

A World Bank Book

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SKILLS FOR PRODUCTIVITY



**VOCATIONAL EDUCATION AND
TRAINING IN DEVELOPING COUNTRIES**

John Middleton Adrian Ziderman Arvil Van Adams

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*Vocational Education and Training
in Developing Countries*

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Foreword

Developing countries need to improve productivity throughout their economies if they are to compete successfully in an era of rapid economic and technological change. Improved productivity requires not only capital investment, but also a work force that has the flexibility to acquire new skills for the new jobs created as the structures of economies and occupations change. The level of competence of a country's skilled workers and technicians is a key determinant of labor force flexibility and productivity. Skilled workers and technicians enhance the quality and efficiency of product development, production, and maintenance, and they supervise and train workers with lesser skills. They are found in the modern wage sector, in agriculture, and in the small unregulated enterprises of the informal sector, both rural and urban.

Developing the capacity to train skilled workers and technicians has held a central place in World Bank support for national programs of human resource development. The World Bank has assisted countries in establishing vocational schools, postsecondary technical educational institutions, vocational training centers, and training capacity in public agencies and enterprises. Support for programs to retrain workers displaced by economic change has become an increasingly important part of World Bank efforts to help governments improve efficiency in their economies. In financial terms, support for short-term episodic training to accompany capital investments in all sectors of developing economies has equaled assistance to formal training institutions.

The responsiveness of skills training to the requirements of changing economies is crucial to national efforts to improve competitiveness. With severely constrained public budgets, nations must mobilize the training capacity of employers and improve the efficiency and effectiveness of public training. In many countries, this will require a fresh approach to the role of the government in ensuring that the skills needed for development are efficiently provided.

This study identifies the elements of this new approach by drawing lessons from successful developing country experiences with skills train-

ing. This volume is the result of a four-year program of research and consultation on vocational and technical education and training conducted by the Education and Employment Division of the Population and Human Resources Department of the World Bank. It draws on a comprehensive review of the research and evaluation literature and the experience of the World Bank, on specially commissioned studies, and on original research conducted in the division. It has benefited from consultations with policymakers from more than fifty developing countries, donor agency representatives, and experts in the field. It is the basis for the World Bank Policy Paper *Vocational and Technical Education and Training*, published in 1991.

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Resources Department
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Preface

Improving the job skills of the work force has been a cornerstone of economic development theory and practice and has received more international assistance than any other form or level of education. Unfortunately, the results of much of the investment in skills training over the past four decades have been disappointing. One consequence has been growing uncertainty among governments and donors about the next steps to take in developing national training capacity in both the public and private sectors. This book seeks to reduce this uncertainty by reviewing research and experience on the cost-effectiveness of skills training, under different economic circumstances, across the developing world.

The causes of poor returns to training investment are complex and vary from country to country. In some cases expectations regarding the power of training programs, especially those aimed at young people making the transition from school to work, have simply been unrealistic, largely because of the slow growth in skilled wage employment. In other cases inefficient administration has reduced the returns to public training investments. The quality and quantity of training by employers have also been limited by economic policies that distort the incentives to firms and individuals to invest in skills, and—in partial consequence—by a low level of professional training capacity. Moreover, the training potential of employers and private training organizations, both voluntary and profit-making, is generally ignored in public training policy.

Unrealistic expectations, inefficient administration, and exclusion of the private sector have combined—in varying weight in different countries—to limit the contributions of skills training to productivity and welfare. Scarce domestic and international educational resources have been wasted. More important, national capacity to develop the skills needed for rapid economic and technological change is unevenly developed.

At the same time, there are many examples of highly effective public, employer, and proprietary training in developing countries. People who are trained use their skills in employment, and the economic value of

training amply justifies its costs, which typically are shared by workers, employers, and the public treasury. Employer training is a recognized element of national training policies and is encouraged by a range of public sector initiatives. The private training industry makes important contributions, especially in the commercial sectors and in higher technical education.

This book is written for the individuals who play determining roles in the allocation of national resources for education and training. These include public policymakers, their academic and professional advisors, the training profession and the staff of the international agencies that seek to support economic and social development.

The objective has not been to develop a single set of policy prescriptions: the intimate connections between skills training and the structure and dynamics of economies make this impossible. Instead, we have sought to develop an approach to the design of public training policies that can help policymakers create strategies that are economically sound and practically feasible in a given national context and that can be appropriately changed as economies evolve.

The training world is vast, and the kinds of training included in the analysis is somewhat selective. The main focus is on the preparation of skilled workers and technicians by private and public employers and on the programs offered by public and private preemployment vocational and technical schools and vocational training centers. Training for wage employment in the modern sector and for work in the informal sector, both rural and urban, is addressed. Other important kinds of training fall outside the scope of the study. These include supervisory and management training, training for the health professions, and (partially) training through agricultural extension. The analytical frameworks and policy options developed in the study, however, are likely to be broadly relevant to these kinds of skills development.

Concern for economic efficiency lies at the heart of the study. This will not be achieved if trained persons do not use and benefit from their skills. Efficiency, in turn, is a prerequisite for equity. Economically and socially disadvantaged citizens do not benefit from training unless the skills learned improve their productivity in employment. Moreover, social equity in the use of public resources for skills development also requires that the costs of training be equitably shared among those who benefit from the skills developed.

The authors are equally concerned with institutional factors. Appropriate policies can greatly improve the efficiency and equity of skills development. But effective institutions are required as well, and there are many valuable lessons about how these can be developed.

The book has been developed through a process that combined reviews of the scholarly literature and World Bank operational experience,

commissioned studies and field research, and on-going World Bank analysis of skills training in developing countries. The study has been significantly strengthened through consultations with policymakers from more than fifty developing countries and by the intellectual support provided by World Bank staff, donor agency representatives, and scholars in the field.

Acknowledgments

Colleagues inside and outside of the World Bank have made substantial contributions to this study through their own work in this field or through background papers commissioned for our study. We note with particular appreciation the work of Martin Carnoy, Christopher Dougherty, Maria Angelica Ducci, Kenneth King, Stephen McLaughlin, George Psacharopoulos, and Bernard Salome.

International donor agencies have helped develop the research base for the book. Under the leadership of Ewald Gold, the Deutsche Gesellschaft for Technische Zusammenarbeit (GTZ) provided financial support for field studies and for the participation of policymakers from developing countries in several consultation meetings. Claudio de Moura Castro, and Richard Johanson, both formerly at the International Labour Office (ILO) and their colleagues, including those at the ILO Turin Center, shared their research with us and helped organize consultative meetings. Financial and intellectual support for research on vocational training in Latin America was provided by GTZ and the ILO, as well as by the International Development Research Centre and the Inter-American Development Bank. Research on in-service training supported by the Development Centre of the Organization for Economic Cooperation and Development (OECD) and by the United Nations Industrial Development Organization has been a valuable source of information, as has a joint OECD–World Bank program of research on the informal sector.

The book benefited substantially from a series of international meetings to review both the developing body of research and a first draft of the study. Senior policymakers and scholars from fifty-three developing countries attended these meetings. The Economic Development Institute of the World Bank helped organize many of the meetings, and support for participants was provided by the GTZ, the ILO, and the Swiss Development Corporation. Staff from the United Nations Educational, Scientific, and Cultural Organization; the International Institute of Educational Planning; the Canadian International Development Agency; the Danish Development Agency; the British Overseas Development Authority; the

Commonwealth Secretariat; the Norwegian Agency for Development Cooperation; the Swedish International Development Agency; the U.S. Agency for International Development; the African Development Bank; and the Food and Agriculture Organization of the United Nations participated in these meetings, providing valuable advice and criticism.

Numerous other persons have contributed to the research program and provided helpful comments on earlier drafts of this study. We note especially Bill Ford, Dennis Herschbach, John Lauglo, Ragnar Solheim, Gail Stevenson, Sissel Volan, Wellford Wilms, and Matthew Zachariah.

Omporn Regel, Robin DePietro-Jurand, Michel Welmond, and Joseph de Stefano prepared statistical analyses and boxes, wrote research summaries, and otherwise provided the support without which the book could not have been written. Workie Ketema and Suchila Burns organized and maintained a computerized reference base of the more than 900 studies and documents consulted, and along with Cynthia Cristobal, Valerie Charles, and Selina Kahn provided expert word processing and administrative support.

Introduction

Both common sense and economic research support the idea that the quality of a nation's work force is important to economic growth and social development. Two factors are generally considered to be the prime determinants of the quality of a work force. One is labor productivity, or the value of the goods and services produced by a worker. The second is the flexibility of the work force, or the ability of workers to move across sectors of the economy and between industries as the structure of the economy changes. These factors are increasingly significant to countries seeking to expand their economies and improve the welfare of their citizens in a highly competitive and rapidly changing world economy. The higher a country's labor productivity and the more flexible its work force, the better able that country is to acquire and adapt the technology needed to produce better quality goods and services at lower cost and to shift the structure of production to new markets and products.

Productivity and flexibility depend on many factors, among them the level of capital investment, the technology of production, and the quality of a firm's management. Both also depend on the skills of workers at all levels, from senior management to semiskilled operatives. Good management is necessary for improved productivity and flexibility, but it is not enough. Equally important is the competence of the skilled workers and technicians who occupy the middle of the work force. In the modern wage sector, these workers facilitate the adaptation and use of new technologies, enhance the efficiency and quality of production and maintenance, and supervise and train workers with lesser skills. In the rural and urban informal sectors, craft and production skills increase worker productivity in self-employment and in small enterprises.

Workers use a wide range of general and specific skills. As the complexity and responsibilities of jobs increase, specific manual skills become less important than higher-order conceptual skills and theoretical knowledge. The content of vocational and technical curricula reflect this continuum. Initial training at the semiskilled level emphasizes specific manual skills. General theoretical and conceptual content receives more

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emphasis in training for skilled workers and can occupy more than half of the curriculum of postsecondary technical education. The level of general education required for successful training also increases with the level of skills being taught. More broadly educated and trained workers are better prepared to learn new skills as production technologies change and thus to move up the occupational ladder and increase their earnings over the course of a career.

The skills of reading and writing, calculation, and problem solving developed directly or indirectly by general and academic secondary education are fundamental to productivity in all forms and at all levels of employment. Moreover, these competencies are learned within a curriculum that builds the base of knowledge needed for effective participation in society. The broad values of general and academic education justify substantial public interest and investment.

Vocational and technical education and vocational training are by design intended to develop skills that can be used in a specific occupation or job. The objectives and content of the curricula in these programs are derived from occupational standards or, more directly, from analysis of the tasks that are to be carried out on the job. The effectiveness of these curricula can thus be measured by the extent to which trained persons can use their skills in employment.

By and large, when individuals decide to acquire some training, they do so in the expectation that it will help them improve their incomes, by enabling them either to enter employment or to move to higher-paying jobs in their current firm or with another employer. Individuals may seek training for other reasons, of course, such as a desire to work in a certain occupation or simply to gain personal satisfaction. Except for possibly the last motive, skills are acquired for economic gain (and even then, new skills may have an economic payoff by enabling individuals to perform services for themselves they might otherwise have to buy). Similarly, employers invest in the skills of their employees to improve their productivity and hence the profitability of the firm. The cost of this more specific preparation for employment can be substantially higher than that of general or academic education, but it may be justified when the value of increased earnings (for individuals) and productivity (for employers) exceeds the cost of the training.

In both industrial and developing countries, most middle-level skills are acquired through work experience and training during employment, financed by enterprises and workers. Training provided by employers can be highly efficient. Much employer training, especially that in small firms, is restricted to informal on-the-job training in the skills needed for existing production technologies. This is the case for traditional apprenticeships, which provide most of the skills workers use in the very small, unregulated firms of the rural and urban informal sectors in many

countries. But larger firms, and some smaller firms as well, have the expertise and technology needed to help their employees develop new skills through formal training programs.

Initial levels of vocational and technical skills can also be acquired before employment in secondary vocational schools, labor training centers, and postsecondary technical education institutions. These schools and institutions are both privately and publicly owned and operated. In some developing countries, private secondary and postsecondary vocational and technical schools and training centers provide a substantial share of initial training before employment, often at high levels of quality, with the costs paid by trainees. Publicly financed and provided preemployment vocational and technical education and training is also an important source of training. In addition, governments also train their own employees in ministerial or sectoral training organizations and support or deliver a variety of specialized training programs to help the unemployed find jobs and to improve productivity and earnings in rural and urban self-employment. Altogether, these public and private training opportunities represent a nation's training capacity.

Issues

The importance of middle-level skills is widely recognized, but there is considerably less agreement on whether training should be provided before or after employment and on the extent to which it should be financed from public revenues and provided by government-sponsored institutions. These issues are of considerable importance in all countries. But they are especially pressing in developing nations that face two enormous challenges: improving productivity under severe resource constraints and responding to competing demands for public education and training resources, not the least of which is improving access to, and quality of, basic education.

Government-sponsored preemployment vocational education and training programs have been especially controversial. Critics have argued that public vocational institutions and programs are inflexible and inefficient compared with skills training offered by employers and private training institutions, which are subject to market forces. Proponents have held that governments must be involved to compensate for limited private training capacity and to stimulate economic growth with a supply of trained labor, among other reasons. Policymakers in developing countries have often sided with the proponents of government involvement. The Indian National Policy of Education 1986, for example, states that "the introduction of systematic, well-planned and rigorously implemented programs of vocational education is crucial in the proposed educational reorganization. These elements are meant to enhance

individual employability and to reduce the mismatch between demand and supply of skilled manpower....” The objective of the Indian policy was to enroll 25 percent of secondary students in vocational schools by 1990 (Dougherty 1989: 71). By 1992 this objective had not been achieved; less than 10 percent of secondary students were enrolled in vocational courses, in most cases of low quality. Other countries, among them Somalia and China, have established policies that envisage enrolling at least half of all secondary students in vocational schools.

The controversy has high political visibility because of the long-held assumption that vocational preparation significantly improves the chances for youth, especially those who are economically or academically disadvantaged, to gain stable wage employment. More recently, in countries where the labor force has grown significantly more than the opportunities for wage employment, this assumption has been extended to include productive self-employment in the rural and urban informal sectors of the economy. Youth unemployment is a volatile social problem without easy short-term solutions. Providing vocational education is intuitively appealing, well understood by the public, and easy to carry out, especially compared with the more difficult steps needed to reform policies that limit economic and employment growth. And in the relatively short history of vocational education in developing countries, policymakers and the public can remember when vocational preparation did indeed lead to wage employment.

Massive support from international assistance agencies during the three decades of development that began in the 1950s has contributed substantially to the establishment and expansion of public vocational education and training systems and to legitimizing preemployment training as an important component of public education and training policy. For example, initial World Bank assistance to education in developing countries was confined to various kinds of occupational training. Even after Bank support for education broadened in the mid-1970s to include basic education, investments in vocational education and training continued to hold a central place in an expanding lending program. From 1963 to 1976, more than half of World Bank–assisted investments in the educational systems of developing countries supported vocational education or training. Two-thirds of this investment was made in middle-income countries. Similar patterns persisted well into the 1980s, not only for the World Bank, but also for the investment programs of the Asian, African, and Inter-American Development Banks.

The results of these investments in public training capacity have been mixed. In some countries public preemployment training is effective. A large proportion of graduates find jobs that use their skills, and the value of their increased productivity broadly justifies the cost of training. Policies and practices that lower costs have improved the efficiency of

some training programs. In too many other cases, however, both effectiveness and efficiency are low, leading to wasted public investment in training systems that respond only weakly to economic change. More generally, the large potential of employer and private training remains underdeveloped, placing additional burdens on inefficient public training systems.

This volume seeks to help resolve the issues surrounding public policy for vocational education and training in developing countries. The principle findings have been reflected in the World Bank's recent policy paper on vocational and technical education and training (World Bank 1991a). The central concerns are when and why governments should finance or provide skills training. The findings also have implications for international support of government policies and programs. The discussion focuses on training for skilled workers and technicians by employers, private training providers, and governments for employment in the modern (or formal) and the rural and urban informal sectors of developing countries. Agricultural extension, the major means of skill development for farmers, is addressed only in passing. (Agricultural extension issues have been addressed in a recently published policy review; see World Bank 1990a.)

Structure of the Analysis

As is generally the case with policy studies, resolving issues requires that three basic questions be answered.

- What can be learned from research and experience?
- What does this analysis suggest for public policy?
- To the extent that policy change is required, how can the process of reform be approached?

These questions are addressed respectively in Parts I, II, and III of the analysis.

Part I. The Record of Research and Experience

The controversy surrounding vocational and technical education and training results in part from a tendency among policymakers and analysts to reach for sweeping generalizations about a highly disparate set of training institutions and programs. There is no general phenomenon that can be labeled "vocational education." Instead, all economies offer a wide range of training activities that serve different sectors of employment, or "markets" for skills. Chapter 1 analyzes the nature of employment and skill needs in the modern and the rural, and urban informal sectors of developing countries and describes the various kinds of skills

training that prepare individuals for work in these different skill markets. The record of training results is mixed, however. Chapter 2 examines available research and evaluation studies to identify factors that affect the cost-effectiveness of various kinds of training in contributing to different economic and social objectives. The analysis shows that skills training can increase worker productivity and flexibility and thus economic growth and individual welfare. But it does so only when skills are used in employment. Thus, the effectiveness of training depends on the nature of employment in society, which is determined in part by trends that shape the economic opportunities of developing countries.

A nation's economic and social policies not only affect patterns of economic and employment growth but also determine the market signals and incentives that guide individuals, employers, and trainers in making decisions about investments in training. Chapter 3 reviews the economic trends that are likely to influence future development, as well as the varying effects of different economic policies on both economic growth and the incentives to individuals and employers to invest in training.

Part II. Options for Public Policy

The record shows that all forms of training, private and public, can be both effective and efficient if directed to feasible objectives in a favorable economic and policy environment. The record further suggests that training policies are more effective if they are adapted to the nature of the economy and that these policies should evolve as economies change. Thus, different policies may be required in different countries. The record also suggests, however, that in all cases the government's role in vocational and technical education and training can be made more effective through more dynamic planning, encouragement of employer and private training, and improved responsiveness and efficiency in public training programs. The effect of training on the earnings and welfare of socially and economically disadvantaged citizens can also be improved.

Chapter 4 addresses the fundamental questions: when and why should governments intervene in skills training? The varying economic rationales for public financing or provision of training are reviewed, as are approaches to financing and organizing public training programs. Government has a role in financing and providing training, but the balance between these two functions should be determined by the extent to which public training benefits others besides workers and employers, by the nature of economic policy and incentives for private investment in skill development, and by the level of development of employer and private training. Public financing can be diversified to increase employer and worker contributions to the cost of training. In addition, implement-

ing and modifying public training policy require dynamic approaches to planning and management that strengthen cooperation between the public and private sectors.

Increasing the role of market forces in determining the amount and kind of training provided will also improve the effectiveness and efficiency of public training. Chapter 5 develops techniques for economic and labor market analysis that can guide decisions on investment in skills that are likely to be important for economic growth. These techniques can also provide the flow of information needed to enable public training systems to respond flexibly to changing employment opportunities and skill needs.

Economically appropriate policies for public finance and provision of training, combined with more dynamic approaches to planning, can provide a more favorable context for employer, private, and public training. But positive policies and programs are needed to ensure an appropriate response from training institutions. Chapter 6 draws on lessons of experience from developing countries to identify ways in which employer and private training can be expanded and improved. Included in the analysis is traditional apprenticeship in the rural and urban informal sectors of developing economies. Similarly, Chapter 7 presents policies and practices that can increase the responsiveness of public training to labor market realities and improve efficiency in the use of public education and training resources.

The analysis in Chapter 2 suggests that much of the hope governments place in the power of preemployment vocational education to improve the employment and earnings of economically and socially disadvantaged citizens has largely been misplaced. Basic education is the key to improved earnings and access to training and wage employment. However, the record also shows that preemployment training can play an important complementary role in broader strategies designed to foster self-employment or to reduce barriers to employment for women and minorities. These training strategies are assessed in Chapter 8.

Part III. Strategies for Policy Reform

Policy reforms in skill training in developing countries can be successful if the strategies for implementing the reforms are appropriate to the degree and pace of economic change occurring in the country and do not outstrip the capacity of the country's institutions for dealing with them. This is the subject of Chapter 9. In many cases support from international donors will be needed. The record of this support and the implications of the findings and conclusions in this volume for continued donor support are addressed in Chapter 10.

Research Base

Vocational and technical education and training in industrial countries have been the subject of considerable research, from many disciplinary perspectives. Economists have studied the training behavior of private firms and have examined the costs and benefits of various kinds of preemployment training and job training for the unemployed. Other economic studies have focused on the effect of technological change on employment. Industrial psychologists have delved into the processes of learning in employment. Educators and trainers have done a great deal of developmental work and undertaken some assessment on issues associated with training effectiveness and efficiency and on such topics as vocational counseling. This literature has been used principally as general background material, often through a commissioned review paper.

The focus, here, however, has been on skills training in developing countries, in order to identify positive lessons of successful training. Thus the research base is smaller and often uneven. The literature contains more than forty evaluations of vocational education and training programs in developing countries that, to one degree or another, measured cost-effectiveness, effectiveness, or costs. Several studies were conducted as part of the research program that supported this study. In addition, the body of case study material on how training systems work is extensive, much of it in the form of donor agency evaluations and reports. World Bank country and sector studies and project evaluations provide a third source of information, and these have been analyzed in a series of background studies. Empirical studies of training by private and public employers in developing countries are comparatively rare, but some do exist and have greatly informed this analysis. Of particular value is a recent series of studies of training and employment in the informal sector, some jointly carried out by the World Bank and the Development Centre of the Organisation for Economic Co-operation and Development, and others by the World Bank alone. Two World Bank-sponsored regional studies of vocational education and training—one for the Middle East and North Africa and one for Latin America—have offered significant insights.

A Note on Terminology

In discussing training for skilled workers and technicians, we necessarily deal with a great variety of training programs and institutions. We have chosen to use the phrases “vocational and technical education and training” or “skills training” as the generic description for this full range of training modes—public, private, and employer. The abbreviated form of the phrase, “VET,” is also used.

Vocational preparation for skilled workers in schools that devote at least half of their curriculum to occupationally specific theory and practical courses is called "vocational education" or "vocational schooling." Schools that provide comparatively fewer occupational courses in an otherwise academic curriculum are called "diversified" schools, and their programs "diversified" education. Preparation of technicians is called "technical education." Unless otherwise specified, this education is assumed to occur at the postsecondary level, where institutions are variously labeled as "polytechnics," "technical colleges," or, more rarely, "junior colleges." "Vocational training" is a generic term used to encompass programs that prepare skilled workers in programs whose credits cannot generally be transferred to institutions of higher education.

