiff competition from the Gulf states in the struggle to attract investment and tourism.

8.42 Each of Iran's three free-trade zones is administered by an independent authority, organized as a company with autonomous legal status, whose capital belongs to the government. A board of directors—three to five people chosen by the board of ministers—administers each zone, for a renewable period of three years. The managing director of each zone is chosen by the President of the Republic from among the board of directors. The firms in the zones do not participate in administration, and the administrators interfere as little as possible in normal business operations.

Box 8.1. Increasing export and employment through free trade zones

Free trade zones (FTZs) are enclaves in which governments attempt to enable manufacturers of exported goods to have duty-free access to imported inputs. They are inferior to free trade for two reasons. First, because it is not efficient for all export activities to be located in a few specified zones. And second, they do not remove import restrictions. As a result, producers in FTZs cannot buy domestic factors of production at the prices that would occur if all trade were free. Even so, they can still be a useful way of expanding trade before the implementation of more thoroughgoing reforms.

FTZs are generally used to achieve three goals: promote export-oriented production and employment, increase foreign exchange earnings through nontraditional exports, and encourage foreign direct investment in countries in which legal, administrative, and infrastructure-related weaknesses impede investment in exportables. FTZs also provide backward linkages and allow the transfer of technology and know-how to the rest of the economy.

International experience with FTZs has been mixed. In Mauritius FTZs generated 71 percent of gross exports and employed almost 17 percent of the work force in 1994. Mexico's FTZs, known as maquilas, employed some 900,000 people in 1997, and the sector is among the largest generators of foreign currency. In contrast, the Senegal FTZ was hampered by excessive administrative red tape and strict labor laws. As of 1990, 14 years after it became operational, it employed only 600 workers and exported just \$15 million worth of goods. The experience of most FTZs falls between these extremes.

Effective FTZs combine clear private property rights and investment regulations, no restrictions on foreign exchange, tariff-free imports for export production, moderate levels of taxation, streamlined administrative procedures, and private sector management. Public provision of basic infrastructure outside the zone—telecommunications, roads, ports—can have positive spillover effects for local and national economies by facilitating economic activities. But FTZ development, including the provision of infrastructure and management, should be privately handled.

The success of an FTZ is highly dependent on a hospitable host country economic environment, including sound macroeconomic and exchange rate policies. Worldwide experience suggests that investors weigh economic and political stability, labor skill compatibility and productivity, and other similar factors carefully. Incentives, such as overly generous tax packages or legal investment assurances, may not attract the right type of investors or any investors at all. Furthermore, forgoing tax revenues may be expensive, especially if major public investments are made to develop the zone. The failed Bataan zone in the Philippines shows that heavy government investment and concessions can be costly and need not create a successful FTZ.

The Philippines' new FTZs have increased both employment and exports. In 1996 the four public and 43 private zones employed more than 150,000 people and exported \$6.5 billion worth of goods. Average wages in the zones are higher than in the rest of the country, but integration and forward and backward linkages with the domestic economy have been difficult to achieve, especially in the absence of more economywide reforms. Despite increases in exports, however, these FTZs have led to high import dependency and low net exports (41 percent) and net foreign exchange earnings.

8.43 The foreign share in the equity of firms is not capped in the zones, and there are laws to protect foreign investment and guidelines for compensation in case of nationalization. Iranians can purchase or lease land in the zones; foreigners can only lease it.

8.44 In addition to exemptions from import taxes on raw materials, parts, and machinery for use in their factories, firms in the free-trade zones receive exemptions from direct taxes for 15 years.⁷

8.45 To foster the development of the zones as offshore financial centers that are not subject to the repressive financial regulations that operate in the rest of Iran, the government allows the inflow and outflow of foreign currency. It may take up to a week for the zone administration to approve requests, however. This verification is supposed to ensure that no ill-gotten gains are transferred into or out of the zones. But this clearance prerequisite can deter foreign investors.

⁷ It seems likely that many firms will simply close after 15 years and then reregister under new names in order to continue to receive full free tax status.

8.46 Labor laws in the free-trade zones are more lenient and business friendly than on the mainland, where it is difficult and costly to dismiss employees. Although labor contracts in the zones allow firms much greater flexibility, procedures to address workers' complaints have been established, and the minimum wage in effect in the rest of Iran applies in the zones as well.⁸

8.47 Officially, the free-trade zones were established to provide exemptions from tariff and nontariff barriers on imported inputs used by manufacturing firms in order to increase non-oil, non-traditional exports, earn foreign exchange, and create employment opportunities in the mostly poor regions in which they are located. In practice, particularly in their early years and particularly for Kish, the zones have provided partial exemptions from tariff and nontariff barriers to finished manufactures. In this sense, Iran's free-trade zones initially functioned as import processing zones rather than export-processing zones.

8.48 The free-trade zones have been used to bypass barriers to imports in two ways. First, Iranian citizens are allowed to bring up to \$80 worth of goods a year from the free trade zones into the mainland. Since there are three zones and effective coordination among them appears to be lacking, Iranians could actually import \$240 a year from the zones. The provision granting \$80 of free imports per person led to the growth of a cottage industry in which small traders hire people to travel to the free-trade zones for the sole purpose of bringing back consumer goods. This practice has been the source of long-standing criticism of the zones in Iran. Critics have correctly argued that if Iran wants to liberalize its imports of consumer goods, it should do so by liberalizing the regulations that apply to all firms, rather than by subsidizing special zones, which are costly to develop, increase the administrative workload on the Customs Department, and facilitate smuggling.

8.49 Second, firms in the zones partially circumvent the nontariff barriers that apply to foreign firms because they are allowed to sell some of their gross output to the mainland without obtaining import licenses. Total exports from each zone to the mainland must not exceed \$100 million a year. As long as this ceiling is not exceeded, each firm in a zone is allowed to export to the mainland an amount of its gross output equal to its value-added plus the value of inputs purchased from the mainland. A firm that exports the full amount to the mainland permitted by this rule therefore makes no net contribution to earning foreign exchange. To see why, suppose that for every \$100 of gross output, the firm buys \$60 of imported inputs from foreign countries and \$10 worth of inputs from the mainland, producing value-added of \$30. For each \$100 of gross output, it can sell \$40 to the mainland, leaving \$60 for exports to foreign countries, just sufficient to pay for the inputs purchased abroad.

8.50 These loopholes shaped the early development and performance of the zones, especially Kish. Exports from Kish to foreign countries averaged only \$1 million a year in 1998 and 1999—about 1 percent of the volume of its exports to the customs territory of Iran.

8.51 The free-trade zones have failed to achieve their primary goals of increasing exports and attracting foreign direct investment. Employment creation has been commensurately low.

⁸ The national minimum wage is 458,013 rials per month (or \$56.50 per month, at US\$1=8,100 rials)

Discussions with officials in November 2000 revealed that efforts are now under way to redirect the zones toward exporting to foreign countries rather than to Iran. Kish, with its natural beauty and pristine beaches, is slated to become a destination for foreign and Iranian tourists. Other commercial activities, including nonpolluting production for export and exports of services, are to be pursued as subsidiary goals. Qeshm is to be developed as a more traditional free-trade zone, specializing in energy and heavy industries that take advantage of its abundant gas resources and its natural deep-sea port. Chahbahar is to take advantage of its position as a port on the Oman Sea with easy access to the Indian Ocean and as a transit site for trade with Afghanistan and the Commonwealth of Independent States. After an extended period of policy uncertainty, the government has nominated a new management team for each zone. It has reiterated its goal to support and accelerate its efforts to implement the new zone-specific development strategy and to attract foreign direct investment—a policy pronouncement likely to encourage potential investors.

Special Economic Zones

8.52 The creation of the special economic zones was mandated by the first five-year development plan. Legislation relating to their activities has been approved over the years as part of general trade legislation. Seventeen special economic zones currently exist in Iran, at various stages of development, with three others in the planning stages.⁹

8.53 Very few data are available on the special economic zones, most of which are still in the early stages of development and do not yet have much production or exports. The Sirjan special economic zone (in the southeast), established in 1990, is one of the oldest and most developed of these zones. It contains more than 50 industrial firms that produce garments, polyurethane, color TVs, and other goods.

8.54 The special economic zones were set up mainly to create jobs in poor and underdeveloped regions by attracting domestic and foreign investment. These zones—generally placed at strategic locations, such as borders and trading crossroads—allow localities to specialize according to their comparative advantage in specific industries. The Sang-e-Lorestan special economic zone, for instance, will focus on mining stones. The Yazd special economic zone will build on the very strong textile tradition of the Yazd region in central Iran.

8.55 The special economic zones are similar to the free-trade zones in that both provide exporters with duty-free access to imported inputs. Three main differences distinguish the two types of zones:

⁹ The special economic zones include Sirjan, Sarakhs, Bandar-e-Anzali, Bandar-e-Anzali (location 2), Khuzistan, Salafchegan, Khorramshahr, Jolfa, Arg-e-Jadid, Bandar Bushehr, Bushehr, Bandar Amirabad Behshahr, Bandar Shahid Raja'ee, Assaluyeh, Sang-e Lorestan, Petrochemicals, Mines and Metals. The three zones being planned are Shiraz Electric and Electronic SEZ, Yazd Textiles SEZ, and Persian Gulf ship building SEZ.

8.56 Social security and labor regulations in the special economic zones are identical to those on the mainland; less stringent regulations apply in the free-trade zones.

8.57 Exporters in the special economic zones are allowed to export their own outputs to the main customs territory of Iran under the same formula as the free-trade zones. However, firms in the free-trade zones are allowed to trade at both the retail and wholesale level, whereas those in the special economic zones can trade only at the wholesale level.

8.58 Firms in the special economic zones can use only the domestic banking and insurance services available to ordinary Iranian firms. In contrast, foreign banks have been allowed to set up in the free trade zones, which the government is trying to develop not only as export processing zones, but also as offshore banking centers. In the special economic zones, national laws govern company registration, intellectual property rights, and foreign investment protections. Firms in free-trade zones have their own regulations in these areas.

Recommendations for reforming trade policy

8.59 It is important that Iran maintain the momentum of trade liberalization that has been built up over the past two and a half years. We strongly support the government's policy of replacing nontariff barriers by their tariff equivalents, except in the case of goods banned for non-economic reasons. We therefore recommend that this process be completed as quickly as possible. The computable general equilibrium model that the World Bank has constructed for analyzing policy options in Iran predicts that this reform would increase aggregate real consumption by 3.4 percent. Most of these gains are due to the fact that the revenue from tariffs accrues to the government and can be put to good uses, whereas the value of import licenses is dissipated in wasteful competition for these licenses.

8.60 We also strongly recommend removal of nontariff barriers in technical regulations or sanitary and phytosanitary standards which discriminate between domestic products and imports. Adopting best practice regulatory procedures in these cases and alignment with WTO principles in the Technical Barriers to Trade Agreement and the Agreement on Sanitary and Phytosanitary Standards are urged because of the large inefficiencies caused by high trade barriers.

8.61 There is also a strong case for reducing import taxes, rather than merely replacing nontariff barriers by their import tax equivalents. According to our computable general equilibrium model, the aggregate real consumption gain of 5.5 percent from replacing existing nontariff barriers by a uniform tariff of 15 percent.

8.62 There are now several examples of countries with tariff structures that are uniform or almost uniform. Estonia and Hong Kong have uniform tariffs because they practice free trade. Bolivia, the Kyrgyz Republic, and Chile have virtually uniform tariff schedules of 10, 10, and 11 percent, respectively. Singapore has a simple tariff average of 0.5 percent and a standard deviation of less than 3 percent and Azerbaijan has a 15 percent maximum tariff. A number of other countries, including Ecuador, Honduras and Mexico, have tariff averages of less than 13 percent and standard deviations of less than 6 percent. The experience of these countries demonstrates that setting a low uniform tariff is feasible, and the econometric evidence indicates

that doing so speeds up GDP growth by promoting factor accumulation and technical progress. The estimates of our model, summarized above, imply that the welfare gains at unchanged levels of technology and factor supplies would also be large. For all these reasons, Iran would gain by reducing tariffs to a uniform rate of 15 percent by the end of the third five-year development plan.

8.63 Iran's foreign exchange reserves situation has eased significantly and its external balances improved on a more structural way helped by the significant lowering of its indebtedness and its repayments requirement. This provides a favourable ground for moving forward with its trade liberalization agenda by harmonizing and lowering and reversing the trade restrictions that the foreign exchange crisis in the mid 1990s has provoked. Accelerating trade liberalization will also ease the reported pressure toward an appreciation of the Rial.

Chapter 9. Reforming Other Subsidies

Introduction

9.1 Reforming the whole complex system of subsidies that has built up over the past 25 years is a difficult but a necessary way to re-establish an efficient and effective mechanism of market allocation of resources. Expliciting these subsidies and retargeting them would lower their costs and increase their social benefits and, by withering their distortive effects, improve the market functioning toward optimal allocation of resources. The Iranian Government is implicitly adopting a policy of step-by-step reform of both direct transfers and indirect consumption subsidies, which could be successful if these steps are clearly defined, a time plan is fixed for implementation.

9.2 The first step being considered is to bring off-budget subsidies onto the budget and make them explicit. The intent is that this will shed light on the financial and fiscal transparency of these subsidies, show their true amplitudes, expose who benefits and who does not to the general public and the policy decisionmakers and parliament, examine this in relation to their underpinning objective of social justice. This step can determine why and by how much to reform, who should be compensated by how much and how, and how to build the political support to ensure the success of the reform and its nonreversibility. The unification of the exchange rate starting March 2002 has explicated in the budget import subsidies without reducing them. The largest subsidies, the energy subsidies, are still implicit.

9.3 The next steps are to implement the reform, improve the transparency and efficiency of the subsidy system's administration, to phase out the many subsidies, to target those that remain more accurately toward the poor, and to replace the ones removed with more efficient alternatives.

9.4 The government has set up a Committee for Re-orienting Subsidies, to investigate ways of compensating consumers for the removal of all subsidies. There is widespread agreement among Iranian policymakers that price subsidies on energy and most other 'essential' products should be explicated and gradually removed or removed with a phased compensation mechanism. There is yet to be a clear timetable of implementation.

Indirect consumption subsidies on essential imports

Iran's current system of indirect subsidies

9.5 Iran's system of indirect assistance to the poor is a combination of subsidies, price controls, and rationing. There are price controls on 39 consumption items. In most cases, the controlled prices are set by the Consumer and Producer Protection Organization (CPPO). The most important items under its control are bread, rice, sugar, edible oils, baby milk, some cheeses, detergents, paper, newsprint, fertilizers,

pesticides, many pharmaceuticals and drugs (for humans, not animals) and car batteries. Prices of water, electricity, and fuels are set by parliament, to which the CPPO makes recommendations.

9.6 For non-energy products, the CPPO sets consumer prices below both border prices and producer prices. Agencies, such as the Wheat Organization, are responsible for obtaining supplies by importing, or buying at controlled prices from domestic producers and then selling at lower prices to consumers—or to middlemen who distribute or process the goods and then sell to consumers. The CPPO monitors these agencies and advises the government on what prices to set.

9.7 Until the unification of the exchange rates in March 2002, the consumption subsidies were financed partly off-budget because the agencies responsible for implementing subsidies were allowed to import at the low official exchange rate of 1,750 rials per dollar, rather than at the market rate of almost 8,000 rials per dollar. Correspondingly, the part of the government's revenue from oil exports that was used to buy these subsidized imports was accounted for on budget at only 1,750 rials per dollar, rather than at the market exchange rate. In 2001/02, we estimate that about 34 trillion rials (about \$4.3 billion) of government revenues and outlays were kept off budget in this way. This amount was 21 percent of total official on-budget expenditure in 2001/02.

9.8 According to the 2001/02 budget, about \$5.5 billion of the government's foreign exchange revenue from petroleum exports was allocated to importing essential products at the official exchange rate of 1,750 rials per dollar (table 9.1). Relative to the open market exchange rate of 8,000 rials per dollar, the implicit cost of these off-budget subsidies was therefore 34.1 trillion rials (\$5,453 million x Rls 6,150/\$).

Table 9.1. Allocations of foreign exchange at the official rate, 2001/02

<i>Item</i>	<i>\$ Millions</i>
Wheat	720
Rice	256
Vegetable oil	472
Sugar	208
Barley	100
Pesticides, pharmaceuticals for animals	60
Pharmaceuticals	475
Medical appliances and equipment	75
Items imported for the armed forces	500
Current expenditure of government ministries and state organizations	334
Capital expenditure on projects of national importance	438
Travel and other services	522
Fertiliser	254
Other, including production equipment for newspapers, heavy agricultural equipment, CKDs for buses	1,039
Total	5,453

Source: Management and Planning Organization

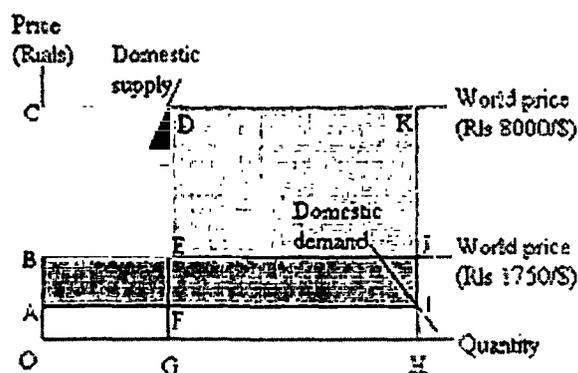
9.9 In addition to the off-budget subsidies are on-budget subsidies that arise because the agencies that implement indirect subsidies operate at a loss. They buy from domestic producers at prices that roughly correspond to world prices (converted at the market exchange rate) and sell at prices far below world prices. In some cases—of which wheat and pharmaceuticals are the most important examples—consumer prices are even lower than the import price at the exchange rate of 1,750 rials per dollar, so the agencies need on-budget subsidies to cover the shortfall between domestic prices and the cost of imports at 1,750 rials per dollar.

The bread subsidy

9.10 Although the prices of essential foods faced by consumers are far below the corresponding world prices at the open market exchange rate, the prices of the corresponding agricultural products appear to be quite close to the world price at the open market exchange rate. The most important of these subsidies to food and agricultural products are those for bread—and, correspondingly, for flour and wheat.

9.11 Figure 9.1 explains how these arrangements were implemented in the period before the unification of the exchange rates in March 2002. In the next section it is used to show how exchange rate unification altered the way in which the subsidy is accounted for, without changing any of the essential features of the system.

Figure 9.1. Wheat subsidies



9.12 The world price of wheat at the market exchange rate is OC, while its world price at the former official exchange rate of 1,750 rials per dollar is OB. The domestic supply curve is the upward sloping schedule through point D; the domestic demand curve is the downward sloping schedule through point I. The producer price is assumed to equal the world price of wheat at the open market exchange rate. The quantity of wheat produced domestically is therefore OG. At the price faced by consumers, OA, total consumption demand is OH and the difference between domestic demand and supply is met by imports of GH. Since the controlled price received by producers is approximately equal to the border price (that is, the c.i.f. price in dollars, converted to rials at the market exchange rate of just under Rls 8,000 per dollar), the production subsidy is approximately zero, while the per unit consumption subsidy is AC, which is the difference between the consumer price, OA,

and the world price at the market exchange rate, OC. The value of the consumption subsidy is the product of the per unit subsidy and the volume of domestic consumption, OH. This value is the sum of all the shaded areas in the figure —ACKI.

9.13 Before the unification of the exchange rates in March 2002, the total consumption subsidy was made up of an on-budget subsidy equal to the sum of the black area and the area shaded in dark gray, plus an off-budget subsidy equal to the area shaded in light gray. The on-budget subsidy of area ACDEJI was (and still is) financed from the government's budget, and transferred to the CPPO. The off-budget subsidy was financed by an implicit tax on petroleum exports of DKJE, due to requiring the National Iranian Oil Company (NIOC) to account for the amount of its export sales that was needed to pay for wheat imports at the official exchange rate, rather than the market rate.¹ The off-budget subsidy was implemented by providing the CPPO with foreign exchange at the official exchange rate of only 1,750 rials per dollar. These arrangements allowed the CPPO to sell OH of wheat to consumers for an amount equal to only OAIH, while paying OCDG for domestic wheat and OEJH for imported wheat.

Subsidies to imports of pharmaceuticals and medical equipment

9.14 Imports of pharmaceuticals in 1999/2000 were about \$479 million, of which \$395 million were imported at the official rate (Rls 1,750) and \$84 million at the open market rate (Rls 8,000/\$). The expenditure on these imports was therefore 1.36 trillion rials. If the exchange rates were unified at 8,000 rials per dollar, the explicit subsidy that would be needed to provide full compensation would therefore be 2.47 trillion rials (\$395 million x [Rls 8,000/\$ - Rls 1,750/\$]). In addition to the off-budget exchange rate subsidy, an on-budget subsidy of 0.19 trillion rials arises because the government meets the cost in rials of importing \$110 million of drugs at the official exchange rate. These are special drugs, which are provided almost free to patients suffering from such serious conditions as blood diseases, some forms of cancer, and kidney malfunctions requiring transplants.

9.15 In addition to the 1.36 trillion rials spent on imports of pharmaceuticals, an additional 2.75 trillion rials is spent on distribution and on domestically produced pharmaceuticals. This brings total spending on pharmaceuticals to about 4.1 trillion rials. This is only 12 percent of total spending on health care, which is estimated to have been 35 trillion rials in 1999/2000. Even so, pharmaceutical items account for about two-thirds of the subsidies to health care that arise from the importing of essential products at the official exchange rate. The remaining third arises from imports of medical equipment, about \$200 million in 1999/2000. The explicit subsidy needed to compensate buyers for exchange rate unification is therefore 1.25 trillion rials.

9.16 An official working group studying the effects of unification has estimated that at the unified market exchange rate, the total expenditure on pharmaceuticals

¹ Similar arrangements applied to all essential imports. The total amount of its export sales that the NIOC was also obliged to value at the low official exchange rate was therefore much greater than the value of wheat imports alone.

would rise from 4.1 trillion rials to 8 trillion. As noted above, the amount of the total increase that can be directly attributed to exchange rate unification is only 2.47 trillion rials.

9.17 The remainder of the total increase of 3.9 trillion rials reflects two factors. First, because the prices of imported pharmaceuticals would rise, the producers of some domestic pharmaceutical products would be able to raise their prices, too. Second, distributors argue that they should be allowed to keep their percentage margins unchanged; if they are able to do so, the revenue in rials earned by the distributors of imported pharmaceuticals would rise by 180 percent, in line with the 180 percent increase in the expenditure in rials on imported pharmaceuticals.²

9.18 Since there is no reason for domestic costs of distribution—in the form of wages, transport, packaging, insurance, handling costs—to rise merely because of exchange rate unification. So there is absolutely no justification for distributors to keep their percentage margins unchanged when the prices of the items being distributed almost triple. If distribution were deregulated and competitive, market forces would prevent distribution costs from increasing in line with the near tripling of the accounting prices of the items being distributed. For as long as distribution costs remain regulated, they should be increased only in line with the increases in domestic costs of distribution.

Rationing: the coupon system

9.19 For bread, consumers can buy as much as they want at the controlled, subsidized prices. This is also so for subsidized energy products. The use of subsidized imports of pharmaceuticals is controlled by the need to have a doctor's prescription to obtain them. In the case of several basic foods, a coupon system is used to allocate rationed imports. During the war with Iraq, this rationing system was very extensive, but now only a handful of goods remain subject to rationing by coupons, of which the most important are edible oils, sugar and cheese.

9.20 The coupon system works as follows. The head of every household has a booklet that indicates the number of people in the household and has pages that can be stamped to indicate when ration coupons are issued. Valid for two years, the booklet also contains a recent photo of the holder. The household head can take the booklet to a bank at regular intervals and collect ration coupons from the bank. The bank stamps the booklet to indicate that the coupons have been issued. Initially, the person who has received the coupons does not know what product they are to be used for. But the government periodically announces that coupons with such and such a number are to be used for a particular product—for example, oil, sugar, cheese. The coupons can then be used to buy the allowed quantities of the specified goods at controlled retail prices from grocery stores. The stores must match the total number of coupons they collect from customers with the quantities of price-controlled goods delivered to them by government agencies, or pay the difference to the government.

² As noted in the main text, the expenditure under current arrangements on imported pharmaceuticals is Rls 1.35 trillion. If all pharmaceuticals were imported at the official rate the expenditure would rise by 180 percent to Rls 3.78 trillion (\$479 million x Rls 8,000/\$).