Part I

*The Record
of Research
and Experience*

1. *Skill Markets and Modes of Training*

The effectiveness of skills training depends fundamentally on the extent to which trained workers use their skills in employment. Thus, a clear understanding of the dynamics of employment in different sectors of the economy—or different “markets” for skills—is central to developing effective public training policies. It is equally important to recognize that workers acquire their skills in many different ways and that publicly financed and provided preemployment training often holds a secondary place.

The Markets for Skills

Postprimary education comes in several forms. Some is general in nature and provides students with broad knowledge and basic skills in mathematics and communications, which provide the basis for further training and learning in employment. “General” secondary education may enable some students to enter postsecondary education and training programs, but it is most often seen as the final preparation for entry into the world of work. The curriculum of “academic” secondary education, however, is specifically oriented toward entrance into the university. Although the structure of the curriculum has much in common with general secondary education, the standards and requirements are higher and are most often based on the knowledge and competencies needed to gain entrance into the university.

But these two forms of secondary education do not prepare students for a specific occupation. In contrast, vocational and technical education and training develop specific skills that a worker is expected to use on the job. The extent to which these skills can be effectively used depends a great deal on the characteristics of different kinds of employment in the economy.

Wage Employment in the Modern Sector

Although the distinctions between the modern and informal sectors of the economy are blurred at the margin, the modern sector is generally considered to be composed of public and private enterprises that are subject to prevailing industrial and labor regulations. Such enterprises are found in all sectors of the economy—agriculture, industry, commerce, and services—and in both urban and rural areas. As usually defined, modern sector organizations tend to employ more than ten workers, but many smaller firms also operate within the sector.

In larger enterprises in the modern sector, the most important characteristics of employment are the division of labor and hierarchies of skills within the company work force. New workers hired at the entry level have limited responsibilities and are typically closely supervised. Initial training is provided, formally or informally, on the job to teach new workers company procedures and the specific skills required to raise their performance to average productivity standards. Workers learn from more experienced employees, and the employee evaluations and promotion policies of the firm create internal labor markets that recognize improved performance through promotions. Few initial responsibilities and limited training by the firm combine to reduce the level of specific skills required for initial employment at the bottom of the promotion ladder in skilled occupations.

In smaller enterprises there is less division of labor, and internal labor markets are often lacking. These employers are more likely to seek workers who already have higher levels of skills. In both large and small enterprises, entry into higher technical levels often requires substantial preemployment training because even larger enterprises are reluctant to provide new employees with the longer, more general technical education needed (although they will often finance such training for current workers).

Above entry levels, occupational classifications and testing and certification systems distinguish among varying levels of skill, and these differences are often (though not always) reflected in the occupational and salary structures.

Semiskilled workers have acquired the rudiments of a craft or trade generally equivalent to what would be learned in basic training programs (often called prevocational education). Most likely, however, they have acquired these skills informally or on the job, not through a formal training course. There are different levels (usually three or four) of skilled workers. At the lowest level, the training outcomes are prevocational. As workers progress, they acquire journeyman and eventually master craftsman skills, the former equivalent to “job readiness,” the latter to higher levels that reflect advanced theoretical and craft knowledge,

enabling workers with these skills to serve as supervisors and trainers of other employees.

Technicians perform the highest level of skilled work, one that shades into the “professional” level of occupation. The theoretical component of competency is greater than it is for skilled workers, although it may be similar to that of a master craftsman. Some technician occupations can be reached through a skilled worker ladder by experience and continuing education and training. Others, more typically in modern occupations such as production quality control or telecommunications maintenance, are entered directly after postsecondary (and occasionally secondary) technical education.

The concept of a craft “occupation” has a long history, extending back to the craft guilds of medieval Europe. Organization of workers into hierarchical occupations has served the interests of labor organizations in more modern eras and has provided a framework for controlling access to apprenticeships as well as for negotiating with employers. The structure of occupations has also served as an important mediating force between preemployment training and jobs themselves, enabling trainers to establish standard definitions of the skills to be learned. Increasingly rapid changes in the technology and organization of production, however, are expanding the amount of information required to keep such definitions current.

The productivity of the firm depends in part on its ability not only to organize tasks into jobs and work units that efficiently use skills of differing types and levels, but also to foster continuing development of the work force. Managers seek the combination of capital and labor—or technology and work force skills—that maximizes the profitability of the firm. The combination selected for a given enterprise results in part from the competence of its management and in part from the environment of economic incentives in which it operates. As will be discussed in chapter 3, these incentives can lead to production strategies that are either capital- or labor-intensive. Both strategies have important, but often unpredictable, implications for skill requirements.

Technological change alters the pattern of required skills. In much traditional manufacturing, these changes are often marginal and can be managed through on-the-job training that accompanies the installation of new equipment or the initiation of new management procedures. Large-scale introduction of flexible production systems and automated technologies, however, can significantly change skill profiles and training requirements.

Such changes are already evident. The trend is toward broader and fewer occupational categories, a decrease in the need for manual skills, and a corresponding increase in the conceptual content of jobs. In Germany, for example, the spread of flexible production systems has led

to a major reorganization of industrial metal working and electrical engineering occupations and training requirements, with manual skills being reduced in importance and diagnostic, repair, and programming skills becoming much more important. Training for manual skills in metal cutting has been reduced from six months to eight weeks (Buschhaus 1985).

These dynamics help explain why large employers in both industrial and developing countries often prefer to hire individuals with comparatively high levels of general education for entry-level jobs and to provide training after employment (Cuervo 1985; Carton and others 1987; Hong Kong Productivity Council 1986; Grootaert 1988; Noah and Eckstein 1988; Middleton and others 1990).

Studies have shown that hiring practices are driven more by the levels of education available on the market than by the skills required for a given position. Individuals holding similar jobs in different countries often have very different levels of education and training (Oxenham 1988). In Indonesia preference for general education graduates results in part from the relative scarcity of well-trained skilled workers and technicians in the labor market. The cost of workers with various levels of competence also matters. In Niger rigid and high government wage standards for graduates of vocational and technical institutions make training of the general education graduate a less costly investment in the eyes of many employers (Mingat, Jarousse, and Richard 1989).

In both industrial and developing countries, higher levels of education increase the chances that an employee will receive in-service training. But employers are also often critical of general and academic secondary education. For example, in reporting on a survey on the involvement of industry and business in education in Europe, Noah and Eckstein point out that "the most frequent criticism voiced [by employers] is that schools provide an inadequate and inappropriate preparation for entry into work" (1988: 45). The criticisms, however, do not focus on specific occupational skills but rather on the quality of academic preparation and on attitudes toward work. Many employers claim that the level of literacy and numeracy that students achieve is unacceptably low. Employers also charge that academic schools do not inculcate their students with an understanding of, and respect for, the world of work (students, for example, may not display proper workplace behavior, understand how wealth is created, or possess communications skills).

In sum, large employers want the general competencies that general or academic education can provide but with the attitudes that a "practical" education is thought to supply. Proficiency in manual skills seems to be a subordinate concern. This stance has had profound implications for the content and subsequent success of vocational and other forms of secondary education. Of crucial importance is whether instruction in

general skills is sacrificed to focus time and resources on providing a more narrowly defined practical education. In such cases, employer needs are not being met, and the students are in fact placed at a disadvantage when seeking employment.

Employment in the Informal Sectors

As noted, the principal distinction between the modern and informal sectors of the economy is the largely unregulated nature of activity in the informal sectors. Moreover, most informal sector activity takes place through self-employment or in very small firms. Indeed, the ability of small firms to avoid labor and wage legislation can lead to two different labor markets operating in the economy. The modern sector labor market is characterized by factors, such as minimum wages, protection of workers against dismissal, and collective bargaining on wages and conditions of employment, that can lead to considerable rigidity. The informal sector can be highly flexible, with wages and conditions of employment determined through market forces.

In contrast with the modern sector, work in the rural and urban informal sectors is extremely diverse, the more so because the largest share of workers in these sectors are self-employed on farms or in very small rural and urban enterprises. Modern sector occupational categories and training certificates have little relevance in this context. Productivity in such employment depends heavily on the availability of markets and credit and on comparatively high levels of entrepreneurial skill.

To improve productivity in smallholder farming, one must overcome a complex set of economic and social problems. These include, but are not confined to, the challenges associated with self-employment in non-agricultural activities, such as access to credit and to markets for products. Self-employment in small rural and urban enterprises share many characteristics, but there are differences, principally in the nature of markets for products and services. Moreover, both the size of an enterprise and the way in which production is organized affect the nature of constraints on productivity growth. This high degree of variability strongly suggests the need to tailor efforts to improve the productivity and earnings of informal sector workers, including training, to fit the specific circumstances in which a given set of workers is found.

RURAL SECTOR. Agriculture is the cornerstone of the economies of most developing countries. Agricultural exports are an important source of foreign exchange, and agriculture provides inputs needed for domestic industry. Moreover, farming provides the livelihood for the largest share of the population, both directly through subsistence and cash crop farming and indirectly through the generation of income to support

other economic activities, notably self-employment and small enterprises engaged in trading, manufacturing, and provision of services. A full treatment of agriculture in developing countries is obviously beyond the scope of this study. Here we concentrate on those aspects of primary importance to skill development, and then only for smallholder agriculture and nonfarm rural employment.

Smallholder farmers, of course, are self-employed entrepreneurs. Improving the productivity of their enterprises is a complex matter involving many factors, among them land rights, irrigation, credit, marketing capacity, infrastructure, and the availability of inputs such as fertilizer. Agricultural pricing systems are crucial in setting incentives for both investment and production.

Central to efforts to improve farm productivity are “packages” of technology—essentially combinations of practices and inputs—tailored to specific crops and to land, water, and climate conditions. The diffusion and appropriate use of these farming technologies depends heavily on the ability of farmers to acquire and use information effectively. Agricultural extension systems that make farm research available to farmers are the principal means of providing this information and are in fact the most important form of organized skill development for farmers.

Women play a major role in agricultural production in most developing countries (see, for example, Cloud 1986; Jiggins 1986; USAID 1986; Creevy 1986; and FAO 1984). In some cases, women manage a substantial share of the small farms because men have migrated to find other work; in Malawi, for example, women are reported to manage one-third of rural farm households (Spring and others 1985). Elsewhere in Africa, women provide 50 to 80 percent of the labor for such tasks as marketing, sowing, and weeding. Women have not had equal access to extension services, however, nor, for that matter, to the complementary general education that enhances the effect of extension information on productivity. Extension programs also often miss the poorest farmers and smallest farms, in part because it is easier to work effectively with the better educated owners of larger farms.

Nonfarm economic activities can include self-employment as well as the establishment of small enterprises that provide rural markets with goods, such as processed foods or farm implements, and services, such as equipment repair and transportation. Self-employment is often a second source of income for farmers. Small enterprises also can and do form a main source of income for both owners and employees, whether privately owned and operated or established as producer cooperatives. The viability of these enterprises depends on the income levels of the intended customers. Farmers who operate near the subsistence level have comparatively little income left over to spend on goods and

services. In more profitable environments, rural incomes can support an increasingly high level of nonfarm economic activity.

Another barrier to productive self-employment and development of small enterprises in some countries is low population density and the consequent lack of concentrated rural markets, a constraint that is intensified where rural transportation systems are weak. In addition, lack of access to credit and raw materials often limits rural entrepreneurship.

Research has demonstrated that reading and computational skills acquired through general education contribute substantially to improved productivity among smallholder farmers. For example, four years of general education (as opposed to none) was found to increase farm productivity an average of 8.7 percent across eighteen studies in a dozen countries (Jamison and Lau 1982). Much of the increased productivity is attributable to the increased ability of farmers to benefit from extension services. This positive relationship is further seen in studies that assess the roles of education, extension services, and productivity in modernizing and traditional agricultural environments. As the pace of technological change quickens, higher levels of and better quality in education raise farmers' ability to use extension services to increase their productivity and expand their economic activity (Cotlear 1986; Welch 1978).

The quality of basic education is critically important to these productivity benefits. The ability to read, to write, and to count is fundamentally important. But also important is a firm grasp of the scientific principles that underlie effective use of farming technologies such as pesticides and fertilizers (Eisemon and Nyamete 1990). Improving the quality of primary (and secondary) science teaching and strengthening applications to agriculture in the curriculum can further improve the contributions of general education to farmer productivity,

URBAN INFORMAL SECTOR. The traditional view of the urban informal sector in the economics development literature, is of a sort of staging place for mainly underemployed workers, often migrants from rural areas, awaiting entry to modern sector employment (Todaro 1969; Harris and Todaro 1970). That view is now seen to be an inadequate description of the positive role played by the informal sector in many developing countries. Particularly since the publication of the International Labour Organisation's path-breaking report on Kenya (ILO 1972), which popularized the concept of the informal sector, numerous empirical studies have now painted a broad picture of the main characteristics of this sector, problems of definition notwithstanding (see Charnes 1990; Fields 1990).

Unlike modern sector firms, which are subject to well-established labor relations codes, factory regulations, wage legislation, and unionization, the informal sector is largely unregulated. Although govern-

ment regulatory (and economic) policy may restrict competition in the modern sector, the informal sector is much less affected and thus usually operates in a much more competitive fashion.

A second key distinguishing characteristic is the ease of entry into informal sector employment compared with the formal, modern sector, where jobs are often scarce and those that are available are protected by high educational and training requirements. It is this ease of entry that has enabled the informal sector to absorb much of the excess labor in many developing countries. Enterprises in the informal sector are usually small (often one-person operations), family owned, dependent on indigenous resources, and labor-intensive. Workers in the informal sector often acquire skills informally (ILO 1972).

Differentiating small firms by the degree of regulation provides a workable definition for the informal sector, but it also masks considerable diversity within the sector. Informal sector firms in fact range in size from the truly informal, one-person enterprise through unregulated firms that, in some countries, may employ ten or more workers, to regulated small firms of similar size. Indeed, where regulation is laxly enforced, the differences between informal and formal sector firms of similar size and capitalization can be very small. Thus, what is called the informal sector is extremely diverse and includes hired workers, apprentices, and unpaid family members as well as the self-employed and owners of small firms with comparatively high levels of capital and technology. A recent review of the evidence in Asian countries found informal sector employment in all the main economic branches; employment tended to be concentrated in such tertiary activities as small-scale trading and service occupations (Sethuraman 1988). Although the range of its manufacturing outputs and services parallels that of the formal sector, the informal sector tends to produce at the lower end of the quality range and to employ fewer capital-using technologies. Markets for its products are most often found among the poorer segments of society.

The differences between firms at the lower and upper ends of the continuum are significant (Fields 1990; Tokman 1990). Fields calls these "lower-tier" and "upper-tier" firms. Lower-tier economic activity has almost no capital requirements and is characterized by single-person firms. Work is unsteady and earnings are low; petty trading is a good example. Entry into economic activity at this level is indeed comparatively free. Upper-tier firms are more likely to be engaged in manufacturing or technically advanced services (such as auto and radio repair or furniture making). They require greater capital and entrepreneurial skill and are more likely to employ family or wage workers. For these firms, entry into business depends largely on levels of capital and skills.

Although there is considerable variation across countries, paid workers form a small percentage of informal sector workers. In Africa fewer than 20 percent of informal workers are paid; the balance of the work force consists of owners, family workers, and unpaid apprentices. In Asia and Latin America the proportion of paid workers rises to 30 to 40 percent (Charmes 1990).

The informal sector is characterized by labor mobility. Workers move not only into modern sector employment, as traditional economic models postulate, but also in the reverse direction and within the informal sector itself. Empirical studies have shown that some workers in the informal sector become owners and that some high-wage earners in the formal sector accumulate enough capital to start up small businesses in the informal sector (Mazumdar 1987). A 1985 survey in Costa Rica, for example, found that over five years, 27 percent of workers in informal sector enterprises moved to formal sector firms and 18 percent became self-employed or owners of small businesses. Six percent of the firm owners in the informal sector had come from the formal sector (Tokman 1990). The variability of mobility patterns across economies and trades, however, is likely to be substantial. In Ibadan, Nigeria, 80 to 90 percent of informal firm owners in upper-tier trades, but fewer than half of those in lower-tier trades, had previous wage employment (Birks and others 1992).

Average earnings in the informal sector are less than those in the modern sector, but informal sector employment (including self-employment) is not necessarily low-income employment (Mazumdar 1976). Studies in eleven African countries show that small business owners earned from two to eight times the official minimum wage; in three Latin American countries informal sector employers earned one to two times the average modern sector wage. In African informal sector firms, paid employees earned one to two times the minimum wage; in Latin America they earned, on average, 70 to 80 percent as much as modern sector employees (Charmes 1990).

Informal sector employment is an important source of income for women, both as entrepreneurs and as workers. Women earn less than men, however, just as they do in the modern sector. They tend to be concentrated in occupations that are traditionally seen as women's work. In Nigeria, for example, virtually all of the owners of small firms engaged in soap making, food processing, meat selling, and women's hairdressing are female; 62 percent of the owners of small tailoring establishments are also female. In contrast, women owned none of the metal-working, construction, automobile repair, or furniture-making enterprises (Birks and others 1992).

Recognition of the diverse nature of informal sector enterprise can be important to policy. Very small enterprises in the lower tier of the

Box 1-1. Constraints on Small Enterprises

A recent survey in Ghana shows clearly that size influences the kinds of constraints that firms encounter in their operations (Box Table 1-1). For firms with fewer than three employees, the two most frequently mentioned constraints are lack of consumer demand and lack of access to credit to purchase raw materials, with the price of local materials coming third. Access to credit for purchasing raw materials is also a significant constraint on firms in the middle range, but, for these firms, lack of credit for equipment and the need to replace equipment are more important problems than the level of consumer demand. The largest firms in the survey, those with more than thirty employees, encountered yet another pattern of problems. Access to credit for raw materials and the high price of imported inputs, as well as low levels of consumer demand, were the three constraints cited most often by these larger enterprises. The fact that large firms did not view either competition from other firms or product prices as a problem suggests that these firms enjoyed a monopoly position.

Significantly, none of the entrepreneurs in this survey cited labor or skill deficiencies among their top four problems. Other studies corroborate this finding. For example, a 1989 survey of twenty-four Tanzanian furniture manufacturers and fourteen construction companies, all of small or medium size, found scarcity of competent workers and lack of technical skills to be the least mentioned constraint on both business entry and business expansion.

Box Table 1-1. Major Problems in Current Operations in Firms of Different Size, Ghana, 1989
(percentage of respondents)

Problem ^a	Firm size, by number of employees			
	Less than 3	4-9	10-29	More than 30
<i>Demand</i>				
People generally do not have money to buy things	55	23	19	29
Too many competing firms	21	12	24	0
People cannot afford my product	15	12	6	0
<i>Credit</i>				
Cannot get credit to buy raw materials	55	54	63	71
Cannot get credit to buy equipment	18	35	50	15
<i>Input prices</i>				
Price of local materials is too high	30	23	69	14
Price of imported inputs is too high	9	23	25	29
<i>Equipment</i>				
Equipment is old and needs replacing	12	35	31	14

a. Firms could list up to four problems.

Sources: Steel and Webster (1991); Levy (1990).

informal sector face quite different constraints on operation than larger enterprises. For the former, lack of demand for products and services and restricted access to credit to purchase raw materials are often the major constraints. Conversely, while lack of access to working capital is also a constraint for larger firms, lack of access to credit for equipment and high prices for imported materials are much more binding for midsize firms than for very small ones (Box 1-1).

Ease of entry into the lower tier of the informal sector provides a mechanism for the economy to absorb excess labor, although a large share of this will be in the form of unpaid family labor and low-paying apprenticeships. But ease of entry also can contribute to market saturation, driving the incomes of the self-employed close to the subsistence margin (ILO 1990b). Low-productivity employment may be better than no work at all, but it does not provide a satisfactory permanent solution to unemployment problems, and such work contributes little to the growth of overall national productivity. Small firms operating toward the more formal end of the continuum present a different picture. These firms have a higher level of capitalization and employment and often serve well-established markets. At this end of the continuum, the employment and productivity potential from firm expansion and the creation of new businesses is much greater than it is at the most informal end.

The characterization of the urban informal sector, or at least substantial parts of it, as a permanent, often vibrant sector of economic activity has important implications for development strategies and for the role of training. Most important, care must be taken not to establish unreasonable expectations for the amount of excess labor that lower-tier self-employment can absorb productively. At the same time, the dynamic potential of upper-tier enterprises to expand productivity and employment merits considerable attention. Providing training to workers in the informal sector could raise their productivity, whether they are currently fully employed or underemployed. But probably as important as raising productivity in given employment is the need to facilitate the movement of workers along the continuum from lower-paid subsistence employment toward higher-productivity, upper-tier employment.

The evidence suggests, however, that the contributions of narrow skills training are likely to be modest, given the greater significance of other factors, most especially constraints on markets, credit, and access to inputs. The skill characteristics of both rural self-employed and those working in the urban informal sector further reinforce this conclusion.

Almost by definition, entry into self-employment in the lower tier of the informal sector (both urban and rural) requires few skills. Those that are required are easily learned informally. In upper-tier enterprises, however, especially those in manufacturing and repair, higher skill

levels are essential. But these skills differ from those required in modern sector enterprises.

Although there is some division of labor in larger informal workplaces, roles and tasks are much less specialized than they are in modern sector firms. Skills required in similar formal and informal establishments, such as auto repair shops, are likely to be the same or similar. Small firm size, however, compels workers to regularly perform a wide range of technical and business tasks. Thus, an experienced worker in a wayside auto workshop may talk with customers, diagnose faults, delegate tasks to other workers, and perform some of the work himself, for example, while those same tasks may be divided among a service manager, a foreman, and a technician in the service department of a large urban auto dealership.

Informal sector establishments, more than modern sector firms, survive by being sensitive to changing market demand and product tastes and by being able to forge links with other sectors and find new market niches in seemingly over-crowded industries. Owners need to be able to find sources of capital, figure out what new equipment and tools to buy and how to order them, where to locate the business or production facility, and how to set it up. Because informal sector firms usually, although not always, cater to the lower-income strata of the population, skill competence there tends to be predisposed toward a less standardized quality and rougher finished product produced at a lower rate of output than in a comparable modern sector establishment.

Informal sector operators—rural or urban—must learn to integrate more diverse aspects of the trade and the business, acquire minimal technical competency more quickly and solve unique practical problems more often than a typical worker in a modern sector establishment. These differences have significant implications for training. An auto mechanic, for example, must have both a lengthy training period and organized instruction just to master the full range of possible automotive malfunctions. The mechanic may pay little attention to business management skills while acquiring technical jobs skills. But business skills become more important as the mechanic acquires a full complement of technical skills, is entrusted with responsibility for dealing with customers in a commercial operation, hires others to perform most of the technical tasks, or contemplates establishing a personal business. Such workers would benefit from being in close and regular proximity to experienced owners and managers and from exposure to a structured sequence of instruction or to other learning experiences that cover the essential topics. Even training for a job in a modern sector firm may not completely suffice since the typical worker there is more likely to perform a more specialized job function. Depending on the resources and the entrepreneurial capacity of the informal sector individual, skills could be

acquired through a long process of unstructured assimilation in another owner's business, through a structured instructional setting, or through immediate self-employment without prior tutelage.

Historically, the bulk of informal sector workers in activities ranging from appliance repair to street-hawking have been drawn from among those who have dropped out of, or never attended, school. There has been some stratification, of course, based on education. Individuals with more education have tended to enter more technical, better-compensated trades, while the less-educated or recent migrants without family connections have been confined largely to less technical, lower-income activities.

Only a generation ago most entrepreneurs were illiterate or minimally literate at best; today's owners and workers are more likely to be better educated. A recent sample survey of individuals who had completed an informal apprenticeship in the Côte d'Ivoire found that more than 40 percent had completed four or more years of education and that more than 10 percent had some secondary schooling (Grootaert 1988). Another survey found that the owners of recently established small enterprises in Malawi were far more likely to have a secondary school education than the owners of firms established before 1966. Similar trends have been found in other countries (see, for example, McLaughlin 1979; USAID 1986).

Younger, better educated entrepreneurs are more likely to be found in newly emerging lines of business, rather than in more traditional industries. In Ghana, for example, 40 percent of people producing wood products had progressed beyond secondary school, but 84 percent of those engaged in the manufacture of cosmetics had acquired post-secondary education. Similar differentiation has been found in Nigeria (Birks and others 1992).

These trends not only reflect expanding access to education, but also suggest a growing realization among graduates and dropouts that formal schooling can be better put to use in establishing or working in a small enterprise than in making an increasingly futile search for salaried, white-collar employment.

The Many Paths to Skilled Employment

Individuals acquire vocational and technical skills in many ways. Publicly supported training before employment is only one path to a skilled job, and, for workers who begin their careers this way, it is usually only an initial step (Box 1-2). In the modern sector, most skills are acquired through initial and in-service training provided by public and private employers, and many informal sector entrepreneurs have acquired their skills in wage employment. Training by private and voluntary organi-

Box 1-2. Occupational Training Histories: Alternative Paths to Success

An examination of the training histories of a sample of workers in Colombia offers evidence that workers in a given occupation acquire their job skills in many different ways, a finding that confirms the results of studies from other countries. Colombia is a particularly interesting case because in 1957 it established a national training organization, the Servicio Nacional de Aprendizaje (SENA). The study looked at the training histories of men and women who worked as secretaries, seamstresses, bookkeepers, electricians, fitters, plumbers, and metal workers. Workers were divided into three categories: those who did not receive any SENA training, those who completed short SENA courses, and those who completed long SENA courses. The short courses, of two to three months duration, are designed to upgrade skills for particular jobs, while the longer training courses (one to two years) include programs to prepare new workers for skilled occupations.

Certain interesting—and unexpected—patterns were evident across subgroups and occupations. For instance, a large percentage of non-SENA trained workers (80 percent of the seamstresses, for example, and more than 60 percent of male fitters) passed directly from general education to their jobs, acquiring their skills primarily through informal on-the-job training. Large numbers of workers also received more than one kind of training. For example, of the 77 percent of female bookkeepers with short SENA training who passed directly to their jobs, 11 percent had related secondary education, and 11 percent had additional institutional training before they took the agency course.

Perhaps the most curious phenomenon is the “topping up” of long SENA courses: 22 percent of electricians and 8 percent of plumbers took institutional training after the course, while another 17 percent, in both cases, participated in formal on-the-job training. A similar pattern existed for participants in the shorter courses.

The most striking pattern was the high degree of flexibility of the training market in practice. Large numbers of trained workers did not receive formal training (SENA or otherwise); many workers receive multiple types of training; and many receive additional formal training—institutional or on-the-job—after completing SENA courses. Thus, even in Colombia, where a highly centralized, well-developed, well-financed government-sponsored training system is in place, workers obtain training in numerous ways. Here, as elsewhere, substantial efficiency gains may be available by taking advantage of the informal training paths that workers appear to be arranging themselves.

Source: Ziderman and Horn (1992).

zations is a second alternative. Agricultural extension is the major vehicle for developing farming skills; agricultural schools and colleges and youth training programs also contribute. Traditional apprenticeship is the primary means of acquiring skills in the rural and urban informal sectors in many countries. Specialized programs designed to help individuals become self-employed, to expand informal enterprises, or to transform them into more modern firms have emerged in the past decade or so.

Together, these many alternatives constitute a nation's capacity for training skilled workers and technicians. Much of the training that takes place is invisible, hidden behind the walls of modern firms or in the simple shelters of informal enterprises, and is financed by workers and employers. Recognition of the breadth and variety of training opportunities puts public preemployment training in proper perspective. Governments do provide an important share of training in society, but most of the burden of skill development is carried elsewhere in the economy.

Training for the Modern Sector

EMPLOYER TRAINING. Most skill acquisition takes place during employment, through informal on-the-job learning or through formal training programs financed by employers and workers and provided either in the workplace or at external training institutions. In Thailand, for example, a 1980 survey of large and medium-size enterprises found that more than half of employed electricians, machinists, and auto mechanics had obtained their positions without attending preemployment vocational education and training institutions (Bovonsiri and Fry 1980). Similarly, studies in Africa reveal that more than half of those passing trade tests had not attended preemployment training institutions (Godfrey 1977; Hinchliffe 1990).

Public sector employers provide a large share of this training. Project-related training that accompanies new physical investment is an important mode of in-service training for both public and private employers. Public training agencies serving a particular sector, such as agriculture or public works, and state-owned enterprises offer an additional source of training during employment.

Private and public employers invest in training to improve their workers' productivity in current jobs and to facilitate worker mobility into higher productivity positions. Continuous informal on-the-job learning, the main means of skill acquisition, is stimulated and intensified where personnel systems recognize and reward improved productivity. But on-the-job training is often not sufficient, especially for more complex and responsible jobs and for situations where technology and management processes are changing significantly. Employers thus

supplement informal learning with organized courses and apprenticeship, when a worker first begins a new job. Firms continue to upgrade skills with their own courses and programs purchased from external training providers.

Decisions on training are complex in medium and large firms and require a high level of professional and managerial knowledge. Managers must weigh the relative importance of different factors when deciding to train inside or outside of the enterprise (Greig 1989). Costs are a central consideration. If many employees need to be trained and external training is expensive, managers will probably choose to train in-house. However, if the firm's equipment is costly and risk of damage high and if the technology is available in external training institutions, it may be more cost-effective to train externally, regardless of number. If only a few employees need to be trained, occupational levels are high, and the primary goal is the acquisition of knowledge rather than the acquisition of specific skills, external training may be more cost-effective than organizing in-company programs. Conversely, training within the enterprise is more suitable where the number to be trained is large, skills are relatively simple or highly specific, technologies are established, and building teamwork is an important training objective.

Managers have considerable flexibility in determining the combination of capital and labor that maximizes profits, thus enabling them to adjust the means of production to the relative prices of both. The possibility of substituting unskilled for skilled labor, and technology for both, is central to the ability of the firm to adjust flexibly to changing prices and markets. Employee training is essential to facilitating this process.

Most entry-level jobs in modern enterprises require comparatively little specialized skill. A high degree of occupational specialization and hierarchies of jobs at different skill levels, with varying education, training, and experience requirements enable workers to learn on the job from others. Promoting workers through these internal labor markets is an important way to reward productivity and retain loyalty. Firms are thus able to recruit individuals at entry levels and to provide training after employment.

Employers in the Côte d'Ivoire, Hong Kong, Indonesia, Panama, and Thailand prefer to hire workers with general education and then train them (Grootaert 1988; Hong Kong Productivity Council 1986; Carton and others 1987; Cuervo 1985; and Middleton and others 1990). Similar preferences are reported in the industrial countries that belong to the Organisation for Economic Co-operation and Development (Noah and Eckstein 1988). Indeed, in industrial countries in general, private employers provide a great deal of skill training, although the systems differ substantially. Historical, cultural, and economic conditions have significantly influenced the development of employer training. The

contrasting cases of Germany, Japan, and the United States offer instructive examples.

In Germany four decades of public-private cooperation have established a "dual" system of training, which is notable for smoothing the transition from school to work; cost-sharing among enterprises, the government, and apprentices; and providing high-quality and flexible programs (Schwartz 1986; Prais and Wagner 1983). German employers provide and finance the direct costs of structured apprenticeship training in more than 400 occupations, reaching two-thirds of fifteen- to eighteen-year-olds. Federal and state governments share the costs of off-the-job learning on a weekly or block release basis, as well as extensive regulatory, examination, research, and development services. Not all employers provide training, but those who do train more apprentices than they require with the expectation that as many as 20 percent of the trainees will seek employment elsewhere, often in firms that do not provide training.

The effectiveness of the dual system rests on several related factors. The willingness of firms to take on a large share of the training burden stems from cultural roots extending back to the craft guilds of the middle ages, as well as the fact that apprentice wages average 25 to 40 percent of those of trained workers. Regulations and contracts protect the interests of all parties—employers, the government, and apprentices. Students enter the program with ten years of superior basic education, especially in mathematics. Becoming an enterprise trainer, or "meister," is an upward move for the best qualified skilled workers and technicians and leads to high professional status. Careful regulation and a high level of professional support from government ensure that training meets standards across firms. German employers can accept worker qualifications with confidence, regardless of where they were obtained.

Strong internal labor markets and traditions of lifetime employment are the key to the extensive training provided by large Japanese firms; government support for training is focused principally on smaller enterprises (Inoue 1985). From the employer's perspective, education before employment serves primarily as a screening device. Individuals are hired according to the level of education completed and the quality of the school. Although vocational schools and colleges exist, the relationship between skill training and subsequent occupation is weak. Supported by traditions of lifetime employment in a single company, Japanese firms combine continuous training at all levels with employee evaluation and strong internal labor markets to create a highly trained and flexible work force. With government support through trainee loans, financial assistance to small enterprises, and professional advisory services, virtually all firms provide training. Large firms, which employ about 27 percent of the work force, provide training through company-

owned training institutions, in-house training programs, and external training. In 1981 associations of smaller firms operated 771 training institutions, and, although small firms were less likely than large firms to provide regular and systematic training, they were more likely to subsidize the efforts of individual employees to acquire skills outside of the workplace.

Public support for employer training is less direct in the United States, with efforts at the state and local levels aimed primarily at small enterprises. The reliance of firms on external training has generated a large market for training services (Carnevale and Gainer 1989). In the mid-1980s, for example, U.S. employers spent \$30 billion a year, or about 1 percent of the payroll, on formal training provided by both company trainers and external training organizations. An estimated \$90 to \$180 billion was spent on informal training. A third of formal training was purchased from providers of external training. Of this, a third was from colleges and universities. The balance was purchased from postsecondary technical education institutions, private training companies, and professional, trade, and labor organizations. The dollar value of external training purchased exceeded \$10 billion. Overall, about 55 percent of the work force had formal preemployment training in schools or from employers, and about 35 percent received in-service training to upgrade their skills. Large firms provided more formal training, and more hours of training, than smaller ones. Eighty-three percent of technical professionals and 58 percent of technicians acquired skill qualifications through preemployment training in schools. But for craft, precision production, mechanics, and repair workers, the percentages trained in school were much lower, ranging from 11 to 19 percent. On average, 40 percent of skilled workers were trained after they were employed in formal programs provided or financed by their employer. Of managers, professionals, technical professionals, and technicians, 47 to 63 percent received in-service training; the range for craft and skilled workers was 26 to 36 percent, and their training was much less likely to have been formal or purchased from outside trainers.

The decentralized nature of enterprise training and the marginal role of the federal government in training in the United States is structurally similar to many developing countries. Analysis of the U.S. experience indicates that the amount and type of training provided is related to the size of the firm, the educational level of workers, the management of human resources, and the availability of external training. Large firms with well-developed internal labor markets are able to provide or purchase formal training. Company-provided training complements education: the higher the educational level of the worker, the more likely that worker is to receive training (Mincer 1962). The availability of external training providers enables firms of all sizes to avoid fixed

investment (plant and staff) in specialized training, a fact that is especially important to small firms.

PRIVATE TRAINING. For-profit (proprietary) vocational schools and training centers, as well as training institutions and programs operated by voluntary agencies, provide a significant share of preemployment training in many developing countries. These operate mainly in commercial and business fields, but there are also technical schools of high quality. In some countries schools operated by nongovernmental organizations (NGOs) have developed specialized training programs designed to retrain the unemployed and to help enterprises restructure their work forces.

Governments have often overlooked private training in assessing national capacity for skills formation. It can be a significant oversight. Private schools, regulated and subsidized to varying extent by governments, enroll 46 percent of vocational students in Bangladesh, 62 percent in Indonesia, 43 percent in Thailand at secondary and postsecondary levels, 44 percent in Lesotho, and 38 percent in Colombia (World Bank sector studies; Middleton and others 1990).

Most private vocational schools, colleges, and centers in developing countries offer courses in commercial and business occupations with comparatively low capital costs and for which instructors are in relatively abundant supply. Schools are flexible in operation, providing courses at times convenient to students and typically offering shorter, more intensive courses that reduce the time that students are out of the labor market.

PUBLIC PREEMPLOYMENT TRAINING. Many types of vocational schools and training centers offer publicly supported preemployment training for entry into skilled occupations in the modern sector. The instruction provided in schools is commonly referred to as "vocational education"; that provided in centers is called "vocational training." Higher technical education is most often provided at the postsecondary level in technical colleges, polytechnics, and junior colleges. Vocational education and training facilities are often quite similar.

Schools and training centers differ substantially, however, in the way they are organized and managed. Vocational schools are most often run by ministries of education, operate on a three- or four-year cycle that parallels the academic secondary school cycle, and provide both general and vocational courses, the latter including both theory and workshop practice. Completion of vocational secondary education sometimes qualifies students to enter postsecondary technical education institutions.

Training centers are typically run by ministries of labor or quasi-autonomous training authorities. Training is more intensive and often

of shorter duration than that provided in schools. Typically, less general education is provided. Centers are thus less frequently linked with higher technical education institutions, although these arrangements are found in some countries—for example, Brazil, Chile, Jordan, and Venezuela (Herschbach and others 1985; World Bank 1991b). Some training centers, especially in Latin America, have begun to offer technical education programs.

The term “vocational school” masks considerable diversity of purpose and curricula, contributing to a lack of clarity in policy discussions (Dougherty 1989). Indeed, the variation across countries and institutions defies simple categorization, especially when one recognizes that the differences between the way an institution is intended to operate and how it actually functions are often significant. Institutional design factors do make a difference in cost-effectiveness, but adequate financing and effective management are also important.

The curricula of different kinds of vocational education and training programs for skilled workers exhibit substantial differences in the relative amount of time devoted to occupational preparation and general education courses and in the duration of programs (Box 1-3). Many countries incorporate vocational courses into academic and general secondary programs. In these “diversified curricula,” vocational courses are expected to improve employment chances by developing employable skills, by providing an introduction to practical occupations as the basis for further training, or by changing student attitudes toward blue-collar work. These are essentially “prevocational” outcomes. Unlike most vocational schools, diversified secondary curricula also enable students to prepare for university entrance. In many diversified schools, occupational preparation has a secondary position in the curriculum, with students receiving as few as six hours of vocational instruction a week. In others, specialization increases in higher grades, with vocational courses assuming a more central place in the instructional program. These different approaches have been labeled “model I” and “model II” (Haddad 1987). The structure of model II curricula approaches that of vocational schools more clearly focused on occupational training, the principal difference being the opportunity for entrance into higher education.

Higher technical education is provided in an equally broad range of institutions, most often at the postsecondary level and less often at the secondary level. Like secondary vocational schools, these institutions provide a combination of general and occupationally specific education and training. Students enter after completing either general or vocational secondary education. Access to universities after students complete technical education is usually restricted, by rule or in practice, by entrance examinations.

Box 1-3. Models of Vocational Curricula

Vocational instruction is offered in varying amounts and degrees of intensity in different kinds of training institutions. Schools combine general education with vocational theory and workshop practice, although the amount of time spent in vocational courses varies significantly between diversified secondary schools and true vocational schools. Vocational training centers typically offer little general education (Box Table 1-3).

The relatively small amount of student time spent on vocational subjects in diversified schools contrasts sharply with time allocation in vocational schools and, especially, vocational training centers. The variation in course duration in centers is also seen in the examples from India and the Republic of Korea, where the length of the course is determined by the entry skills of trainees and the nature of the occupation to be learned.

Box Table 1-3. Course Time in Diversified and Vocational Schools and Vocational Training Centers
(percent unless otherwise indicated)

Type of institution	Distribution of course time (percent)			Vocational course	
	General	Vocational Theory	Vocational Practice	Hours per week	Duration (years)
<i>Diversified secondary I</i>					
Kenya	87	4	9	6	3
Zimbabwe	87	0	13	4	4
Turkey	80-87	.. 20-13 ..		4-6	2
<i>Diversified secondary II</i>					
Colombia	68-72	.. 32-28 ..		—	4
Morocco	30-55	.. 70-45 ..		—	3
<i>Vocational secondary</i>					
Indonesia	30	29	41	19	3
Thailand	37	29	34	18	3
<i>Vocational training</i>					
Korea, Republic of	7	23	70	25	0.5-3
India	0	40	60	—	1.5-2
Colombia	0	45	55	35	3

— Not available.

Source: Cumming and others (1985); Haddad (1987); Unesco (1987); Middleton and others (1990); World Bank data.

Retraining unemployed adults (and youth) for new jobs is a significant training challenge in many countries, especially those undergoing rapid and large-scale structural change in the economy, such as is currently the case in Eastern Europe. Training is generally only one of several

elements in government employment programs. Other crucial ingredients include job creation programs, labor market information and counseling services, and income maintenance programs. Various models have been used to deliver training, but most involve the use of existing training capacity through grant and contract arrangements.

Training for the Informal Sectors

RURAL SECTOR. In the rural sector of most developing countries, smallholder farming is the principal source of employment. Agricultural extension services are the main source of technical information and skills development for farmers. In addition, agricultural schools and colleges, run by ministries of education or agriculture, also seek to prepare young people for farm employment, as well as for wage employment in the agricultural sector. Very often, graduates of these preemployment training institutions find work in public agriculture ministries and related organizations.

Especially in Africa, youth brigades have been established to provide larger numbers of young people with the skills needed for rural self-employment, including farming. The programs are residential, are usually, but not always, government operated or subsidized, and feature a combination of training and productive work, the proceeds of which are used to finance training operations. The concept has also been extended to rural secondary schools, many of which follow a philosophy that combines general education with productive work and training in rural skills.

Additionally, NGOs and government agencies operate a wide and disparate array of formal training programs established to train young men and women for rural employment. These include small business development programs, training in cooperatives, and training as part of income generation strategies.

URBAN INFORMAL SECTOR. In West and North Africa and in Latin America, young people in the urban informal sector acquire much of their skill training through traditional apprenticeship in unregulated small firms. The firm owner provides the training, which is financed by the trainee through reduced wages and in some cases payment of a training fee. Traditional apprenticeship provides broad practical training in the technical and business skills needed in a particular trade.

Workers in the urban informal sector also acquire skills through other means. One is wage employment in the modern sector, which enables individuals to accumulate both the skills and the capital needed to establish an informal sector enterprise. Graduates of preemployment vocational education and training institutions also enter the informal

sector when opportunities for wage employment in the modern sector are limited. Finally, governments and NGOs have established a wide variety of small business development and improvement programs to support urban informal sector employment, and many of these have training components.

Summary

The payback to investments in training—to individuals, to employers, and to society—comes when workers use their job skills to complement the other factors essential to enhanced productivity. The fundamental factors of production are land, capital, and labor. But these appear in different forms, and are used in varying ways, in the various sectors of the economy. Training is likely to be more effective when these differences are recognized in the design of training programs and institutions, and this in turn implies that specialization to different skill markets is likely to be important to good training. Thus, training should be quite diverse in form and process, and the variety of training operations found substantiates this assumption. This diversity makes training different from, and much more complex than, basic and academic or general secondary education. Large-scale delivery of standardized training programs is not likely to be viable.

In the modern sector, training must adapt to two key factors. The first is a comparatively high degree of division of labor and specialization. Specialization, which immediately creates the possibility for workers to learn from others with more advanced skills, lies at the heart of the natural advantages of training during employment. And it also goes a long way toward explaining the variety of educational and training backgrounds of workers in the same occupations and jobs.

The second factor is the central role of production technologies and processes. Not only do these offer managers a choice between alternative combinations of capital and skills, but, because they can change rapidly, they frequently alter the nature of the job skills required. Preemployment training institutions seek to link themselves to these characteristics of modern sector employment in two ways.

First, institutions use the formal structure of occupations and procedures of occupational analysis to determine the knowledge and skills that need to be developed. Second, the technology and procedures of the workplace are replicated within the training institution. The greater the degree of job specialization and the more rapid the change in technology, the more difficult and expensive these linking mechanisms become. In these circumstances, there will be pressure on preemployment training to become broader and more general, and the importance of continuing in-service training will increase.

Employment in the rural and urban informal sectors is marked by less division of labor. Work is more labor-intensive and less reliant on capital; technological change is consequently slower. Moreover, the capital, organizational structures, and markets needed for productive use of worker skills that are already in place in modern organizations are much less well developed in the informal sector, suggesting that they must be developed along with worker skills if productivity is to increase. In these circumstances, farmers and urban informal sector workers need, in addition to technical skills, the ability to mobilize capital, organize production, and find markets. And skills alone are unlikely to be sufficient to these tasks.

Modern sector occupational categories based on a high division of labor are largely irrelevant to these kinds of economic activity. The opportunity to learn from workers with more advanced skills is reduced in informal sector employment. But, at the same time, the slower pace of technological change makes it possible for skill development to be an extended and continuous process. These factors are clearly built into the design of agricultural extension programs and are woven firmly into the fabric of traditional apprenticeship. Other forms of training for informal sector employment are likely to be effective to the extent that the need to generate the complementary factors needed for productive use of skills is recognized.

In sum, in all sectors, training in employment has the natural advantage of enabling employees to learn from other workers, using the technology and structures of production already in place. This advantage is most marked in modern sector wage employment but also exists in traditional apprenticeship. By delivering information and training to farmers where they work, agricultural extension is, essentially, a form of on-the-job training. Preemployment training for wage employment must constantly re-create the learning advantages of a changing workplace, including changing patterns of specialization and technology. And training for rural and informal sector self-employment must recognize the need to help individuals mobilize the complementary inputs needed to make skill training pay off.