9.21 The rich generally do not use the coupon system, because they find that queuing at banks for coupons that can only be used to queue at grocery stores for limited amounts of often low-quality goods is more trouble than it is worth. Middle-income people often do not use the coupon system either. But some affluent and moderately affluent people collect their coupons, and then give them away, or sell them in the black market.

9.22 Although the coupon system has many inefficiencies, its rationale is sensible. It allows the government to reduce the cost of providing the poor with any given value of indirect subsidies by preventing the rich and those on middle incomes from buying greater amounts of the rationed and subsidized goods than poor people can afford. Indeed, to the extent that the rich do not use the system because it is more trouble to them than it is worth, they get smaller absolute benefits from it than do the poor.

9.23 The rationing of price-controlled items has effects similar to those of cash transfers, particularly if the rationed limit is less than most consumers would buy in the absence of rationing. But it has several disadvantages, relative to cash transfers. In the absence of controls to prevent trade in ration coupons, it would differ from cash transfers only by imposing the additional cost on those who want to sell some of their allocations of having to find a buyer. If these transactions costs were negligible, rationing would be equivalent to a cash transfer set equal to the difference between the market price and the rationed price of each good, multiplied by the rationed allocation of the good. To the extent that legal restrictions on selling ration coupons are binding, they generate waste by preventing mutually beneficial trades between those who would otherwise choose to consume less than their rationed allocations and those who want to consume more than their allocations.

Reforming indirect subsidies

Bringing indirect subsidies on budget to increase transparency

9.24 With the unification of the exchange rates in March 2002, the non-energy subsidies were made explicit and brought onto the budget. Correspondingly, on the revenue side of the budget, all government revenues from oil exports are to be recorded at the market exchange rate. But at least in 2002/03, the agencies that import essential goods on the government's behalf will continue to be given access to foreign exchange at 1,750 rials per dollar. As far as they and consumers are concerned, nothing has yet changed, despite exchange rate unification. All that has changed is that the government's budget will show a new item of explicit subsidies—equal to the compensation that it will now have to pay to the central bank, which will incur losses by supplying the importing agencies with foreign exchange at 1,750 rials per dollar, after buying it from the government at the market rate of just under 8,000 rials per dollar. For wheat, this corresponds to the area DKJE in figure 9.1 that is shaded in pale grey.

9.25 The reform of accounting for the subsidies to essential imports was the only reform of the indirect subsidy system in 2002/03. As proportions of world prices, the rates of both the energy and essential import subsidies were actually increased slightly, because world energy prices rose in dollar terms and the controlled

subsidized prices in rials were increased by only 10 percent, less than the rate of inflation. The unification of the exchange rates did not affect either the implementation of the energy subsidies, nor how they are accounted for. For now, they remain off-budget: NIOC continues to supply crude oil to domestic refineries at a fraction of its world price, thereby depressing its own gross operating surplus and the contribution that it can make to the government's non-tax revenues by the amount of the off-budget subsidies that allow domestic energy prices to be held far below world prices.

9.26 As the next step in the process of reforming indirect subsidies, we recommend that the energy subsidies be made explicit. To do this, the NIOC would have to sell crude oil domestically at the same price at which it can export it, after adjusting for transport, insurance and other relevant handling costs. This would raise the gross operating surplus of the NIOC by the amount of the current implicit subsidy. If the NIOC remitted this surplus to the government, non-tax revenue would rise by the same amount. To enable domestic users to buy oil, other refined products and electricity at unchanged prices that are far below border prices, the government would have to use its additional on-budget revenue to pay an explicit subsidy to energy users.³

9.27 Merely bringing subsidies onto the budget is not an adequate substitute for genuine reform, it serves two useful purposes in the short run:

- It makes subsidies more transparent.
- It provides a signal that the government is committed to more substantial reforms that will replace the present arrangements.

Targeting indirect subsidies by self-selection

9.28 Given the inefficiencies of the coupon system, we support that, in parallel, the authorities use self-selection to target indirect subsidies. This means using quality and packaging for price differentiation with indirect subsidies redirected to items that only the poor buy.

9.29 We recommend that Iran consider the methods used in Tunisia to implement self-targeting of indirect consumption subsidies:

‘A particularly innovative aspect of the Tunisian reform program has been its reliance on self-selection mechanisms to improve the distributional incidence of subsidies. Self-targeting occurs when benefits are available to all, but the program is specifically designed so that the non-poor elect not to participate. While other targeted programs require social workers or other agents to undertake some kind of screening (such as individual or group assessment) to determine eligibility, with self-targeting the decision to participate is made by the individuals themselves.

³ In the national accounts, making energy subsidies explicit would raise indirect subsidies and GDP at factor cost by equal amounts, while leaving GDP at market prices unchanged

‘In practice, consumption patterns may not differ significantly across income groups. This does not mean that self-targeting is not feasible, but rather that it may require some creativity to invent “inferior” subsidized goods which are unattractive to wealthier consumers and unsubsidized alternatives (“superior” goods) to siphon off the demand by the rich (Tuck and Lindert, 1999: xiii).’⁴

9.30 For sugar, Tunisia eliminated subsidies on cube sugar but kept them on unrefined brown sugar. For wheat flour products, subsidies remained on semolina but were taken off couscous and pasta. For bread, subsidies were taken off baguettes, but kept on *pain unique*. Tuck and Lindert note that inferior goods can be ‘invented’ by appropriate choice of cheap and flimsy packaging, as well as content.

9.31 Iran already uses self-targeting of indirect subsidies to a limited extent. For example, subsidized flour is not available for the more expensive types of bread, nor for pastry items. We recommend that the use of self-targeting be extended. In the case of energy subsidies, we recommend that kerosene should continue to be subsidized because it is a very important part of the consumption of the poor, but not of the rich.

Reforming the pharmaceutical subsidies

9.32 Rather than subsidizing the price of imported pharmaceuticals and medical equipment across-the-board, the government might allow the cost of all, or at least most, imported items to rise to the border price (at the market exchange rate), let the market price reflect this, and compensate consumers by subsidizing health insurance, which currently covers about 80 percent of the population as a way to better targeting. The responsibility for ensuring that subsidies to health insurance were passed on would fall on the Health Insurance High Commission, the regulatory authority for the industry, chaired by the Minister of Health. This would not be an easy task, since there is little if any competition in the health insurance industry. Most people receive health insurance at no charge and are allocated to one or other of three main providers.

9.33 The Social Security Organization, which covers about 20 million people, is the designated insurer of employees of state owned enterprises and their families.

9.34 The Medical Services Insurance Organization is the designated insurer of most people in rural areas and certain other groups, for example students. It covers about 25 million people.

9.35 The Imam Khomeini Foundation provides health insurance for about 5.5 million of the very poor.

9.36 Members of the armed forces and their families are covered separately and the total coverage of all other providers is only 2 million people. Clearly, these arrangements for assigning people to particular funds, according to which population groups they belong to, prevents any possibility of competition among the funds.

⁴ See Laura Tuck and Kathy Lindert (1996) ‘From Universal Food Subsidies to a Self-Targeted Program. A Case Study in Tunisian Reform’, *World Bank Discussion Paper No 351*. Washington, D.C.

9.37 Subsidizing health care has advantages relative both to uniform cash transfers to all citizens and to the present policy of very large subsidies to imported items and small subsidies to domestically produced items. Its advantage relative to uniform cash transfers is that it is a potentially more effective way of targeting compensation to those with medical conditions very costly to treat and to the needy. The value per person of the cash subsidies needed by the very sick are often so large that it would be impossible to provide this level of transfer to everyone.

9.38 The advantage of subsidizing targeted health insurance—rather than subsidizing imports of pharmaceuticals and medical equipment—is that it does not distort choices between imports and domestic production. This distortion should be eliminated, even though in many cases it is not very important, because there is little substitution between imported pharmaceutical items and the simpler and more basic ones that are domestically produced. But there is no need to switch subsidies from pharmaceutical products and medical equipment to health insurance, merely to avoid distorting choices between domestically produced and imported items. The simpler solution is to set the same rate of subsidy on any given item, regardless of whether it is produced domestically or imported. On equity grounds, there is a case for the most expensive pharmaceutical items to be subsidized more heavily than simpler and cheaper ones. It is true that this will lead, on average, to higher subsidies on imported than on domestically produced pharmaceuticals. But the variation should be done on item-by-item, not on the basis of whether a product is imported or domestically produced.

9.39 Relative to providing subsidies through health insurance, there are two main advantages of providing them instead through subsidies to products, item-by-item. First, this avoids the risk that the subsidies would be captured by the very monopolistic health insurance industry. Second, the 20 percent of the population not covered by any health insurance scheme probably include many of the poorest people in Iran. These people would miss out entirely from subsidies delivered through the health insurance system. The health insurance system does not have any advantages, as a vehicle for implementing health care subsidies, that could not be matched by providing subsidies to pharmaceutical products and medical equipment on an item by item basis. So we recommend against using it—in favor of amending the current subsidies to remove any differences, for any particular item, between the subsidies to domestic production and imports.

Reforming direct subsidies to the poor

Education and health

9.40 Reforms to education and health care are envisaged in the plan as direct mechanisms for poverty alleviation through empowerment. To demonstrate that education is a way to fight poverty, the plan analyzes the links between poverty and educational attainment and literacy. It envisages upgrading the quality of the educational system at all levels, and improving its alignment with the needs of the economy and the labor market. It also envisages reforming education curricula, and developing vocational training programs.

Infrastructure

9.41 Iran has 28 social assistance and labor market programs to help the poor. Many of these programs overlap, and their targeting, coverage and management performance need to be reviewed. Most of the existing programs are charitable in nature and involve transfers from the government or the quasi-public religious foundations to individual households.

9.42 The government is now devising a new poverty reduction strategy that will use NGOs, community-based organizations and local village and city councils to identify needs and design and implement projects. The World Bank proposes to support this new strategy by implementing a Social Fund Project that would comprise micro-credit schemes and community-based infrastructure programs. The project is intended to supplement existing programs, while demonstrating more productive, employment and community-based social assistance as an alternative to direct assistance.

Provision of a universal pension

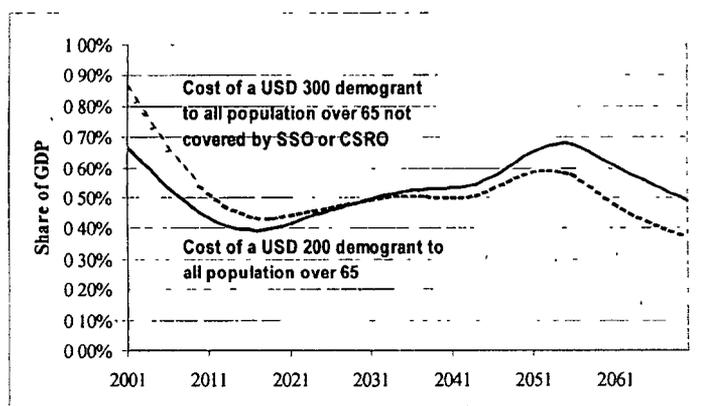
9.43 The bulk of the population is outside existing pension arrangements, which only apply to public sector employees and employees of some private firms. A major step toward achieving the objectives of social protection is that a universal pension be generalized for all Iranians over the age of 65 years. This could be funded by using a part of the savings from removing indirect subsidies. By itself, pension generalization would contribute significantly to eliminate extreme poverty, in particular because more than 40 percent of households in the poorest decile of the expenditure distribution have heads over 60 years old.

9.44 This implies that social assistance programs targeted to the elderly will remain an important component of the Government strategy to ensure an adequate level of income during old age. The following actions are necessary to the design and implementation of alternative schemes of pension generalization if not targeting.

- Conduct appropriate surveys to estimate the coverage gap and its causes. The objective of this activity is to identify population groups not covered by the system, as well as their geographic and socio-economic characteristics.
- Conduct a review of current social assistance programs for the elderly, including estimates of costs, benefits, number of beneficiaries and their socioeconomic characteristics. The review should assess management, targeting, and monitoring mechanisms and present recommendations in terms of the need to expand, eliminate programs, and/or design additional ones.
- Consider the introduction of a demo-grant. The demo-grant is a special form of cash-transfer that is not limited to the elderly poor, but to all elderly. Countries that have introduced a demogrant include many developed and developing countries like Chile, Nepal (pension is equivalent to 10% of GDP per capita), and Namibia (pension is equivalent to 19% of GDP per capita). Today in Iran, providing USD 200 per year (roughly 20% of the minimum wage) to all the population above 65 (2.9 million individuals in year 2001) would cost between 0.4% and 0.7% of GDP.

- Alternatively, Iran could consider some type of means-tested pension. Countries such as Australia and Canada use this scheme. For instance, a minimum pension could be provided to all population above 65 who are not receiving pensions from the contributory system. In Iran providing a USD 300 pension to this population would cost between 0.4% and 1% of GDP (see Figure 1).

Figure 9.2. Estimated cost of a USD 200 demogrant in Iran



Source World Bank (2002)

Unemployment insurance

9.45 Iran already has an unemployment insurance program. As of 1995 (the most recent year with data), this program had 4.2 million active contributors in the public and private sectors of the economy, and another 0.6 million contributors among the self-employed and some specific categories of workers. The program was paying unemployment benefits to 200,000 persons, roughly 15 percent of the unemployed.

9.46 Raising unemployment benefits would reduce incentives to work, and increasing the level of the contributions to finance increased benefits would reduce the willingness of firms to hire workers, and of the self-employed to enroll in the program. Another possible defect of the scheme is suggested by anecdotal evidence that some of the people receiving unemployment benefits are not unemployed.

9.47 These incentive problems need to be studied to design effective remedies. We recommend that the unemployed be required to undertake training, community service, or unskilled work as a condition for receiving benefits. Experience in industrial countries shows that this is an effective way of inducing those who can find some kind of work to do so. For any given total budgetary cost, this is a way of greatly increasing the benefits that can be paid to those who genuinely cannot find jobs. Alternatively, for any given level of benefits per recipient, it is a way of greatly reducing the total budgetary cost of the scheme.

Chapter 10. Quantifying the Benefits of Reforms, and Sequencing Them

10.1 We present in this chapter quantitative estimates of the impacts of individual and combined reforms affecting the pricing system, in particular trade, foreign exchange and energy price reforms. The impact is gauged by the changes on output, distribution of income and welfare of the poor as well as fiscal balance, real exchange rate, price levels, the real wage and the rental rate of capital. This evaluation is based on a multisector computable general equilibrium model of the Iranian economy, built at the World Bank to study the effects of policy reform in Iran. The model includes 20 household types—10 rural and 10 urban, grouped by income to allow assessing the impact of reforms on the average spending of the poor and on income distribution.

10.2 Replacing nontariff barriers with tariffs and then lowering tariffs are important steps in Iran's plan to join the WTO. These measures will have significant benefits for economic development in Iran, and improve the welfare of all Iranians, especially of the poor. They will also affect the government budget, the real exchange rate, the output and price levels of each industrial sector, the real wage and the rental rate on capital.

10.3 Iran has also undertaken a major policy reform of unifying the multiple exchange rate. This means making explicit the subsidies that the multiple exchange rate used to cover. This is done with full compensation—and thus with no impact on distribution and savings. The authorities intend to follow this step with a major reform of retargeting subsidies toward efficiency (reducing their costs) and effectiveness (higher impact on poverty reduction).

10.4 Sequencing of the different reforms is important for their success and is a challenging task facing the Iranian authorities. The coordination between Iran's deeply interrelated pricing system reforms (energy, trade, foreign exchange, output prices) and between these reforms and the reforms of the financial sector and the public enterprises is technically and politically complex task¹.

10.5 For example, reforming the tariff system is related both in terms of magnitude and sequence with that of the exchange rate system and the reform of the subsidy of major inputs such as the energy subsidies. Progress in the reform of the trade reform

¹ In some other countries of transition a "big bang" approach was adopted to deal away with these complexities. Iran has adopted a gradual approach based on the need to minimize output disruption, and abrupt fall in general welfare that could harm the poor and undo gains realized, and that could threaten its social and political stability.

was made possible by the easing of the foreign exchange situation, the unification of the exchange rate at the market rate and the reported appreciation pressure on the rial are an occasion to further the trade reform by harmonizing and lowering tariffs. Energy subsidy reform is connected to trade and competitiveness through the cost protection it plays on some sectors, and trade reform and tariffication has to take it into account. Progress in the privatization process depends in many ways on progress in the reform of the pricing system reform itself, as potential buyers and investors, prior to making their decision, will still await for progress and direction in the implementation of the pricing system reform to be able to anchor their evaluation on more stable foreign exchange and trade regime and input prices. The subsidy system reform toward more efficiency would provide a source for self financing of the reforms and cover the transitory costs of this reform be it in terms of safety net toward the poor and those who will be affected by these reforms, be it for economic costs, such as banking recapitalization or transitory support for companies that are willing to technologically adjust to the reforms (case of companies that reconvert to more energy efficient technology).

10.6 Reforming the regulatory and legal environment to become more conducive to private enterprise development is at the upstream of other reforms and should be on the top of the transition reform agenda. On top of trade reform, this includes the removal of barriers to trade and investment; the introduction of competition policy to minimize barriers to all potential new firms; and the pursuit of the modernization of the systems of direct and indirect taxation. One of the most important aspects of the liberalization of trade and investment in services will be financial deregulation.

The estimated effects of trade liberalization

10.7 In reporting the effects of policy reforms we regularly refer to 'welfare gains.' These are measured as the increase in total household consumption, measured at constant consumer prices, and holding constant the current account balance, the supplies of factors of production, real investment and real government spending. There is an obvious sense in which a rise in real consumption in these circumstances is a gain in welfare.

10.8 In many constant returns to scale models, the estimated welfare gains from trade liberalization are less than 1 percent of GDP². The much larger gains estimated below for Iran reflect the unusually high distortions at the starting point of reform, suggesting that the benefits from reform are potentially enormous.³

Tariffying nontariff barriers

10.9 The impact of the tariffication of nontariff barriers depends on whether the rents from existing nontariff barriers are dissipated through rent seeking. We perform two simulations with different assumptions about the resources wasted in competing

² see de Melo and Tarr 1990, 1992, 1993; Harrison, Rutherford, and Tarr 1993, 1997a, 1997b; Morkre and Tarr 1980, 1995; and Tarr and Morkre 1984.

³ The welfare gains reported here are expressed as percentages of GDP. The corresponding changes reported in World Bank (2001) were expressed as percentages of household income, and were therefore much larger, since household income is only 37 per cent of GDP

for import licenses. In the first—‘rent dissipation’—it was assumed that in the pre-reform situation, the value of import licenses is entirely dissipated in rent-seeking behavior. In the second—‘costless license allocation’—it was assumed that in the initial pre-reform situation importers do not use up any resources in competing for license. This would be the case if the government could allocate licenses in a lump-sum fashion to those who value them most highly. We believe the actual situation is closer to rent dissipation and employ it as our central assumption.

10.10 In the first scenario, tariffication increases aggregate welfare by 1.3 percent of GDP (column 1 in table 10.1), or 3.4 percent of average household income. Here and throughout, unless otherwise specified, we assume that the government distributes additional revenues generated by reform back to households in equal absolute amounts. Since the poor have low incomes, the distribution of these revenues represents a significant share of their income. Although all households gain in this scenario, the impact on the poor is greatest: the income of the poorest rural household type rises 23 percent and that of the poorest urban household type by 11 percent. The favorable distribution effect on the poor reflects the fact that converting nontariff barriers to tariffs increases the government’s tariff revenue by 2 percent (to 2.3 percent of GDP). At the same time, government revenues are endogenously affected by the depreciation of the real exchange rate. The depreciated exchange rate implies that the cost of government subsidies to foreign exchange and imported petroleum products increases, worsening the government’s fiscal position. On the positive side, the revenues the government receives (after factor payments) from the sale of oil on world markets increase by 0.5 percent of GDP as a result of exchange rate depreciation. The net fiscal impact is a positive 1.4 percent of household income.

10.11 An interesting aspect of this scenario is that the output of all Iranian industries expands, as real resources previously allocated to rent seeking are freed up by tariffication. At the same time, the increase in the supply of labor and capital for production results in a 0.1 percent decline in the real wage and a 0.4 percent decline in the rental rate on capital. These declines are more than offset by the additional output available from the productive use of the newly available capital and labor and the income transfers from the government.

10.12 The principal impact of the tariffication of nontariff barriers without rent dissipation is the increase in government revenues, which increase by 2.0 percent of GDP (column 2 in table 10.1). Since it is assumed that the government distributes these gains back to households in equal Iranian rial amounts, poor households gain substantially, even though rich households lose in this scenario (see below for a discussion of the distribution scheme). The distributional impacts are strictly progressive, because we assume that the rents from the quotas were not dissipated but rather accrued to households in proportion to their income.

10.13 There is a slight negative welfare effect due to the fact that tariffication induces a small increase in the food and energy subsidies. Given the change in the distribution of income, expenditure in the economy shifts toward the budget items consumed more intensely by the poorer households. The poor intensively consume food, energy, and transportation (an intensive direct user of energy subsidies). The increased demand for food and energy results in a slight reduction in economywide

efficiency and welfare because the higher consumption of these products due to subsidies reduces efficiency.

Removing of exchange rate subsidies by unification

10.14 We simulate the recent unification of the exchange rate *without* replacing implicit subsidies by explicit subsidies. That is, we simulate the complete removal of the subsidies that arise from the central allocation foreign exchange at the official exchange rate for essential commodities and for the investment demands of state-owned enterprises. In these simulations we assume that energy subsidies remain unchanged.

10.15 Eliminating subsidized foreign exchange for the investment demand of state-owned enterprises increases efficiency with no obvious impact on the poor, since the owners of capital and labor employed in these enterprises are not likely to be poor. Since the objective of subsidizing foreign exchange for essential commodities is to assist the poor, alternate safety net programs need to be provided if the subsidies are removed. Consider two alternate programs that could be designed to address the needs of the poor.

10.16 First, we assess the impact of distributing the additional revenue the government obtains from eliminating subsidies back to all households in equal lump-sum payments to each household (column 5 in table 10.1). All households, rather than just poor households, are included because it may be difficult to identify at first which households are poor. As a practical manner, the design and implementation of social safety nets is difficult. Any scheme which distributes income back to households is subject to fraudulent claims. Some households may collect more than once. More seriously, intermediaries may attempt to capture distributions intended for others, possibly excluding some poor households. Over time, excluded households should be able to obtain payments, and it may become possible to accurately identify poor households, at which time safety net payments can be targeted.⁴ Including all households should minimize the risk that no needy household is excluded.

10.17 The aggregate welfare gain from this policy is 2.6 percent of GDP, or 6.9 percent increase of income. The magnitude of the effect shows how inefficient a dual exchange rate regime can be when the market exchange rate is four or five times the official exchange rate and substantial amounts of foreign exchange are allocated at the official rate. The gains are derived from the fact that subsidized foreign exchange means that different sectors face different prices for their imports. Moreover, even the same sector or firm faces different prices for its imports depending on how the foreign exchange is spent (investment demand versus current use of imports as intermediates). This implies that foreign exchange is inefficiently allocated between sectors and uses. Sectors and uses that receive subsidized foreign exchange value it less highly than those who have to pay the market price for foreign exchange. Unifying the exchange rates will induce purchases so that foreign exchange is valued equally at the margin by all sectors and uses.

⁴ This was the process adopted in Jordan, where food subsidies were initially converted to a payment to all households. Only later were payments targets at the poor.

10.18 Once the subsidies are lifted, the prices of essential commodities increase significantly (38 percent for sugar, 11 percent for farm products, 6 percent for food). Despite these price increases, the welfare of the poorest households increases significantly. The real incomes of the two poorest rural household types rise by 72 and 45 percent. The real incomes of the two poorest urban household types rise by 32 and 20 percent. These increases occur because these households are so poor that the lump-sum distribution payments represent a large fraction of their income. Note that all individual households gain from this policy but that the distribution scheme is monotonically progressive: the poorer the household, the larger the percentage gain. Thus even though the proposed lump-sum distribution scheme is not perfectly targeted at the poor, it is neutral in absolute terms and therefore highly pro-poor in relative terms. In contrast, the exchange rate subsidies are roughly neutral in relative terms, and therefore strongly targeted to the rich in absolute terms.