2. *The Record*

Historically, training for productive employment was a private matter. Individuals acquired skills through apprenticeship or on-the-job training and financed their training through reduced wages during the learning period. The small enterprise sold training as well as goods. Not only blacksmiths and carpenters, but also lawyers, accountants, and physicians learned their trades in this way. The rise of mass production and the creation of large commercial and service organizations led to increasing division of labor. A hierarchically organized work force, in which entry-level jobs required relatively few skills but a high level of industrial discipline, replaced the single craftsman who personally carried out all the tasks associated with a product. In the early part of the twentieth century in the United States, then the largest industrial economy, initial training for these jobs was provided by large enterprises themselves in factory schools. Educational reformers at the time, however, saw vocational preparation as a natural role for an expanding secondary schooling system, and the vocational school was born (Herschbach 1973). Much of Europe followed, although employers often assumed greater responsibility for training.

From these origins it was a short step to the common wisdom of the 1950s and 1960s that governments in developing countries needed to supplement capital investment with investment in occupational skills training. Private sector training capacity in small enterprises was considered inadequate to the immediate task of replacing expatriate skilled workers and technicians in the newly independent nations, where colonial policy had often restricted the access of indigenous populations to skills training.

Economic growth was to be generated through accelerated industrialization, and this in turn would require a supply of skilled workers and technicians. With significant support from international assistance agencies, governments built, equipped, and staffed a variety of institutions to prepare young people for farming and for skilled wage employment, and created or strengthened the vocational and technical training capacity of ministries and state-owned enterprises.

Warning flags regarding vocational education began to go up as early as the mid-1960s. Research on agricultural high schools in West Africa demonstrated the value of academic secondary education in helping students find wage jobs in economies dominated by public employment, as well as the failure of agricultural schools to divert students from aspiring to employment in the modern sector. These phenomena were known collectively as the “vocational school fallacy” (Foster 1965). In many countries economic stagnation, rising levels of public debt, and economic stabilization and adjustment policies severely limited wage employment and government budgets in the 1970s and early 1980s. Vocational graduates could not find jobs, and governments could not afford vocational programs whose average unit costs could be twice those of academic secondary education. The quality of these vocational programs fell, and returns to public investment were low.

Vocational schools became second-choice options for academically able and often economically privileged students in places where there were not enough academic secondary schools to accommodate everyone. Poor employment prospects did little to improve the negative attitudes of these students toward their vocational courses, reducing their motivation to learn. Moreover, relatively few academically disadvantaged and poor students gained access to vocational programs, raising doubts about the equity effects of vocational schooling.

Thus, the common wisdom about the value of preemployment vocational education and training began to change. The evidence on the cost-effectiveness of training has consistently been mixed, however. A lack of clarity in defining the type of training being studied and the variety of objectives to be gained from vocational education and training continue to hamper the debate. Nor is there universal agreement on the theoretical framework that should be used to evaluate human resource investments.

This chapter reviews the available empirical and case study evidence on the effectiveness and costs of various kinds of vocational and technical education and training. More than forty studies employing various methodologies and approaches were evaluated, many of them conducted in the middle and late 1980s (Appendix I). The accumulated weight of evidence suggests three conclusions. First, human capital theory, which emphasizes the contributions of education and training to individual productivity, can provide a fruitful framework for evaluating training investments. Second, skills training does increase worker productivity. And while some training modes—notably training by employers—are more efficient than others, most modes of training can yield good returns when jobs for graduates are available and training is closely linked to employment demand. Third, preemployment training has not been cost-effective when it has been used as a supply policy to stimulate

industrial growth, to reduce youth unemployment, or to address issues of social equity.

Human Capital and Development

It has long been recognized that education and training can play a central role in raising the earnings, job prospects, and life chances of individuals; yet only in the last thirty years have these considerations been formally integrated into the body of mainstream economics. Expenditures on education are now widely seen to constitute a form of investment, augmenting individuals' "human capital" and leading to greater output for society and enhanced earnings for the individual worker. Inherently, individuals differ in productive capacity: the human capital concept emphasizes the possibility of augmenting the productive potential of individuals. While the discussion on human capital that follows is concerned with investments in education and training, the human capital concept is far broader than this, extending beyond skill creation to other sectors such as health care and preventive medicine.

Greater productivity and enhanced earnings do not, of course, encompass all of the benefits stemming from education; for individuals, as for society as a whole, the benefits of education are more widespread and far-ranging. The value of education as an investment in future work-related benefits extends not only to higher income but also to utilities such as status, job security, and other income in kind. Education also can be viewed both as a consumer good, in that students may derive satisfaction, even enjoyment, from study, and as a durable consumer good in that it confers future utilities (the enjoyment of reading books, for example) over the lifetime of the educated individuals. More broadly, education has a positive effect on the quality of parenthood, on citizenship, and on health, benefits that are not confined to the individuals directly concerned, but extend more widely to family and to society at large.

This book focuses on the human capital dimension, in which education is seen as a process that improves an individual's skills and abilities, and therefore his or her productivity, in the workplace. Thus, to the extent that it raises the skills of workers, and therefore productivity, greater educational attainment is expected to increase an economy's output of goods and services and, more generally, to contribute to the process of economic development.

Formation of human capital not only leads to higher worker productivity, but also contributes to economic development through its positive effects on the rate that workers are absorbed into the economy and their job mobility, that is, their ability to move into higher-productivity sectors and occupations. Investment in human capital also has positive effects on the supply of entrepreneurial activity, and, perhaps most important,

technological innovation, through workers' enhanced ability to apply and adapt existing knowledge and processes as well as new discoveries.

The empirical research of the past three decades provides reasonably strong evidence to support the human capital perspective. This research has taken three main forms: growth accounting studies, productivity studies, and studies of rates of return.

Growth Accounting

The seminal works of Schultz and Denison in the 1960s led to a series of growth accounting studies that attempted to account for the unexplained "residual" growth in national output in various Western economies (Schultz 1961; Denison 1962, 1967). Earlier studies that had compared the growth of the two basic inputs in the economy, capital and labor, with changes in national output over time often succeeded in accounting for only about a half of the measured growth in output.

Many attempts have been made to account for the large unexplained residual, which has been called a "measure of our ignorance" (Abramovitz 1962). A central role was ascribed to factors that enhanced the productivity of capital and labor inputs, and education was identified as the most important of these. Scholars estimated the effect on national output of upgrading the educational levels of the labor force by assuming that the earnings differential associated with a given level of education was an appropriate proxy for the increased output actually produced by a worker with that level of education, an assumption that has not escaped criticism from skeptics.

A survey of growth accounting studies covering twenty-nine countries found estimates of education's contribution to explaining economic growth rates in developing countries ranging from less than 1 percent in Mexico to as much as 23 percent in Ghana (Psacharopoulos 1984). Among the developing countries covered by the studies, education appears to have been a significant factor in Africa and Asia, where educational upgrading explained from 10.5 to 23.2 percent of economic growth. In Latin American countries (with the exception of Argentina), the contribution of education to explaining growth was much less, from 0.8 to 6.5 percent.

Subsequent studies using econometric methods to relate inputs to outputs have corroborated the importance of education to economic growth. One study found that, on average, an increase in the literacy rate of 20 percentage points was associated with a 0.5 percent higher economic growth rate (Hicks 1980), while a second review found that the average response of economic growth to increases in basic literacy was twice as high in Africa as in the larger sample of all developing countries (Wheeler 1980).

Productivity Studies

Critics of growth accounting models argue that their validity depends upon the critical assumption used in the computations, namely, that earnings differentials are an accurate measure of increased productivity. This criticism is weakened by the findings of productivity studies that bypass income altogether; instead, these studies analyze the relationship between educational attainment and physical output by estimating the contribution of additional education to the physical productivity of workers and farmers. A widely quoted study, which summarized more than thirty studies on the relationship between education and agricultural productivity, concluded that, on average, productivity increased by 8.7 percent if a farmer had finished four years of primary schooling (Jamison and Lau 1982). A more recent aggregative study estimated that every 1 percent increase in the number of agricultural college graduates raises agricultural output by about 10 percent (Lau and Yotopoulos 1989).

Several productivity studies in the nonagricultural sector provide similar findings (Fuller 1976; Min 1987). Fuller's research in two electrical machinery factories in India shows that education and training have a positive effect on output, particularly when that training is provided by the employer. Min's study of academically and vocationally educated workers in a Chinese automobile factory also shows a small, but significant, increase in productivity associated with more education; those with vocational schooling were 6 to 11 percent more productive than those with academic schooling.

Rates of Return

A third category of generally supportive empirical evidence derives from benefit-cost studies. Adopting the same discounted cash-flow techniques that are now standard in industry for appraising physical investment projects, a rate of return to society may be estimated on investments in education. Rate-of-return analysis systematically compares the societal costs of providing various types and levels of education with the resulting benefits in future years. Costs are measured as the value of goods and services that must be withdrawn from other uses to provide educational facilities. These are compared with the future increase of output resulting from such educational expenditures, for which the earnings differentials of individuals who have benefited from additional education are a proxy measure.

Numerous rates-of-return analyses are now available for many countries and at different points in time. The evidence, overall, suggests that the economic payoff to education is high and remains sizable with

economic growth, even as educational systems expand the supply of educated workers. Psacharopoulos (1988) brings together estimates for some sixty countries, both industrial and developing. He shows societal rates of return on education in developing countries to be at least as high as, and generally exceeding, those on physical capital investment.¹ Rates-of-return analysis applied to education should not be regarded as a precision tool, given the many weaknesses of the technique documented in the literature;² however, it is a valuable broad-brush measure.

The Role of Screening

In recent years several economists, including some of the most distinguished in the profession, have advanced a "screening" hypothesis that runs counter to the mainstream human capital approach. This perspective acknowledges a role for cognitive development and psychomotor skills training but argues that empirical estimates of returns to schooling inflate the payoff to this process (see, for example, Phelps 1972, Taubman and Wales 1973, and Stiglitz 1975). Part of the value of education to employers lies in its ability to provide information to employers about individual aptitudes and behavioral characteristics. These innate aptitudes and behavioral traits are assumed to be important determinants of labor productivity. Thus, it is argued, employers do favor more educated individuals (and pay them higher salaries) but not solely, or even primarily, because education enhances their productivity. Instead, such people are desired as employees because employers believe that individuals who attain higher levels of education are inherently more productive.

Although the available evidence confirms the existence of some degree of screening, it nevertheless points to the importance of education's productivity-enhancing effects. In many ways, the challenges to the human capital perspective have expanded and qualified earlier, simpler explanations of the mechanisms by which education influences economic activity and individual and societal welfare. The general tone of the research findings is supportive of the human capital perspective—no doubt the process of cognitive development and the formation of psychomotor skills *do* constitute an important part of the role of education—but the successful completion of the requisite education acts as a signal to prospective employers of the presence or enhancement of the desired attitudes.

If the accumulating evidence does point to a positive influence of education on national output, what are the channels through which education transmits these effects on productivity and development? Many attempts have been made to address this issue, which is also posed in a recent paper, by Lau, Jamison, and Louat (1990).

They argue that education does provide relevant knowledge and abilities to undertake standard tasks required by the workplace. Yet a

major source of resistance to the investment approach to education is the tenuous connection in practice between knowledge imparted within the schooling system and the actual skills and abilities required and utilized by the world of work. Although certain jobs require high levels of psychomotor or cognitive skills (extreme examples are, respectively, brain surgeons and lawyers), these are a minority in any economy. Most jobs, particularly in a modernizing country, require a degree of flexibility and a capacity to learn in conjunction with doing, rather than the possession of a substantial stock of facts, concepts, and skills. Education enables individuals to learn to perform new tasks and to absorb new information: the evidence showing a positive correlation between educational background of workers and the amount of training received as employees (Mincer 1962), does suggest that formal schooling complements on-the-job training (and learning).

Lau, Jamison, and Louat also argue that education enhances the abilities of individuals to communicate and coordinate activities and that it facilitates adjustment to change, enhancing the probability that workers and employers will adopt new technologies and practices. Many of the ways in which education, particularly at lower levels, contributes to output growth are benefits that are not captured directly in higher earnings by more educated individuals; they represent an "externality" benefit to society as a whole, which, though not captured in the traditional rates-of-return measures, evidently constitutes part of the unexplained residual in growth accounting.

Training and Productivity Growth

Assessing the contribution of skills training to economic growth is more complicated than determining the contribution of general education, where outcomes can be analyzed for reasonably homogeneous groups, such as primary school graduates. Vocational and technical education and training (VET) serve population groups of varying ages and educational achievement and very different occupational segments of the labor market.

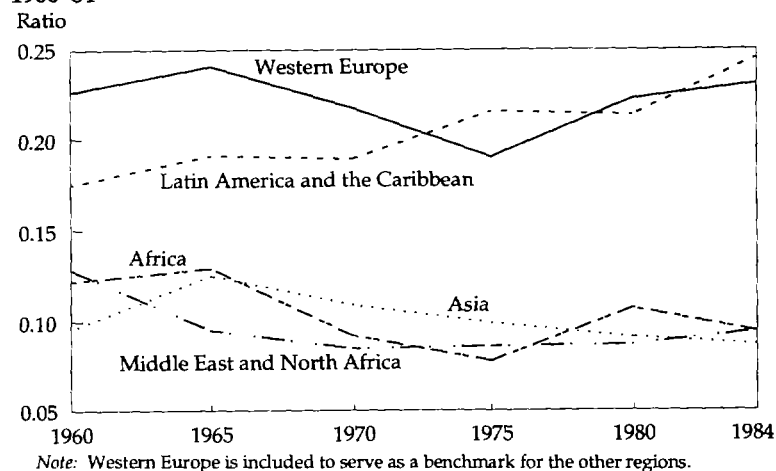
No growth accounting studies have successfully identified the contribution of skills training. A central problem is the lack of statistics. The only fairly comprehensive data available are annual vocational school enrollment figures published by Unesco (the United Nations Educational, Scientific, and Cultural Organization) for most countries for recent decades; for some countries, the census of population offers information on the number of adults with vocational schooling. For other training modes, data are sketchy. Enrollment figures for public sector training centers are published for a few countries but are virtually nonexistent for training in proprietary institutions and by employers.

Box 2-1. Enrollment in Secondary Vocational Education

In real numbers enrollment in secondary vocational education has increased in all regions and across all income levels. As a share of all secondary enrollments, however, the proportion of students enrolled in vocational schools declined between 1960 and 1984. To show enrollment trends, Box Figure 2-1A shows unweighted vocational education enrollment ratios by region for sixty-five countries. To compute the average unweighted vocational education enrollment ratio for a region or a country group by income level, a simple average of individual vocational enrollment ratios is taken for the countries of interest. Thus, the experience of each country, regardless of size, is accorded equal weight in the overall enrollment ratio average. These ratios, however, mask the considerable differences that exist between countries (see Enrollment Ratios in Appendix II, Table 1). Decreasing vocational enrollment seems to be the prevalent pattern in most countries. Eastern Europe (not shown) and Latin America appear to be the only developing regions where vocational education enrollment is not decreasing; in Latin America the ratio of vocational to all secondary enrollment is more than double that in other developing country regions.

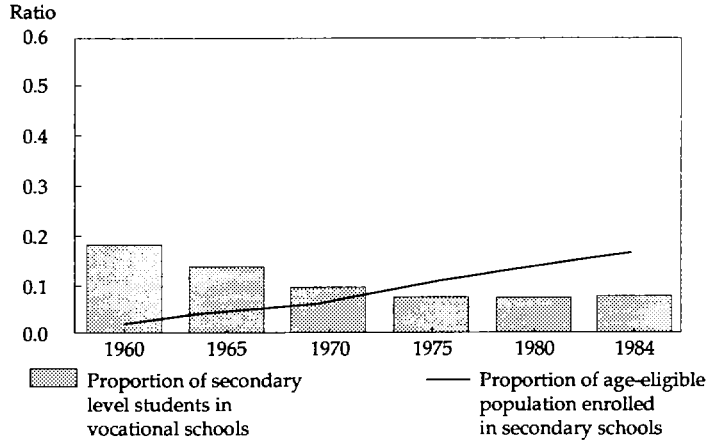
Trends over the period differ markedly in low- and middle-income countries (Box Figures 2-1B and 2-1C). In low-income countries, total secondary school enrollment (as a proportion of the population of secondary school age) rose from 3 to about 20 percent, while the vocational schooling ratio declined 19 percent, leveling off to 8 percent. Thus, the growth, albeit slow, in secondary schooling in low-income countries has

Box Figure 2-1A. Vocational Education Enrollment Ratio by Region, 1960-84

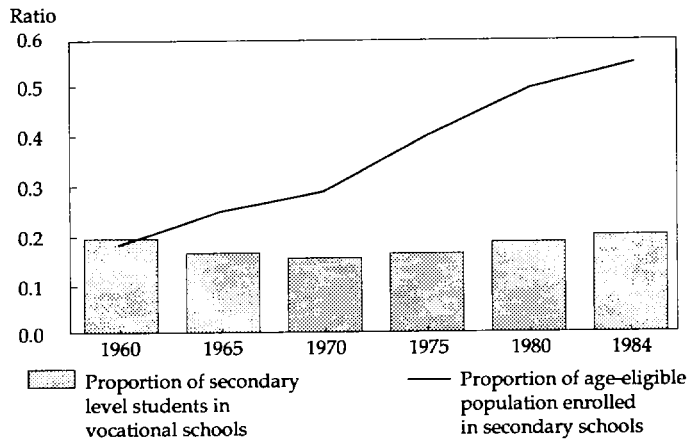


occurred primarily in the academic-general education streams. The pattern is different for the middle-income countries group. Here, the share of total secondary school enrollments in vocational schools has remained fairly constant, hovering at around 20 percent, while the overall secondary school enrollment ratio has risen dramatically, from 18 to 55 percent. Overall, then, vocational schooling in middle-income countries has expanded at about the same rate as the secondary school system as a whole.

Box Figure 2-1B. Enrollment in Low-Income Countries, 1960-84



Box Figure 2-1C. Enrollment in Middle-Income Countries, 1960-84



Note: Eastern Europe was excluded because large VET enrollments in these countries would have skewed the data.

Source: Unesco (1987).

Given the lacuna in the data, it is not surprising that attempts to examine VET's contribution to economic growth have been unsuccessful. Over the past thirty years, the level of vocational school enrollments has risen in most countries, although much less than academic enrollments (Box 2-1). Examining these statistics, Benavot (1983) failed to find any statistical relationship between changes in vocational school enrollments and economic growth indices across countries.

However, this study and others of its genre (such as Tilak 1988) have been inconclusive because national vocational school enrollment statistics are not indicative of the amount of training provided in a country. Indeed, the proportion of total VET provided by each training mode differs across countries. Comparisons between vocational schools and publicly funded training centers in selected countries display considerable differences in the relative importance of these forms of provision (Table 2-1). In Brazil (and many other Latin American countries), for example, vocational training institutes enroll far more students than vocational schools, while the situation is just the reverse in most Asian and African countries.

Evidence from rates-of-return studies is more positive. A recent examination of several studies for developing countries concludes that social rates of return were "nearly always acceptably high" compared with alternative investment choices (Metcalf 1985). However, favorable economic background conditions—particularly employment opportunities—must be present for success. Where economic expansion has been

Table 2-1. Enrollment in Vocational Schools and Training Centers, Selected Countries (percent)

<i>Country (year)</i>	<i>Vocational schools</i>	<i>Training centers</i>
Brazil (1985)	10.9	89.1
Cameroon (1988)	88.1	11.9
Colombia (1988)	61.5 ^a	38.5 ^b
Jordan (1986)	84.6	15.4
Korea, Republic of (1987)	97.5	2.5
Morocco (1985)	18.6	81.4
Thailand (1986)	79.9	20.1
Togo (1987)	95.7	4.3
Tunisia (1986)	84.4	15.6
Turkey (1985)	47.5	52.5 ^c
Zimbabwe (1988)	95.5	4.5

a. Includes diversified secondary schools.

b. Data is for 1987 and includes only those students participating in long SENA courses.

c. Includes part-time and adult training.

Source: World Bank data.

Box 2-2. Job Availability and the Effectiveness of Training

For preemployment vocational education or training to pay off for individuals and for governments, skilled jobs must be available. Moreover, because of the length and costs of training programs oriented to the modern sector, the best payoff is likely to come in wage employment. Where jobs are not available, the returns to training investments are unsatisfactorily low.

From 1981 to 1986, the economy of Togo was in recession, with gross domestic product (GDP) shrinking an average of 1.1 percent a year. After experiencing 7 percent annual growth in the first half of the 1980s, the economy of Cameroon suffered a sharp recession in 1987, with GDP falling by 2.7 percent. Tracer studies were conducted in 1986 for graduates of secondary vocational schools in both countries. In Cameroon 77 percent of graduates had sought employment. Of these, 27 percent had found wage jobs, 24 percent were working in the informal sector, and 49 percent were unemployed. In Togo 84 percent of graduates sought work; of these, 30 percent found wage jobs, 42 percent were working in the informal sector, and 28 percent were unemployed. Social rates of return to training were 7 and 4 percent, respectively. The earlier and longer recession in Togo helps explain the greater willingness of graduates to work in the informal sector at lower wages, rather than wait for a job in the formal sector.

Changing economic conditions can rapidly improve returns to pre-employment training. Beginning in 1980, the government of Thailand instituted vigorous policies to open the economy to competition and to expand exports. By the mid-1980s, the economy began to expand rapidly, led by growth in manufacturing and exports. Evaluations of secondary education in the early 1970s had found higher returns to academic schooling than to vocational programs. In the mid-1980s, a third of those who had graduated from postsecondary vocational institutions were unable to find employment a year after graduation. But by 1989, strong and consistent economic growth changed these patterns significantly. There were more jobs than there were students who had graduated from all secondary schools, and the rates of return to vocational schooling were 12 percent, double those of academic secondary education.

Sources: Paul (1990); Middleton and others (1990); World Bank (1990d).

sustained, or where modern sector employment is large relative to the output of postprimary education, VET graduates have been more readily absorbed into the labor market (Box 2-2). The most notable case is the Republic of Korea, where vocational schools and labor training centers achieved placement rates in excess of 90 percent in an economy that grew on an average of 7 percent a year from 1973 to 1984 (Adams 1989).

The studies show that rates of return on all forms of training can be substantial. In Malaysia, enterprise and preemployment training for manufacturing jobs have produced social rates of return of 20 percent (Cohen 1985). The preemployment, center-based training offered by the national training agencies in Brazil and Colombia have produced similarly high rates of return. Even though economic growth has been erratic in those countries, modern sector employment is large relative to the numbers of people who go through the national training systems (de Moura Castro 1979; Jimenez, Kugler, and Horn 1986; Puryear 1979).

These effects are not restricted to middle-income countries. In the low-income country of Botswana, the economy has been expanding at an average of nearly 9 percent for the past two decades, with industrial growth averaging 22 percent. A 1989 study of the country's small pre-employment training system (400 graduates a year) found returns of 36 percent to preemployment training in craft and technical trades and 26 percent to informal training in the youth brigades (Hinchliffe 1990). In India on-the-job and organized training by employers increased worker productivity by 6 to 7 percent.