10.19 Eliminating subsidies to imports also reduces demand for foreign exchange, causing the real exchange rate to appreciate by an estimated 13 percent. Output effects by sector are also partly explained by this appreciation.

10.20 An alternate scheme for protecting the poor that is sometimes proposed is subsidizing consumption of essential commodities (column 6 in table 10.1). This subsidy does not discriminate based on the geographic source of the product, thereby removing the implicit tax on domestic producers of the import-competing product and eliminating the distortion in consumer choice between imports and domestically produced goods. It should therefore be welfare-superior to an import subsidy (Bhagwati and Srinivasan 1971).

10.21 In fact, we observe a substantial aggregate welfare gain from this policy, equal to 2.5 per cent of GDP, or 6.7 percent of household income. But since subsidies to consumption of essential food commodities and pharmaceuticals distort resource allocation toward production and consumption of these commodities, the aggregate welfare gain is slightly less than that generated by the policy of exchange rate unification without subsidies to consumption (6.9 percent).

10.22 By design of the experiment, there is no change in the price of any of the essential commodities. Since all subsidies to foreign exchange (not only those to essential commodities) are eliminated in this scenario, the net fiscal impact on the government is positive.⁵ Poor households gain in this scenario but considerably less than they do if the government eliminates foreign exchange subsidies without subsidizing food consumption. The smaller gains to poor households are explained by the fact that the fiscal gains to be distributed back to households are smaller as a result of the subsidization of food consumption. The model helps us understand that a policy designed to help the poor can be counterproductive.

⁵ There is, however, a net fiscal cost to the government associated with replacing an import subsidy with a consumption subsidy for a particular product

Lowering tariffs and introducing competition

10.23 The government intends to introduce foreign competition in the Iranian marketplace after it has replaced nontariff barriers by tariffs. Since the government intends to adopt a gradual approach to tariff liberalization, we simulate a sequential process of lowering tariffs in two steps. In the first step, the government lowers all tariffs above 25 percent to 25 percent, leaving all other tariffs unchanged. In the second step, the government imposes a uniform tariff of 15 percent. Unless otherwise indicated, all simulations are based on a benchmark equilibrium in which rents are dissipated. The simulation combines the effect of tariffing nontariff barriers and lowering tariffs in some sectors. We infer the marginal impact of lowering tariffs as the difference between the gain from both removing nontariff barriers and lowering tariffs and the gain from tariffing nontariff barriers but leaving tariffs at their current levels.

10.24 The first simulation examines the case in which tariffs above 25 percent are lowered to 25 percent and nontariff barriers are tariffed (column 3 in table 10.1). Under this scenario, the efficiency gain is equal to 1.5 percent of GDP. The average effective or collected tariff, 2.5 percent initially, increases to 19.4 percent. When the maximum tariff is set at 25 percent, the average effective tariff falls to 15.3 percent.

10.25 Given tariffication of nontariff barriers, the marginal impact of lowering high tariffs to 25 percent maximum is 0.6 percent of real household income. By international standards, this is a large gain in welfare for a change in the average tariff rate of this magnitude. It illustrates that the largest gains from trade policy reform are derived from reducing protection to moderate levels in sectors with the very high protection.

10.26 After tariffication the sectors with the highest tariffs would be clothing (93 percent), textiles (74 percent), weaving and leather products (75 percent), and motor vehicles (37 percent). Reducing these tariffs, as well as those on glass and other food products, to 25 percent results in a depreciation of the real exchange rate by 2.5 percent, which induces an increase in exports of 4.5 percent. Three of the four sectors with the highest protection contract, while all other sectors expand. When tariffication is combined with setting a maximum rate of 25 percent, the negative impact on these sectors is muted but still negative.

10.27 The weaving and leather products sector is interesting, because it will expand despite the lowering of nominal protection, according to our model. This seemingly anomalous result occurs because the depreciation of the real exchange rate increases exports, and the price of imported textile products, which represent 30 percent of the intermediate inputs used in this sector, declines significantly.

Setting a uniform tariff of 15 percent

10.28 Eliminating nontariff barriers and setting a uniform tariff rate of 15 percent (except on petroleum products) results in an increase in welfare equal to 2.0 percent of GDP (column 4 in table 10.1). The impact on output by sector is similar to that in the 25 percent maximum tariff scenario.

10.29 The combined effect of tariffing nontariff barriers and lowering tariff protection has a strong positive impact on the income of the poorest households, with the income of the poorest rural household type rising 20 percent and the income of the poorest urban household type rising 11 percent. All households gain, but the percentage increase in income declines monotonically with income, since the equal lump-sum transfers of the fiscal surplus represent a larger percentage of income for poorer households.

10.30 Given tariffication, the marginal impact of lowering tariff protection has a revenue impact on government revenues. The adverse fiscal impact is greater under the 25 percent maximum tariff scenario (0.7 decline in revenue) than under the 15 percent uniform tariff (0.4 percent decline in revenue). The second option has less negative an effect on fiscal balances because low tariffs are raised to 15 percent, offsetting the revenue loss associated with lowering tariffs above 15 percent. Since the impact on the poor is primarily a function of the lump-sum transfers and the negative fiscal effect can be assumed to cause a lump-sum transfer from households to the government, the marginal impact on the poor of lowering tariff protection given prior tariffication is negative. The combined impact of tariffication plus lowering tariff barriers is positive for the poor, if they receive their share of the fiscal surplus generated as transfers.

The estimate effects of integrated pricing reforms

10.31 By evaluating a combination of policy scenarios, we determine the relative importance of the various reforms and the magnitude of the combined effects (tables 10.3 and 10.4). Our results should help inform the discussion of key policy reforms.

Reforming petroleum prices

10.32 Eliminating the subsidy to domestic consumption of petroleum products potentially has strong links with trade and exchange rate reform. In particular, the elimination of subsidies to petroleum product consumption will increase the relative costs of energy intensive industries. This could change the pattern of comparative advantage, inducing Iran to export more crude oil and more of products that do not use energy intensively, and import more of the products that use energy intensively. It will also induce Iran to use energy more efficiently, reflecting the value of oil and petroleum products on world markets. Moreover, the additional exports of oil would be expected to induce a real appreciation of the rial that in turn will adversely impact on non-traditional exports and put further pressure on import competing industries.

10.33 Consistent with theory, the elimination of the petroleum subsidies results in a strong increase in exports of crude oil of 76 percent (table 10.3). The additional crude oil exports earn additional foreign exchange so that the real exchange rate appreciates by 26 percent in order to restore equilibrium in the balance of trade. Aggregate exports and imports increase by 30 percent. Thus, import competing sectors contract and non-traditional exports contract by more than 50 percent, while oil exports expand. This phenomenon is sometimes referred to as the 'Dutch disease,' because it is analogous to the adverse effects of the development of North Sea oil on the non-oil tradable sectors of the Dutch economy.

10.34 This scenario results in an enormous increase in the real spending of households equal to 12.2 per cent of GDP (column 3 in table 10.3). The results are explained by the fact that oil moves to where it is valued more highly (world markets) and the economy uses petroleum products more efficiently. If the fiscal surplus from eliminating the petroleum product subsidies is transferred back to households in equal amounts, the income of the poorest urban household type doubles, while that of the poorest rural household type rises by more than 200 percent.

Combining trade and exchange rate reform

10.35 In these scenarios we combine the effects of tariffing nontariff barriers, unifying the exchange rate for imports and exports and lowering tariffs. Consider two tariff policies: a uniform tariff of 15 percent and zero tariffs. Under the first policy, the gain in household real spending is 4.4 per cent of GDP. Under the second policy, this gain is 4.7 percent of GDP. The poor gain enormously from these combined policies, but they benefit slightly more under the 15 percent uniform tariff, because there is less fiscal surplus to distribute to them if tariffs are eliminated. The impact on production is dominated by the sectors that benefit from eliminating the foreign exchange subsidies.

Combining energy and exchange rate reform

10.36 Combining exchange rate reform with energy reform increases the aggregate welfare gain to 14.4 percent of benchmark consumption (column 4 in table 10.3). Since both energy and exchange rate reform increase government revenues, there is an enormous potential increase in welfare to the poor if the fiscal surplus is distributed to households as a lump sum. The poorest urban household type gains 116 percent, and the poorest rural household group gains 239 percent. All households gain, but the percentage gains decrease with the household's income level.

Combining trade, energy, and exchange rate reform

10.37 We estimate the gains from combining all the key policy reforms based on two different policy options: a uniform 15 percent tariff (column 5 in table 10.5) and free trade (column 6). Our estimates suggest that the Iranian economy would enjoy an enormous gain of 18.5 percent of GDP as a result of the combined reforms. The poor gain slightly more from the uniform tariff of 15 percent because the fiscal surplus is larger when tariffs are not eliminated.

Sequencing reforms

10.38 The third five-year development plan incorporates an ambitious program of reforms and in this report we have suggested still further reforms. To avoid discouraging potential private investors by creating unnecessary uncertainty, the government will need to commit itself to a credible and detailed timetable for these reforms. An essential element of any credible plan is that the government must anticipate the possible effects of reforms on unemployment and the poorest groups in society and implement policies to offset potentially adverse effects. The proposed

reforms of the exchange rate system and of energy subsidies will produce large fiscal gains, which will be reinforced by proposed reforms to direct and indirect taxation. They should therefore provide the government with sufficient fiscal financing possibilities to offset transitory adverse effects on unemployment and the poor. Obviously, as we have stressed previously when analyzing Iran's strategy of oil wealth management, these fiscal gains are essentially destined to saving/investment and their use for the purpose of easing up the transition effects should be limited in scope and in time and should be well defined ahead of use so that they will not be wasted and diffused in general government expenditures rendering their mobilization again an impossible task.

10.39 Since the methods currently used to alleviate poverty are not well targeted, it should be possible to design more effective methods at a modest budgetary cost. Moreover, since the reforms will remove barriers to non-oil exports—industries that are intensive users of unskilled and semi-skilled labor—the aggregate effect of the reforms may well be to boost demand for these types of labor. But the whole purpose of reforming trade policy and reducing input subsidies is to change relative prices and cause resources to move from activities in which their marginal social productivity is relatively low to activities in which it is higher. This will inevitably lead to job creation and expansion in some sectors—and to job losses and the closure of firms in others.

10.40 The sectors likely to be adversely affected by the reform program are those that have relatively high barriers to imports and those that are intensive users of subsidized oil products. The industries that receive the greatest protection from imports are those that produce finished manufactures, particularly garments and vehicles. Following reform, therefore, the transport sector may shrink, but it will inevitably survive. The most important users of oil products are the transport, petrochemicals, steel, cement, and brick-making industries. Given Iran's abundant fuel supplies, even without subsidies or protection from imports, these industries will almost certainly be viable, if they are efficiently operated. There is no reason why Iran should not be internationally competitive in all these industries following reform. But to make Iranian firms competitive at international prices in these sectors as well as in vehicle production, it may be necessary to privatize them and allow the new owners to restructure them.

10.41 The government will need to ensure that the regulatory and legal environment becomes more conducive to private enterprise. This will be important both for ensuring the viability of privatized enterprises and for ensuring that entrepreneurs who wish to set up wholly new private enterprises are able to do so. In turn, the successful development of a vigorous private sector is very important for ensuring the long-term viability of the reforms. The reforms that are needed to achieve this objective are not merely the trade sector reforms dealt with in this report, though these are essential, but also:

- Remove of barriers to trade and investment in services.
- Introduce competition policy to minimize barriers to all potential new firms.
- Modernize the systems of direct and indirect taxation.

10.42 One of the most important aspects of the liberalization of trade and investment in services will be financial deregulation. But other service sectors will also need to be deregulated if Iranian businesses to compete on equal terms with foreign competitors after the opening of trade in goods. Reforming the regulatory environment so that policies are in place that encourage the entry of new firms will be urgently needed both to ensure that new private entrants to markets that were formerly dominated by state enterprises are able to compete on equal terms. It has been shown that free entry is the most effective competition policy to stop new private owners of formerly state owned monopolies from capturing all the benefits of privatization in the form of monopoly profits.⁴ Finally, an efficient tax system is an essential feature of an environment conducive to private enterprise, though this is outside the scope of this report.

10.43 If the Ministry of Industry's estimates of the tariff equivalents of existing nontariff barriers are accurate, the total import taxes on the items under the responsibility of the Ministry of Industry would be 37 percent and the maximum import tax rate would be 100 percent. The unweighted economywide average total import tax for all items would be about 30 percent.

10.44 To improve the efficiency of resource allocation and encourage growth and poverty reduction (as well as gain entry into the WTO), it will be necessary to reduce the average level of import taxes after tariffication, narrow the dispersion between these taxes, and reduce fuel subsidies. Deciding which import taxes will be reduced and when is likely to involve a great deal of lobbying and uncertainty. To minimize these problems and simplify the process as much as possible, the government could announce that beginning in March 2003, only a few import tax bands will exist. Setting a small number of tariff bands would have no particular economic benefit or cost. Setting a date after which there could no be no further lobbying for tariff reductions could have a political benefit, however.

10.45 The advantage of reducing the number of bands—to, say, four—is that it could be used to truncate the period over which industry lobby groups could plead for special treatment. It could also help make it easier for the government to resist lobbying by making it impossible to raise the protective tariff for one industry without lowering for others. We now clarify these claims. Suppose that only 10 percent of items are placed in the highest band and that the remaining items are equally distributed among the other three bands. Setting import tax bands for March 2003 at 3 percent, 20 percent, 40 percent, and 60 percent would satisfy the condition that the average import tax be 25 percent and the maximum 60 percent.⁶ Setting bands for March 2004 at 10 percent, 18 percent, 25 percent, and 40 percent would satisfy the condition that the average import tax be 20 percent, with a maximum of 40 percent.⁷ All import taxes would be unified at 15 percent by March 2005.

10.46 There is nothing especially important about the particular choice of bands suggested above—many others might be just as good. The advantage of picking any one of the many possible sensible choices is that it would reduce the scope for

⁶ $0.3 \times 3\% + 0.3 \times 20\% + 0.3 \times 40\% + 0.1 \times 60\% = 24.9\%$.

⁷ $0.3 \times 10\% + 0.3 \times 18\% + 0.3 \times 25\% + 0.1 \times 40\% = 19.9\%$.

lobbying to the question of which band any particular item would be placed in. The economics ministries would make a preliminary assignment of items to the four bands; lobbying groups could get particular items assigned to higher bands only by having other items assigned to lower ones. Once the bands had been chosen, the future path of all tariffs would be determined. After all tariffs had been unified, there would be a strong case for passing an act of parliament to replace the commercial benefit tax and customs duty with a single tariff.

Table 10.1. Impact of trade and exchange rate reforms: welfare and macroeconomic effects

<i>Item</i>	<i>Initial situation (level values)</i>	<i>Tariffication</i>	<i>Tariffication without rent dissipation</i>	<i>Tariffication + maximum tariff of 25 percent</i>	<i>Tariffication + uniform 15 percent tariff</i>	<i>Exchange rate unification</i>	<i>Exchange rate unification + food subsidies</i>
	(0)	(1)	(2)	(3)	(4)	(5)	(6)
Aggregate welfare change (% of GDP)		1.3	-0.1	1.5	2.0	2.6	2.5
<i>Fiscal effects (change as percent of GDP)</i>							
Food subsidies	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-2.1
Foreign exchange subsidies							
Petroleum subsidies	-18.1	-0.8	-0.1	-1.7	-1.9	2.7	2.3
Import taxes	0.3	2.0	2.0	1.7	1.6	0.0	0.0
Oil rent	15.7	0.5	0.1	1.4	1.5	-3.8	-3.7
Net effect	n.a.	1.4	1.9	0.7	1.0	5.3	2.9
Average effective tariff rate							
<i>Trade effects</i>							
Real exchange rate	n.a.	1.1	0.2	3.6	3.8	-13.0	-12.2
Aggregate exports	n.a.	1.0	0.1	5.6	4.9	-21.9	-22.4
<i>Factor incomes</i>							
Wage rate	n.a.	-0.1	0.1	0.2	0.4	3.0	6.8
Return to capital	n.a.	-0.4	-0.2	1.1	1.4	-4.7	-1.7
<i>Price of essential goods</i>							
Primary food items	n.a.	1.2	0.3	1.6	2.5	10.5	
Food products	n.a.	0.6	0.2	0.8	0.4	6.0	
Sugar	n.a.	0.0	0.0	0.6	7.4	37.6	
Pharmaceuticals	n.a.	-0.3	-0.1	0.8	2.3	1.0	
<i>Change in household welfare</i>							
Rural 1	n.a.	23.3	27.9	15.6	20.2	72.0	46.3
Rural 2	n.a.	15.2	16.6	10.9	14.2	44.6	30.5
Rural 3	n.a.	10.8	10.4	8.3	10.9	30.4	21.8
Rural 4	n.a.	9.8	8.9	7.9	10.4	26.6	19.7
Rural 5	n.a.	8.0	6.3	6.9	9.0	20.9	16.1
Rural 6	n.a.	6.3	3.9	6.0	7.9	15.6	12.7
Rural 7	n.a.	5.6	2.9	5.6	7.4	13.0	11.3
Rural 8	n.a.	5.2	2.4	5.7	7.5	11.7	10.7
Rural 9	n.a.	3.6	0.1	4.7	6.2	6.7	7.3
Rural 10	n.a.	1.1	-3.8	2.6	3.6	-0.4	1.9
Urban 1	n.a.	11.1	10.6	8.3	10.9	32.0	21.9
Urban 2	n.a.	7.5	5.6	6.3	8.3	19.9	14.9
Urban 3	n.a.	5.9	3.2	5.4	7.1	14.8	11.6
Urban 4	n.a.	5.0	2.0	5.0	6.7	11.9	9.9
Urban 5	n.a.	4.4	1.1	4.7	6.2	9.9	8.6
Urban 6	n.a.	3.9	0.5	4.4	5.9	8.4	7.8
Urban 7	n.a.	3.3	-0.4	4.1	5.5	6.5	6.5
Urban 8	n.a.	2.6	-1.6	3.7	4.9	4.0	4.9
Urban 9		1.8	-2.7	3.1	4.2	1.9	3.4

Item	Initial situation (level values) (0)	Tariffication (1)	Tariffication without rent dissipation (2)	Tariffication + maximum tariff of 25 percent (3)	Tariffication + uniform 15 percent tariff (4)	Exchange rate unification (5)	Exchange rate unification + food subsidies (6)
Urban 10		09	-41	24	35	-07	15

n a Not applicable

Source. World bank staff estimates

**Table 10.2. Impact of trade and exchange rate reforms on domestic output and prices,
by sector
(percentage change from initial equilibrium)**

Sector	Tariffication with rent dissipation (1)		Tariffication without rent dissipation (2)		Tariffication + maximum 25% tariff (3)		Tariffication + uniform 15% tariff (4)		Exchange rate unification (5)		Exchange rate unification + food subsidies (6)	
	Output	Prices	Output	Prices	Output	Prices	Output	Prices	Output	Prices	Output	Prices
	Farming	29	12	06	03	30	19	36	26	130	73	158
Livestock	31	17	08	04	26	22	19	22	40	57	63	24
Other agriculture	35	-02	07	-00	28	08	26	18	-35	32	-29	07
Mining	35	-03	05	-01	69	08	50	11	-144	-17	-148	13
Crude oil	09	13	02	02	19	49	19	53	-57	-144	-62	-125
Sugar	31	00	10	00	13	11	208	21	1591	37	1728	-03
Other food	33	07	07	02	28	14	13	17	54	41	78	05
Paper and print	36	-01	05	-00	36	09	49	15	-69	-16	-69	-00
Cement	09	-01	01	-00	19	05	07	05	-47	-14	-48	11
Brick	14	-02	00	-00	16	06	08	06	-26	-16	-28	11
Gypsum and other minerals	16	-03	01	-01	25	07	13	08	-44	-28	-47	-02
Glass	29	-02	02	-01	19	08	-08	08	-23	-26	-29	00
Other nonmetal products	08	-02	-00	-00	12	07	10	06	-12	-26	-14	-02
Textiles	35	00	01	-00	-82	01	-123	03	-96	-19	-98	-03
Clothing	31	-01	-02	-00	-146	-05	-183	-08	-28	-18	-39	07
Weaving and leather products	69	-02	07	-00	138	-03	133	-03	-219	-20	-218	-02
Rubber and plastic products	43	-00	03	-00	55	13	07	25	-70	-43	-75	-20
Pharmaceuticals	20	-03	03	-01	17	09	57	14	183	-31	180	-09
Kerosene	34	13	10	02	34	48	40	51	53	-141	46	-122
Fuel oil	62	09	07	02	104	39	121	42	-165	-109	-157	-87
Gasoline	24	11	01	02	31	44	38	47	01	-128	09	-108
Gas oil	30	13	04	02	34	48	40	51	01	-140	05	-121
Liquid gas	41	03	15	01	36	20	42	23	91	-54	75	-28
Other materials and chemical products	81	00	13	-00	153	13	205	25	-287	-37	-287	-17
Metal and steel products	37	-01	05	-00	59	09	03	03	-126	-36	-132	-13
Copper, aluminum, and other basic products	43	-02	05	-00	85	06	48	07	-217	-11	-214	05
Metal products	14	-01	01	-00	35	08	54	03	-77	-31	-78	-09
Industrial machinery	01	00	-01	00	04	01	144	-11	4344	-27	4289	00
Radio and TV equipment	37	03	04	01	85	15	21	01	-180	-53	-195	-27
Motor vehicles	30	-01	00	-00	-54	07	-148	04	-116	-37	-120	-12
Other industrial products	23	02	03	00	54	17	09	06	-139	-55	-147	-29
Electricity	32	-03	-01	-00	31	04	28	06	02	-07	-04	26
Water	35	-01	01	01	40	01	46	01	39	07	39	37
Natural gas	67	-00	10	-00	129	12	130	14	-147	-33	-157	-10
Construction	03	-02	-00	-00	03	07	03	06	01	-25	01	-01
Trade	26	-03	-17	-01	27	09	28	12	-17	-30	-12	-04
Restaurants	32	03	-02	01	36	10	61	10	-56	19	-29	-02
Hotel and motels	38	01	-15	00	82	08	173	09	-171	08	-129	04
Load transport	46	-03	10	-01	49	08	62	09	27	-30	09	-05
Passenger transport	36	-02	05	-01	31	09	51	11	16	-26	04	00
Post and telecommuni- cations	27	-01	-12	00	25	03	29	04	15	04	08	35
Transport and storage	33	-02	-02	-00	38	04	39	05	-11	-10	-07	17

Sector	Tariffication with rent dissipation		Tariffication without rent dissipation		Tariffication + maximum 25% tariff		Tariffication + uniform 15% tariff		Exchange rate unification		Exchange rate unification + food subsidies	
	(1) Output	(1) Prices	(2) Output	(2) Prices	(3) Output	(3) Prices	(4) Output	(4) Prices	(5) Output	(5) Prices	(6) Output	(6) Prices
Other services	1.8	-0.2	-0.0	-0.0	1.7	0.6	2.4	0.7	2.7	-1.7	2.0	0.6

Source: World bank staff estimates

Table 10.3. Impact of trade, exchange rate, and energy pricing reforms (percentage change from initial equilibrium)

Item	Initial unification (level values)	Tariffication + exchange rate unification + uniform 15% tariffs	Tariffication + exchange rate unification + zero tariff	Energy pricing reform	Energy pricing reform + exchange rate unification	Energy pricing reform + tariffication + exchange rate unification + tariff reform	15% uniform tariffs	Zero tariffs
	(0)	(1)	(2)	(3)	(4)	(5)	(6)	
Aggregate welfare change (percent of GDP)	-	4.4	4.7	12.2	14.4	18.5	18.8	
<i>Fiscal effects (percent of GDP)</i>								
Food subsidies	-	-	-	-	-	-	-	
Foreign exchange subsidies	0.4	6.4	6.4	2.1	6.4	6.4	6.4	
Petroleum subsidies	18.1	0.8	-0.3	18.1	18.1	18.1	18.1	
Import taxes	3	1.6	-0.3	0.1	0.1	2.1	-0.3	
Oil rent	5.7	-2.2	-0.6	-7.0	-9.2	-8.1	-6.6	
Net effect		6.6	5.1	13.3	15.3	18.5	17.6	
Average effective tariff rate (percent)	5	14.0	-	2.7	2.9	14.7	-	
<i>Trade effects</i>								
Real exchange rate	a	-8.5	-3.5	-26.1	-35.5	-31.9	-26.1	
Aggregate exports	a	-17.2	-8.9	30.4	16.6	25.8	35.3	
<i>Factor incomes</i>								
Wage rate	a	3.1	3.2	2.4	7.7	8.4	7.8	
Return to capital	a	-3.7	-1.3	-6.1	-7.1	-5.8	-3.7	
<i>Rice of essential goods</i>								
Primary food items	a	13.5	13.1	8.2	19.4	24.9	23.9	
Food products	a	7.4	6.9	4.3	8.1	10.3	9.5	
Sugar	a	40.9	41.9	-0.3	36.4	41.6	42.1	
Pharmaceuticals	a	2.1	3.1	-4.0	-1.2	0.4	1.4	
<i>Change in household welfare</i>								
Rural 1	a	95.6	77.7	209.8	239.1	292.2	282.9	
Rural 2	a	60.8	50.5	139.0	157.2	193.3	188.7	
Rural 3	a	42.5	36.1	98.5	112.8	140.2	137.4	
Rural 4	a	38.1	32.9	90.0	102.4	128.1	126.2	
Rural 5	a	30.7	27.1	73.1	84.0	105.9	104.7	
Rural 6	a	24.0	21.9	58.7	67.8	86.3	85.8	
Rural 7	a	20.8	19.5	51.6	60.0	77.1	77.2	
Rural 8	a	19.6	18.7	49.5	56.8	73.6	74.2	
Rural 9	a	12.9	13.4	34.6	40.6	53.9	55.0	
Rural 10	a	2.8	5.2	11.9	15.6	21.6	23.2	
Urban 1	a	44.3	37.3	102.6	116.3	143.1	139.5	
Urban 2	a	28.9	25.4	70.3	79.8	99.4	97.9	
Urban 3	a	22.4	20.3	55.1	63.5	80.0	79.2	
Urban 4	a	18.9	17.7	47.5	54.9	69.8	69.6	
Urban 5	a	16.3	15.8	41.8	48.4	62.0	62.2	
Urban 6	a	14.4	14.3	37.8	43.9	56.5	56.9	
Urban 7	a	12.0	12.5	32.1	37.7	49.2	49.9	
Urban 8	a	8.8	10.0	25.1	29.9	39.6	40.7	

Item	Initial valuation (level values)	Tariffication + exchange rate unification + uniform 15% tariffs	Tariffication + exchange rate unification + zero tariffs	Energy pricing reform	Energy pricing reform + exchange rate unification	Energy pricing reform + exchange rate unification + tariff reform	
	(0)	(1)	(2)	(3)	(4)	15% uniform tariffs (5)	Zero tariffs (6)
Urban 9	a.	5.7	7.5	18.4	22.6	30.3	31.5
Urban 10	a	2.3	5.0	10.5	13.9	19.4	21.1

n a Not applicable Source World Bank staff estimates

Table 10.4. Impact of trade, exchange rate, and energy pricing reforms on domestic output and prices, by sector (percentage change from initial equilibrium)

Sector	Tariffication + exchange rate unification + uniform 15% tariffs		Tariffication + exchange rate unification + zero tariffs		Energy pricing reform		Energy pricing reform + exchange rate unification		Energy pricing reform + tariffication + exchange rate unification + uniform 15% tariffs		Energy pricing reform + tariffication + exchange rate unification + zero tariffs	
	(1) Output	(1) Prices	(2) Output	(2) Prices	(3) Output	(3) Prices	(4) Output	(4) Prices	(5) Output	(5) Prices	(6) Output	(6) Prices
Farming	17.3	10.2	16.6	10.2	12.0	-7.3	23.3	16.0	29.8	21.2	28.1	20.4
Livestock	6.7	8.6	5.2	8.4	15.6	8.8	14.5	13.4	18.5	18.2	16.6	17.4
Other agriculture	-0.2	4.3	-3.9	5.6	3.0	-2.0	-2.7	3.3	2.5	5.0	-0.8	6.0
Mining	-9.0	-0.8	-13.1	0.4	-29.3	-2.7	-37.8	-2.4	-33.3	-1.4	-37.1	-0.4
Crude oil	-2.8	-8.6	-0.7	-2.6	-12.9	-25.7	-19.8	-34.5	-16.2	-29.5	-12.4	-23.2
Sugar	175.6	5.3	169.0	6.5	22.4	-0.7	180.7	4.9	210.0	7.3	202.9	8.1
Other food	8.7	6.1	7.0	6.3	18.3	3.8	16.7	8.2	21.2	11.4	18.9	11.3
Paper and print	-0.6	-0.2	-6.6	0.1	-9.1	-3.5	-17.6	-3.7	-8.6	-1.8	-13.8	-1.6
Cement	-3.8	-1.0	-5.6	-0.7	-10.8	3.7	-15.2	1.8	-13.8	1.4	-16.1	1.7
Brick	-1.8	-1.1	-3.3	-0.4	-10.6	2.1	8	19.6	-12.7	20.3	-15.6	21.9
Gypsum and other minerals	-2.9	-2.2	-5.2	-1.1	-10.5	3.7	-14.2	-0.0	-11.7	-1.0	-14.5	0.1
Glass	-3.1	-1.9	-7.7	-1.1	-5.1	-1.9	-9.6	-2.9	-10.3	-2.2	-15.0	-1.4
Other no-metal products	-0.2	-2.1	-0.7	-1.7	-1.2	-2.5	-2.6	-3.9	-1.1	-3.2	-2.0	-2.8
Textiles	-25.6	-1.9	-27.5	-1.9	-9.5	-3.0	-16.4	-3.3	-37.4	-3.3	-40.4	-3.3
Clothing	-23.7	-3.0	-27.9	-3.0	-5.0	-2.6	-0.7	-2.8	-27.3	-4.3	-31.0	-4.4
Weaving and leather products	-20.6	-2.5	-10.9	-2.3	-24.5	-2.5	-30.3	-3.3	-36.7	-4.1	-35.2	-3.9
Rubber and plastic products	-6.4	-1.7	-9.7	-2.6	-12.2	-5.8	-17.1	-8.7	-16.3	-5.6	-20.1	-6.1
Pharmaceuticals	21.6	-2.0	21.3	-1.0	13.8	-4.6	30.5	-5.2	36.3	-3.8	35.9	-2.8
Kerosene	9.6	-8.4	8.9	-2.5	-88.2	-24.7	-90.1	-33.3	-93.0	-28.4	-93.8	-22.3
Fuel oil	-6.9	-6.4	-6.2	-1.6	-86.2	-19.2	-86.7	-25.3	-84.8	-21.3	-85.8	-16.4
Gasoline	4.1	-7.7	4.7	-2.3	-32.3	-21.6	-29.2	-29.5	-26.6	-25.0	-28.1	-19.3
Gas oil	4.2	-8.4	4.0	-2.5	-85.0	-24.7	-87.4	-33.2	-90.8	-28.4	-91.9	-22.3
Liquid gas	13.7	-3.1	11.4	-0.7	19.2	-4.0	25.4	-7.0	34.1	-4.8	31.6	-2.1
Other materials and chemical products	-13.1	-1.0	-16.1	-2.1	-63.2	9.5	-69.7	5.9	-62.8	9.5	-66.5	9.5
Metal and steel products	-8.9	-3.2	-16.5	-3.8	-38.6	-5.2	-46.6	-7.6	-44.4	-6.7	-48.9	-7.0
Copper, aluminum, and other basic products	-19.0	-0.2	-18.9	-0.3	-36.8	-1.0	-45.5	-2.2	-44.4	-0.8	-46.2	-0.9
Metal products	-2.1	-2.5	-2.1	-3.5	-13.1	-4.8	-18.5	-7.4	-12.3	-6.3	-13.4	-7.0
Industrial machinery	547.2	-3.6	489.3	-5.0	15.8	-5.9	255.4	-7.7	349.2	-8.3	315.4	-9.4
Radio and TV equipment	-14.4	-4.9	-22.1	-6.8	-27.9	-9.4	-40.0	-12.2	-36.1	-11.4	-40.5	-12.7
Motor vehicles	-24.0	-3.3	-32.3	-3.6	-30.2	-4.7	-39.1	-7.3	-49.0	-6.7	-53.8	-6.9
Other industrial products	-11.7	-4.6	-18.8	-6.1	-25.0	-9.2	-35.3	-12.5	-33.0	-11.3	-37.4	-12.3
Electricity	3.0	-0.3	2.3	0.7	-3.1	28.1	-1.9	27.2	2.2	29.2	1.1	31.7
Water	8.6	0.7	8.6	0.6	11.2	-5.9	15.6	5.6	23.5	4.3	23.0	4.0
Natural gas	-6.3	-1.9	-0.5	-0.4	-21.8	0.9	-22.8	-1.0	-17.7	0.9	-16.8	2.8
Construction	0.4	-2.0	0.3	-1.8	0.8	-0.9	0.8	-2.5	1.3	-1.7	1.2	-1.2
Trade	0.6	-2.1	1.3	-0.5	3.4	-3.2	4.6	-4.1	7.9	-3.0	7.6	-1.5
Restaurants	1.2	3.2	-1.3	3.9	1.5	0.6	-4.8	2.7	6.7	4.7	4.2	5.0
Hotel and motels	-0.8	1.8	-2.3	2.6	-17.4	0.5	-28.3	1.7	-8.3	3.0	-11.1	3.4
Load transport	9.3	-2.3	8.5	-1.1	7.6	5.4	13.1	-0.3	26.4	-2.2	24.7	-0.8
Passenger transport	8.2	-1.8	4.9	-0.6	4.0	1.8	4.3	-1.3	17.1	-1.8	13.6	-0.7
Post and telecommunications	4.4	0.6	4.4	1.0	13.1	2.8	14.0	4.8	19.3	5.4	19.2	5.6
Transport and storage	2.8	-0.7	2.8	-0.1	-24.5	6.3	-23.8	5.1	-21.3	5.2	-22.5	6.2
Other services	5.2	-1.3	4.7	-0.3	-12.6	-1.8	13.9	-1.5	18.8	-0.7	18.2	0.1

Source: World Bank Staff estimates

Chapter 11. Financial Sector Liberalization

11.1. Rigid controls and state ownership of financial institutions make Iran one of the few remaining examples of the financial repression once characteristic of most developing countries. It has one of the most highly state-dominated banking systems in the world. All the major Iranian banks are state-owned, and collectively they hold 99 percent of the assets of the banking system. The direct controls of the central bank, BMJII, over the commercial banks have removed most of their autonomy: they are subject to interest rate ceilings for both deposits and loans and to direct controls on the allocation of loans among sectors. In addition, BMJII must approve every individual large loan. The insurance sector is also monopolized by state-owned firms whose rates are regulated.

11.2. The controlled rates of return on bank loans do not provide enough variation to compensate for the variation in borrowers' creditworthiness. Indeed, the intersectoral differences in the lending rates that the banks are allowed to charge tend to run counter to the risks of lending to the various sectors. Since these regulatory inefficiencies prevent banks from pricing their financing facilities efficiently, it is not surprising that they have not developed risk management and credit appraisal expertise commensurate with the size and scope of their operations.

11.3. Many of the current weaknesses of the Iranian financial system, particularly its lack of transparency, are the result of political involvement in the operation of banks and regulatory agencies. Banks have had to implement sectoral credit allocation targets and to try to meet social and public policy objectives that are not clearly specified and sometimes conflict. The conflicts arise because the commercial banks and BMJII are governed by a complex array of overlapping committees, councils, and assemblies. The need for clearly defined objectives, autonomy and accountability applies also to BMJII (in its monetary policy, in its prudential supervision of financial institutions, and in its lending to the government), to auditors, and to other state-owned financial institutions, as well as to the state-owned banks.

11.4. Under the five-year development plan financial repression is being gradually lifted. Some important changes have already occurred, and others are planned. Several private near-bank credit institutions that can perform most of the functions of banks were licensed in 2000. And in 2001 two small private banks were licensed to operate in the free trade zones, which the government is hoping to develop as offshore financial sectors, and export processing zones. To make the financial sector more competitive and efficient, it will also be necessary not only to allow foreign and private banks to compete on equal terms with Iranian banks—but also to remove the ceilings on deposit and lending rates

and the direct controls on the allocation of bank loans by sector. The removal of ceilings and credit allocation controls would also enhance monetary policy by allowing it to change credit conditions evenly across all sectors of the economy. Despite having been recently reduced, reserve requirements remain excessive and impose a heavy implicit tax on bank intermediation. Similar, market-oriented reforms are needed in the insurance sector and new legislation is being introduced to improve the regulation of the stock market.

11.5. In 2001 BMJII issued its own 'participation paper,' similar to a certificate of deposit, but in bearer form, conforming to the prohibition of interest in Islamic banking. It has been sold at periodic auctions to commercial banks and companies. The first issue had a maturity of six months and an expected yield of 19 percent. The government has also introduced its own participation paper. A liquid secondary market in participation paper does not yet exist, and this constrains the ability of BMJII to operate an efficient monetary policy. It can tighten or loosen monetary conditions day-to-day only by operating in the foreign exchange market, or by the inevitably clumsy methods of tightening or loosening direct controls or reserve requirements.

11.6. Exchange rate unification at a floating market-determined rate has been achieved by the removal of most exchange controls on current account transactions and by the creation of a single inter-bank foreign exchange market. That replaces the former system in which BMJII managed the rate at which it was willing to balance supply and demand on trade transactions at the TSE, while a separate but very closely related market operated through the banks for transactions in services.

11.7. The liberalization of the financial sector will create a more open and competitive system, with the capacity to deliver a wider range of financial services. This is a prerequisite for the successful development of the private sector—and thus for Iran's prosperity. Even so, financial liberalization poses serious risks. Economywide deregulation will make the environment for banks more volatile. And recent international experience has demonstrated that financial liberalization, combined with implicit government guarantees of depositors, but without an adequate legal and regulatory framework, is a recipe for costly financial crises. The liberalization of the financial and non-financial sectors will therefore greatly increase the need for banks and other financial institutions—and regulators—to face incentives to contain and assess risk. The focus of bank supervisors is now on making sure that banks comply with the regulations on credit allocation by sector. In the future, their focus should be on the banks' capacity to evaluate and manage risk. Some technical assistance to supervisors on dealing with these new tasks is already being provided under an IDF grant.

The banking system

11.8. There are 10 large state banks. Six of them are general commercial banks that take deposits from the public and make loans to both public and private sectors. The other four are specialist banks that lend to particular sectors: one lends exclusively to finance housing, a second lends to the agricultural sector, a third to industry and mining, and the fourth specializes in export finance. These four specialist banks obtain most of their funds from the general commercial banks, BMJII, and other public sources.

Functioning

11.9. The instruments that banks can use for borrowing and lending are governed by a 1982 law on Islamic banking with the rates of return on both loans and deposits set by BMJII, generally less than the rate of inflation over the last decade. The controlled lending rates vary with the term and the sector receiving the loan. Every large loan must be approved by BMJII, which also sets the minimum percentages of each bank's loan portfolio that must be lent to various broad sectors—housing, agriculture, exports, and state-owned enterprises.

11.10. The commercial banks offer current accounts, savings accounts, and investment accounts. No interest can be paid on current accounts, and the only return on savings accounts is a small lottery system whose prizes provide a return of about 2 percent a year on average. Over two-thirds of deposits are held in investment accounts. The controlled rates on these accounts increase steeply with maturity. Although interbank lending among the state-owned banks is permissible, it is little-used in practice and the banks rely on BMJII to meet short-term liquidity needs.

11.11. One notable feature in the regulated nominal interests is the lack of variation (table 11.1). Another is that the returns on deposits in short-term investment accounts have always been well below the rate of inflation. Only in the last two years have the real rates of return on longer maturities become positive. Even in the absence of tax, a deposit in an investment account with a one year maturity at the beginning of 1989/90, and then repeatedly rolled over, would have lost 62 percent of its real value by the end of 2000/01. The average pre-tax real rate of return over this period was -7.8 percent.

Table 11.1. Inflation and the regulated rates of return on deposits by maturity

	Short-term	6 months	1 year	3 years	5 years	Inflation ¹
1990/91	6.5	9.0	10.0	11.5	13.0	29.0
1991/92	6.5	9.0	10.5	11.5	14.0	19.8
1992/93	7.5	10.0	11.5	13.0	15.0	27.5
1993/94	8.0	11.5	13.5	14.5	16.0	44.9
1994/95	8.0	11.5	13.5	14.5	16.0	36.6
1995/96	8.0	14.0	15.0	16.0	18.5	17.3
1996/97	8.0	14.0	15.0	16.0	18.5	18.3
1997/98	8.0	14.0	15.0	16.0	18.5	18.9
1998/99	8.0	14.0	15.0	16.0	18.5	18.0
1999/00	8.0	14.0	15.0	16.0	18.5	11.3
2000/01	7.0	13.0	13.0 - 17.0	13.0 - 17.0	17.0	11.1

Source: BMJII

Note: ¹ Inflation is measured as the percentage increase in the CPI in the 12 months ended in the last month of the financial year indicated

11.12. With the exception of loans to borrowers in the trade and services sectors, the controlled interest rate ceilings on bank loans by sector in 1999/2000 and 2000/01 were similar to deposit interest rates on 1 year and 3 year investment deposits. They therefore left little room either for credit risk, or for the cost of maintaining the banks' large branch network.

Table 11.2. Controlled interest rate ceilings on bank lending

	1999/2000 (% per year)	2000/01 (% per year)	2001/02 (% per year)
Agriculture	13-16	13-16	14-15
Industry and mining	17-19	17-19	16-18
Housing	15-16	15-16	15-16
Trade and services	22-25	22-25	23, or more
Export	18	18	18

Source: BMJII

11.13. The banks have more than 12,000 branches, including several dozen abroad, mainly in Europe and the Gulf, a network far larger than could be justified by purely commercial considerations.¹ The two largest banks—Bank Melli, the former bank of issue and Bank Saderat ('trade')—control more than half the total market. Because the branch network is so large, ownership of deposits is relatively widespread: Bank Melli alone has over 4 million current accounts, 14 million savings accounts, and 5 million investment accounts.

¹ For example, Iran has more than twice as many bank branches as Indonesia, although its broad money supply is about half that of Indonesia.

11.14. Despite the huge branch network, financial repression has resulted in low ratios of financial variables to economic activity. Bank credit to the private sector is only 20 percent of annual GDP, far below the level even of countries with a long tradition of state involvement in finance, such as Brazil, Egypt, and Tunisia. The ratio of broad money to annual GDP recently ranged between 40 percent and 45 percent, about the same as in Pakistan, a much poorer country.

11.15. The share of bank lending under budgetary directive has declined but still accounts for about a quarter of the total. Reserve requirements and required sectoral shares determine the broad allocation of another substantial portion of the banks' resources, leaving only about one-fifth that the banks can allocate freely.

11.16. The defects of the current regulatory arrangements have raised operating costs and inhibited innovation and proper risk management. The payments system has failed to keep up with international developments. Check processing is still fully manual and the process of electronically linking the branch network not well advanced. Only 300 ATMs were in place in early 2001, and banks were only just beginning to introduce EFT-POS. The clearing system introduced in 2001 has exacerbated interbank credit risks by building in automatic interbank overdraft facilities from banks that are net creditors to those that lack the liquidity to meet their clearing obligations. In addition, clearing is now operated by one of the commercial banks, giving it an informational advantage over the others. Such a system could have been imposed only on state banks that are dominated by the central bank and not much concerned about profitability.

Poor profitability

11.17. In a liberalized financial system, private ownership and high minimum capital requirements can provide banks with an incentive to innovate—to increase operating efficiency, to provide the products best suited to their customers' needs, and to monitor and manage risk efficiently. In Iran's repressed financial system, low interest rate ceilings and directives on credit allocation greatly inhibit the banks' ability to operate efficiently. And state ownership reduces the incentives for them to do so.

11.18. State-owned banks are notoriously liable to make bad loans, partly because it is very difficult for their managers to resist political pressures to lend at low interest rates to politically influential borrowers. It can also happen as a result of outright corruption, when managers accept bribes or other favors to make loans that are excessively risky or that they know will never be repaid.

11.19. Minimum capital requirements reduce the moral hazard, or outright corruption, created by government guarantees of deposits when banks are privately owned. This happens because private equity plays the role of the deductible amounts in the government's implicit, or explicit, guarantee of deposits. When small losses occur, their cost is entirely borne by the private owners of bank equity. The government need pay out only when losses exceed the initial value of private equity. In contrast, when banks are

state-owned, capital requirements are merely cosmetic. Since the capital is owned by the state, all losses are also borne entirely by the state if deposits are guaranteed. For state-owned banks, the only capital that plays the prudential role of a private bank's capital is the value to managers' of retaining their jobs.

11.20. One implication is that the Iranian banks should be privatized, with high minimum capital adequacy requirements. A second is that if the banks are not privatized, it is important that managers believe that retaining their jobs depends crucially on their performance. They must therefore be given clearly defined objectives and regularly audited. Because the capital at risk all belongs to the state, auditing alone is not sufficient: prudential supervisors are needed to monitor and control the risks currently being taken.

11.21. Auditing and prudential controls for state banks are a poor second-best to full privatization. Cost will sometimes constrain managers' ability to undertake commercially justifiable risks. But managers' day-to-day involvement with their bank's operations and customers gives them a large informational advantage over supervisors and auditors. Managers can therefore disguise some of the risks they are taking and conceal losses for substantial periods.

11.22. The past performance of Iran's banks is typical of worldwide experience with state banks. Over the past five years, the reported pre-tax profitability of the main commercial banks has been only about 0.2 percent of their total assets. The real situation is even worse than the reported situation because current accounting practices for classifying and making provisions for bad and doubtful loans are too much lenient. Depending on what assumptions about the degree of impairment of loans, the injection of taxpayers' money needed to raise bank capital to the international norm of 8 percent of risk-weighted assets is estimated to be between 5 and 12 trillion rials.

11.23. One reason for this poor performance is heavy reserve requirements. Another is the excessive density of the branch network relative to the value of deposits. But the major reason for banks' low reported profitability is that their commercial autonomy has been removed by direct controls that have forced them to lend at the low controlled rates to the sectors to which the government has wanted to direct subsidized credits (table 7.2).

11.24. In addition to the losses already acknowledged, or that would have to be acknowledged if rigorous accounting standards were followed, the banks also face the problem that many of the state-controlled firms that dominate their loan portfolios depend on energy subsidies and access to capital goods imported at the old official exchange rate, which used to be only a small fraction of the real cost of foreign exchange. As these subsidies are phased out, firms that were once the banks' best customers could become problematic credit risks.

11.25. To help the rest of the economy plan for the future, the government should make clear how rapidly it will remove subsidies. While the removal of subsidies will worsen

the net revenue position of state-owned enterprises, it will improve that of the government. What is needed is a one-time netting of some of the government's gains against state-owned enterprises' indebtedness to banks. This could best be achieved in conjunction with privatization of both banks and state-owned enterprises. With the traditional constitutionally based resistance to private ownership of banking now coming to an end, this solution is more feasible.

11.26. The risks of financial liberalization would be reduced by allowing foreign banks to operate in Iran and to buy state banks when privatization occurs. This would have several very important benefits. First, it would allow the banks operating in Iran to hold a more globally diversified asset portfolio. Overseas experience has shown that, as common sense suggests, a banking sector with a globally diversified portfolio is much less likely to collapse in a speculative attack than one whose assets are all invested in the domestic economy. Second, foreign ownership is also an excellent way of introducing new technologies and skills. Third, foreign ownership can avoid undesirably close links between banks and their borrowers, and make it easier for the banks to resist local political pressures to lend to favor but uncreditworthy borrowers. A first step towards encouraging entry by foreign banks is a proposed joint venture Saudi-Iranian investment bank, to be established abroad, but with an office in one of the Free Trade Zones.

11.27. The government should implement an initial program to privatize small state-owned enterprises, but banks and other large state-owned enterprises should not be privatized until several prerequisites for successful large-scale privatization are in place. The banks and other large state-owned enterprises that are not immediately privatized should be audited to determine their net worth in the new environment of gradually diminishing subsidies and freer trade. When the audits have been completed, the government should take over part of SOE debt to banks in recognition two facts. State-owned enterprise managers cannot be blamed for losses incurred as a result of the government's removal of energy and other input subsidies. And bank managers cannot be blamed for following the regulations that forced them to lend to SOEs at interest rates that did not reflect the true risks.