Reasonable economic returns can also be found where the training system is sufficiently flexible to adjust the volume and composition of training to meet fluctuations in the economy. This is the case in Malawi, where a flexible system for enrollment planning leads to high placement rates for apprentices despite stagnation in modern sector wage employment (World Bank 1990f).

The point should not be pressed too far. VET investments are not always sound in practice. Indeed, profitability differs significantly from country to country and across training modes and over time within a given country. Much of this variation can be explained by the types of training modes under scrutiny (and how well they are linked to the labor market), the nature of the economic environment in which they operate, and the particular objectives to which training is addressed.

Although the main thrust of the evaluation literature supports VET, two major themes with important implications for policy have attracted some attention: these are the debate over the issue of the economic effectiveness or "external efficiency" of different training modes and the relative efficacy of secondary vocational and general schools in preparing individuals for employment.

Comparison of Training Modes

The results of the research on training modes must be used with caution. First, most of the economic evaluations of training can be challenged on technical grounds.³ Second, it is often difficult to disentangle issues of institutional design from issues of implementation in reaching conclu-

sions about economic effectiveness. Did the school (or center or enterprise training scheme) fail, or succeed, because of inherent characteristics or simply because of poor (or superior) financing, implementation, or management? Third, as shown in Chapter 3, the external efficiency of training, regardless of mode, is heavily determined by the size of the training system relative to demand, and by economic policy distortions. Finally, the great diversity of content and level of training attempted across institutions with the same label makes comparisons risky.

Nevertheless, enough evidence has accumulated to permit judgments to be reached.⁴ Overall, any mode of training for industrial and commercial occupations can be cost-effective when the institution is well linked to employers, adequately financed, efficiently organized, and sufficiently autonomous to adjust the size and content of courses to meet the quantitative and qualitative dimensions of employment demand. At the same time, enterprise training and skills training centers have been shown to be more cost-effective than vocational schooling.⁵

EMPLOYER TRAINING. A study of turners, millers, and grinders in a modern Indian factory compared the effect on job performance of three alternative training modes: casual on-the-job training, organized in-firm training, and preemployment training in government training institutes. Job performance was about 10 percent higher for those formally and informally trained in-plant than for those trained in training institutes, where the costs were considerably higher. Workers with high levels of general education, trained informally on the job had the largest productivity gains (Fuller 1976).

A Korean study of electric welders in shipbuilding found formal in-plant training to yield a social rate of return of 28 percent, compared with 17 percent for preemployment training in centers and 11 percent for vocational schools; these differences are largely explained by relatively low in-plant training costs (Lee 1985). In Israel a long-term follow-up study of skilled workers failed to show any significant differences in the earnings of graduates of alternative training modes—including vocational secondary schools, factory-based industrial schools, and traditional apprenticeship. Lower training costs rendered apprenticeship the more cost-effective mode, particularly in relation to vocational schooling (Ziderman 1989). In Malaysia company training has been found to yield only marginally higher returns (21 percent) than preemployment training centers (19 percent) (Cohen 1985).

In many countries, particularly lower-income ones, enterprise training capacity is not always strong enough to justify extensive on-the-job training. Where conditions are favorable, however, enterprise-based training can yield high returns at low cost.

Vocational and General Secondary Schooling

A large empirical literature has developed over the last twenty-five years arguing strongly against vocational schooling on cost-benefit grounds. This literature, which compares labor market outcomes in earnings and employment of vocational schooling with general schooling, mainly at the secondary level, has been extensively reviewed by Zymelman (1976), Psacharopoulos (1987a), and Tilak (1988).

A "new wave" of research has qualified the established orthodoxy. These recent studies have shown that when employment opportunities are available or growing and a match is made between training and available jobs, vocational schooling has produced higher productivity (China), wages (Brazil and Hong Kong), and present values of investment (Israel) than general education does (Min and Tsang 1990; Arriagada and Ziderman 1992; Chung 1990; and Neuman and Ziderman 1991, respectively). Social rates of return to secondary vocational education in Thailand, on average and across disciplines, exceed those of general education—11.4 percent compared with 6.7 percent (World Bank 1990d).

More frequently, however, favorable conditions are not present, and net returns to vocational schooling are comparatively low. Examples are found in low-income countries where training capacity exceeds employment demand and where labor market factors operate to reduce external efficiency—the match of training with jobs. Studies in Kenya (Lauglo and Närman 1988); Niger (Mingat, Jarousse, and Richard 1989); Benin (Rasera 1988); and Tanzania (Psacharopoulos and Loxley 1985) indicate low returns under conditions where a third to a half of vocational school graduates cannot find employment for as much as three years, on average.

Other evidence yields mixed results. A number of studies show advantages to general secondary education; graduates of general and vocational schools earn about the same, but the costs of vocational schooling are much higher. Two such studies are set in Côte d'Ivoire (Grootaert 1988) and Indonesia (Clark 1983).

DIVERSIFIED SCHOOLS. Diversified schools combine some occupational courses in an otherwise academic curriculum. The most thorough study of these schools to date was conducted by Psacharopoulos and Loxley (1985), who examined the efficacy of diversified education in Tanzania and Colombia. Choosing two different kinds of diversified systems, the study compared the costs and outcomes of diversified education with those of conventional academic and purely vocational secondary schooling in terms of what was learned and what was later accomplished either in economic or education activities.

In most cases, diversified education did not provide students with any significant advantage. Students from diversified schools were no more likely than students from academic or vocational schools to find employment upon completion of school or to obtain higher paying positions. Students from diversified schools were as likely to go to university as to go to work as were graduates from academic schools and often studied subjects there that had no relation to the diversified courses taken in secondary school. The data also revealed that because of the need for special equipment and specific training for teachers, diversification was the most expensive form of secondary school in both countries. It also proved to be a much more difficult program to implement.

Studies and evaluations in other countries corroborate the findings in Tanzania and Colombia. Evaluations in Kenya showed little labor market advantage for students who took industrial education courses offered in academic, lower secondary schools. Nor did these students in Kenya enter self-employment (Box 2-3). An analysis of the record of diversified schools in Trinidad and Tobago came to a similar conclusion (Chin-Aleong 1988). In Sri Lanka three different types of diversification have been attempted since independence, all with disappointing results (Wijemanna 1986).

The Record of Training as a Supply Policy

From first principles, it might seem that the overall contribution of VET to productivity and economic growth would exceed that of general education, about which so much more is known. The contribution of general education is largely diffuse and often indirect; much of this contribution lies beyond enhanced self-productivity and many of the benefits are not captured directly in terms of enhanced earnings. In contrast, VET is, by definition, more narrowly and directly oriented toward the world of work, a factor that might be expected to enhance general productivity. It is this very specificity, however, that may militate against high productivity gains, since these are only likely to be forthcoming when the skills taught are closely matched to the skill requirements of particular jobs. Such matches may be difficult to achieve in practice. VET offered in institutions distant from the world of work, for example, or with poor links to the labor market, may not match the available jobs.

Moreover, the recognition that VET is unlikely to provide as many external benefits as general education means that VET is effective only if it achieves direct productivity gains through relevant employment. Instead of focusing on productivity enhancement, however, governments (and donor agencies) have promoted VET as a means of achieving a range of social objectives. These efforts have been largely unsuccessful,

Box 2-3. *Diversifying Elite Secondary Schools in Kenya*

With significant support from international donors, the government of Kenya in the 1980s diversified the curricula of thirty-three elite, urban, lower secondary schools by adding workshop-based courses in wood and metal technology, power mechanics, and electrical technology in the 1980s. Students were required to take six periods of workshop training (out of forty-five total periods) in the first two years and could elect to take an additional six periods in the second two years, specializing in one subject. These industrial education courses were popular with parents and students, who considered them to be "prevocational" education that would aid students in finding a job.

Recurrent costs for industrial education were twice those for academic subjects, and workshop capital costs were five times those of regular classrooms. The equipment for a workshop was nine times as costly as the equipment for a science laboratory.

Tracer studies were carried out for a sample of about 1,000 students drawn from three groups: students with two years and four years of industrial education and a control group from schools that did not offer the industrial education. A year after graduation, very little difference was found in the activities of the three groups. Most students were still at school or in training; of the rest 40 to 44 percent were looking for opportunities for work or schooling, and only 5 to 7 percent were employed. Of the latter group, only twenty-two respondents were in jobs described in the survey as "technical or practical." Only six were self-employed.

A further follow-up two years later again found little difference among the three groups. Twenty-six to 27 percent were still in school or training, 34 to 41 percent were looking for work or education, while 33 to 40 percent were employed. Of those working, less than a fifth were in technical or practical jobs. Although it is possible to detect a somewhat greater tendency for former industrial education students to work in these jobs, industrial education was not a major factor in finding employment.

In an economy where there were as many as six new entrants into the labor market for every new job, industrial education courses conferred no advantage for employment.

Sources: Lauglo (1985); Cumming (1985, 1988); Lauglo and Närman (1988); Närman (1988a).

however, because they have been based on mistaken assumptions about the nature of employment, the demand for skills, and the capabilities of formal training institutions to bring about social change.

The argument that skills enhance productivity provides the firmest justification for training, and the record shows that training does increase

productivity, as measured directly and in terms of increased earnings. Advocates, however, also have expected VET, particularly preemployment vocational schooling, to achieve additional, primarily social goals. These objectives have included creating a reserve of trained workers to stimulate growth, improving the employability of the disadvantaged, providing a path to wage employment for women, and diverting young people from aspirations for white-collar employment and higher education. The record on whether VET has fulfilled these objectives is decidedly mixed.

Creating a Reserve of Trained Workers

A major theme of this chapter is that skills training will not lead to employment and productivity growth if job opportunities are not expanding. A supply of skilled labor does not automatically create its own demand. But can a readily available pool of skilled workers attract new capital investment and thus indirectly create increased employment? What is the efficacy of training skilled workers in anticipation of demand?

Although the presence of skilled labor is a factor, it is not necessarily central to investment decisions. Other concerns such as relative labor costs and the overall macroeconomic environment may be equally or more important. Much new investment in developing countries is in low-skilled, labor-intensive industries such as textiles and electronics assembly.

Most of the skills needed to complement new investment can be acquired quickly. Where levels of basic education are adequate, enterprise owners, sometimes with the assistance of national training authorities, can readily develop in their employees the skills needed in a new manufacturing facility while it is under construction. Among the many examples are pharmaceutical and fertilizer plants in Nigeria, a shoe factory in Mauritius, and metals industries in Singapore (Behrman and Wallender 1976; Eng Fong and Salome 1986). If preemployment training is needed, and if training agencies are sufficiently flexible, entry-level occupational skills can be created in intensive programs of a year or less.

"Training for the shelf," even when feasible, may not be effective. Skills, if not used, deteriorate over time. They may also become obsolete, as skill requirements for various occupations change, especially where technologies are evolving. The longer trained workers wait in reserve, the more likely it is that they will need retraining if hired, raising the total cost of training.

Nonetheless, some capital investments in strategic growth areas require higher technical skills that take longer to develop. For example, improving productivity in manufacturing through the introduction of

computer-aided design, numerically controlled machine tools, and flexible systems of production management can necessitate a range of higher skills such as management, computer programming, statistical quality control, and electronics maintenance. Or, where the growth strategy requires a larger financial services sector, accounting and computer operation may be strategic occupations.

The absence of such skills can pose barriers to growth, but the number of skilled workers required is usually small relative to the overall size of the work force; an exception might occur in economies experiencing rapid structural adjustment. Research in Asia shows that firms can upgrade current employees in many of these skills; however, external training is often justifiable when demand for skills in new occupations is large and scale economies can be achieved. Eastern European countries, for example, urgently need accountants as they move rapidly from command to market economies. In general, however, training in anticipation of demand has not proved to be a sound basis for skill development.

Employment Access for Youth

Although skills acquisition can raise the productive level of workers who are already employed, a major justification for VET has been the notion that acquisition of skills can improve the chances that the unemployed will find stable wage employment. As applied to economically and academically disadvantaged young people, the underlying assumption here is that vocational skills are a more appropriate means of improving employability than is general education. A complementary argument, to be developed later, is that VET improves attitudes toward skilled, manual work, and thus diverts at least some young people from seeking the white-collar jobs that are in increasingly short supply. Whatever additional value the possession of vocational skills and new attitudes may have, however, their productive value can be put into effect only where employment opportunities are available. In many countries, it is the absence of jobs, rather than a lack of appropriate skills, that forms the main barrier to productive employment of the unemployed.

Providing vocational and educational training is often posited as a cure for the large-scale unemployment of young people that is a widespread and persistent social and economic problem in developing countries.⁶ The logic assumes that young people cannot find employment because they do not possess the specialized skills required either by employers or for successful self-employment. Occupational training, it is reasoned, would therefore enable some significant proportion to achieve employment. This logic, however, fails to take into account the

dynamics of different markets for skills in the modern, urban informal, and rural sectors.

MODERN SECTOR EMPLOYMENT. Training as a solution to youth unemployment has not proven viable for two main reasons. First, in the absence of job opportunities, the acquisition of labor market skills does not lead to enhanced employment: vocational education and training, alone, does not provide jobs. Second, even where an expanding modern sector does offer employment opportunities, most entry-level jobs do not require significant formal training before employment.

The principal causes of youth unemployment are demographic and macroeconomic, not lack of skills. In many countries, wage employment in the modern sector is small compared with the number of people with postprimary education and training who are entering the labor market, and the number of wage jobs is growing very slowly. In many countries, there are four or five labor-market entrants (with postprimary education and training) for every vacancy; in small countries, there can be ten or more such labor-force entrants for every new job vacancy (Table 2-2). In these conditions, the chances of the newly trained finding employment are slim.

In most countries, moreover, only a fraction of the employed work force requires specific vocational and technical skills. In 1980, for example, only 15 percent of Turkey's total paid labor force of 18 million held skilled and technical positions. Even in technologically advanced nations, most entry-level jobs require very little training, and most of that is acquired after employment.⁷ Many employers in developing countries prefer to hire and train individuals with a good record of achievement in general secondary education.

Table 2-2. Ratio of Educated Labor Market Entrants to Jobs Created, Selected Countries, 1988

<i>Country</i>	<i>Ratio</i>
Niger	*
Sri Lanka	*
Hungary	*
Colombia	*
Togo	12:1
Mexico	12:1
Zimbabwe	12:1
Benin	11:1
Chile	5:1
Turkey	3:1
Thailand	2:1

* Net reduction in wage employment.

Source: Appendix II, Table 2.

Educational planners have tended to overestimate the efficacy of training for entry-level employment in the modern sector, largely because they assume that skilled workers needed for replacement and employment expansion must be trained in formal institutions (see Chapter 5). This assumption may have some validity in low-income countries as planned development gets under way. But for most countries formal preemployment training is only one of many paths to skilled employment, and often less important quantitatively than training sponsored or provided by employers. Indeed, the acquisition of skills is a continuous process, and individuals take advantage of a wide variety of training sources over their careers.

The diversity and dynamic nature of training markets is one of the least understood aspects of VET in developing countries. Hiring of trained workers may simply displace others with lower (or less recent) qualifications; thus, although productivity may increase as the qualification level of the employed rises, overall employment is unaffected (for labor market displacement effects, see Ziderman 1975, 1977, 1978). Indeed, in many countries, the large pool of educated unemployed, including those with college degrees, and ensuing “credentialism”—the inflation of formal educational requirements for jobs—pose a real threat to the employment chances of trained skilled workers.

Even where workers must be skilled to enter the job, the evidence shows that diversified schools are no more cost-effective than academic secondary education in placing students in wage employment. The evidence for vocational schools is mixed but generally not favorable. Time spent learning narrow vocational skills at the expense of conceptual and communication skills may reduce student flexibility and trainability over the course of a career. Weakness in language, mathematics, and other basic skills can considerably reduce chances of employment. This is especially true where firms provide training, which must be built on a solid foundation of good general education.

INFORMAL SECTOR EMPLOYMENT. If the modern sector is growing too slowly to absorb unemployed youth, many seek work in the informal sector. Can training help? Craft skills are important in some small informal enterprises, but much less specialization of tasks is required than in the modern sector. Although the sector may be able to absorb many more workers than the modern sector can, the largest share of informal sector activity is in such occupations as petty trade and simple food processing, with low requirements for specialized skills or pre-employment training.

Available evidence does suggest that young people with vocational preparation enter the informal sector when opportunities for wage

employment are limited, although this may come after an extended search for a wage job. This is clearly a second-best option in comparison with stable wage employment. Moreover, entry is easiest where skill requirements are lowest. In the upper-tier informal sector firms where skills are important to productivity, the potential for labor absorption is often limited by market saturation. Moreover, experience shows that an extended period of traditional apprenticeship in such firms is often needed to complement skills learned in formal institutions. Nevertheless, the informal sector can provide employment for youth. The potential contributions of training will be discussed in some detail in Chapters 6 and 8.

Overall, severe doubts arise concerning the potential contribution of preemployment training to the alleviation of widescale youth, as well as adult, unemployment in developing countries. In the absence of complementary employment policies, large-scale formal VET has not succeeded in improving the employability of poor youth. Yet programs closely tailored to employment opportunities can be effective, although the contribution in terms of the numbers trained and placed may be small. Policies to counter youth unemployment in developing countries should emphasize longer-term strategies that focus on population policy to reduce the rate of increase in the youth labor force and the reform of macroeconomic policy and labor market regulatory policy to improve and broaden the employment framework within which vocational training takes place (Box 2-4).

EMPLOYMENT TRAINING. Under conditions of high unemployment, postschool training programs for young people are generally more effective when they are part of job creation policies and programs. Industrial countries have instituted comprehensive job training programs in an attempt to deal with massive youth unemployment. Yet, even in those industrial countries where training has been complemented by other labor market policies, such as employment subsidies, stipends, intensive vocational counseling, and labor market matching activities, results have been mixed. Although programs in Sweden have succeeded in retraining and placing displaced workers, efforts in Great Britain have fared less well. In Northern Ireland, for example, people who spent a year acquiring vocational training and work experience in the Youth Training Service did not have significantly greater success finding a job than people who did not take the course. The principal obstacle to employability was the low level of basic education (Daws 1987). The record, overall, of these costly programs suggests caution in introducing them in developing countries, especially if professional and administrative structures are weak and levels of general education are low.

Box 2-4. *Employment Strategies in Tunisia*

Tunisia in the mid-1980s faced high levels of official unemployment, running at about 15 percent. High population growth combined with stagnant net emigration, a skewed age pyramid, and rapidly rising female participation in the labor force, rendered it difficult to match labor supply with job creation. In 1982-88, employment grew 2.7 percent a year, while the labor force grew 3.2 percent a year. Aware of the seriousness of the unemployment problem, the government of Tunisia has initiated a number of measures to encourage the creation of employment opportunities, especially for youth.

Tunisia's strategy for promoting employment consists of four general approaches. The first is an activist population policy: Tunisia has made a strong commitment to reducing population growth and will continue to do so through family planning activities and measures that encourage smaller families. Part of the success of these policies will be measured by the supply of labor at the beginning of the next century.

The second approach is an effort to remove macroeconomic distortions that have increased the cost of labor relative to capital. Liberalization of the economy will promote industries that are more labor intensive (such as export-oriented enterprises and tourism). Real interest rates have been allowed to rise, increasing the cost of capital, and the government is trying to increase the utilization rate of production facilities in enterprises. A number of measures are also being considered that specifically lower the cost of labor. Employer contributions to social security and insurance plans will be lowered. Also, a payroll levy will be reduced for many enterprises. The general goal of these measures is to encourage employers to use more labor-intensive means of production and thus increase employment opportunities.

The third policy approach seeks to improve labor mobility and employer responsiveness to the labor market. Tunisia's labor market regulatory framework has worked as a disincentive for the development of new employment opportunities. A number of reforms are being initiated to create an environment that is more conducive to hiring. Employers will have greater control of setting salaries, salary scales, promotion policies, hiring, and layoffs. Real wages have been rolled back in some sectors. In addition, restrictions on alternative working arrangements, such as temporary and part-time employment, will be removed. Finally, the structure

Serving the Academically Less Able Student

A major argument advanced to justify VET is that it enables young people with less academic ability to learn a craft or manual trade, thus equipping them to find gainful employment. This rationale is particularly relevant

of worker representation organizations will be made more uniform. Currently, that structure is determined by the number of workers employed and, as a consequence, employers were reluctant to hire beyond certain threshold numbers of employees in order to avoid these changes. These restrictions will be loosened, thus removing an important disincentive to hiring in Tunisia.

The final approach established a number of incentive programs for the creation of jobs. These programs are of two sorts. The first type promotes the establishment of small- and medium-size enterprises, which are usually more labor intensive. The Fund for the Promotion and Decentralization of Industry provides loans at subsidized interest rates for industrial or construction firms with less than 1 million dinars of capital (US\$1.1 million). Other privileges are also extended to eligible enterprises, especially those which are established in targeted regions of the country. The National Fund for the Promotion of Crafts and Small Enterprise provides interest-free loans to small businesses with less than 20,000 dinars of capital (US\$23,200). Other services are also offered to assist in the establishment and maintenance of small firms.

The second set of employment creation schemes are aimed specifically at encouraging the employment of young people. The Training-Employment Contract releases employers from paying social security and insurance during the first three years of employment for all apprentices that are hired at the end of their one-year training period. The stipends for apprentices are also subsidized. Firms that hire their apprentices are also granted a reduction in their payroll levy. Finally, the government is undertaking a number of public works projects that hire unemployed youth. Rural employment projects have focused mainly on reforestation efforts. Some urban projects have integrated a training component.

Few other developing countries facing high unemployment rates have attempted such an active effort to create employment opportunities. It is too early to judge the success of the measures being adopted in Tunisia in terms of actual (and sustainable) job creation. These efforts, however, represent a novel approach to the problem. They combine measures that make the use of labor-intensive modes of production more attractive with those that subsidize employment for targeted populations.

Source: Government of Tunisia.

in those countries that have achieved high levels of secondary enrollment overall and can thus place students in an "appropriate" form of education based on academic achievement. The evidence on the success of this policy in industrial countries is in some dispute, but research in the United States indicates that vocational schooling increases the earn-

ings of students when they are employed in their training specialty; the studies included women trained for secretarial and business jobs (Bishop 1989; Wiesberg 1983). The skills match is made in less than half of the cases, however, significantly reducing the cost-effectiveness of vocational programs in relation to general education.

Available evidence from developing countries tends to support the view that vocational education can improve the employment chances of the academically disadvantaged when secondary enrollment ratios are high and unemployment is low. A recent study of vocational high schools in Israel, which serve the 50 percent of the student cohort with lower academic achievement, demonstrated higher returns to vocational education than to general education when students were employed in their training field (Neuman and Ziderman 1991). The vocational training centers of Korea have a steady record of placing more than 90 percent of their students. Both countries have high secondary enrollment rates (more than 90 percent) and traditionally low levels of unemployment.

In most developing countries, however, secondary enrollments are low. In 1986 the average gross enrollment ratios, including enrollments in vocational schools, were 23 percent for Africa, 40 percent for Asia, 48 percent for the Middle East and North Africa, and 52 percent for Latin America (Unesco 1987). Students allocated to vocational schools based on relative academic standing within an already highly selected group are not, in the usual sense of the term, academically disadvantaged.

Diversion Objectives: Changing Attitudes and Aspirations

Governments use preemployment VET as a means to divert young people into futures other than higher education or white-collar work. These policy packages generally contain three elements. First, students are channeled to vocational courses on the basis of educational achievement, by national or school examinations. Second, vocational schooling and training is intended to improve student attitudes toward skilled and technical jobs. Third, either by regulation or by the content of university admission examinations, vocational students are cut off from all or part of postsecondary education.

In nearly all developing countries, university education is highly subsidized; in many it is virtually free. Admission in many cases is guaranteed to those who graduate from academic secondary education (Egypt, Morocco, Algeria); in others admission is regulated by government control of the number of university places and rationed by examination (Thailand, Korea). In the first case governments cannot afford the higher education of all those who might qualify; in the second, they have an interest in reducing the pressures that unmet social demand for higher education can bring. In both cases governments seek to avoid an excess

supply of university graduates, with high expectations. The issue is clearly of considerable political significance.

In such circumstances, diversion of a significant share of secondary students to VET has appeared to be a rational policy, given the additional justifications offered by supply and employability objectives. The policy has worked reasonably well in countries such as Korea that have achieved sustained employment growth. Thailand has managed the process by opening postsecondary technical courses to secondary VET graduates, an opportunity taken up by more than 60 percent of those eligible. Although this policy has resulted in five years of somewhat duplicative and expensive training and may therefore not be particularly efficient economically, it has enabled the country to manage the social demand issue reasonably well.

In the absence of employment growth, these policies have been enormously costly. Egypt's case is perhaps extreme but indicates clearly the dimensions of the problem and is similar to conditions in Morocco and Algeria (Adams 1989; Salmi 1989). Not only is free university education guaranteed to graduates of academic secondary schools, but government employment is guaranteed to all technical secondary and university graduates. Enrollments in secondary technical schools have increased on average by 10 percent a year between 1981 and 1988, and 61 percent of all upper secondary students are in vocational institutions. These institutions consume 45 percent of the government's budget for primary and secondary education in a country that needs to build two primary schools a day to keep up with population growth (Salmi 1989). Because of budget constraints, the quality of government vocational education is very low.

Oversupply of skilled labor and stagnant employment growth means that engineers do the jobs of technicians, technicians replace skilled workers, and so on down the ladder. This downward substitution of skills not only lowers the employment chances of vocational graduates but also the cost-effectiveness of vocational education. The government has found it necessary to impose a five-year waiting period for the first guaranteed public job, with the result that whatever skills are learned will decay, and may be obsolete, by the time employment begins. Narrowly and poorly trained in the first instance, and unwilling to accept wages lower than the level set by administered government pay scales, vocational graduates face a bleak future.

Similarly, formal vocational education and training for agricultural workers has often been justified as a way to keep young people in the rural sector. The policy has implicitly assumed that rural and urban educational opportunities should be different, with the latter oriented toward modern sector employment and upward social mobility. The assumption immediately raises significant equity issues: should rural

young people not have the same opportunities as their counterparts in the city?⁸ The policy has, in any case, failed in most instances. In countries as disparate as the former Soviet Union, Ghana, and Tanzania, vocational schools have not kept young people in rural areas (Blumenthal and Benson 1978; Foster 1965; Dodd 1969). The Tanzania case illustrates the major causes. Perceiving wage opportunities in urban areas, parents believed that the government was discriminating against their children by sending them to agricultural schools. Parents were also unwilling to take farming advice from their children when they graduated. The few agricultural school graduates that did go into farming did so only when the income from cash crops was expected to exceed that of clerking positions.

Diversified curricula generally allow students to compete for entrance into postsecondary education. But an express objective of diversified schooling is to induce students to accept a blue-collar job. The evidence indicates that practical courses can lead to more positive attitudes toward manual occupations. But positive attitudes are of little help if blue-collar employment opportunities are limited. In Kenya, for example, half of the students with four years of industrial education courses in elite lower secondary schools selected a practical or technical job when asked to choose freely among desired occupations, while fewer than 20 percent of students without such courses did so. However, there was very little difference in activities after graduation: 40 percent of industrial education students and 43 percent of the other students continued to higher secondary education (Lauglo and Närman 1988; see also Box 2-3).

Moreover, students may take a more positive stance toward vocational occupations without altering their career aspirations. For example, a study in Sierra Leone found positive student attitudes toward vocational courses, but student aspirations for higher education and higher-status employment persisted. Interestingly, student attitudes toward technical drawing were more positive than toward metalwork and woodwork, perhaps reflecting recognition that the skills involved in drawing could be applied more broadly. The researcher concluded that

. . . pupils are fully aware that it is subjects like physics, mathematics and chemistry which provide entry to university engineering courses, *not* woodwork or metalwork. Thus, pupils may well have a liking for woodwork or metalwork, and may well acquire an appreciation for the dignity of manual labor, but when it comes to their career aspirations they would invariably wish to keep their chances alive by concentrating on other subjects. (Wright 1988: 133).

In countries where vocational schooling and training does not lead to the university or to more prestigious white-collar employment even when there are jobs, surveys show that students in vocational schools and training are often poorly motivated and try very hard to get reas-

signed to nonvocational, general courses that promise more desirable educational and employment opportunities. In Kenya in 1986 nearly all students in industrial arts courses wanted to go on to further education, and nearly two-thirds aimed at the university. In Bangladesh in 1988 the vast majority of students in vocational schools and centers did not want to be there. In Hong Kong in the same year, students preferred to pay for general education in private schools rather than to take up free places in government craft centers, recognizing the greater flexibility of general education in the rapidly changing labor markets of a dynamic manufacturing and service economy (Cheng 1987).

The situation is even worse in those countries where formal pre-employment VET does not lead to wage employment, not to mention better earnings. In these countries, aspirations for general education can be powerful indeed. And government policies aimed at blunting their force have proven problematic. The government of Somalia sought to reverse the status accorded general and vocational education by assigning the highest achieving students to vocational schools. Correctly perceiving the low demand for vocational skills (1985 projections indicated a total of 325 jobs for the 11,452 people who graduated from secondary school each year), students continued to choose general education, and the vocational schools were underutilized even as the number of vocational classrooms was being expanded (Chapman and Windham 1985). These cases illustrate the vocational school fallacy referred to earlier, a powerful and persistent deterrent to effective VET.

We have noted that aspirations for academic and higher education are not easily diverted, especially when VET students consider themselves part of an educational elite. Using academic achievement levels to assign students to a vocational track reinforces the second-class status of skills training. To freely choose vocational preparation can help establish the motivation needed to develop high levels of skill and professionalism; to be assigned to it is much less likely to do so.

Skills Training for Women

The conditions that make preemployment training effective are the same for women as they are for men: jobs must be available and good linkages must be forged between training institutions and employers to ensure that training is relevant to market needs. But even where these conditions have been present, the role of VET as a path to employment for women has been limited. Putting aside for the moment the deleterious effect of broader societal perceptions about the appropriate role of women, the structure of the educational system and working of labor markets have militated against the ability of vocational preparation to enhance employment opportunities for women.

Participation rates of women in vocational schooling (the proportion of females of secondary school age attending vocational schools) are lower than those for men in most developing countries. More important are gender differences in fields of study. Female vocational students are concentrated in white-collar-related fields of study, while men predominate in blue-collar trades. For example, census data from Israel reveals that, of those individuals who have completed secondary vocational education and for whom course of study is known, 83 percent of males were concentrated in blue-collar fields of study, while 89 percent of females were concentrated in white-collar fields (Neuman and Ziderman 1991).

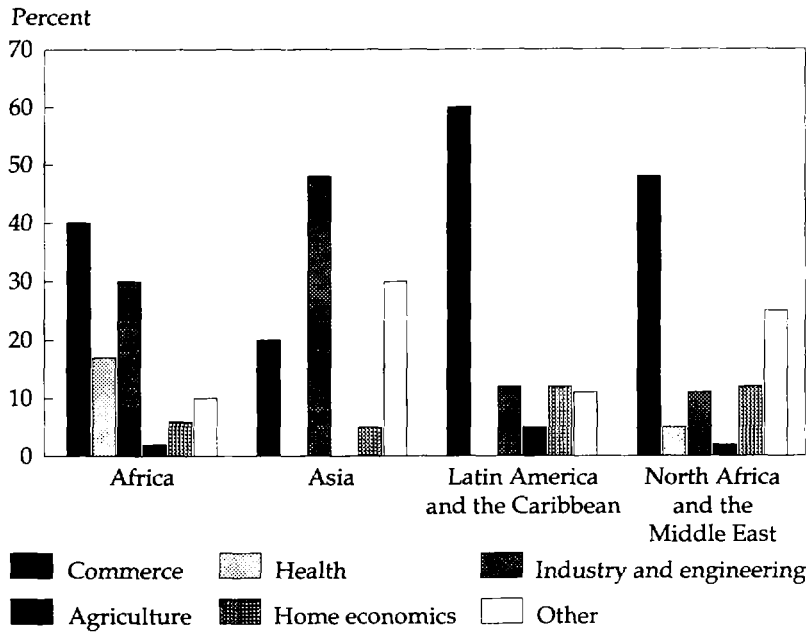
International Labour Office data on vocational training in six Latin American countries reaffirm the channelling of women into “female” areas of study. More than 80 percent of the students in such fields as secretarial and clerical studies, beauty care, and handicrafts were women; in some cases, 95 to 98 percent of the students were women (beauty care in Argentina and Colombia; handicrafts in Argentina). In contrast, women constituted, on average, less than 10 percent of students in such fields as motor vehicle mechanics, electricity, electronics, and technician training (and less than 1 percent in some fields in certain countries).

What are the major factors determining the level and nature of female enrollment in vocational education? Reproductive and domestic obligations as well as acquiescence in accepting the occupations traditionally assigned to women no doubt go some way in explaining the pattern of VET provision. But the realities of the labor market also play a leading role.

The employment chances of skilled women are adversely affected by employer prejudice and societal conventions concerning women and work. More objective labor market factors are also important, however. Employers may have imperfect information about the productivity of individual workers but possess experience about the average performance and productivity of women in different occupations.⁹ These employers are less prone to hire a woman for certain lines of employment because she is identifiable as a member of a group that poses a greater risk of leaving the labor market or for which average productivity levels are perceived to be lower. This example of statistical discrimination acts to channel employer demand for female workers into those occupations—such as teaching—for which interruptions and shorter career paths are not severe constraints on productivity. Such factors underlie the tendency for women to seek training largely in traditional “female” occupations in education, commerce, home economics, and health (Figure 2-1).

Although the status and pay of the jobs for which most women are prepared are comparatively low, VET can increase the probability that

Figure 2-1. Distribution of Female Vocational School Enrollment by Field of Study, 1988



Source: Unesco (1987).

women will participate in modern sector wage employment.¹⁰ Possession of a certificate enables some women to overcome the lack of employer information about their qualifications (King 1990). In some developing countries, the growth of “female” jobs in industries undergoing technological change (for example, in electronics assembly and services), is providing an alternative entry point for women, although one with comparatively low skill requirements and meager prospects for upward mobility (Carnoy 1990).

Access to training for and employment in higher paying, traditionally male occupations is more problematic. In markets with labor shortages, access will be easier. Indeed, rapid expansion of manufacturing and service industries in combination with declining rates of population growth are beginning to provide job opportunities for women as labor shortages emerge in a number of newly industrializing economies, including Korea, Mauritius, Singapore, and Thailand. These conditions are likely to increase female wage employment and open access to training in a broader range of occupations. The high levels of female enrollment in industrial and engineering vocational courses in Asia compared with other regions is no doubt a reflection of these trends.

Skills Training for the Poor

A popular adage holds that to give people a fish is to make them a meal, but to teach them to fish is to give them a living. But adages are often half-truths. To make a living at fishing, an individual needs a hook, line, and sinker, perhaps a boat, and access to individuals who can afford to buy the fish. Skills are important in helping the poor improve their incomes, but other factors are necessary for productivity. Training alone is unlikely to improve the earnings of the poor.

In many countries, most of the very poor live in rural areas.¹¹ Agriculture is the main source of income, supplemented by income earned through episodic work as a farm laborer or through low-skill self-employment to produce goods and services for local consumption. Policies that improve agricultural productivity, such as investments in infrastructure and appropriate pricing policies, are the most direct means of improving the incomes of the rural poor. Such policies not only raise farm income, but also expand markets for the products and service of nonfarm self-employment. Because basic education is the fundamental prerequisite for heightened farm productivity, the most important contribution that a country's education and training system can make is to expand access to and learning achievement in its primary schools.

The urban poor work largely in the lower tier of the informal sector. Incomes are low and unstable. Low levels of basic education and even lower levels of secondary education limit access to wage employment. Poor urban youngsters with low levels of basic education may suffer from low self-esteem, and their values and aspirations may be inconsistent with modern sector wage employment (Montrichard 1987).

Formal preemployment training in vocational schools and training centers is largely out of reach for the rural and urban poor, who lack both the basic education necessary to succeed and the resources necessary to support themselves while in training. Vocational education and training for the modern sector has not been an effective means of improving the incomes of the poor. In Thailand in 1979, farmers and laborers made up 88 percent of the work force, but their children held less than 20 percent of the places in vocational secondary schools. The balance was occupied by the sons and daughters of government officials and businessmen (Middleton and others 1990). The parents of more than 90 percent of vocational students in Bangladesh in 1989 owned their own homes, and the brothers or sisters of half of these students were enrolled in colleges or universities (World Bank 1990b).

Some studies show that training can contribute to improved earnings for the rural poor when it is coupled to income generation strategies. Small business development programs that include training can be effective, if costly, in establishing or expanding small enterprises in the

urban informal sector, creating job opportunities. These programs are most effective, however, when they build on a solid foundation of basic education. These strategies will be discussed in more detail in Chapter 8.

The Costs of Training

Much more is known about the costs of preemployment vocational education and training than about costs for other training modes. Data on the costs of sponsored training for rural and urban informal sector training, for example, are almost nonexistent—and the diversity of programs makes broad cost comparisons of little value outside of a given area and client group. The data do confirm, however, that the unit costs of vocational schooling and training before employment are high in comparison with academic schooling, and that costs vary substantially across training modes. A recent survey of some forty VET cost studies, drawn from thirty-five countries, confirms wide cost differences between the various types of training and secondary schooling alternatives (Tsang 1989). The study compared the unit costs of different types of secondary education, different modes of training, and different training trades.

Vocational and Academic Schooling

According to the Tsang study, vocational schools are more expensive to operate than are academic or diversified secondary schools (Table 2-3). Technical schools are even more expensive. Commercial courses in vocational schools are the least expensive. A number of factors account for this pattern, including significant differences in teacher and capital costs as well as class size. Although variations across countries are large, recurrent costs per student for vocational and technical schools exceed those of academic schools (the least expensive type of school) by an average of 153 percent in developing countries.

The reasons for the higher recurrent unit costs are straightforward. First, the low student-teacher ratios required for training in workshops increase the cost of instructors. Second, where wage policies permit the hiring of skilled workers and experienced technicians as instructors, the need to compete with other employers raises the cost of instructors beyond that of teachers in general secondary schools. Third, higher requirements for specialized facilities and equipment can raise costs substantially and continuously for vocational schools that seek to match the level of technology in use in advancing industries (Table 2-4). Fourth, the costs of consumable supplies and maintenance are significantly higher than they are in general secondary schools; in Thailand in 1988, these costs amounted to 30 percent of unit costs in industrial courses in

Table 2-3. Comparison of Recurrent Costs per Student of Different Types of Secondary Schools in Developing Countries

	<i>Diversified</i>	<i>Vocational</i>	<i>Vocational, technical</i>	<i>Technical</i>
Africa				
Lesotho	—	—	150	—
Sierra Leone	—	—	—	352
Somalia ^a	—	122	—	234
Tanzania	114	—	—	—
Zimbabwe	220	—	—	—
Asia				
Malaysia	—	280	—	265
Philippines	—	132	—	—
Thailand	—	256	—	419
Middle East				
Israel	—	182	—	—
Turkey	—	250	—	—
Latin America				
Colombia	115	144	—	—
El Salvador	—	197	—	—
Honduras	—	720	—	—
Peru	—	—	210	—

— Not available; blank cells indicate lack of school.

Note: Academic secondary schools = 100.

a. Figures are for institutional costs, which are the sum of recurrent operating and recurrent capital costs.

Sources: Tsang (1989); World Bank data.

Table 2-4. Relative Capital Costs of Alternative Classrooms

<i>Country</i>	<i>Science classroom</i>	<i>Industrial arts</i>
Barbados ^a	243	695
China ^a	480	—
Jordan ^a	203	614
Kenya ^b	—	550
Malaysia ^a	467	—
Zimbabwe ^b	—	257

— Not available.

Note: Index: ordinary classroom = 100.

a. Furniture and equipment.

b. Construction costs.

Sources: Zimbabwe, World Bank data; all other data, Psacharopoulos (1987a).

vocational high schools. A final factor is the low level of utilization of expensive staff, workshops, and equipment. This is caused by under-enrollment, which stems from limited employment opportunities and consequently low student demand for places. Scheduling practices in secondary vocational schools also can lead to low rates of facility use.

Other Training Modes

Among the other training modes, enterprise-based training generally has lower unit costs than institutional training (Table 2-5). The studies Tsang presents for Asia show that unit costs of institutional training are more than twice those of enterprise training (which is generally shorter in duration and involves smaller earnings forgone during training).

Summary

It is easy to see how vocational education and training gradually fell under a cloud in the minds of some analysts and policymakers, while continuing to hold a place in the sun for others. Training by employers is generally cost-effective but tends to operate outside the purview of public policy. The most visible form of VET—preemployment vocational and diversified schooling—has very often been less than cost-effective.

Table 2-5. Cost Ratios of Alternative Training Modes, Selected Studies

<i>Country</i>	<i>Vocational, technical schools</i>	<i>Training centers, institutes</i>	<i>Enterprise-based training</i>	<i>Type of enterprise training</i>
Brazil ^a	74	—	100	Factory-managed school
Côte d'Ivoire ^a	243 (3) ^c	100 (2)	—	—
India ^a	90 (3) ^d	88 (2.5)	100 (3)	Formal apprenticeship
			53 (0.5)	On-the-job training
Israel ^b	384 (4)	133 (1)	100	Formal apprenticeship
Korea, Rep. of ^b	420 (3)	375 (1)	100 (0.5)	Factory-managed school
Malaysia ^a	—	146	100	—

— Not available.

Note: 100 is the basis for comparing unit cost ratios within any one study, but the indexes are not comparable across studies. The duration of the course in years is indicated in parentheses, where known.

- a. Recurrent and construction costs.
- b. Recurrent costs only.
- c. Vocational schools.
- d. Technical schools.

Three factors explain much of the variation in the effectiveness of preemployment VET: the objectives sought, the capacity of institutions to respond to changing patterns of employment demand, and the economic context in which training is delivered. Use of preemployment vocational education or training to create a supply of trained persons to stimulate investment, or to address broad social issues—such as reducing youth unemployment, serving the academically less able student, changing youth aspirations, and improving earnings for women and the poor—has generally not been successful. Training policies with these objectives have largely failed because they misjudged the nature and dynamics of employment. In some cases, they have led to an expansion of pre-employment vocational and diversified schooling that cannot be sustained financially, given the much higher costs of vocational instruction. In these circumstances, the ability of training institutions to respond to changing skill needs with good quality training is severely limited, further lowering the value of vocational preparation in the labor market.

In dynamic and growing economies, preemployment VET has been cost-effective, in some cases more so than academic or general secondary education. The availability of jobs does much to explain these positive outcomes. Moreover, in such circumstances vocational education and training institutions are more likely to be able to respond to employment opportunities. Their access to employment information is improved simply by the fact that their graduates find skilled jobs about which they can report. Effectiveness is further strengthened when the preemployment training system is formally oriented toward productivity objectives and is thus conditioned to adapt to changing patterns of demand in different skill markets.

On balance, then, preemployment VET can be cost-effective when it is focused on improving productivity, when jobs are available, and when it produces workers with needed skills of acceptable quality. Understanding the economic context in which training is delivered is therefore critical to the development of effective training policies and programs. Moreover, there is a continuing need to identify ways to reduce the high costs of delivering good-quality training.

Notes

1. Relating to the late 1970s, rates of return for developing country groups in Africa, Asia, and Latin America respectively are: 26, 27, and 26 percent for primary education; 17, 15, and 18 percent for secondary education; and 13, 13, and 16 percent for higher education. Measured rates of return display diminishing returns, both in relation to educational level within a country and across countries. They are highest for primary education where the unit costs are relatively low and the output forgone during study minimal; for higher education both unit costs and output forgone are sizable in relation to additional

earnings. There is also a positive relationship between social rates of return and a country's average income level: rates of return in less developed countries are generally higher, because of the relative scarcity of educated manpower (Psacharopoulos 1988, Table 1).

2. See Leslie and Brinkman (1988) for a full discussion of methodological issues in the context of higher education.

3. Typically, the costs and benefits of training are compared across different training modes. In most of these studies benefit measures are based on "follow-up" surveys of the labor market experience of former trainees. Problems of sample design, length of follow-up period, and replicability of findings have not been fully solved in most studies; a review of evaluation methodology is given in Ziderman (1978).

4. This discussion is based on an analysis of some forty economic evaluations of VET programs listed in Appendix I.

5. The record of formal VET for wage employment in agriculture is similar to that for other occupations, but VET for farmers has not been cost-effective.

6. It has also been a major problem in European economies, where large scale manpower supply programs have been instituted to facilitate the transition from school to work.

7. Studies in the United States show that 87 percent of high school graduates in 1972 needed less than three months training after employment (Sherman 1983).

8. See Barber (1981) for a review of these issues.

9. See Mincer and Polachek (1974) for evidence that women in the United States are more likely than men to work fewer hours, to work part-time, and to move in and out of the labor market.

10. See Arriagada (1989b and 1990) for recent results for Peru.

11. For a full discussion of poverty in developing countries, see World Bank (1990e).

3. *The Economic Environment of Skills Development*

Worldwide, the pace of economic change is accelerating and the process of development has become much less predictable. Today, development is approached by managing the economy under conditions of uncertainty rather than through the more traditional model of prediction, policy, planning, and implementation. Market signals and mechanisms, and economic management through incentives, are of central importance in the managerial approach. In most countries, this flexible approach to development must be managed within severe resource constraints. This is leading to pressures to reduce inefficiency by increasing the capacity of institutions to respond flexibly to short-term changes. These pressures fall heavily on the employers and the training institutions that develop the skills needed to facilitate economic change.