11.28. Steps are already in hand to use tax revenue to boost bank capital by 5 trillion rials. This is not a cost of recapitalization, since the government could not avoid it by not recapitalizing the banks. Instead, it is an estimate of the losses the government has suffered as a result of the bad operating practices of the banks and the mostly state controlled enterprises to which the government forced them to lend.

11.29. The danger in bank bailouts is that one bailout may lead to expectations of another. In Eastern Europe, repeated recapitalizations gave bankers an incentive to gamble taxpayers' money in a self-serving way on high-risk projects often promoted by their associates. If banks are sold to new owners, the market value of banks that are initially technically insolvent can be made positive by having the government take over the bad debts of SOEs before privatization. Since this does not involve bailing out the new owners, no moral hazard is created, and the primary responsibility for improving

governance rests with the new owners. But if banks are recapitalized with no change in ownership or management, there is a great moral hazard. That makes it especially important to improve governance standards, and the responsibility for doing this rests entirely with the government.

11.30. Two approaches to improving governance are needed. First, training and equipment must be provided to make it easier for managers to adopt best practice techniques. Second, incentives must be put in place to make it their interest to do so. For the first approach, banks should get help in reforming their internal management and operating procedures. This will involve providing some new technology and training to improve their ability to assess and manage risk and to raise standards of transparency and accountability. Accounting practices must be revised to be consistent both with Islamic banking principles and with the International Accounting Standard.

11.31. For the second approach, banks must be regularly audited. A recent bank-by-bank portfolio audit was a welcome step toward putting the banks on a surer financial basis, establishing a base line to measure their profitability. The recent decision to clear delinquent government-guaranteed loans promptly with budgetary funds will help to draw the fiscal authorities' attention to the true costs of directed lending to uncreditworthy state-owned borrowers. Now needed is to update these audits to reflect any subsequent injections of capital, clearing arrears, or taking over doubtful SOE debts by the government. Banks should then be given target rates of return, relative to their new net asset positions.

11.32. Banks should be required to present quarterly estimates and audited annual accounts of their performance relative to their targets—and to account for any failures to meet them. Managerial contracts should include salary bonuses for exceeding the targets—and penalties, including dismissal, for falling short. Managerial salaries should be greatly increased so that the possible gains from corrupt practices no longer dominate the possible losses from being dismissed.

The non-bank financial sector

11.33. The non-bank financial sector, though much smaller than the banking sector, is also experiencing rapid change. The number of stocks listed on the Tehran Stock Exchange (TSE) continues to grow, though the pace has slowed since the first large wave of privatizations in the early 1990s. A new wave of privatizations is expected to boost trading. In the next few years, even so, total equity market capitalization is well below many relevant comparators, and the market still falls short of what could be achieved in activity and infrastructure.

11.34. Excessively restrictive regulation of the banks has been responsible for the rapid growth of unregulated 'investment companies' and boosted informal finance—described as 'bazaar finance,' but not confined to the traditional markets. As well as providing an alternative to would-be borrowers rationed out of the banking system, bazaar finance

offers much higher rates of return to savers than those available on bank deposits (table 11.3). The very large gap between these rates and the much lower lending rates in table 11.2 is evidence of the severity of rationing in the formal sector.

Table 11.3. Lending rates in unregulated money markets, March 2001

	Minimum rate (% per year)	Maximum rate (% per year)	Most prevalent rate (% per year)
Tehran	36	60	48
Other large cities	35	84	54
Small cities	36	84	60
Other towns	30	84	60

Source: BMJI.

11.35. Charitable Gharz-al-hasaneh schemes are widespread. These schemes collect interest-free deposits of up to 1 million rials and make interest free loans of up to 50,000 rials to persons in need. Almost 1,000 registered credit cooperatives are in operation throughout the country, but these are very small: average membership is under 300 persons, and total assets are less than 100 billion rials.

11.36. There are insurance brokers and agents, and stock exchange brokers, but no credit information agencies, and no specialized leasing, factoring or hire-purchase concerns. Nor are there open-end mutual funds. A few large firms and certain categories of government employees have set up occupational pension schemes and the state-controlled Social Security Organization, which is funded by compulsory contributions, holds a diversified portfolio that exceeds 30 trillion rials.

11.37. So far, foreign financial institutions have only representative offices in Iran. A joint-venture Iranian-Saudi Arabian investment bank has already been proposed, and there are no formal legal barriers to stop other foreign banks from operating in the free trade zones.

11.38. To realize the Iranian economy's full potential, the underdeveloped state of financial services and non-bank finance will have to be corrected. Even-handed regulation of institutions that perform similar functions is necessary to ensure the efficient development of the entire financial sector. This will be achieved by liberalizing the banking sector and by extending prudential regulation to the non-bank financial sector.

The stock exchange

11.39. Demonstrating the recent rapid growth in the importance of securities trading on the Tehran Stock Exchange (TSE) is a sharp increase in the stocks listed. The trading floor has been computerized, and the regulation of the market is being overhauled. Market capitalization was just over 10 percent of GDP at the end of 2000, after peaking

at 13 percent in 1996–97. Liquidity, measured by turnover, has been growing but was still less than 15 percent of market capitalization in 2000. The price-earnings ratio, about 4 and fluctuating between 2.5 to 6, is also low. The ownership of listed shares is highly concentrated, with most listed companies are controlled by the government.

11.40. An underlying problem: the market is dominated by a limited number of players. Most large firms brought to the market remain majority-owned by one or more state-owned companies, and the free-float is low by international standards. Most privately owned companies on the exchange are also controlled by a handful of insiders.²

11.41. Minority shareholders are understandably nervous about how they might be treated by these powerful groups, especially since their legal protections are weak. This discourages outside investors and depresses market prices, probably the main reason for the price-earnings ratio to be low. Even where regulations to protect minority shareholders are in place, they are not always enforced. About a third of companies are in violation of the requirement that there should be at least 1,000 shareholders in any listed company. That this requirement is too demanding is beside the point—regulations should be enforced or repealed.

11.42. The regulation and governance of the TSE has improved, but more needs to be done, particularly in enforcement and detecting trading abuses. Worldwide experience with shareholder protection demonstrates that self-regulation alone is inadequate. Needed is a public oversight body, independent of market professionals, but communicating with them. In addition, the rules on corporate governance, accounting disclosure, and insider trading need to be strict and tightly enforced. These needs are particularly acute in newly emerging markets, since unscrupulous operators are quick to apply fraudulent techniques from abroad to an unprepared market.

11.43. The governing body of the TSE plans to establish an over-the-counter market and a second board that would have lighter listing requirements. And the authorities already plan to introduce a Securities Market Act, to protect investors by regulating the issuance of securities, ensuring that investors receive adequate information, and establishing a securities commission to oversee these regulations and be responsible for approving proposed new listings. We support these proposals. We also recommend stricter sanctions on insider trading, a higher minimum free-float for listed stocks, and full and prompt disclosure of material information to all classes of shareholders.

² For more than 40 percent of the companies listed, the 5 biggest investors own more than 90 per cent of the shares.

Collective savings

11.44. A recent proliferation of unlisted investment management companies takes advantage of the fact that securities regulations only apply to forms of collective savings listed on the TSE. Altogether 43 investment companies are known to the authorities, but only 14 are listed and regulated. Some of the listed firms are reputable market leaders, such as the investment company that is a subsidiary of Bank Melli, which holds about 8 percent of the equity in the 20 largest companies on the stock exchange. The quality and reliability of the unlicensed and unregulated firms cannot be judged. But worldwide experience shows that the absence of regulations governing collective savings presents opportunities for the unscrupulous to set up fraudulent schemes, disguised as investment companies. That makes it essential to regulate all collective savings schemes, listed or not. The best way of doing this would be to enact new legislation.

11.45. In addition to protecting small or gullible investors, there is a need to expand the range of collective savings media on offer. In particular there is a need for open-end mutual funds, as well as the closed-end funds that are now so prominent, but that trade, as in many other countries, at a discount to their net asset value. The open-end mutual fund has been found much more flexible for pooling small savings for investment in stock exchanges around the world.

Insurance

11.46. The insurance industry, like banking, is monopolized by state-owned firms that operate in a tightly regulated environment, raising costs and inefficiently restricting the range of services. The central insurance authority (BM: *Bimeh Markazi*) approved the design of all insurance products and sets all tariffs and commission rates. Some of the tariffs are too high, and some too low, relative to average costs. The monopoly powers that this tightly regulated regime have conferred on the insurance sector hold premiums down to only 0.7 percent of GDP, well below the level in comparable Islamic and Arab countries. As a result, the industry has been both profitable and stable, but cannot adequately handle the needs of a liberalized financial system. As with banking, recent legislative changes will allow domestic private companies to compete with the state-owned ones and allow foreign insurance companies to operate in the FTZs.

Islamic finance in a liberalized Iranian financial system

11.47. Because of its constitutional prohibition on interest for religious reasons, financial liberalization in Iran will present problems that are not encountered elsewhere. A ban on usury is applied in many Islamic countries around the world, but wholly non-interest based Islamic systems are rare. Sudan and Pakistan are sometimes mentioned, but for different reasons they provide little guidance for Iran.

11.48. A distinctive menu of some 14 Islamic financial instruments was devised by religious and financial experts in the early 1980s. A common way of avoiding interest,

while rewarding lenders, has been to use contracts in which lenders share with borrowers in the profits, or losses, of the projects undertaken with the funds lent. These instruments have allowed the banks to meet the financing requirements expressed by their clients. But apart from the introduction of central bank and government participation papers, there has been little innovation since the early 1980s.

11.49. We believe that Islamic finance can provide all the services needed to support Iranian economic growth. The problem is to ensure that implicit assumptions based on experience in western financial systems do not lead to a false sense of security. In addition to managing risk, there is an extra dimension in Iran because the profit (and loss) sharing elements built into several of the Islamic instruments have so far been partially suppressed by controls.

11.50. It is possible in a liberalized environment that borrowers will be much better placed to argue for at least partial debt forgiveness by banks—by concealing or diverting some of their revenue to make it seem that the venture or activity being financed has been unprofitable. The presumption that they should pay the rate announced by BMJII prevents such behavior now. Nor can banks be confident that, if they encounter difficulties of this type on the lending side, they will be able to pass on the losses to their depositors. Since most depositors have become accustomed to receiving very predictable returns, they will react very unfavorably to a bank that fails to deliver the expected rate of return.

11.51. Part of the solution may be to liberalize rates of return only gradually. In addition, the authorities should require the banks to specify very fully and precisely just how rates of return on their borrowing and lending contracts will depend on the outcomes of the projects they are financing. Part of the solution may also be innovative new instruments. For example, an instrument that guarantees lenders a return that is the same over a very wide range of outcomes, but much lower, or even zero, in the event of disaster would be very similar, in practice, to western 'fixed' interest contracts, which are also variable, de facto, in the event of disaster. If an instrument of this type can be designed so that it is consistent with Islamic banking principles, the Iranian financial system will be able to offer much the same range of instruments found in western systems.

11.52. There is no presumption that the 14 instruments devised two decades ago exhaust the range allowable. A new committee of financial and religious experts should be established to consider the scope for further innovation to extend the list of instruments deemed consistent with the prohibition on usury.

Box 11.1 FSAP (2000) Recommendations on Financial Sector Reform

Monetary instruments and markets

- Issue CPPs
- Allow the CPPs to be auctioned and used in open market operations
- Redesign the standing facilities
- Reform reserve requirement
- Introduce and develop interbank?? Fund market

Bank competition and autonomy

- Liberalize deposit and lending rates
- Accelerate removal of directed credit and sectoral allocation of credit
- Recapitalize the banking system
- Tighten bank accounting rules that both take adequate account of Islamic instruments and are consistent with the International Accounting Standard (IAS)
- Reorient the state-owned banks towards clear commercial objectives and financial autonomy
- Move towards a more active and equitable competition between banks, and between banks and nonbank financial institutions and markets, including through financial sector liberalization and privatization

Prudential supervision and regulation

- Move towards an overall evaluation of banking risks and of the banks' capacity to manage them
- Prepare and implement a new regulatory framework consistent with international standards
- Intensify training of supervision staff

Capital Market

- Enact a securities market legislation to replace the Stock Exchange Act of 1966, to regulate the issue of securities (listed and unlisted)
- Create an independent securities commission
- Upgrade accounting, auditing, and disclosure standards

Chapter 12. Private Sector Development— To Generate Employment

12.1 The public sector has been until now the backbone of Iranian economic growth and employment generation. Promoted by import substitution policies, financed by oil wealth in the 1950s and 1960s, and sustained by the logic of a war economy and revolution thereafter, Iran's public sector-led economy has increasingly been showing its limitations in terms of growth and employment. The public sector already suffers from high over-employment and low labor productivity. Thus the additional growth required to meet the challenge of unemployment will have to come from the private sector.

12.2 Iran has chosen a gradual path for its transition rather than the big bang approach of many countries of the former Soviet bloc where economic transition was made as part of a political system change and transition involved massive privatisation of the public sector. More like China, Iran's economic transition is being made within its existing political and institutional structures. A heavy value is placed on minimizing political and economic costs and maintaining the integrity of its social achievements, especially the priority assigned to "social justice" as a major pillar of its political ideology.

12.3 Other factors also present obstacles to a massive privatization of the public sector. First, Iran's public sector has one of the highest concentration rates consisting of very large enterprises making it difficult to find acquiring private investors inside and outside Iran. And because Iran is still a closed economy, perceived risk for foreign investors is high. Second, the value of many enterprises is still uncertain because of the many economic distortions that still exist. The profitability potential and cost profile of many enterprises will not be accurately known until, for example, high subsidies on energy and other inputs are eliminated. The impact of these yet to come reforms will have a major effect on relative prices which are unknown to investors. And third, unemployment is high and rising, given the pressure from the supply side, increasing the social and political costs of massive privatisation.

12.4 For these reasons among others, it is unlikely that the private sector will emerge from the vestiges of the public sector; rather, the two sectors will need to coexist for a while. A two-fold strategy can support this evolution:

12.5 Public sector enterprises will first need to improve their governance. They can then be catalogued with a view to gradual privatisation, starting with enterprises that are profitable, that have potential domestic buyers, and whose transformation into private entities will not result initially in high labor shedding.

12.6 For encouraging private sector development, the government should ensure a level playing field with the public sector by instituting and enforcing fair access to credit and foreign exchange; equal and fair tax treatment; fair access to markets, in particular to public administration markets (public enterprises now have priority in administration purchases by law); new anti-trust legislation that protects private enterprises from monopolistic (economic and political) power of the public sector and bonyads (religious foundations); further trade reform; a competitive financial sector; and reform of the labor law.

Iran's private sector

12.7 Public enterprises in Iran are large and include numerous monopolies controlling strategic industries, such as steel, heavy equipment, power supply, oil, the railways, shipping, telecommunications, airlines, and banking. There are also the quasi-governmental foundations (bonyads) that manage a large number of manufacturing companies, mostly confiscated during the Revolution. These enterprises enjoy specific monopolies and other privileges and draw monopolistic power and privileges from political factors. Bonyads are under the supervision of the highest religious authorities. The privileges—from preferential access to credits, markets, foreign exchange and other resources—and the stifling investment have pushed the private sector to the margin.

12.8 By relying on hydrocarbon revenues, Iran has built a relatively diverse, public-dominated, and vertically integrated industrial base, oriented to the domestic market, with exports a negligible part of production. Data lacks for all sectors, but in industry, Public enterprises and foundations account for more than 60 percent of value added.

12.9 A modern entrepreneurial class did emerge in the late 1960s and 1970s, and it flourished with reforms to liberalize the economy and encourage foreign investment. But after the Revolution, and through the long war with Iraq, the private sector shrank, with the size and dominance of the public sector increasing substantially. A wave of nationalizations targeting royal holdings and private interests identified with the previous regime. Also driving the public sector's expansion was the need to fulfill the Revolution's claims of social justice and equity. Labor market considerations and import-substitution imperatives also figured heavily.

12.10 Iran's private sector today comprises manufacturing enterprises and bazaar merchants. The analysis here is confined to the industrial sector because of data availability.¹ The industrial sector has more than 12,500 private firms (92 percent of

¹ Even in this case, there are serious data deficiencies that limit the analysis of the private sector and response to government policy. First, the data refers to the annual survey of 13,000 industrial firms with more than 10 workers, as reported in Salehi (2001). Second, the time coverage for the data is 1994 to 1997. Third, data on such important indicators as investment and cost structure of enterprises, which are critical in the analysis of the behavior and response to policy reforms, are not available. Similarly, information on entry and exit rates of private firms cannot be detected from the survey data as reported in Salehi, 2001,

total) employing 10 or more workers, some 1,100 public enterprises account for more than half of industrial sector's production (table 12.1). The number of private firms increased by 11 percent between 1994 and 1997, and the number of public firms by 14 percent. The number of state-owned firms (public enterprises that are defined in the Law) has increased despite government announced policy for privatization and private sector development since the first FYDP.

12.11 The industrial concentration in Iran is very high relative to other countries (table 12.2). This reflects a combination of factors such as technological requirements, the country's general inward orientation, and the need for self-sufficiency (due mainly to embargos) that have led to vertical integration. It also reflects a lack of antitrust laws and mechanisms to discourage concentration and encourage entry of the private enterprises—and a deliberate policy in the past to promote strategic industries and protect them from foreign and domestic competition (box 12.1). The pattern of concentration poses important concerns for the competitiveness of the industrial sector and limited the benefits that could be derived from price liberalization and other envisaged reforms. Concentrated ownerships and interlocking directorates reinforce the negative effects of industrial concentration.

Table 12.1. Industrial sector production

Year	Total number of	Number of firms			Total Sales (Rls. Bil)		
		Private	Public	State	Private	Public	State
1994	13,091	11,496	1,595	535	15,622	18,025	11,350
1995	12,977	11,876	1,101	597	21,983	25,482	15,808
1996	13,358	12,219	1,139	611	29,330	36,488	22,848
1997	13,904	12,797	1,107	607	35,438	43,052	33,641

Source Salehi 2001

Note State firms are a subset of public firms

Table 12.2. Industrial concentration

	1994	1995	1996	1997
Herfindhal index of workers	979	1027	1017	986
Herfindhal index of sales	1062	1085	1063	948
Herfindhal index of value added	966	1020	1071	911

Source Salehi 2001

despite the fact that this information should be easily obtained from the database. Salehi, Hossein, 2001, "Market Structure and Performance of the Industrial Sector in Iran," Institute for Research in Planning and Development, Working Paper EC-8011475. The annual survey is conducted by the Statistical Center of Iran.

Box 12.1. Concentrated structure and monopolistic behavior

Many legal monopolies such as those in tobacco, grain, oil, among many others derive their status from legislation passed many decades ago—the original justification for their establishment having long since vanished. Furthermore, other processes reinforce monopolistic structures and suppress competition.

Hydrocarbon revenues Over the past 40 years the Iranian state has earned close to \$1 trillion in today's prices, with some of that establishing large industrial firms with monopoly powers. Often quite inefficient, these firms receive protection from foreign and local competition. More than act as a barrier to private initiative, they actively suppress such activities.

Protection Remnants of the import-substitution model of industrialization, the level of protection and the access to preferential foreign exchange rates and cheap credit from government banks reinforce the hold of firms over markets—many of them are now owned by or closely linked to the government.

Monopolies as policy instruments The government has also established monopolies and monopsonies to channel funds to activities and services focused on achieving its economic and social objectives.

Revenue The tobacco industry is a good example: revenues go directly toward financing the government's budget.

Entrenched managerial class Politics is important in securing management positions in firms owned or controlled by government. The incentives are NOT to foster competition—but instead to foster cooperation and coordination in everything from procurement contracts to employment policies.

Overall economic policies Past government stabilization policies, especially through price controls and its predictable effects on competition, mean that firms find themselves unable to compete on the basis of price, innovation, quality, and service.

Source: Salehi 2001

12.12 Monopolies exist in all sectors of the Iranian economy: public, state, and private. But the monopolies in the private sector are considerably smaller than in the public ones.

12.13 Concentration does not always generate anti-competitive behavior and excessive profits, but it does increase the risk of collusive practices and market dominance. Given the embargoes and the need for self-sufficiency, this might not have been an issue until recently. But it now poses important concerns for the transition to a more liberal and private-sector friendly environment. And it will limit benefits from macroeconomic reforms, such as foreign exchange unification and price liberalization.

12.14 In the concentrated sectors with actual or potential import competition, or the threat of domestic entry, there may be little market power, especially if combined with domestic policies to facilitate entry and exit and to limit uncompetitive practices. The unification of foreign exchange and making further progress on import liberalization, would increase competition and improve efficiency and job creation in the industrial sector. So would the opening of the capital of public enterprises and the foundations to private investors (domestic and foreign).

12.15 Private firms are far more labor-intensive than public enterprises, employing 60 percent of industrial sector workers. Looking at value added per worker, the labor intensity of private firms is more than three times that of public enterprises and four times

that of state firms (table 12.3). More important, capital intensity of all firms increased over 1994-97, blunting employment generation. This is despite the fact that an average public enterprise employs 327 workers, while an average private firm employs only 40 workers. Furthermore, employment in private sector firms has increased by nearly 20 percent between 1994 and 1997, while during the same period employment of the public enterprise sector declined by 12 percent (table 12.4).

12.16 It is becoming clear that the public sector has reached its limits contributing to economic growth and employment generation. The hydrocarbon sector and its downstream industries contribute little to direct employment generation. The publicly owned enterprises established over the past decades cannot generate sustainable employment, given their inefficiencies and reliance on an increasingly untenable non-competitive, and tightly regulated internal market.

Table 12.3. Value added per worker in private firms

Year	Total	Value Added per Worker		
		Private	Public	State
1994	1.81	1.42	2.22	2.69
1995	2.41	1.86	3.15	3.36
1996	3.35	2.36	4.70	5.83
1997	4.22	2.93	6.05	7.57

Source: Calculated based on data reported in Salehi, 2001

Note: State enterprises are a subset of public enterprises

Table 12.4. Employment in public sector firms

Year	Indicator	Ownership		
		Private	Public	State
1994/97	Growth of jobs	19.1	-12.0	2.5
1994	Jobs per enterprise	38	258	417
		39	311	329
1996		39	313	315
1997		40	327	377

Source: Calculated based on data reported in Salehi, 2001

Note: State enterprises are a subset of public enterprises

Constraints to private investment

12.17 Significant challenges remain for private sector development. When it comes to encouraging private investment, one needs to underline that Iran remains a challenging environment for investors. Research indicates that shortage of capital and deficiencies of the labor law, discussed above, are amongst the five most serious obstacles to production

in Iran. Businesses have, however, ranked policy instability and a general antipathy towards production even higher. The implementation of laws and regulations has often been equally unpredictable in Iran. The highly regulated economy and centralized governance encourage clientelism, corruption and generally furtive business practices. Investors have often experienced the lack of transparency as unpredictable contract negotiations, long customs procedures and inefficient administrative (including tax) procedures. Clearly, if the employment crisis is to be alleviated, a holistic understanding of the Iranian investment environment must be complemented with measures targeting specifically the population segments most burdened by unemployment: the educated and skilled youth, women and population in disadvantaged rural areas. The key constraints are outlined below:

Policy and regulatory issues

12.18 **Taxation.** The corporate income tax system has been redesigned, and the onerous 64 percent marginal rate on profits was lowered to a flat 25 percent. While this is a step in the right direction, the new corporate income tax system needs to be implemented in an equitable, efficient and transparent way. Also, note that unless the tax privileges enjoyed by various parastatal enterprises (*bonyads*) and other charitable organizations are revoked, the benefits of the new legislation will be undermined with direct impact on future domestic and foreign investments. However, implementation issues aside, the authorities do continue to reform legislation in this area. For example, in early August a bill for Value-Added Taxation (VAT) was submitted to the Council of Ministers for revision. The new Direct Taxation Law, for example, nearly triples the ceiling of tax exempt incomes from Rls520,000 (\$65) to Rls1.45 million (\$181.25). The across the board reduction in real persons' income tax rates should facilitate employment creation. In addition, the new Tax Code has reduced the burden of dividends' tax considerably. However, the exact proposal made in the Third Plan, a law to reduce the employer's share of premiums and to eliminate newly employed staff has still not been implemented. While this flurry of tax reform measures has been positive, it is important to remember that rather than tax regulations, it is the labor law that employers in Iran commonly highlight as the most obstructive employment related state intervention.