Whether training can be a cost-effective means of increasing a country's productivity and economic growth is clearly conditioned by that country's economic context. The rate and nature of economic change shapes the patterns of employment and skill needs in society and thus determines the incentives to individuals, employers, and society to invest in skills development. The economic environment of training in a given country is determined by two sets of forces. One consists of demographic and international economic trends that create a framework of challenges and opportunities. The second is the nature of the country's economic policies and strategies, which establish the pattern of incentives that guide economic and employment growth as well as the efficiency with which skills are developed.

Trends in Development: The Challenges of the 1990s

Four trends have a substantial effect on employment and thus on the demand for skills: demographic change, adjustment and indebtedness,

changes in the patterns of trade and competition, and technological change.

Demographic Change

The size of the world's economically active population will have increased by 589 million persons between 1985 and the year 2000 (ILO 1986). Of these new entrants to the work force, more than 90 percent will be in developing countries. The size of the group of new entrants relative to the economically active population will differ from country to country. Table 3-1 gives a rough indication of the future employment opportunities that will need to be created.

The particular socioeconomic conditions in each country will determine, to a great extent, how successful new entrants will be in finding jobs. The task will be most difficult for countries with a small or stagnating modern sector, few resources (or means to exploit them), an education system of poor quality, and continued high fertility rates. These conditions guarantee high unemployment, underemployment, and low wages, especially for a country's youth. If resources are abundant and the means to exploit them are readily available, if the modern sector is already large and growing, if education levels are high, and if fertility rates are falling, then an expanding labor force can be a source of further economic growth.

To accommodate more workers, a country must be able to increase its stock of capital. Countries with small or stagnating modern sectors have the greatest difficulty mobilizing more resources, that is, building more factories, ports, power stations, and transport systems for a growing labor force. A poorly developed infrastructure makes it more difficult for a country to exploit available resources at a quickening pace. Countries without the capacity to expand the stock of capital in line with a rapidly growing work force face lower productivity per worker and, consequently, falling incomes and shrinking employment opportunities.

Table 3-1. Ratio of Male Labor Force Entries per Hundred Departures in Developing Countries, by Region, Selected Years

<i>Region</i>	<i>1980</i>	<i>1990</i>	<i>2000</i>
East Asia	213	191	178
South Asia	304	302	310
Africa	279	299	323
Latin America and Oceania	330	329	359
Total	268	267	273

Source: Wander (1987).

Countries with higher levels of development are better able to expand their capital stocks to match labor expansion.

In many industrial countries, the massive shift of labor from agriculture to industry and services, where productivity and earnings are higher, facilitated economic growth. Many of the developing countries experiencing the highest population growth rates, and, therefore, the largest number of new entrants to the labor force, have a large proportion of their labor force in agriculture. This labor force faces resource and technology constraints similar to those found in the modern sector. If arable land is not abundant and the technologies that increase agricultural output are not available, output per agricultural worker will decrease. Consequently, these countries will have difficulty absorbing a growing rural labor force. Because of the large numbers of agricultural workers, the transfer of labor out of agriculture to industry and services has proceeded slowly in these countries, and more workers must be absorbed in the rural economy at comparatively lower levels of productivity. If these countries wish to shift their economies to more productive modes, they can ill afford continued high rates of population growth.

High population growth rates also increase the demand for education. Unless a country can accommodate this demand with more classrooms, teachers, and teaching materials, educational quality will diminish. A decline in educational quality will affect the school-age population's future assimilation into the work force in two ways. First, low-quality education tends to raise the number of students who drop out of school, bloating the number of new entrants to the labor force. Second, the difficulties of absorbing a growing labor force are exacerbated when new entrants have low levels of educational attainment. The combination of low levels of physical capital per additional worker and low levels of human capital will lead to large-scale unemployment of unskilled workers and acute shortages in a variety of skilled professions. While higher levels of education alone will not create new employment opportunities, countries will more easily be able to absorb new entrants into the labor force if they are more educated.

High population growth rates can, under certain conditions, push countries into a vicious circle. When resources are already strained, additional workers in the labor force cannot be sufficiently "equipped," in terms of human and physical capital, to attain their productive potential. As economic growth slows, resources are spread even more thinly, and the cycle continues. It is the poorer countries that can least afford increases in the size of their labor force and the subsequent dilution of their stock of capital.

Current attempts to slow the rate of population growth can do little to stem the present flow of new entrants into the labor market. Growth in the labor supply is determined mainly by population growth rates of the

previous decade. Changes in current population growth rates, however, do affect the absorption of new entrants into the labor force. First, lower fertility rates decrease the number of people dependent upon the earnings of an individual worker. Decreasing this dependency ratio can boost living standards and saving rates as earnings are freed for spending on items other than basic necessities. This in turn makes it easier for a country to increase its stock of capital and thus absorb new labor entrants.

Second, lower fertility rates free women to enter the labor force. In addition, as the reproductive age span of women decreases, demand for education increases. The initial result may be an increasing number of new entrants into the labor force and the education system. As the demographic changes work their way through the population, however, the negative pressures of a growing labor force ease.

Lower population growth can also ease problems associated with emigration. When a country is unable to provide employment opportunities, many may seek jobs through emigration. A number of countries, especially in the Middle East, have been able to ease labor surpluses because workers travel to oil-rich neighbors to seek employment. When demand for emigrant labor slows, however, countries can be faced with the double challenge of absorbing both returning workers and new entrants from its pool of youth into the labor force.

The relationship between population growth and employment is not a simple one. Optimists claim that population growth leads to economic growth, which subsequently creates more employment opportunities. Pessimists paint a Malthusian future of high underemployment with falling standards of living. Which scenario develops depends on the particular resource endowments of a country: human and technological as well as natural. These endowments will help determine a country's facility for absorbing new entrants into the labor force and whether they will add to the country's productive capacity.

Adjustment and Indebtedness

The world economy in the 1980s was dominated first by a sharp recession, then by steady growth in the industrial countries, high real interest rates, declining real commodity prices, massive movements in exchange rates, and the collapse of voluntary private lending to many developing countries. These and other more localized shocks have made adjustment to changing international circumstances both necessary and difficult, particularly for the highly indebted countries.

In many cases inappropriate domestic policies compounded the difficulties of adjusting to external circumstances. Massive and often inefficient public sectors, high rates of protection of domestic industries,

inefficient and protected capital markets, careless borrowing on international financial markets, and unsustainably high levels of government spending all typically contributed to exacerbating external imbalances. Many countries recently have undertaken extensive programs to reallocate resources more efficiently and to restructure their economies toward greater responsiveness to international markets.

For labor-abundant countries, reallocating resources in accordance with a country's comparative advantage should maximize employment opportunities over the long run. The elimination of policy-induced distortions in markets, particularly for producer prices, interest rates, and the exchange rate, should also maximize employment. Despite the long-run advantages of these policies, job losses and short-term unemployment in the formal sector can occur for several reasons (Demery and Addison 1987).

First, adjustment policies, through their effects on relative prices, reallocate resources away from products and services that are primarily sold domestically (nontradable goods) toward those that can be exported (tradable goods). The process of switching production from nontradables to tradables can be impeded by price rigidities, imperfect information, the lack of an appropriate infrastructure (roads, port facilities, and so forth), capacity constraints, or capital markets too underdeveloped to provide sufficient new investment. Many countries have experienced employment problems during the transitional phase because of the varying rates at which some enterprises contract and others expand.

Second, the size of the resource constraint and the extent of the economic disequilibria may require tight restraint of demand to restore macroeconomic balance. Although macroeconomic stabilization policies combined with microeconomic incentives can promote industrial restructuring, the initial deflation of demand often reduces employment faster than adjustment policies generate it.

Finally, the fiscal restraint required to reduce unsustainable levels of debt and resource imbalances often entails a reduction in public sector employment. Because government services are primarily nontradable, the restructuring of the economy toward tradables often requires the release of resources from government. Public sector employment policies are often reviewed on efficiency grounds, which can also lead to the release of large numbers of public sector workers. The transitional unemployment often further exacerbates a situation of long-standing high unemployment, in many countries the result of the inappropriate policies that made adjustment necessary in the first place.

Adjustment policies not only dramatically increase the need for skills training, retraining, and upgrading so that the system is more responsive to domestic and external market signals, but also tend to constrain the

resources available to social sectors, including education. Because a large percentage of government spending on education is on wages for teachers and administrators, the adjustment process can hit the education sector particularly hard unless special attention is paid to the effects of the fiscal retrenchment process.

A recent review of twenty-one countries found that although government spending on health and education remained relatively stable during the adjustment period, those countries that faced the most severe adjustment circumstances had to reduce their spending on health and education the most (World Bank 1988a). In another study, seven out of ten countries examined showed either declines in primary enrollment and completion rates or a serious decline in the quality of education over the course of the adjustment period (Cornia, Jolly, and Stewart 1987). In Ghana, for example, more than 4,000 fully qualified teachers left the school system between 1977 and 1981.

Economic restructuring toward a more open system of production, based upon comparative advantage in traded goods, introduces an additional element of uncertainty into the planning process. This uncertainty, combined with prospects for continued restraints on government spending, point to the need for a more efficient and, above all, more flexible, demand-oriented employment and training system. The task for policymakers in the 1990s will be to provide workers with the work-related and job-search skills that allow them to move as quickly as possible into newly competitive sectors.

Changing Patterns of Trade and Competition

Many of the economic policy reforms implemented by developing countries are designed to promote trade liberalization and encourage greater competition. Greater competition and trade can have important implications for employment. Competition and trade spur economic growth, improving long-term employment prospects. However, the transition from an economy protected from competition to one that promotes competition often leads to dislocation of labor and changes the pattern of demand for different skills. A more competitive environment, coupled with current trends in international trade, also makes future employment needs more difficult to predict.

The arguments for removing barriers to competition are well known. First, increased competition obliges firms to allocate resources more efficiently, thus increasing productivity and leading to economic growth. Second, competition among domestic producers (domestic competition), between domestic producers and foreign exporters (import competition), and between domestic producers and their foreign rivals in international markets (export rivalry) stimulates efficiency in resource

allocation and use. As Japan and other successful East Asian countries have shown, stimulating domestic producers to compete at home and in international markets is the key to helping firms mature technologically and managerially.

Third, a competitive economic environment should have a neutral or positive effect on employment. Because labor is allocated more efficiently, more jobs will either be created or be shifted to more productive sectors. Countries that inhibit competition limit the number of employment opportunities that could be created or waste them on unproductive undertakings. Fourth and finally, trade liberalization and the promotion of exports tend to promote more labor intensive industries, with positive ramifications for employment.

A more competitive economic environment, however, is also a more uncertain one because it is more sensitive and vulnerable to changes in demand. Therefore, although more competition can lead to more employment throughout the economy, the demand for labor may constantly shift from one sector to another, leading to a higher prevalence of unemployment. The key here is that this type of unemployment is temporary: job opportunities created in growing industries should offset job losses in waning industries. As industries come and go, however, so does the demand for specific skills associated with them. As a consequence, it becomes very difficult to foresee which skills will be needed in the future and for how long. The mobility of the work force, and its flexibility in adopting new skills determines how quickly absorption into new sectors occurs.

Relatively few developing countries have truly competitive economies. Many governments have actively pursued policies that protect a certain number of industries from competition. Regulations limiting access to, as well as exit from, the market place are common. Many developing countries, however, are showing a growing willingness to remove barriers to competition and free trade. This shift toward greater competition has certain short- and long-run implications for employment.

In the short run, workers and producers most likely will lack the experience and flexibility to adapt quickly to the demands of a more competitive economic environment. Displaced workers may have trouble finding employment in new growth industries because they lack the necessary skills and the base of good general education that would enable them to learn new skills quickly. Producers in formerly protected industries may incur large losses. In the long run, employment losses in sectors that are no longer viable in a more competitive economy should be offset by employment creation in other sectors. In addition, competition should lead to economic growth, which can contribute to higher wages, especially for those prepared to work in the growth sectors. This process, however, may take some time and can be tumultuous.

If the short-run costs are too high and the benefits deferred for too long, reforms that encourage greater competition may be jeopardized. This dynamic has been particularly prevalent where trade liberalization and other pro-competition measures have been adopted during economic crisis. When the high expectations for immediate benefits go unfulfilled, support for the reforms quickly dissipates. Attempts to introduce competition too quickly (or halfheartedly) may lead to an economic and political environment that is even more hostile to competition and ultimately to a reversal of policy. Unfortunately, when such pro-competitive measures are removed, a country may have incurred all the costs of more competition without any of the benefits—particularly in terms of employment.

As noted, a country that opens its economy to more competition becomes increasingly sensitive to the uncertainties of the market, particularly to specific demands for labor. This is especially true when a country opts for greater participation in the world economy. Moreover, greater protectionism among industrial countries not only heightens the uncertainty associated with entering the international market, but may negate or seriously reduce the benefits of competition altogether.

The markets of choice for the products of developing countries are in industrial countries. Closing or restricting these markets to imports from developing countries discourages investments in industries in which a country may have a comparative advantage. In addition, because protectionist restrictions can be introduced arbitrarily, developing countries may face significant losses after making what seemed to be rational investments. These factors will have obvious implications for employment as sectors that promise new employment opportunities are turned overnight into losing enterprises.

The experience of Bangladesh is a case in point. In the early 1980s the country increased its production of textiles significantly, although it remained a tiny supplier next to giants such as China, Hong Kong, and Korea. Bangladeshi products could not be construed as a disruption to the international market in textiles. Nonetheless, France, the United Kingdom, and the United States all put restrictive quotas on the import of Bangladeshi textiles. As a consequence, the country stopped expanding its textile industry, operational facilities stood idle, and jobs were lost.

Technological Change

New production technologies are having a significant effect on aggregate employment and on the skills profile of the work force in both industrial and developing countries. General patterns are discernable,

although considerable uncertainty remains regarding the effect of change in a given economy (Carnoy 1990).

Microelectronic technology has greatly reduced the cost and time of processing information and increased the accuracy with which it can be transmitted. Along one dimension, the marriage of computers with advances in telecommunications technology has linked participating countries into a highly efficient, interactive communications web that is accelerating the pace of change. In the international division of labor, large multinational corporations have been able to shift labor-intensive assembly operations to countries where labor costs are low. Along a second dimension, microelectronics has led to the development of numerically controlled machine tools (NCMT), robotics, and computer-assisted design (CAD) and manufacturing (CAM). These technologies are replacing the single-task machines that characterized traditional manufacturing with durable equipment that can be programmed to perform a wide range of tasks and to produce a variety of products. More of the labor costs of producing these technologies are in the software component than in the hardware itself. These technologies have the greatest influence on productivity when they are organized in flexible production systems. Unlike the traditional division of labor, in which each person engages in one or a set of specialized repetitive tasks, these systems revolve around multiskilled teams that produce whole products. Flexible production facilitates high levels of quality control, reducing the unit cost of production. It also reduces the size of output needed for scale economies, increasing the ability of firms to change products quickly and to produce customized products efficiently.

Biotechnology has contributed significantly to agricultural productivity in developing countries; the development of high-yielding varieties of rice and maize have been particularly successful in areas where complementary inputs such as irrigation and fertilizers have been available. Tissue culture, which enables single plant cells to grow into complete plants, and other new technologies hold considerable promise but are developing slowly and are not widespread. In addition, microelectronics has a potential to improve efficiency of food storage and irrigation, but the technology has yet to be tested in developing countries. Similar hopes are held out for solar energy technologies (Bhalla and James 1984). More research needs to be done on how these technologies are likely to affect employment.

The new technologies based on microelectronics are diffusing unevenly across countries. Threshold levels of consumer electronics and telecommunications appear to be preconditions for diffusion. The data indicate close association between the number of telephone lines in the population and the introduction of advanced production technologies. The threshold seems to come at about four or five telephone lines per 100

people in the population. Without telephone communications, a country has difficulty linking to the international structures through which technology is diffused or coordinating technology applications internally.

The price and availability of specialized skills also affect diffusion. Economies seeking to expand the use of technologies find it easier to begin with supply industries that rely on local raw materials (food processing, textiles) and scale industries (steel, automobiles, shipbuilding), where the skills base is comparatively well developed. In specialized industries, such as instruments and precision machinery, however, lack of strategically important engineering and technical skills makes it difficult to "copy" the technology quickly, and a long process of learning is needed for adoption and adaptation. The shift to manufactured exports, which forces a country to meet international standards of quality, increases the demand for capital-intensive technology. Labor shortages can also increase the rate of adoption of new technologies. For example, labor shortages led to the rapid mechanization of sugar cane harvesting in Cuba, but not in Jamaica, which had an abundance of agricultural labor (Edquist 1985).

Numerically controlled machine tools can be introduced only where an engineering industry exists. Robots, which substitute for higher priced skills, are less attractive where wages are low. In addition, suppliers are reluctant to market these advanced technologies in small economies with low demand because of the cost of the information and training required for their installation and use. Computer-aided design is a necessity in the electronics industry and crucial in reducing lead times in heavy manufacturing (automobiles, shipbuilding) and thus tends to follow these industries.

Movement into the production of consumer and, eventually, business electronics depends on the presence of four key factors: the availability of management and labor skills; supply conditions, such as a developed infrastructure, that attract multinational corporations to locate part of their production in the country for export to the world market; a large domestic market for the goods, either because previous use has established consumer demand or because the government is a large consumer; and economic incentives that attract foreign manufacturers to import components from the country and local entrepreneurs to invest in their production.

Developing countries have followed three basic models for developing the technological capacity of industry. Brazil and India have sought to establish protected industries to serve their large domestic markets. This strategy can be successful in developing basic capacity, but if the rate of technological innovation is rapid, such industries may find it difficult to keep up with the changes. A consequence is that the technology available to export-oriented industries is of higher cost and lower

quality than that available in international markets, reducing their competitiveness.

The newly industrialized countries of East Asia have followed a second model, which begins with assembling components for export, followed by production of consumer electronics and then production of high-quality business electronics for export. This last phase has been supported by government investment in education and research and development. A third model is found in Mexico and Spain, where multinational corporations establish manufacturing plants to produce goods such as automobiles for export to their own market and to other countries in the region. Managers and engineers from the parent company provide training and advice to local counterparts and assist local producers of the manufacturing components to develop their technological expertise. In such cases, the government is often a large consumer of the product. This model and the East Asian approach have demonstrated that, given an educated and therefore trainable labor force, high levels of productivity and quality can be achieved in a relatively short time.

The experience to date is encouraging for large countries, with well-developed telecommunications infrastructures, educated labor forces, and large domestic markets, which are an advantage in negotiating technology acquisition. Smaller countries without these assets, however, have benefited very little from technology diffusion and risk being "disarticulated" from the emerging world network of production.

Technological change has significant, but variable, effects on employment and skills. Studies in developed countries indicate that although technological change results in job losses at the firm and industry level, these losses are more than offset by overall employment growth in expanding economies. At the same time, significant displacement of labor occurs across industries, regions, and countries as elements of production are shifted abroad. A few developing countries have benefited from this shift of production and employment, but most have not.

Evidence on the effect of these technologies (including flexible production management systems) on the profile of skills demand indicates the presence of offsetting trends. Traditionally, manufacturers used machines to replace skilled labor, with the increased skill intensity in machine-building industries offsetting any "de-skilling" effects that occurred in production processes in other industries. In the 1960s and 1970s, the human capital argument pointed to the higher wages paid for rising levels of education in increasingly capital-intensive and organizationally complex industries as evidence of increasing skill intensity. This argument was buttressed by the logic of the industrialization school of thought, which held that increasing specialization of function and division of labor required more specialized and higher level technical and managerial skills.

The “de-skilling” argument runs counter to these propositions. One element argues that new technologies enable managers to design technological means to control labor and thus to reduce the skill levels they need (Braverman 1974). Another element argues that de-skilling occurs not only because of changes within production processes, but also through the shift of labor from higher skilled manufacturing to lower skilled service occupations as economies are restructured. In this latter case, evidence from the United States indicates that, although high-skill, high-technology jobs are increasing relatively rapidly, they still represent a small share of total employment, and that the largest share of new employment is in low-skill clerical and service jobs (Levin 1987).

Studies in other industrial countries generally show a complex pattern of skill change that is highly volatile and that differs sharply across regions and industries. An important finding is that traditionally male, blue-collar, skilled jobs in manufacturing are declining. The largest share of new jobs are low in skill requirements; other new jobs have professional or managerial requirements that displaced skilled workers cannot easily meet. These factors greatly hinder retraining of displaced workers.

Recent studies by the International Labour Office of several industries in Asia tend to confirm that technology change has a complex and varied effect on employment and skills (ILO 1988b). Similar findings have emerged from studies of the banking industry in industrial countries (Bertrand and Noyelle 1986, Adler 1983).

Shifts toward increasing the use of semiskilled female workers in the production of electronic goods in both industrial and developing countries has major implications for skills demand. Generally, a much smaller portion of the labor force in these industries provides managerial and technical supervision, and workers tend to be less highly educated and female. In industries where research and development and software production is significant, men dominate the scientific and technical positions. In these circumstances, male workers with traditional craft skills who are displaced when new technologies are introduced into traditional industries are largely closed out of the new industry.

Manufacturing in developing countries is likely to follow the line taken by the electronics industry, with technically sophisticated components being manufactured in developed countries and assembled locally with low-skilled labor. As they enter developing countries, biotechnologies are likely to require relatively few, but very highly skilled, workers in research and development and extension services. These technologies are most likely to be used first in the agricultural sector, and their diffusion will be aided by high levels of general education among farmers. The impact of other technologies such as solar power cannot be estimated.

The Policy Environment

A nation's economic policies interact with demographic and world economic trends to shape employment opportunities for individuals with different skills. Economic policies also affect incentives for individuals and enterprises to invest in skills formation. In relatively undistorted economies, employers and consumers respond to market prices, which provide a reasonably accurate measure of the social value of productive resources and the goods and services these resources produce. Movements in relative wages and employment in response to economic and social forces guide employers and workers in using their resources for developing skills efficiently.

The economic environment, however, is frequently subject to market distortions where prices do not accurately reflect the social value of productive resources. Government interventions in pursuit of social and economic goals can distort wages and employment from their competitive levels and, thereby, the market signals sent to employers and individuals. These interventions can introduce market rigidities and distort the operation of labor markets affecting employment growth and incentives for skills development. Unless compensating market interventions offset these distortions, their effects can be significant, making it difficult for private and public training institutions to meet skill needs efficiently. One consequence of these interventions is a structural imbalance in the demand for and supply of skills for economic development.¹

In contrast, many countries take a supply-side view, which holds education and training systems responsible for both creating and correcting these imbalances in the supply of skills. The case can be made, however, for examining the demand side of the marketplace, as outlined above, and the effect of a country's economic policies on incentives for individuals and enterprises to invest in skills development. As this chapter will show, efforts to improve the economic returns to these investments will benefit from a careful study of economic policies and the incentives they offer for skills development. The evidence supports both economic reforms to get the prices "right" in an economy and the integration of economic and human resources planning.