12.19 **Labor law.** Iran's Labor Law provides another example of how regulations intended to achieve a desirable goal, may in fact do the opposite. In seeking to preserve jobs, the Labor Law makes it so hard for employers to retrench employees that, except when hiring workers to perform non-continuous tasks for short periods, employers must offer lifetime employment contracts, or nothing. Not surprisingly, they often choose to offer nothing, exacerbating the country's unemployment challenge.

12.20 The prohibition on shedding labor obviously greatly reduces the ability of the Iranian economy to make structural adjustments. If labor cannot be easily reallocated from declining firms and sectors to those that have the opportunity to expand, the benefits from liberalizing trade and investment, privatization and reducing energy subsidies will all be very much less effective than if all factors can be flexibly allocated to where they

are most useful. More specifically, Article 21 of the Labor Law of Iran, which deals with termination of employment contracts, does not allow a firm to terminate an employment contract. These contracts must be either temporary, or non-temporary (Art. 7) and the employer is not obliged to renew temporary contracts, but the ability of workers seeking jobs and employers to get around Article 21 by using temporary contracts is severely limited by Article 7, which states that even when the employee is performing a task of a non-continuous nature, the maximum temporary duration of a contract shall be determined by the Ministry of Labor and Social Affairs and approved by the Council of Ministers.

12.21 The only circumstances in which the employer can terminate an employment contract are when the worker fails to perform assigned duties, or violates the firm's disciplinary code, and then only with the agreement of the workers' representative (Art. 27).² Even if the workers' representative agrees that termination is justified, the firm must pay the worker one month's salary for every year of service (Art. 27) The worker has the right of appeal to a dispute settlement board, and if the board finds in favor of the worker, the employer has to pay damages (Art. 29); if the board finds that termination was justified, the worker is still entitled to one month's salary for every year of service (Art. 165).

12.22 *Judicial system.* Uncertainties in the Iranian Judiciary have been cause for concern among private sector players and potential foreign investors that have little confidence in the system of courts and arbitration. Arbitration processes are inconsistent, lengthy and costly.

12.23 *Monopolistic and unfair trade practices.* As discussed above, Iranian industrial structure is highly concentrated. The current economic structure and the preponderant weight of the state was enshrined in the constitution—among others, Article 44, which excluded the private sector from key industries (box 12.2).

Box 12.2. Article 44 of the Iranian Constitution

The economic system of the Islamic Republic of Iran shall be based on public, cooperative, and private sectors, with proper and regulated planning. The public sector includes all large-scale industries, mother industries, foreign trade, large mines, banking, insurance, power supply, dams and large irrigation channels, radio and television, post, telegraph, and telephone, aviation, shipping, roads, rails and the like, which are public property and at the disposal of the government. The cooperative sector includes cooperative production and distribution companies and institution established in cities and villages on the basis of Islamic principles. The private sector includes such activities related to agriculture, cattle-raising, industry, trade and services that supplement the economic activities of public and cooperative sectors. Ownership in the aforesaid three sectors, insofar as it conforms to other articles of this chapter, does not surpass the limits of Islamic laws, causes economic growth and development of the country, and does not harm the society, shall enjoy protection of law in the Islamic Republic. Details of regulations, scope and conditions of the three sectors shall be determined by law.

² Unions are not permitted. In their absence, the workers' representative in an enterprise may be an Islamic labor council, or a 'guild society'. In workshops with neither of these bodies, dismissal on disciplinary reasons must be approved by a discretionary board (Art.158) comprising representatives of the employer, the workers, and the Ministry of Labor and Social Affairs.

12.24 Public enterprises and foundations enjoy preferential treatment in terms of access to finance, markets and subsidies, and have crowded out private enterprises. Many investors, including potential buyers of public sector enterprises have expressed concern about unfair competition either from enterprises that remain in the public sector, or from enterprises that already have dominant market positions or privileged access to credit and other facilities, such as enterprises owned or controlled by the religious foundations. Salehi (2001) has shown that many sectors of the economy have very high concentration ratios. In some sectors a single firm has as much as 90 percent of the market. The high concentration ratios could be barriers to new private sector entry and investment and there is a danger that privatization could result merely in the transfer of monopolies from state ownership to private ownership. Therefore, the government should consider enacting laws, regulations and institutional arrangements to prevent all abuses of market power, including predatory pricing practices. Public sector companies should of course be brought within the ambit of these laws and regulations.

12.25 *Access to finance.* Public enterprises account for over 80 percent of credit allocated by the banking system, and have preferential access to foreign exchange. They also have preferential access to markets—for example, public enterprises have priority in terms of bidding for public procurement contracts—and enjoy tax exemptions and a variety of subsidies.

12.26 Another issue is red tape and cumbersome bureaucratic procedures for obtaining credit. For instance, an export loan may take more than two months to be converted into rials. Recognizing the need to facilitate access to finance by the private sector, a number of recent measures aim at creating competition in the financial sector. Notwithstanding Article 44, the Guardians Assembly agreed to private sector banks in June 2000. Twenty-three years after Iran's banking was nationalized in the wake of the "Islamic" revolution, the first full-service private bank—Bank Karafarin—received its operating license from the Central Bank in December 2001. Two others—Bank Eqtesade-e Novin and Bank Parsian—have been approved and are expected to qualify for licensing once their minimum capital requirement of IR200bn (\$25mn) is met. Approximately 40 other private entities have reportedly applied for licenses to operate as private banks. But two state-owned banks—Bank Saderat and Bank Refah-e Kargaran—have asked to be privatized and allowed to compete with the new private banks.

12.27 The Tehran Stock Exchange (TSE) also has the potential to play an important role in raising capital. However, it has not been very effective because of inadequacies in the regulations governing its operations and listings. These pertain mainly to pricing policies, disclosure requirements, share allocation rules, and minimum financial standards, deficiencies that need to be urgently addressed.

Recent reforms

12.28 The country's economic and monetary management has improved. The stable rial, a more disciplined management of economic affairs, and a greater emphasis on laws and

regulations are all indicative of this trend. Substantial headway was made in trade reform and foreign exchange unification. The new laws and bills that have been passed or are being debated in parliament show a greater appreciation for areas that are needed to make Iran a more friendly location for investors. These include the law on private banking, the new foreign investment law, bills on privatization of the insurance sector, and a new tax code. A decree concerning "investment security", issued by the Rahbar in March 2002, underlines the resolve of the political establishment to implement economic reform and provide greater investment security.

12.29 In addition, several structural reforms have been initiated. A number of state institutions have reduced the size of government. The creation of new authorities (such as the Tax Authority and the Organization for Privatization) and the dismantling of some monopolies in conjunction with the policies of the third five-year development plan are encouraging processes aimed at improving the country's competitive environment and encouraging greater private sector activity.

12.30 Even so, considerable policy challenges remain on many fronts. Efforts need to be directed at reforming the regulatory framework to create transparent rules of the game. Also needed are reducing monopoly powers, modernizing and privatizing the large and inefficient public enterprise sector, reducing distortions stemming from subsidies as well as directed credit policies and administrative interest rates. Following these reforms, measures may be envisaged to create better linkages between the oil and gas and other sectors.

12.31 The following reforms are necessary for private sector development in Iran:

- Strengthening the legal, regulatory, and institutional framework.
- Reducing the size of the public sector.
- Improving corporate governance.
- Strengthening the legal, regulatory, and institutional framework
- Competition policy and anti-trust

12.32 To encourage a truly market-oriented, competitive environment and greater private investment, the government should consider withdrawing from sectors where public companies have been privatized. An explicit policy announcement by the government that it, or its agencies, would not undertake any fresh investments in certain identified sectors would assuage concerns of private investors about having to face future competition from the public sector. An anti-trust law needs to be one of the first and most critical priorities of the Government in the near future.

Labor law

12.33 To increase the flexibility of the labor market and therefore increase employment opportunities in the private sector, the Labor Law needs to be amended. Employers should be allowed to terminate those currently employed under contracts of unspecified duration, on the condition that they are given one month's pay for every year of service. Since even this is more generous to those already employed than the regulations in most comparable countries, the law may stipulate that for new employees—that is, those hired after the amendment of the Labor Law—the rate of compensation in the event of retrenchment should be one month's pay for every two years of service. But provision should also be made in the Labor Law for employees and employers to be able, if both sides agree, to enter into contracts that explicitly provide for larger redundancy payments in specified conditions. Other needed changes in labor legislation are highlighted below:

12.34 *Inefficient design of non-wage benefits.* It is generally more efficient to let each firm decide what non-wage benefits to provide for its employees than to set uniform requirements for all firms. It is important to realize that it is in a firm's self-interest to provide all the non-wage benefits that its employees value at more than the cost to the firm of providing them. If this condition is fulfilled, the firm can raise its profits, making its jobs more attractive to potential employees, by substituting non-wage benefits for money wages. The current law requires employers to provide housing (Art. 149), transport between homes and work (Art. 152), and sports facilities (Art. 154). These articles reduce the demand for labor by imposing an implicit tax on most employees, to cross-subsidize those that most value the particular benefits that all receive. We recommend that these articles of the Labor Law be replaced by minimum requirements on occupational health and safety. From the employee interest, it is generally better that these benefits in nature are in cash and add to their wages. From a systemic point of view, it is also more efficient to change them in cash³.

12.35 *Overtime.* Articles 58 to 61 greatly limit employers' ability to make flexible use of overtime. The case against imposing such constraints is closely analogous to the case against requiring firms to provide a wide range of in-kind non-wage benefits: it is in each employer's self-interest to design a total remuneration package that makes efficient use of normal time and overtime hours. We therefore recommend the repeal of Articles 58 to 61.

12.36 *Investment climate.* Another important requirement will be to establish an appropriate enabling environment for all private sector firms, including the newly privatised ones. The focus needs to be on creating a well-regulated market economy in which advantage is not conferred by governmental fiat or connections but by the usual workings of the market. The need to build this enabling environment should not detract from the fact that the government should move to privatize the many smaller and more productive enterprises it currently holds. This would send a strong signal to markets and

³ A remarkable example is the number of busses belonging to public administration which are used for employees' transport and which are used only twice a day.

enable government to learn from this experience as it moves to larger enterprises. The key, however, lies in liberalizing the economy, doing away with anti-competitive laws, regulations and practices ensuring that the Iranian economy becomes a full partner in the global economy. To succeed, Iran will need to move on a wide variety of fronts, from taxation and FDI, to labor and capital markets.

12.37 Extending a sound investment climate beyond enclaves will require effective and efficient regulatory systems and governance structures that allow firms and individuals to pursue productive activities without harassment. It will also require an environment in which contracts and property rights are respected, disputes resolved speedily and equitably, and opportunities for rent seeking by government officials and others significantly reduced. Competition and, where needed, effective regulatory institutions and processes are key.

12.38 Investors and potential private buyers of state enterprises must be given a favorable environment to operate in—and must know as much as possible about the rules under which they will have to operate. The government also needs to reinforce its commitment to privatization and to the growth of the private sector by continuing to improve the overall legal and regulatory environment.

12.39 How can the government change its role from producer/manager/regulator to effective regulator? It needs to:

12.40 Develop a strong regulatory capacity focused on protecting the interests of consumers and workers—disallowing monopoly elements, whether outright monopolies or de facto via restrictive entry procedures and restrictive licensing practices

12.41 Raise the quality of the civil service and the services they provide—given that high transaction costs and information costs are linked to the degree of bureaucratic intervention, an indicator based on transaction costs could be used to monitor this.

12.42 Facilitate a shift of attitude among bureaucrats from interventionists to facilitators by promulgating and enforcing clear, transparent, and uniform rules which preclude discretionary and discriminatory practices.

12.43 Move from support systems—such as subsidies, market protections, and job guarantees—to new and sustainable types of support—such as social insurance, health insurance, and programs to promote private initiative and self-employment.

Promote restructuring and the organizational upgrading of firms

12.44 Focus on small and medium-size enterprises, now under the radar, and either totally or partially in the informal sector. To pull these firms into the formal economy and help them grow will need a streamlined regulatory framework, well-targeted capacity-building programs, promoting clustering and forward linkages with larger firms, and

access to needed land and infrastructure services—based on sustainable cost-sharing formulas.

Foreign investment

12.45 With a large and largely untapped market, Iran offers many investment opportunities. But few foreign firms working outside the energy sector have established significant interests in the country. Total foreign investment during 1993–98 amounted to only \$2 billion, half in petrochemicals.

12.46 *Important measures have recently been taken.* In the past two years, segments of the political leadership have realized the important role of FDI in achieving Iran's development objectives. The membership in the Multilateral Investment Guarantee Agency (MIGA), as well as the ratification of two new laws concerning taxation and foreign investment represent important progress in building foreign investor confidence. In early May 2002 Iran's parliament passed two measures in fast succession that are steps of a sort toward opening the country's economy to the rest of the world. On May 8 the parliament ratified the New York Convention, and a week later passed a new foreign investment law. Both measures are aimed at attracting foreign investment into the country and at easing Iran's entry into the World Trade Organization.

12.47 The New York Convention is an international agreement on enforcing arbitration awards. By joining the Convention, Iran has agreed to allow disagreements between foreign investors and their Iranian partners to be taken out of the country for settlement before an impartial international arbitration panel (until May, investment disputes were to be settled in Iranian courts). In addition, Iran has agreed to recognize and enforce foreign arbitration awards. This means that if an Iranian company, or a branch of the Iranian government, loses to a foreign partner in an overseas arbitration proceeding, Iranian courts will have to recognize that fact and award damages to the foreign partner.

12.48 Passing a new investment law was also a necessary step to build investor confidence. Working closely with the World Bank, the government has recently scored successes, foremost in passing Iran's first foreign investment law since the 1950s. After lengthy debates and disputes between the Iranian Parliament and the watchdog Council of Guardians of Constitution over a legislation on foreign investment, the Expediency Council, the highest state arbitration body in Iran, finally approved early in June the Law for Promotion and Protection of Foreign Investments. While the passage of the law was contentious, its ultimate success represents a significant stride forward.

12.49 This law makes important provisions to protect investments and eases restrictions on the repatriation of profits. The law confirms the right of investors to hold more than 49 percent of a local company, and promises that foreign investments would not be exposed

to expropriation or nationalization.⁴ The foreign investor may bring in foreign exchange and conduct business in Iran. Funds brought in and not spent may be sent back out without interference. Profits earned after taxes may be transferred abroad. Furthermore, the law says that foreign investments will be not be given any preferences over Iranian companies and that no foreign company will be given a domestic monopoly. Specifically, it allows:

- Foreign investment in all sectors open to domestic entrepreneurs.
- Repatriation of profits in hard currency, exchanged at the market rate.
- Repatriation of profits made in the domestic economy rather than just from exports, as was the case previously.
- A maximum of 45 days for processing investment applications.
- Fair compensation at market values in the event of nationalization.

12.50 Furthermore, work between the World Bank and the government is underway in this area, with a view to strengthen the Organization for Investment, Economic, and Technical Assistance of Iran (OIETAI) which gathers within it previously dispersed activities related to the promotion of foreign investment. OIETAI will be working towards putting in place the implementation degrees to operationalize the Foreign Investment Law, including the regulatory framework on for the resolution of commercial disputes. The Bank will also be working closely with OIETAI to develop its investor outreach and awareness campaigns.

12.51 Another area of importance is to encourage foreign portfolio investment. Increased foreign portfolio investment via the Tehran Stock Exchange (TSE) would directly contribute to privatization and would indirectly facilitate it by increasing the TSE's liquidity. While foreign portfolio investment is allowed in principle, it has not happened in practice because of exchange control regulations. It is recommended that the government relax exchange control restrictions for portfolio investors. To avoid excessive speculative inflows and outflows of capital, the government could consider implementing a system of tax incentives that discourages short-term outflows and speculation. These measures could in due course enhance access to international capital markets and allow for use of a greater variety of financial instruments to support privatization (such as foreign currency denominated convertible bonds, exchangeable bonds, and GDRs).

12.52 *But more needs to be done.* Overall, while advances are being made in the enabling environment for private sector development, the recognition of the role of FDI

⁴ In a kind of double-speak, though, the law goes on to state that if the government decides, for whatever reason, to take over a company, the government and the company would have to come to terms before the government actually did so

as an important vehicle for Iran's development needs to be absorbed by a larger constituency. Foreign investors are attracted not by comparisons between the past and present in Iran but by how the country's investment climate stacks up against other-country comparators and competitors. While the signals that these recent changes send are welcome and do demonstrate a commitment to pursue reforms, it should be remembered that much still needs to be done. As was shown in the passage of the foreign investment law, such changes will take time but Iran's stable macro situation has indeed given it sufficient time to undertake needed steps in a medium-term framework. What is needed is to maintain the determination to move ahead.

12.53 The recent achievements would need to be complemented by moves on privatization and creating a level-playing field for private sector. Legislation to eliminate public and private sector monopolies (foundations) in sectors where private entry is permitted is crucial, and withdrawal of special preferences for state and foundation enterprises to ensure equal treatment with the private sector and increase competition is necessary. It would also be important to reform labor laws, improve institutional support structures, remove export price fixing and exchange controls, and strengthen accounting and auditing standards by introducing consistent procedures that conform to international standards allowing meaningful performance comparisons for private or public companies.

Box 12.3. Balancing efficiency; effective corporate control, and widespread ownership

There is an inevitable tension between the objectives of spreading the ownership in privatized companies as broadly as possible and enhancing efficiency through concentrated ownership. Too broad an ownership structure would result in shareholdings being spread so thinly that outside shareholders have little opportunity to exercise their rights as owners. Too narrow an ownership structure would reduce public support for privatization. To balance these two objectives, the government should consider adopting a two-part approach. A controlling interest (at least 25–30 percent) could be sold to a core private investor through competitive tendering procedures. The remaining shares could then be offered to individuals through a public issue.

Several variants are possible. One useful approach that has been adopted in many countries is to sell ownership in public sector companies to private mutual funds that are subscribed by private individuals. The mutual funds enable individuals to diversify their participation in the privatization program. Such diversification lowers risks for individuals and thus encourages them to participate in privatization programs. At the same time, part ownership of companies by mutual funds enhances governance over the affairs of the company and maintains performance pressure on managers. Some closed-end mutual funds already exist, but overseas experience suggests that open-end funds are a more efficient vehicle for most investors. It is therefore recommended that the government enact legislation to facilitate the setting up privately managed open-end mutual funds. Another medium-term option is to privatize holding companies wholly or majority owned by the state or state entities. Private contracting, on a competitive basis, of the management of SSO portfolio investments and other pension fund investments could be also considered.

Improving the governance of public enterprises

12.54 Given the preponderance of the public sector in the economy today, it is clear that a medium term strategy that minimizes social dislocation while preparing the ground for sustainable private sector led growth is needed. But given the size of the public sector, rapid moves towards privatizations are not practical, nor would they yield much in the way of expected benefits unless the overall environment for PSD is effectively dealt with.

The focus should be on a medium-term approach, taking initial steps to improve the efficiency of the public sector and move gradually toward sustained and effective privatization, taking care that due diligence is paid to social safety nets and other mechanisms to cushion to short-term negative effects of privatization on employment and welfare.

12.55 In this context, there should be a focus on improving the efficiency of the public sector (see box 12.4) while moving gradually towards an effective liberalization and privatization strategy which also looks at creating the right environment for privatized and newly established firms to engender needed growth. However, the need to move in a measured way does not mean that nothing should be done on the privatization issue. There are numerous smaller and more competitive enterprises on which to move. Successful small scale privatization would generate investor and public confidence and help build a momentum for large-scale privatization and the remainder of the government's plans for broad economic reform.

Box 12.4. Improving the governance of state enterprises

If enterprises remain under state-ownership, the government must resolve the very difficult problem of improving governance. If it takes over state enterprise debts to banks, it risks creating the expectation that it will always bailout state enterprises that cannot repay their debts. This would encourage the banks to lend to state enterprises for risky and unprofitable projects, and encourage the state enterprises to believe that they need never repay their debts.

To improve governance, the government should adopt a five-part strategy, sometimes called 'corporatization', under which it would

Reform labor regulations and make a credible commitment to a timetable for phasing-out energy and other subsidies

Audit state enterprises to assess their expected profitability in the new environment, both with the requirement to repay their outstanding loans and also without it

Close an enterprise that would be unprofitable even if its loans were forgiven. The assets of these non-viable enterprises should be disposed off in a piecemeal fashion. If the government had guaranteed the loans, it should fulfill these guarantees

Take over part of the loans of an enterprise that would be profitable if its loans were forgiven. The value of loans taken over by the government should vary positively with the capitalized value of the loss incurred by the state enterprise as a result of the phasing out of subsidies

Set managers of state enterprises a target rate of return on assets, net of un-forgiven debt, equal to perhaps 12 percent per year. Managerial contracts should include bonuses that vary positively with the amount by which actual enterprise earnings exceed the target, and penalties for falling short of it. In the absence of special exonerating factors, managers that fell far below the target should be dismissed

The corporatization strategy described above is the best way of improving the accountability and transparency of state enterprises. However, because it involves costly auditing and making difficult and inevitably subjective judgments by auditors, bureaucrats, and ministers, it cannot provide such a clear and efficient solution as privatization. In addition, it is likely to fail if political constraints prevent state enterprise managers being paid salaries that are high enough to make the potential losses from dismissal larger than the potential benefits from using their positions to provide hard-to-detect favors to enterprises with which they are covertly associated

The privatization program

12.56 Despite the constraints in the enabling environment noted earlier, there are good reasons for the government to launch a limited privatization program immediately, not to wait for all other long-term reforms to be implemented. Although it is recommended that the government should seek to obtain a clear and long-term mandate for privatization from the parliament, it need not wait for the passage of a Law on Privatization to start

implementing privatization. Article 35 of the 1997–98 Budget Law already gives it a mandate to do so. The broad mandate in the Budget Law can be complemented by an executive decree that would define an initial small scale privatization program in greater detail, set up the necessary institutional arrangements and elaborate all the guidelines required for implementation of privatization in a professional and transparent manner—in this first phase, we recommend that the government adopt the following principles:

12.57 The enterprises to be privatized should be small to medium firms and those in which the state does not have a controlling share.

12.58 The first companies to be offered for sale should be ones that are profitable or potentially profitable. In the past, there has been a tendency to off-load loss making or risky companies. By discouraging private investors, this eventually damaged the credibility of the privatization program.

12.59 Prior to privatization, the financial and operating condition of the companies should be evaluated, the accounts re-written to conform to international standards and the evaluation results publicly announced. This is essential for enabling a proper assessment by prospective buyers and for gaining their confidence.

12.60 Given the small size of the companies, the preferred privatization method is a competitive bidding process so that ownership and control is transferred to a core investor. Managers and employees of these companies could be given the right to match the best offer.

12.61 During the next two years, while small-scale privatization is taking place and lessons are gleaned from its workings, the government should put in place the prerequisites for successful large-scale privatization.

12.62 *The need for a law on privatization.* An annual process of authorization via the Budget Law can support small scale privatization, but is unsatisfactory for large-scale privatization. It will inevitably take several years to implement a comprehensive privatization program, and a more permanent legislative mandate—which only a Law could provide—would help to build confidence among prospective investors. The government should immediately prepare a draft Privatization Law and begin building a consensus within the general public and among the members of the legislature on the benefits of privatization.

12.63 *The need for a comprehensive catalog of public sector enterprises.* There is an urgent need for a comprehensive catalog, by type of ownership structure, of all the enterprises owned, or partly owned, by the government or by bodies wholly or partly controlled by it. Indeed, while discussions around a privatization law should begin as soon as possible. This catalog should differentiate between enterprises in the following categories:

- The state has managerial control and owns a majority of the equity.

- The state has managerial control, but owns only a minority of the equity.
- The state does not have managerial control.

12.64 The catalog should also differentiate between the following possible interpretations of 'the state':

- State holding companies.
- State banks.
- The SSIC.
- Religious foundations (bonyads).
- Combinations of the above types.

12.65 A comprehensive catalog of state enterprises is needed in designing the privatization program. It is also needed to remove ambiguities in the national accounts and other official statistics, which do not all use the same definitions of 'public' and 'private' companies.⁵ We recommend the following definition of a private company:

- It receives no monetary transfers from the budget.
- One or more private owners (legal or natural) control its management and finance.

12.66 Total direct or indirect state shareholding through investment companies, pension funds, holding companies, or other wholly or majority owned government entities are less than 20 percent.

12.67 *The need for a catalog of laws and regulations.* In addition to a catalog of public sector enterprises, there is also a need for a catalog of all laws and regulations that have a bearing on their financing, operations, and regulation. This is needed to identify in advance all potential legal and regulatory obstacles to privatization.⁶ In setting out its reform timetable, it is particularly important that the government clarify how, and how quickly, it plans to reform these laws.

12.68 To realize its full potential gains, privatization must involve converting companies controlled by managers who are ultimately responsible to ministers and

⁵ Ambiguities in current definitions of the public sector are reflected in the national accounts and in monetary statistics. For example, the share of the private sector in GDP in the national accounts does not appear to be consistent with the share of the private sector in total bank credit in the monetary statistics.

⁶ Sharing this information with the World Bank would enable the Bank to assist the government in designing the privatization program.

bureaucrats into ones that meet the narrow definition of a private company given above. Merely selling non-controlling parcels of shares in public companies to private portfolio investors is unlikely to improve efficiency, or to have more than cosmetic effects on the government's budgetary position. Similarly, the transfer of ownership from one arm of government to another may be counted as privatization if the private sector is defined very loosely—as has happened in the past—but will also achieve little, or nothing, of substance.

12.69 *The need to have data on public enterprises.* At present, it is difficult to obtain consistent and reliable information on the financial position, ownership and operational aspects of public sector enterprises. The lack of such information will make it very difficult to deal with issues like state enterprise debts (see box 12.5) an issue which is a sine qua non for successful privatization. No single agency has a full picture of the scope of public sector activities, let alone their performance.

12.70 The lack of comprehensive data on the public sector is due partly to the lack of transparency of individual enterprises, and partly to a failure to put what information is available on a consistent basis and collect it in a single location. Until this situation is corrected, it will be difficult even for the institution responsible for privatization to prioritize candidates for privatization and classify public sector enterprises into the categories that it proposes to use in designing the privatization program. We recommend that the government immediately begin preparing a standardized data-sheet on all public sector companies. It should also obtain full information on the portfolios and operations of the various holding companies established by the government, state banks and other public sector entities. Without this information, the government will not be able to obtain a clear picture of the structure of ownership in public sector enterprises. Providing this information will also improve the transparency and efficiency of public sector enterprises that are not privatized, or not privatized immediately.

Box 12.5. The need to restructure state enterprise debts before privatization

State enterprise debts to the banks need to be restructured before privatization occurs. Many state enterprise have debts to the commercial banks that would be classified as non-performing if best practice accounting procedures were used. Additional debts are likely to become non-performing or increasingly risky when energy and other subsidies are phased out. It is argued in the section on the financial sector that some part of the government's on-budget gains from subsidy removal should be netted out against that part of the state enterprise's indebtedness that they will no longer be able to repay. This can best be achieved in conjunction with the privatization of the banks and state enterprises. To facilitate the sale of the banks, the government should take over most of the debts of the state enterprises to the banks. To facilitate the sale of the state enterprises, the government should excuse most of these debts, which are merely debts from one arm of government to another. If property rights were clearly defined and transaction costs negligible, these proposed operations would have no net impact on the government's finances: the sale price of the state enterprises would rise by a dollar for every dollar of state enterprise debt excused by the government. In fact, property rights are not clearly defined and the status of the state enterprise debts to the banks is murky: these debts are guaranteed by the government, but getting the government to fulfil its guarantees if the state enterprises default is likely to be a time consuming and costly process. Privatizing the banks and state enterprises without clarifying this murky situation would reduce the overall revenue that the government can expect by the cost to potential buyers of resolving these ambiguities.

12.71 *The need for a strategy to deal with redundancies in newly privatized firms.* Clearly, the short-run impact of reforms will be to boost some sectors and contract others, with net effects on labor demand that cannot easily be predicted. If, as appears likely,

large scale over-staffing is prevalent in the public sector, privatization could well result in short-run job losses in many newly privatized enterprises. This is a legitimate cause of concern, especially given Iran's existing high rate of unemployment and the fact that the labor force is growing rapidly. The Ministry of Labor estimates that there are over 4 million public sector employees in Iran, of which about 2.5 million are civil servants and over 1.5 million are employees of state enterprises. Of this latter group, about 400,000 are employed by large state enterprises (defined as those with more than 50 employees) in the manufacturing sector, and the remainder are employed in small state enterprises, and large state enterprises in non-manufacturing sectors. Since hundreds of enterprises are to be privatized, it would be extremely difficult to evaluate the extent of probably redundancies on a case-by-case basis.

12.72 Two important questions need to be resolved as a preliminary to designing a strategy for redundancies in state enterprises: first, what obligations does each state enterprise have to its employees? Second, once the obligations of any particular state enterprise have been determined, should its existing state-controlled management design a retrenchment package and make some employees redundant before the enterprise is privatized, so as to make it more attractive to potential buyers, or should these tasks be left to the new private owners? If the existing obligations are not clarified before privatization, potential buyers will bid low, and the successful bidder will then try to minimize obligations to unwanted employees.

12.73 Iran's Labor Law does not currently allow firms to retrench workers. A firm is not obliged to re-hire a worker at the end of a fixed term contract, but contracts of indefinite duration can only be terminated if the worker retires, resigns, is totally disabled, neglects assigned duties, or violates disciplinary codes (Arts. 21 and 27). In the latter case, dismissal for neglect of duties, or violation of disciplinary codes, the employer must obtain the consent of a worker's representative, and must also give the worker one month's pay for every year of service (Art. 27).

12.74 Based on public sector wages and length of service—and on the assumption that retrenched workers should be given one month's pay for every year of service—it is likely that average retrenchment costs per worker would be slightly less than \$2,000. If 100,000 of Iran's 1.5 million state enterprise employees were retrenched, the cost would be \$200 million, or between 2 and 4 percent of the likely proceeds from privatization.

12.75 The gross revenue from privatization will obviously be less if the new owners are made responsible for designing and paying for retrenchment and early retirement packages than it would be if surplus employees were shed before privatization. Whether the net return to the government—after deducting the cost of retrenchment and early retirement schemes from the gross revenue from privatizations—is increased, or diminished, by shedding surplus employees before privatization depends on whether the government or the new private owners have a comparative advantage in designing and implementing retrenchment and early retirement packages.

12.76 The basic rationale for privatization—that business decisions are best left to the private sector—suggests that the responsibility for designing and implementing retrenchment and early retirement packages should usually be left to new private owners, rather than undertaken by the government before privatization. However, in some circumstances, the government may have a comparative advantage over new private owners. For example, necessary retrenchments may be so strongly resisted by the current employees that only the government would be able to undertake them. In such cases, the government should design and implement a retrenchment and early retirement package before privatization. These packages would also serve the useful purpose of being a model for acceptable practices by new private owners.

12.77 Effective labor retrenchment programs are a combination of measures of which severance payments form the most critical component. In order of priority, the steps that need to be taken are:

12.78 *Estimating overstaffing and possible redundancies.* Different enterprises will be affected differently by privatization, as well as by reforms such as trade liberalization and the removal of other barriers to competition.

12.79 *Designing an adequate severance package.* Traditionally, severance payments are designed around a few variables, of which the most important are tenure and salary.

12.80 *Utilizing the revolving door threat.* This means ensuring that laid-off public sector employees do not return to employment in the public sector after they have received their redundancy package. It can be dealt with through a variety of measures—such as issuing regulations and decrees—directly addressing the issue.

12.81 *Minimizing adverse selection.* This refers to the danger that restructuring could lead to the departure of essential and/or highly productive workers. Enterprise surveys are useful in targeting these workers and ensuring their continued employment. Performance-based compensation schemes can also be used to retain needed workers⁷.

Improving corporate governance

12.82 A strong governance structure is needed to align the interests of managers with those of shareholders and to encourage widespread ownership by assuring small investors that their interests will be protected. The commercial code already regulates the fiduciary responsibilities by the board of directors. Corporate governance could be further improved by:

⁷ Note that these issues are all related—overcompensation can lead to increased adverse selection while adverse selection could leave enterprises with no choice but to re-hire staff declared redundant.

12.83 Statutory adoption of international accounting and auditing standards. The Iranian Audit Organization has drafted accounting guidelines consistent with GAAP but these have not been adopted. It is recommended that, in consultation with the Iran Institute of Certified Accountants, the government should adopt international auditing and accounting standards and make their use mandatory. It is also recommended that the accounts of public sector companies that are to be privatized should be re-written in accordance with these standards. This will enhance the credibility of the privatization process and enable proper valuation of companies. It will also send a strong signal to private domestic and foreign investors about the government's commitment towards a fair and transparent privatization process.

12.84 Establishing, in collaboration with the Iran Institute of Certified Accountants, clear guidelines for valuing companies to be privatized. This is essential because in the past improper valuation methods (including inappropriate revaluation of assets prior to privatization) have undermined credibility.

12.85 Reforming TSE listing regulations to provide adequate safeguards for minority shareholders. This would encourage participation by small investors and make the TSE more effective. Four explicit safeguards should be considered: (a) compulsory disclosure of all connected party transactions; (b) full and detailed financial disclosure and analysis of business prospects in prospectuses; (c) a requirement that all shareholders be offered the same purchase price and the right to sell to the bidder in merger and acquisition transactions; (d) the appointment of independent investment advisors to minority shareholders in cases of mergers and acquisitions.

Annex to Chapter 4

Annex 4.1. Optimal consumption path of oil reserves

Assume that the government has a stock of an exhaustible resource which it will extract at a predetermined rate y , which is a defined function of time given by $y(t)$.

Assume that the government divides its oil revenues between the production of a public consumption good and savings. Assume that the share that is saved can be invested at a constant real interest rate r .

Assume that the government social welfare function is a traditional utilitarian function U^1 given by $\int_0^{\infty} e^{-(r-n)t} u(c(t)) dt$ where n is the population growth rate and $c(t)$ is per capita consumption of the public good.²

Let A be the stock of financial wealth of the government, then the government budget constraint could be written as:

$$\dot{A} = rA + y(t) - e^{nt} c(t)$$

Hence the problem of the government is:

$$\text{Max} \int_0^{\infty} e^{-(\rho-n)t} u(c(t)) dt \text{ subject to}$$

$$\dot{A} = rA + y(t) - e^{nt} c(t) \text{ where}$$

$$w_0 = \int_0^{\infty} e^{-nt} y(t) dt \text{ the present discounted value of stock of oil wealth is bounded}$$

To solve this problem we write the Hamiltonian:

$$J = e^{-(\rho-n)t} u(c(t)) + v(rA + y(t) - c(t))$$

The first-order conditions for a maximum of U are:

$$\frac{\partial J}{\partial c} = 0 \Rightarrow e^{-(\rho-n)t} u'(c) - v e^{nt} = 0 \Rightarrow v = e^{-\rho t} u'(c)$$

¹ Dasgupta and Heal (1979), (Chapter 9) show that this formulation is consistent with other moral frameworks, such as the Rawls theory of "Justice as Fairness".

² The size of the population at time zero is here normalized to 1.

$$\frac{\partial J}{\partial A} = -\dot{v} \Rightarrow \dot{v} = -rv \Rightarrow \dot{v} = -re^{-\rho t} u'(c)$$

The transversality condition in this case is given by:

$$\lim_{t \rightarrow \infty} v(t)A(t) = 0$$

If we differentiate the first equation of the first-order condition and equate the expression we get with the expression given by the second equation of the first-order conditions we get:

$$\dot{v} = -\rho e^{-\rho t} u'(c) + e^{-\rho t} u''(c) \dot{c} = -re^{-\rho t} u'(c)$$

which gives the basic condition for choosing the optimal consumption path:

$$\dot{c} = (\rho - r) \frac{u'(c)}{u''(c)}$$

Given the usual assumption that the utility function is concave, i.e., $u'' < 0$, this equation shows that if the discount rate is greater than the market interest rate, the government will choose to make current generations benefit more from the oil wealth than future generations. But there is no justification for the government to discount future generations' utilities at a greater rate than the market rate, or to discount less, the most reasonable assumption is to choose a discount factor equal to the market rate.³ Under this assumption the optimal consumption path per person is flat.

To find the optimal level of constant consumption per capita, go back to the government budget constraint and regard it as a first-order differential equation in A:

$$\dot{A} - rA = y(t) - e^{nt} c(t)$$

multiplying both sides by e^{-nt} and integrating both sides gives:

$$[e^{-nt} A]_0^{\infty} = \int_0^{\infty} y(t) dt - \int_0^{\infty} e^{-(r-n)t} c(t) dt$$

The transversality condition implies that $\lim_{t \rightarrow \infty} e^{-nt} A(t) = 0$ ⁴ hence

$$c^* \int_0^{\infty} e^{-(r-n)t} dt = A_0 + w_0 \text{ where } A_0 \text{ is the initial level of financial wealth}$$

this implies that $c = (r - n)(A_0 + w_0)$.

³ In fact some authors like Ramsey regarded the practice of discounting the utility of future generations "as ethically indefensible". Dasgupta and Heal argue that "one might find it ethically reasonable to discount future utilities at a positive rate, not because one is myopic, but because there is a positive chance that future generations will not exist." They also show that discounting at a constant rate like the specification chosen here is the right thing to do if the stochastic process generating the possibility of extinction is a Poisson process.

⁴ Solving the second equation of the first order condition for the value of the Lagrange multiplier we find $v(t) = v_0 e^{-nt}$ hence the transversality condition implies $\lim_{t \rightarrow \infty} e^{-nt} A(t) = 0$ which is the condition we

wanted.

Annex Table 4.1a. Islamic Republic of Iran: Adjusted And Optimal Central Government Budget
(in billion of Iranian Rials)

	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/2000	2000/01
The Adjusted Budget										
Total revenues	35,295	40,758	45,321	65,248	105,422	142,952	142,096	151,238	249,435	302,501
Oil & gas revenues	30,994	34,735	37,988	55,674	89,844	119,203	110,223	111,301	190,032	240,828
Tax and nontax revenues	4,301	6,023	7,333	9,574	15,578	23,749	31,873	39,937	59,403	61,673
Total current expenditure	33,925	38,681	38,725	55,845	92,442	123,401	124,684	151,158	225,339	222,401
Explicit current expenditures	6,481	9,092	15,420	21,651	32,029	42,351	50,908	62,477	79,794	109,778
Energy subsidy	8,255	9,449	12,106	19,234	29,170	33,533	36,248	50,997	69,097	65,929
Other subsidy	19,189	20,140	11,198	14,961	31,243	47,517	37,528	37,685	76,447	46,694
Current budget balance	1,370	2,077	6,596	9,403	12,980	19,551	17,412	80	24,096	80,100
An Optimal Budget										
Total revenues	35,295	41,224	46,529	67,742	110,200	149,513	151,368	165,771	269,424	323,276
Oil & gas revenues	30,994	34,735	37,988	55,674	89,844	119,203	110,223	111,301	190,032	240,828
Tax and nontax revenues	4,301	6,023	7,333	9,574	15,578	23,749	31,873	39,937	59,403	61,673
Interest receipts		466	1208	2494	4779	6562	9272	14534	19988	20776
Total current expenditure	24,253	27,811	34,523	51,155	80,722	98,032	114,589	155,785	219,941	215,776
Financed by tax and nontax	4,301	6,023	7,333	9,574	15,578	23,749	31,873	39,937	59,403	61,673
Financed by energy wealth	19,951	21,788	27,190	41,581	65,145	74,283	82,717	115,848	160,538	154,103
Per capita consp In 1990 dollars	247	247	247	247	247	247	247	247	247	247
Population in million	55.8	56.7	57.5	58.4	59.3	60.2	61.1	62.0	62.9	63.8
Total consp in 1990 dollars	13,773	13,980	14,189	14,402	14,618	14,838	15,060	15,286	15,515	15,748
Total consp in current dollars	14,049	14,544	15,058	15,589	16,140	16,709	17,299	17,910	18,542	18,820
Current budget balance	11,042	13,413	12,006	16,587	29,478	51,482	36,779	9,987	49,482	107,500
Financial assets (incl. Valuation adjs.) 2/	11,042	25,061	42,215	78,944	148,941	215,525	268,591	373,333	549,195	626,890
Stock of financial assets in billion US\$ 1/	7.8	16.7	23.4	29.6	36.9	48.5	56.2	57.7	63.4	76.6
GDP	77,551	96,052	116,915	162,576	232,946	320,235	354,850	405,766	566,480	662,452
Shadow Exchange rate (in Rials/\$)	1,420	1,498	1,806	2,667	4,036	4,446	4,782	6,468	8,658	8,188

1/ Assumes all savings are invested in dollar assets earning a real dollar return of 4 percent

2/ Valuation adjustment reflects the nominal depreciation of the Rial

Annex Table 4.1b. Islamic Republic of Iran: Adjusted And Optimal Central Government Budget
(in billion of Iranian Rials)

	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/2000	2000/01	Average 1991-2000
	The Adjusted Budget										
Total revenues	45.5	42.4	38.8	40.1	45.3	44.6	40.0	37.3	44.0	45.7	42.4
Oil & gas revenues	40.0	36.2	32.5	34.2	38.6	37.2	31.1	27.4	33.5	36.4	34.7
Tax and nontax revenues	5.5	6.3	6.3	5.9	6.7	7.4	9.0	9.8	10.5	9.3	7.7
Total current expenditures	43.7	40.3	33.1	34.4	39.7	38.5	35.1	37.3	39.8	33.6	37.5
Explicit expenditures	8.4	9.5	13.2	13.3	13.7	13.2	14.3	15.4	14.1	16.6	13.2
Energy subsidy	10.6	9.8	10.4	11.8	12.5	10.5	10.2	12.6	12.2	10.0	11.1
Other subsidy	24.7	21.0	9.6	9.2	13.4	14.8	10.6	9.3	13.5	7.0	13.3
Current budget balance	1.8	2.2	5.6	5.8	5.6	6.1	4.9	0.0	4.3	12.1	4.8
	An Optimal Budget										
Total revenues	45.5	42.9	39.8	41.7	47.3	46.7	42.7	40.9	47.6	48.8	44.4
Oil & gas revenues	40.0	36.2	32.5	34.2	38.6	37.2	31.1	27.4	33.5	36.4	34.7
Tax and nontax revenues	5.5	6.3	6.3	5.9	6.7	7.4	9.0	9.8	10.5	9.3	7.7
Interest receipts	0.0	0.5	1.0	1.5	2.1	2.0	2.6	3.6	3.5	3.1	2.0
Total current expenditure	31.3	29.0	29.5	31.5	34.7	30.6	32.3	38.4	38.8	32.6	32.9
Financed by tax and nontax	5.5	6.3	6.3	5.9	6.7	7.4	9.0	9.8	10.5	9.3	7.7
Financed by energy wealth	25.7	22.7	23.3	25.6	28.0	23.2	23.3	28.6	28.3	23.3	25.2
<i>Total consp in current dollars</i>	13,773	13,980	14,189	14,402	14,618	14,838	15,060	15,286	15,515	15,748	14,741
Current budget balance	14.2	14.0	10.3	10.2	12.7	16.1	10.4	2.5	8.7	16.2	11.5
Stock of financial assets 1/ 2/	14.2	26.1	36.1	48.6	63.9	67.3	75.7	92.0	96.9	94.6	94.6
<i>In billion U S dollars</i>	7.8	16.7	23.4	29.6	36.9	48.5	56.2	57.7	63.4	76.6	76.6

1/ Assumes all savings are invested in dollar assets earning a real dollar return of 4 percent

2/ Valuation adjustment reflects the nominal depreciation of the Rial

Annex to Chapter 5

Appendix 5.1

The Calculation of the Effect of Energy Sector Price Increases on the Aggregate Cost of Living.

Theoretical Model

Sector prices can be linked to aggregate prices through the medium of an input output table. Using standard notation the relation between outputs and final demand is written:

$$y = Ay + f \quad (1)$$

where:

y = vector of total outputs of the m sectors of the economy;

f = vector of final demands for each of the m sectors;

A = m by m matrix relating the amount of sector i used to produce 1 unit of the output of sector j .

The relationship between prices and costs is written:

$$p = A'p + v \quad (2)$$

where:

p = vector of prices per unit output of the m sectors;

v = vector of value added per unit output of the m sectors.

Equation (2) expresses the hypothesis that prices are based on a cost plus basis: the price of a good is equal to the sum of the costs of all inputs (price times quantity as shown by the input output table) from other sectors plus value added per unit output. The price is invariant with respect to the level of output, which implies that the wage per unit output, profit per unit output, and net indirect tax per unit output are all constant. This allows final prices to be expressed as a function of the input output coefficients and the value added per unit output coefficients:

$$p = [I - A']^{-1} v \quad (3)$$

The potential removal of energy subsidies on the subset of energy sectors can be treated as the imposition of an indirect tax (or negative subsidy) per unit on these sectors. Through the input output structure this will be immediately passed on into the output prices of these goods; next into the prices of goods which uses energy as a direct input; and from there into goods which use goods which use energy etc.

Equation (3) is the starting point for an investigation into the impact of changes in the unit value added coefficients on final prices. Denoting initial value added coefficients $v(0)$ and final coefficients $v(1)$, and initial output prices $p(0)$ and final output prices $p(1)$, the relationship between the initial shock, via changes in subsidies, and changes in output prices is given by:

$$\Delta p = [I - A']^{-1} \Delta v \quad (4)$$

where:

Δp = vector of changes in output prices;
 Δv = vector of changes in value added factors.

The equation above considers all prices as endogenous, so that shocks come through changes in the added value vector.

In a standard input output table the initial set of the prices of each output can be taken to be unity (the inputs to a unit output are expenditures on that input) so that equation (4) also expresses the final price changes as percentage changes relative to the base year. Combining these sector price changes with sector expenditure shares in the aggregate of consumers' budgets gives the increment in aggregate prices (P) which, because the base year aggregate price is normalized to unity (all sector prices being unity) is in fact the increment in the rate of increase in the consumer price index measured relative to the base year:

$$\Delta P = \sum \Delta p_i c_i \quad (5)$$

where:

c_i = share in total expenditure of good i .

In the context of the Iranian economy the analysis has to take a different route because it is proposed that energy prices are raised to equal border prices, and are fixed at that level. This implies that these prices will not further respond to indirect impacts caused by their own changes, unlike the standard case. In the model above, for example, when the price of gasoline is raised to its border price this raises the cost of transport and other goods which are inputs to gasoline production. In the standard formulation this would increase the gasoline price further, because the wages and profits per unit (the value added) are assumed fixed. In the current case it is assumed, for the energy sectors only, that the final price is fixed, so that the surplus per unit decreases as costs increase. This formulation is consistent with the situation where the energy sectors are state enterprises

for which the reduced surpluses or increased deficits could be centrally financed. To accommodate this formulation, in which final energy prices are exogenous, and the values added per unit for the non-energy sectors are exogenous, an expanded formulation of the price equation is needed:

$$\begin{bmatrix} p_e \\ p_n \end{bmatrix} = \begin{bmatrix} A_{ee}' & A_{en}' \\ A_{ne}' & A_{nn}' \end{bmatrix} * \begin{bmatrix} p_e \\ p_n \end{bmatrix} + \begin{bmatrix} v_e \\ v_n \end{bmatrix} \quad (6)$$

where:

- p_e = prices of energy sectors (exogenous);
- p_n = prices of non-energy sectors (endogenous),
- v_e = values added per unit of energy sectors (endogenous);
- v_n = values added per unit of non-energy sector (exogenous);
- A_{ee} = inputs of energy sector to energy output;
- A_{en} = inputs of non-energy sector to energy output;
- A_{ne} = inputs of energy sector to non-energy outputs;
- A_{nn} = inputs of non-energy sector to non-energy outputs.

Solving for the prices of non-energy outputs gives

$$p_n = [I - A_{nn}']^{-1} A_{ne}' p_e + [I - A_{nn}']^{-1} v_n \quad (7)$$

This equation shows that prices of non-energy sectors depend on the energy sector prices and on the values added in the non-energy sector modified by how these are passed through the relevant portions of the input-output matrix. Hence, as energy prices are altered, the equation for the changes in the levels of non-energy sector prices is:

$$\Delta p_n = [I - A_{nn}']^{-1} A_{ne}' \Delta p_e \quad (8)$$

Since the initial prices in an input output table are all unity, equation (8) also expresses price changes in percentage terms (relative to the base levels of the input output year). The change in non-energy sector prices depends on: the change in energy prices; the magnitude to which energy inputs are used by non-energy outputs; and the extent to which non-energy sector inputs are also used by the non-energy sectors.

From this vector of final prices of the non-energy sector and the final prices for the energy sector, the change in the cost of living (ΔP) relative to the base year from which the changes in energy prices are defined, is:

$$\Delta P = \sum \Delta p_n \cdot c_n + \sum \Delta p_e \cdot c_e \quad (9)$$

The initial cost of living is also unity, since it is a weighted average of sector prices in the base year, all of which are unity. Hence, equation (9) is the percentage change in the aggregate cost of living index.

If required, the endogenous changes in the added values per unit of the energy sectors can be found by solving (6) for v_e .

The total changes in sector prices can be decomposed into “direct” effects and “indirect” effects. The direct effect on (say) steel is the impact of energy price increases on the output price of steel; in addition to this, the impact of energy prices on transport then leads to a further rise in steel prices etc. The sum of all these second round and third round etc. impacts is the indirect effect of the initial price rise. The sum of direct plus indirect effects is the total impact. From (6) the direct effects on non-energy prices (pdn) can be calculated by:

$$\Delta \text{pdn} = A_{ne}' \Delta p_e \quad (10)$$

These sector prices can be combined with their cost of living weights and the change in energy prices with their cost of living weights to estimate the impact of the first round effects on the aggregate price (ΔP_d); the indirect effect on consumer cost of living can then be obtained by subtracting this figure from the total cost of living (9).

$$\Delta P_d = \sum \Delta \text{pdn} \cdot c_n + \sum \Delta p_e \cdot c_e \quad (11)$$

So far the model has assumed that the components of added value are constant, with the exception of the energy sectors where the government can control prices and is willing to accept variable surpluses as costs change. A more general analysis considers a positive link from consumer prices to wages, which hitherto has been assumed to be zero. It is assumed that in each sector, in response to a change in the general cost of living, the wages per unit output of the base period would be increased by a constant fraction (λ) of this increase in the aggregate consumer price index. This pass through creates a more complex equation for solution as derived below.

The added value of each sector can be split into wage (w) and non-wage (s) elements. It is assumed that the non-wage elements per unit of output continue to be fixed, but that the wage element increases in relation to the aggregate cost of living index. Hence, changes in prices brought about by energy price rises lead to an increase in the overall price level, which then will be passed through to some extent into higher wages. This increase in turns leads to a further rise in output prices of each sector as firms respond to cost changes. This wage-price spiral can be solved for the final prices through the medium of the input output table. The wage pass through hypothesis is modeled as:

$$w^* = w (1 + \lambda [P - 1]) \quad (12)$$

When λ is equal to zero (no pass through) the adjusted wages (w^*) would be the same as the original wages, but as λ tends to unity (complete pass through) the adjusted wages would increase at the same rate as prices. Since the aggregate price index is a function of all the sector prices, which are in turn affected by energy prices, this implies

that wages are endogenous. Substituting for non-energy wages into equation (7) yields a solution for non-energy prices in terms of exogenous factors:

$$p_n = [I - Ann' - \lambda wncn']^{-1} [Ane' p_e + w_n + s_n + \lambda w_n (ce' p_e - 1)] \quad (13)$$

This equation collapses back to (7) as the pass through coefficient tends to zero since the sum of the base wage (w_n) and surplus (s_n) is equal to added value in the non-energy sectors. The level of wages in the energy sector does not affect non-energy prices since they are absorbed into the exogenous energy prices by the endogeneity of the non-wage component. Weighting these prices and the final energy prices gives the cost of living with wage pass through.

Equation (8), which relates changes in the level of non-energy prices to the changes in the level of energy prices, can also be expressed in percentage changes of both for any base year if the starting price levels for that base year, from which the percentage changes for energy and non-energy prices are to be measured, are known:

$$\begin{aligned} \text{Since } \Delta p_n &= D_{pn} [I - Ann']^{-1} Ane' [D_{pe}]^{-1} D_{pe} \Delta p_e & (14a) \\ R_{pn} &= D_{pn} [I - Ann']^{-1} Ane' [D_{pe}]^{-1} R_{pe} \end{aligned}$$

(14b)

where:

- R_{pn} is the vector of percentage changes in non-energy prices;
- R_{pe} is the vector of percentage changes in energy prices;
- D_{pn} is a diagonal matrix of the inverse of starting level non-energy prices;
- D_{pe} is a diagonal matrix of the inverse of starting level energy prices.

IF ALL PRICES HAVE CHANGED EQUIPROPORTIONATELY BETWEEN THE YEAR OF THE I/O TABLE AND THE STARTING YEAR FOR THE CALCULATION, THEN ALL ELEMENTS OF THE D MATRICES ARE EQUAL AND (14B) REDUCES TO (8) EXPRESSED AS PERCENTAGE INCREASES RELATIVE TO THE STARTING YEAR.

Application of Model

In the present case the calculation is made more complex by the fact that energy prices are due to be raised by a large amount on the first day of 2003/2004 (March 21, 2003) while the most recent input output table available is based on the year 1994/1995. This presents two difficulties:

- (i) the input output and factor use coefficients are likely to have changed in the period between the compilation of the table and the date at which the calculation of the incremental inflation effect must be estimated;
- (ii) the incremental costs due to the energy price rises must be compared to the general levels of prices that will rule at the beginning of 2003/2004.

Our calculation involves thus approximations of unknown amounts.

The method we use takes the set of prices at the start of the year 2003/2004 to be unity and then considers the impact of the projected percentage prices increases for energy products through the use of equation (8). The calculated increments in sector prices will be equal to their percentage increases because of the initial normalization to unity. This method does not need to know the change in factor prices or factor use coefficients since the date of the input output table because, whatever level they are, their contribution is assumed unchanged during the period of the energy price increment. Also, this method does not require knowledge of sector prices, other than energy prices, at the beginning of 2003/2004. Energy prices, which are needed to calculate the percentage increases contemplated, are known with certainty since they were fixed by decree at the beginning of 1999/2000. The inaccuracies of this method result from the fact that relative prices may have changed dramatically since the year of the input output table, so that setting all prices normalized to unity will impose an approximation to the relative importance of given percentage increases as they are passed through the input output structure.

Appendix 5.2.

Constructing of Quintile Expenditure Levels from Household Survey and Input Output Table⁵

From the Household Expenditure Survey were derived expenditures by urban and rural deciles for the same 43 commodities used in the Input Output table (IO). We have been assisted by the Ministry of Energy and the Institute for Research in Planning and Development to map the detailed classification used in the Household Expenditure Survey (HES) into the 43 commodity classification used in the IO table.

To disaggregate by income class and commodity the actual aggregate final private rural and urban consumption, we adopted the following steps:

- We derived from the HES (urban and rural separately) the table of the shares of expenditure of each decile in total commodity expenditure.
- We derived from the HES the shares of each commodity in total expenditure for every decile.
- To derive the IO equivalent tables of the expenditure of each decile in total commodity expenditure, we used the HES-based table and multiplied it by the vector of urban (rural) final private consumption from the IO table.
- The IO-based table of coefficients of the shares of expenditure per commodity for each household decile were then derived.
- The same table was derived for quintiles following the same steps by simple addition of deciles two by two.
- The quintile actual expenditure levels were calculated by using the aggregate figures of the urban (rural) final consumption, by first obtaining the total consumption by commodity by multiplying the actual urban (rural) aggregate private consumption by the vector of shares of each commodity, and then multiplying by the table of coefficient of the shares of expenditure per commodity in each household decile expenditure to get the actual expenditure by decile and by commodity.

Impact of Energy Price Increase on Household Expenditure by Commodity and Quintile:

- The impact on expenditure of the energy price increase by commodity and class was obtained by multiplying back the vector of the price impacts by the matrix of coefficients calculated above (step 4).

⁵ The corresponding data and model have been delivered to the authorities and are available upon request.

- To obtain the absolute effects and the welfare losses, we multiplied the matrix of price impact by the vector of actual expenditure by commodity (obtained by multiplying the aggregate figures of urban/rural final consumption by the vector of shares by commodity in total expenditure).

Appendix 5.3.

Shares in Total Expenditure by Quintile Groups (i) Urban Households (quintile 1 is lowest income).

	Q1	Q2	Q3	Q4	Q5
Farming	7%	6%	6%	5%	3%
Livestock	3%	2%	2%	2%	1%
Other agriculture activities	1%	0%	0%	0%	0%
Mining	0%	0%	0%	0%	0%
Crude petroleum & natural gas	0%	0%	0%	0%	0%
Sugar	2%	1%	1%	1%	0%
Other food industries	22%	19%	18%	16%	8%
Paper, printing & publishing	1%	1%	1%	1%	1%
Cement	0%	0%	0%	0%	0%
Brick	0%	0%	0%	0%	0%
Gypsum and other minerals	0%	0%	0%	0%	0%
Glass and glassware	0%	0%	0%	0%	0%
Other non-metal products	0%	0%	0%	0%	0%
Textile	0%	1%	1%	1%	1%
Clothing	3%	5%	6%	6%	5%
Weaving and leather products	2%	2%	2%	3%	2%
Rubber & plastic products	0%	0%	0%	0%	0%
Pharmaceutical products	1%	1%	1%	0%	0%
Kerosene	0.72%	0.60%	0.47%	0.36%	0.11%
Fuel oil	0.00%	0.00%	0.00%	0.00%	0.00%
Gasoline	0.16%	0.20%	0.30%	0.30%	0.25%
Gas oil	0.02%	0.01%	0.03%	0.07%	0.05%
Liquid gas	0.25%	0.16%	0.13%	0.09%	0.03%
Other materials and chemical products	2%	2%	2%	1%	1%
Basic metal & steel products	0%	0%	0%	0%	0%
Copper, aluminum and other basic products	0%	0%	0%	0%	0%
Metal products in construction etc.	0%	0%	0%	0%	0%
Industrial machinery	0%	0%	0%	0%	0%
Radio, TV and other communicative equipment	0%	0%	1%	0%	0%
Motor vehicle equipment	0%	0%	0%	0%	4%
Other industrial products	0%	0%	0%	0%	0%
Electricity	1.22%	1.15%	1.17%	1.19%	0.75%
Water	1%	1%	1%	1%	0%
Natural gas	0.16%	0.17%	0.18%	0.15%	0.08%
Construction	0%	0%	0%	0%	0%
Trade	1%	3%	4%	9%	34%
Restaurant	2%	2%	2%	2%	2%
Hotel and motels	0%	0%	0%	0%	1%
Load transport	7%	10%	7%	7%	5%
Passenger transport	3%	3%	3%	2%	2%
Post and telecommunications	1%	1%	1%	2%	1%
Other transport and storage	0%	0%	0%	0%	0%
Other services	39%	36%	36%	35%	27%

(ii) Rural households

	Q1	Q2	Q3	Q4	Q5
Farming	8%	8%	7%	7%	3%
Livestock	8%	7%	7%	7%	3%
Other agriculture activities	1%	1%	0%	0%	0%
Mining	0%	0%	0%	0%	0%
Crude petroleum & natural gas	0%	0%	0%	0%	0%
Sugar	3%	3%	2%	2%	1%
Other food industries	28%	27%	25%	26%	12%
Paper, printing & publishing	2%	2%	1%	1%	0%
Cement	0%	0%	0%	0%	0%
Brick	0%	0%	0%	0%	0%
Gypsum and other minerals	0%	0%	0%	0%	0%
Glass and glassware	0%	0%	0%	0%	0%
Other non-metal products	0%	0%	0%	0%	0%
Textile	0%	1%	1%	1%	1%
Clothing	3%	5%	7%	9%	6%
Weaving and leather products	2%	3%	3%	4%	3%
Rubber & plastic products	1%	1%	1%	1%	0%
Pharmaceutical products	1%	1%	1%	1%	1%
Kerosene	1.57%	1.30%	1.02%	0.90%	0.44%
Fuel oil	0.00%	0.00%	0.00%	0.00%	0.00%
Gasoline	0.21%	0.21%	0.27%	0.29%	0.17%
Gas oil	0.06%	0.04%	0.06%	0.07%	0.06%
Liquid gas	0%	0%	0%	0%	0%
Other materials and chemical products	3%	3%	2%	2%	1%
Basic metal & steel products	0%	0%	0%	0%	0%
Copper, aluminum and basic products	0%	0%	0%	0%	0%
Metal products in construction etc.	0%	0%	0%	0%	0%
Industrial machinery	0%	0%	0%	0%	0%
Radio, TV and other communications	0%	0%	0%	1%	0%
Motor vehicle equipment	0%	0%	0%	0%	4%
Other industrial products	0%	0%	0%	0%	0%
Electricity	1%	1%	1%	1%	0%
Water	0%	0%	0%	0%	0%
Natural gas	0%	0%	0%	0%	0%
Construction	0%	0%	0%	0%	0%
Trade	0%	0%	5%	0%	45%
Restaurant	2%	2%	2%	3%	2%
Hotel and motels	0%	0%	0%	0%	0%
Load transport	13%	15%	14%	13%	6%
Passenger transport	5%	4%	3%	3%	1%
Post and telecommunications	0%	0%	0%	0%	0%
Other transport and storage	0%	0%	0%	0%	0%
Other services	16%	14%	13%	14%	8%

Appendix 5.4. Inefficiency of Energy Subsidies: A Staggering Deadweight Loss

“What could be more useful to us as a guide to priorities in tax reform than the knowledge that the deadweight losses stemming from the tax loopholes open to explorers for oil and gas are probably greater in total magnitude than the deadweight losses associated with all the other inefficiencies induced by the corporate income tax?... These and similar questions seem to me so interesting, so relevant, so central to our understanding of the economy we live in, that I find it hard to explain why the measurement of deadweight losses should be the province of only a handful of economists rather than at least the occasional hobby of a much larger group.”
Harberger (1964, p58)

Harberger advocated and was successfully convincing of the need to measure deadweight losses as a crucial input in weighing the trade-offs in alternative tax reform policies. An extensive literature has indeed followed, measuring the deadweight losses associated with different policies in the U.S. leading to robust estimates of the deadweight loss induced in taxation and improvements were made. In the context of developing countries, however, Harberger’s, now 40 years old message, does not seem to have made it.

In energy-producing countries energy subsidies continue to be most pervasive. Several studies have analyzed their potential harm including their budgetary costs, their inequity, their procyclical nature, and their inefficiency.⁶ These studies, however, have all used the simple Harberger approach to estimate the deadweight loss associated with this policy, and this approach usually produces estimates which are rather small, i.e., often less than 1 percent of GDP. Hence the tendency to downplay the inefficiency argument in advocating the need to phase out this policy.

The simple Harberger approach to estimating the deadweight loss associated with energy subsidies equates the deadweight loss with the loss of government revenues which is in excess of the gain in consumers’ surplus. In applying this approach actual estimates treat all domestic sales of energy products as sales for final consumption. However not all domestic sales of energy products are for final consumption, and the use of a larger share of this cheap energy as an input in the production of other goods entails another type of inefficiency. That inefficiency is reflected in an overproduction of non-energy goods; i.e., a level of production at which the marginal product of the energy used is lower than its opportunity cost. This second type of inefficiency is not captured by the simple Harberger approach. Hence an analysis of the total deadweight loss associated with energy subsidies has to be examined in a general equilibrium model where both types of inefficiencies can be captured at the same time.

⁶ The latest the date is the paper by Gupta and all “Issues in domestic petroleum pricing policies in oil producing countries” IMF WP/02/XX

The purpose of this paper is to do that. The choice of Cobb Douglas function for consumer utility and production allows the derivation of a closed form solution, which can readily be used to derive an estimate of the deadweight loss. It shows that together these two efficiency losses may add up to a staggering deadweight loss, which, in the case of Iran, we estimate to be in the order of 5 percent of GDP for illustrative purposes. That estimate might be looked at as an upper bound of the actual deadweight loss to the extent that price elasticities in reality might be lower than 1, which is the underlying assumption using Cobb Douglas utility functions.⁷

Model Setup

The economy is modeled as having two sectors. The government sector produces a fixed quantity of oil Y_1 . It sells domestically a quantity C_1 for final consumption and a quantity I for use as input at a price p . It exports any remaining surplus at a price p^* greater than p . The private sector, on the other hand, uses labor and oil to produce a quantity Y_2 of a homogeneous good whose price is normalized to 1 and which is traded internationally. The external terms of trade between oil and the single homogeneous good is exogenous, as well as the level of oil production.⁸ For simplicity we assume no investment and zero national savings. Government revenues from the sale of oil are transferred to the private sector. Hence in this set up government oil exports are matched by private sector's import of the homogenous good. If we let C_2 be the level of consumption of good 2 and M be imports of good 2, then we would have $M = X$ where $M = C_2 - Y_2$ and $X = p^*(Y_1 - I - C_1)$ ⁹

The usual definition of the deadweight loss in a partial equilibrium set up of the market for a single commodity equates the deadweight loss to the difference between government subsidies and the increase in consumers and producers' surplus. In our general equilibrium model, and given that the government transfers all its revenues from oil to the private sector and does not derive any welfare from any consumption, the deadweight loss is fully captured by the difference in the private sector's welfare, as measured by its utility level, with and without the subsidy policy. Such a measure would express the deadweight loss in utils. An equivalent measure of the deadweight loss expressed in units of output is given by that amount of extra revenues to the private sector that would be needed to make it achieve the same level of utility under the price subsidy policy as the level it could achieve if the policy is phased out.

Hence if R_w is the private sector's income with the subsidy policy and R_{wo} its income without subsidy then the deadweight loss D is defined by the equation:

$U(R_w + D/p) = U(R_{wo}/p^*)$ where $U(R/p)$ is consumers' utility at a level of income equal R and with a domestic oil price equal p .

⁷ On the other hand, as noted by Gupta and All, our estimate of the deadweight loss is understated to the extent that the presence of negative environmental externalities may imply that the optimal price of energy is higher than the international market price.

⁸ A valid assumption for small oil producing countries, whose level of oil exports is unlikely to affect the international oil market and whose level of production is often constrained by limited installed capacity.

⁹ We will show in footnote 5 below that this equilibrium condition is satisfied as long as the private sector's budget constraint is obeyed

Modeling the consumption side

Let's assume that the private sector maximizes a constant elasticity of substitution (CES) utility function:

$$U(C_1, C_2) = (C_1^\sigma + C_2^\sigma)^{1/\sigma}$$

subject $R = p C_1 + C_2$, where R is private sector's income measured in units of good 2.

The demand function for energy products associated with this CES function is given by:

$$C_1 = p^{r-1} R / (1 + p^r) \text{ where } r = \sigma / \sigma - 1 \quad (1)$$

while the indirect utility function is given by:

$$U_0(p, R) = (p^r + 1)^{(-1/r)} R \quad (2)$$

Also if we let a be the share of energy expenditure in total expenditure, then:

$$a = \frac{p^r}{1 + p^r} \text{ or equivalently } p^r = \frac{a}{1 - a} \quad (3)$$

Modeling the production side

Let's assume that the private sector endowment in labor is fixed at L and that real wages clear the labor market. Let's also assume a Cobb-Douglas production function with constant return to scale:

$$Y_2 = I^\alpha L^{(1-\alpha)} \text{ with } 0 < \alpha < 1$$

If we let w be the nominal and also the real wage in units of good 2, profit maximization could be written as:

$$\max I^\alpha L^{(1-\alpha)} - pI - wL$$

First order conditions of profit maximization determine the optimal use of oil and real wages:

$$\begin{aligned} I &= (p/\alpha)^{1/(\alpha-1)} L \\ w &= (1-\alpha)(p/\alpha)^{\alpha/(\alpha-1)} \end{aligned} \quad (4)$$

Both functions are decreasing function of the price of oil. An increase in the price of oil leads to a downward shift in the marginal product of labor and hence should lead to a decline in real wages to clear the labor market. An increase in the price of oil should lead to a cut in its use such as to re-establish the equality between its value marginal product and its price.

This in turn determines the optimal level of good 2's production:

$$Y_2 = (p / \alpha)^{(\alpha / \alpha - 1)} L \quad (5)$$

This shows that the optimal level of production of good 2 is also a decreasing function of the price of oil, consistent with the prediction in other models that an increase in the price of energy acts as an adverse supply shock.

By first order condition of profit maximization wage income is given by :

$$wL = (1 - \alpha)Y_2 \quad (6)$$

while the share of energy input in total production is α , i.e.,

$$pI = \alpha Y_2^{10} \quad (7)$$

Hence an increase in the price of oil will lead in this case to a decline in the wage income of the private sector measured in units of the consumption basket for two reasons: the absolute decline in income measured in units of good 2 plus the fall in the terms of trade between good 2 and the consumption basket.

Measuring the deadweight loss

Based on equation (2) we could derive the following expressions for the utility of the private sector with and without the subsidy policy:

$$U(R_w / p) = (p^r + 1)^{(-1/r)} R_w$$

$$U(R_{wo} / p^*) = (p^{*r} + 1)^{(-1/r)} R_{wo}$$

It follows from these expression that the deadweight loss will be defined by the equation:

$$(p^r + 1)^{(-1/r)} (R_w + D) = (p^{*r} + 1)^{(-1/r)} (R_{wo})$$

which, using the expression for the share of energy consumption in total expenditures of the households given in (3), yields:

$$D = (\alpha p^r + 1 - \alpha)^{(-1/r)} R_{wo} - R_w \quad (6)$$

$$\text{where } \rho = p^* / p$$

The private sector total income is equal to wages plus government transfers.

Under the subsidy policy private sector's income is hence given by:

$$R_w = wL + p^*(Y_1 - I - C_1) + p(I + C_1) = (1 - \alpha)Y_2 + p^*Y_1 + (p - p^*)(I + C_1)$$

Using equations 7 and 1 to replace I and C_1 by their relative expressions we can solve for R_w as:

¹⁰ Now we are in a position to show that if the private sector obeys its budget constraint then the trade balance is in equilibrium. The budget constraint of the private sector can be expressed as

$wL + p^*(Y_1 - C_1 - I) + p(I + C_1) = pC_1 + C_2$. Since $X = p^*(Y_1 - C_1 - I)$ and $M = C_2 - Y_2$, the budget constraint can be expressed as $wL + X + pI = Y_2 + M$. Using the first order condition of profit maximization we get.

$(1 - \alpha)Y_2 + X + \alpha Y_2 = Y_2 + M$, which reduces to the trade balance being in equilibrium.

$$R_w = \left(\frac{1-\alpha\rho}{1+a(\rho-1)}\right)Y_2 + \left(\frac{1}{1+a(\rho-1)}\right)p^*Y_1$$

$$= \left(\frac{1-\alpha\rho+\beta}{1+a(\rho-1)}\right)Y_2 \text{ if we let } \beta \text{ be the ratio of oil to non-oil output} \quad (8)$$

Private sector's income without subsidy is given by:

$$R_{wo} = (1-\alpha)Y_2^{wo} + p^*Y_1 \quad (9)$$

where Y_2^{wo} is the level of the good 2 production when domestic oil price is equal to the international price. Using equation (5) we can establish a relationship between the level of good 2's production in the presence or absence of subsidies. This relationship is given by:

$$Y_2^{wo} = \rho^{(\alpha/\alpha-1)}Y_2 \quad (10)$$

Using the last four equations we derive the following expression for the deadweight loss:

$$D = \left[((1-\alpha)\rho^{\alpha/(\alpha-1)} + \beta) * (a\rho^r + 1 - a)^{(-1/r)} - \frac{1-\alpha\rho+\beta}{1+a(\rho-1)} \right] Y_2$$

Illustrative calculations for the case of Iran:

To have an estimate of the share of energy costs in the total cost of non-oil GDP, we used the most recent available input output matrix for Iran. It reveals that the cost of energy input is 2.6 percent of total value added of the non-oil sectors. Hence we take as an estimate of α , 0.026. Based on data for 2001, the weighted average domestic sales price of energy products is 25 percent of border prices. Hence $\rho = p^*/p = 4$. An estimate of the share of oil GDP in total GDP is subject to a wide margin of variability given volatile international prices, and wide movement in the market real exchange rate. An average figure of 25 percent is adopted in this calculation, corresponding to a value of .33 for β . These parameters lead to an estimated total deadweight loss equivalent to 6.1 percent of non-oil GDP or 4.6 percent of GDP.

IMAGING

Report No.: 25848 IRN
Type: ER