Policies and Economic Growth

A country's economic environment shapes incentives for economic growth. In an environment where the prices of market goods, including capital and labor, are an accurate indicator of relative scarcity, producers and consumers are encouraged to use scarce resources efficiently. This environment creates conditions favorable to noninflationary economic growth. Barriers to growth arise, however, where monopolistic tenden-

cies in the private sector or government policy interventions result in price distortions. Price distortions lead to the inefficient use of scarce resources. A country's choice of development strategy influences the government's role in the economy and the level of price distortions.

DEVELOPMENT STRATEGIES. Governments that adopt inward-focused development strategies often overregulate the economy. An inward-focused development strategy is sustained by macroeconomic policies that provide high levels of protection for domestic industries. By increasing the cost of imports through import quotas and tariffs, investment licensing, inflated exchange rates, price controls, and other measures, protectionist policies make it more profitable to produce for domestic markets and discourage the growth of exports. By creating monopolistic market conditions and price distortions, this strategy leads to incentives for further regulation.

An outward-focused development strategy, in contrast, encourages trade and production for export. To export, domestic producers must meet the market test of global competition. This environment discourages government interventions that create price distortions which adversely affect the competitiveness of export goods. External competition reduces monopolistic powers in the private sector and encourages efficient production. Prices are more likely to reflect the relative scarcity of market goods, including that of labor and capital. Market distortions are not only an outgrowth of a country's choice of development strategy, but also a negative force influencing the pace of economic growth (Box 3-1).

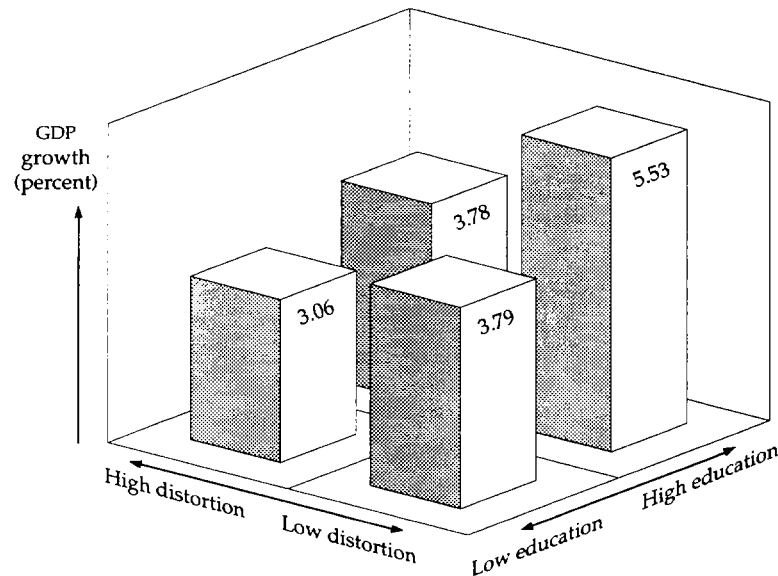
LABOR MARKET DISTORTION. Labor markets function to allocate labor among alternative uses in production. Movements in wages and employment provide incentives to encourage labor mobility and the development of requisite skills. These markets perform these functions best when wages are flexible and barriers to labor mobility are low. Under these conditions, labor markets provide timely signals that encourage the movement of labor from less productive to more productive activities as economic circumstances change. These adjustments are important to an economy's growth and the welfare of individuals affected by economic change. Impediments to wage flexibility and labor mobility, however, often arise when governments intervene in labor markets in pursuit of social and economic goals.

Government interventions that distort the operation of labor markets affect incentives for individuals and enterprises to invest in skills development and impede economic adjustment. A failure to consider labor market distortions alongside distortions in other markets can threaten the supply response to economic reforms and constrain economic

Box 3-1. How Policy Distortion and Education Affect Gross Domestic Product in Developing Countries

Education in creating human capital can be an important ingredient in the process of economic growth (see Chapter 2). However, the efficacy of human capital investments in generating growth will be diminished in the absence of a sound, undistorted economic environment. A study of sixty developing countries confirms the positive relationship between education development and economic growth. In particular, the study demonstrated the complementarity between human capital investment and a sound economic environment. Countries with distorted economies and a low level of educational development grew by about 3 percent a year while economies that had either higher levels of education or fewer policy distortions did better, growing at nearly 4 percent a year. But countries that had both high levels of education development and few distortions grew at over 5.5 percent a year.

Box Figure 3-1. Policy Distortion, Education, and Growth in Gross Domestic Product in Sixty Developing Countries, 1965-87



Note: High distortion reflects a foreign exchange premium of more than 30 percent; low distortion, a premium of 30 percent or less. Education is measured by the average years of schooling, excluding postsecondary schooling, of the population age fifteen to sixty-four. High education is defined as more than 3.5 years; low education, 3.5 years or less.

Source: World Bank (1991c).

growth. Government interventions in labor markets are often part of a broader pattern of government economic regulation. The same forces that encourage adoption of distortionary macroeconomic policies, namely, inward-focused development and protectionism, also favor government interventions in labor markets. Thus, labor market distortions need to be viewed in the context of the broader economic policy environment.

Policies and Incentives for Skills Development

The relation between the economic environment and skills development is frequently overlooked in planning and policy development. To develop an effective national training strategy, policymakers must understand the economic environment and the incentive structure for skills development that individuals and enterprises face. Education planners must take this structure into account in anticipating the mix of public and private investment in skills development and the demand for training places. Economic planners and policymakers must consider the market signals a country's economic policies send to individuals and enterprises for training and skills development and the consequences of these signals for labor supply, economic growth, and wage and price stability.

DISTORTION OF INCENTIVES TO ACQUIRE SKILLS. Individuals are expected to apply their resources in schooling and training so that they receive a stream of net benefits whose present value is greater than that of alternative uses for the resources. Thus, events that alter this stream and its present value in relation to the value of alternative uses are expected to change an individual's incentives to acquire skills. Economic policies that intervene in the operation of competitive markets can affect the stream of benefits and costs for skills development, thereby altering incentives and distorting the allocation of resources to skills development from what would have occurred in a competitive economy. Within this framework economic policies can produce persistent underinvestment or overinvestment in education and training. This framework applies, of course, where compulsory education and curriculum placement do not constrain choices.

Economic policies that influence wages and employment growth alter the stream of benefits to skills development. Policies that disconnect wages from productivity and reduce wage flexibility distort individual incentives to acquire skills. Minimum wages, for example, which are found in industrial and developing countries worldwide (Fallon and Riveros 1986), provide a minimum standard of living for low-wage workers and stimulate increased productivity. Because minimum wages

are typically set at levels above wages that would be paid to unskilled workers in a competitive market setting, much of the debate surrounding them has focused on their disemployment effects (Rottenberg 1981). Less attention has been given to their effect on incentives for skills development.

In countries such as India and Egypt, which have an excess supply of educated labor, minimum wages contribute to a compression of the wage profile. Wages are increased at the lower end of the profile, while the labor supply at the upper end discourages any upward pressure on wages. Taxes on labor incomes, administered wages in the public sector, and collective bargaining in the private sector may also introduce wage compression at the upper end of the wage profile. The compression of wages for employed workers reduces the private benefits of skills acquisition. For the unskilled, it increases the private cost of training by raising the forgone value of time spent in work. Minimum wages, however, may encourage the unskilled who are also unemployed to develop their skills to improve their position in the labor queue.

Progressive income taxes can also reduce the monetary benefits of skills development through wage compression. The effective use of this tax is more pervasive in industrial than in developing countries. The progressive taxation of labor means that tax rates are higher for skilled, technical, and managerial labor than for unskilled labor. If effectively enforced, these taxes reduce the economic incentive of individuals to invest in these skills. In Morocco, for example, the marginal tax rate in 1982 ranged from 13 to 75 percent (Belassa 1988). The top marginal tax rate in Thailand in the early 1980s was 65 percent; in Korea, 55 percent; in Colombia, 49 percent; and in Mexico, 42 percent (Leechor 1986).

Wage compression is also frequently observed in public sector employment, including government administration and state-owned enterprises. A study of thirty-eight developing countries shows that employment in the public sector accounts for an average of 44 percent of nonfarm employment (Heller and Tait 1983; Fallon and Riveros 1990). This percentage is inversely related to per capita incomes and varies by region. Public sector employment accounts for 59 percent of all nonfarm employment in Africa, 36 percent in Asia, and 27 percent in Latin America, compared with 24 percent in industrial countries. The percentage tends to be much higher in countries with socialist-oriented economies; it is 87 percent in Benin, 81 percent in Zambia, 78 percent in Tanzania, 72 percent in India, and 74 percent in Ghana. Through their size and visibility, governments play an important role in wage setting and employment.

Wage determination in the public sector tends to separate wages from productivity (Fallon and Riveros 1990). Public sector wages exceed private sector wages at lower, although not at higher, levels of education

in Brazil, Colombia, Greece, Malaysia, and Portugal (Psacharopoulos 1983). The result is a compression of wages. In Indonesia, government pay scales for those with secondary school education or less are two to twenty times the monthly income of similarly educated nongovernment employees. This differential, which does not exist for college graduates, produces long queues of persons with high school diplomas or less for government jobs and distorts skills demand (IEES 1986).

In many countries the compression of public sector wages is a manifestation of egalitarianism and a means to restrict wage growth and control labor costs. In Zambia, government and parastatal employment represent 75.3 percent of total employment in the modern sector. The government's wage policy has restricted wage growth while protecting the purchasing power of low-wage earners. Observers contend that this compression of the wage structure has reduced workers' incentives to acquire more skills and exacerbated the problem of scarcity of skilled labor.

Wage compression in the public sector also distorts employment in public and private sectors. The Zambian government has experienced difficulties filling vacancies for skilled jobs. Both the government and parastatal sectors indicate that they are losing their most skilled workers to the private sector where salaries are higher and where the wage structure has not been compressed to the extent that it has in the public sector. In the Sudan, where the pay differential between a deputy undersecretary and an unskilled worker in 1986 was reduced to half its 1975 level, the rate of workers voluntarily leaving the public sector has increased, leading to shortages of certain types of skilled labor (Lindauer, Meesook, and Subsaeng 1988).

Substantial inefficiencies in skills development are created when the public sector acts as an employer of last resort, as it does in countries such as Egypt, Mali, and Tanzania (Belassa 1988). When graduates of educational institutions are guaranteed jobs, the emphasis is on credentials rather than productivity. Nothing directly links the job, productivity, and social output. Guaranteed employment encourages an overinvestment in credentials-based skills. In Egypt, where the guarantee of public sector employment and the government's assumption of the cost of education inflate the net private benefits to higher education, 8 percent of the labor force held a university degree in 1986. That rate was well above the 1 to 2 percent in neighboring Mahgreb countries at similar stages of development (Adams 1989).

Wage policies are not the only factor influencing the benefits of skills development. These benefits are affected by other economic policies that determine the pace of economic growth and the likelihood of employment once trained. If no jobs are available, the incentive to acquire skills is reduced. Economic policies that distort relative capital and labor costs

affect employment growth and also the pace of technological change. Policies reducing the relative cost of capital encourage its substitution for labor and thus discourage employment growth. These policies can also change the mix of skills required to work with capital. The distortion of capital markets takes place through domestic financial and tax policies and trade regimes (Haggblade, Liedholm, and Mead 1986).

Domestic financial policies relating to inflation are an important determinant of the price of capital because of inflation's effect on real interest rates. High and unstable rates of inflation discriminate against the holding of financial assets unless they are fully indexed. Without indexing, nominal interest rates need to be raised to compensate for inflation. As Brazil discovered, even when indexed, real interest rates may vary because of macroeconomic policies (Belassa 1988).

Although several developing countries have experienced high real interest rates in recent years, conventionally these rates have been excessively low and even negative. The Pakistani government's adoption of below-equilibrium interest rates reduced capital costs by an estimated 53 percent in the early 1960s and the early 1970s; similarly capital costs were reduced by an estimated 3 to 9 percent in Argentina, Brazil, the Côte d'Ivoire, and Tunisia (Belassa 1988). Brazil, Chile, Haiti, India, Nigeria, Sierra Leone, and Sri Lanka all had negative real interest rates in the early 1970s (World Bank 1975). The consequences were suppressed savings rates, investments with low social rates of return, and the introduction of selective credit arrangements, which distort the quality and productivity of investments (Lanyi and Saracoglu 1983).

Protectionist policies in inward-focused countries tend to enlarge the financial incentives to adopt capital-intensive methods of production in the modern sector, slowing the pace of employment creation. Economic development becomes focused inward when a country tries to control scarce foreign exchange to advance its economic development. Typically, import controls are introduced and the production of domestic substitutes for imported goods is encouraged. Domestic producers are protected from foreign competition, and the demand for foreign exchange is reduced, allowing it to be allocated to important development needs. The decision of what goods to purchase with this foreign exchange, however, often mires governments in economic regulation.

The shortage of foreign exchange creates a demand for rationing, which leads to exchange controls and inflation of the exchange rate. Twenty-five countries in 1984 used multiple exchange rate systems for this purpose, while others such as Ghana, Pakistan, Sierra Leone, and Tunisia relied on quotas and tariffs (Lizondo 1985). Access to scarce foreign exchange for imported capital is an important subsidy encouraging the use of capital-intensive methods of production in place of those

that are labor intensive. Governments tend to favor larger over smaller modern enterprises in the use of this subsidy because of the lower risk attached to producing for protected markets and because of the national interest in the larger companies (Krueger 1983). The differential in the cost of capital between large and small enterprises is estimated to range from 30 to 65 percent (Haggblade, Liedholm, and Mead 1986).

Domestic tax policies also distort the price of capital. Taxes on interest and dividends, for example, reduce the after-tax return on capital and discourage its use. A number of developing countries including Colombia, Korea, and Mexico have followed the European example in adopting value-added taxation to avoid this distortion. Tax policies can also be used to encourage the use of capital. A World Bank study found tax credits for capital investments used in Colombia, Korea, and Mexico; Colombia used tax discounts and special reduced tax rates for capital investment; Mexico issued tax certificates for paying other taxes; and Thailand used tax holidays. All four countries permitted accelerated depreciation on new investments (Leechor 1986).

An important World Bank study, moreover, found that tax policies that favor human capital over physical capital produced higher rates of investment in skills and higher growth rates in per capita incomes (Arrau 1989). This finding and the evidence on trade policies and capital rationing clearly show that shifts in the relative prices of capital and labor affect employment growth and the willingness of individuals to acquire skills. Trade and tax policies that distort prices for labor and capital influence employment expectations and skills development. The magnitude of this distortion depends on the ease with which capital can be substituted for labor.

The potential for capital to replace labor is first an issue of technology and second an issue of economics. The technical potential for this substitution is expressed in the so-called elasticity of substitution. This measure shows the percentage increase in the quantity of one factor of production needed to replace a percentage decrease in the quantity of another factor and still keep the total output of production constant.² Actual estimates of this measure range from 0.5 to 1.2, indicating that in the lower range of values modest problems exist in substituting capital for labor (Arrau 1989).

The technical potential for replacing labor with capital is then evaluated in economic terms by comparing the relative cost of capital and labor. The efficient enterprise substitutes capital for labor wherever the cost of the capital needed to replace labor is less than the cost of the labor it replaces. Knowledge of the elasticity of substitution along with knowledge of the magnitude of price distortions in capital and labor can be used to measure the effect of price distortions on employment. In Thailand, for example, a 26 percent premium of minimum wages over the

price for unskilled labor is associated with a 20 percent reduction in unskilled employment (Akrasane 1976).

The ways in which developing countries tend to distort capital and labor prices have an important bearing on skills development. In the modern sector, the tendency is to reduce the cost of capital while increasing the cost of labor through various labor regulations. The opposite occurs in the informal sector where capital costs are driven up by the favorable treatment of larger enterprises in the modern sector and smaller enterprises are able to avoid government labor regulations. Employment growth thus tends to be concentrated in the informal sector where the demand for vocational schooling is weakest. The resulting stagnation of employment growth in the modern sector, exacerbated by these policies, reduces individual incentives for acquiring modern sector skills.

Capital-intensive growth, encouraged by market distortions, is also expected to accelerate embodied technological change through investments in new machinery and tools. Such technological change increases the uncertainty about the expected useful life of a particular set of skills and may therefore reduce an individual's willingness to invest in skills development. Alternatively, technological change can encourage a movement from specific to general skills training as a means to hedge the risk. General skills training reduces the demand for vocational schooling. Where rapid technological change is occurring, the risk factor may force government or enterprises to subsidize the cost of an individual's training as an incentive to develop technology-related skills.

By distorting the stream of benefits and costs of training from competitive levels, economic policies can thus alter individual incentives to acquire skills. The ability to find employment and the wages paid are two of these incentives. Economic planners and policymakers must understand how government interventions can influence these streams in order to anticipate their effect on skills development and economic growth. The education planner who ignores the economic environment in the design of a training strategy risks the inefficient use of resources in skills development. Building vocational schools where there are no jobs is but one example of this.

DISTORTION OF INCENTIVES TO TRAIN. The economic environment influences not only the incentives to acquire skills but also the incentives to offer training. Government interventions that distort competitive markets can also affect the willingness of enterprises to train. This is important because enterprises are efficient providers of skills training. Governments in many developing countries face pressures to stabilize spending on social programs, including education and training. At the same time, rapid population and labor force growth is expanding the

demand for these services. To the extent that enterprises can be encouraged to train, they offer an important means to expand the resources available for skills development. Common economic policies, such as minimum wages and social insurance programs, may, however, actually discourage enterprises from offering skills training. Enterprises are reluctant to invest in general skills training because of the risk that their investment will be lost through labor turnover. The individual worker can capture all the benefits of investment in training by leaving the enterprise for higher wages elsewhere. The enterprise may therefore be willing to offer general skills training only when its costs are paid for by public subsidies or by workers through reduced wages.

The requirement to pay a minimum wage, however, may restrict the ability of an enterprise to shift the cost of general skills training to the worker in the form of lower wages. The outcome will be a lower private rate of return for the enterprise and a reluctance to provide this training. Workers who stand to benefit from training will increase their demand for training from other sources, including formal schooling. An important study in the United States found minimum wages to be associated with a reduction in wage growth, implying less skills development in the enterprise. Minimum wages were also linked to an increase in labor turnover as skills development and wage growth do not take place. Minimum wages were also linked to lower rates of reported training (Leighton and Mincer 1981).

By reducing opportunities for general skills development in the enterprise, minimum wages are expected to prolong formal schooling and increase the demand for vocational training in schools. Because minimum wages are often combined with other labor market policies, it is difficult to isolate their net contribution to incentives for skills development. Zimbabwe, for example, has attempted to offset the employment displacement effect of minimum wages by introducing job security provisions making it difficult to lay off workers. Zimbabwe's aggressive enforcement of these provisions was closely followed in 1982 by the peaking of youth unemployment and a sharp reduction in the number of apprenticeship positions that enterprises offered (Hawkins and others 1988). Both were considered responses to the increased cost of unskilled workers.

Labor market policies, including minimum wages, tend to be more aggressively enforced in the modern sector than in the informal sector (Belassa 1988; Liedholm and Mead 1986). The distortions arising from these policies contribute to the capital bias of the modern sector and its low rates of labor absorption (McMahon 1988). The flexibility of the informal sector in Latin America and Sub-Saharan Africa has helped offset the imbalance between the growth of labor supply and modern sector employment. In India, Indonesia, Pakistan, and the Philippines,

informal sector activities have expanded to fill the gap left by dwindling employment growth in the modern sector (Fallon and Riveros 1990). The stagnation of employment growth in the modern sector has important consequences for vocational schools, whose training is largely focused on the needs of the modern sector.

Government interventions that discourage enterprises from entering the modern sector and encourage them to remain hidden in the informal sector radically alter the nature of enterprise training. The ability of an enterprise to avoid government regulation is correlated with its size. The informal sector tends to be composed of enterprises that generally employ fewer than ten workers. This small size, together with difficulties informal sector enterprises face in acquiring capital, tends to restrict the amount of capital available per worker. The combination of these factors affects the type of skills required by the enterprise. Workers must perform a broader range of production functions in the smaller enterprise. The preliminary findings of a series of enterprise surveys in the informal sector in West Africa suggest that general primary and secondary schooling combined with apprenticeship in the enterprise is the preferred method of training for this sector (World Bank 1990c).

For workers in the informal sector, general schooling provides basic skills for on-the-job learning, including the ability to learn a wide range of functions in production. In the modern sector, in contrast, the division of labor and capital intensity affect the scope and level of required skills, and the scale of production enlarges the number of skilled workers needed. The combination of these factors leads modern sector enterprises to use modes of training different from those the informal sector uses.

Apprenticeships are used less often in the modern sector than in the informal sector, and when they are used in the modern sector, the power of unions to separate wages from productivity through collective bargaining can affect the level of training. Britain and France, for example, have building industries of about the same size, but France produces two to four times as many qualified building craftsmen as Britain does. A study of apprentices in the building trades of the two countries found that the average wages of a second-year trainee in Britain in the 1970s were about 70 percent of a qualified craftsman's wages, while those trained in France received only about a quarter of a craftsman's wage (Prais and Steedman 1986). The researchers concluded that bargained wages in Britain increased the cost of apprenticeships to the point that enterprises no longer found it profitable to train—a result, the study suggested, that was reflected in the quality of construction in Britain.

Social insurance charges that fail to take economic costs into consideration also play a role in the employment of apprentices and the willingness of enterprises to train. Frequently applied to larger enter-

prises in the modern sector, these charges covering pensions, disability, health, and unemployment benefits are mandated in many Latin American countries and are also found in countries such as Sri Lanka, Malaysia, and Zambia (Squire 1981). Employers in Tunisia must pay these charges for their workers age 18 and older. Social insurance charges in Tunisia approach 40 percent of the wage bill and sharply increase the cost to the enterprise of workers who have not yet attained craftsman status. As a result, laying off apprentices before they are incorporated in the social security system is a common practice.

Many developing countries have adopted job security provisions, which can encourage enterprises to train but may also discourage employment growth because restrictions on dismissal reduce an enterprise's flexibility in its use of labor. Labor in these cases is treated as a fixed resource in production. Argentina, Colombia, Greece, India, Mexico, and Portugal have the most stringent job security provisions in their labor codes (Riveros 1989), but strong regulations are also found in other parts of Latin America and in both Western and Eastern Europe. A study of these regulations in India and Zimbabwe found that enterprises were increasingly reluctant to hire workers (Fallon and Lucas forthcoming). In other countries such as Egypt, enterprises have preferred to expand the hours of overtime worked and to use contract workers rather than hire new workers.

The effect of job security restrictions on skills development and productivity in the enterprise is mixed (Box 3-2). On one hand, enterprises are less able to respond flexibly to macroeconomic shocks, and productivity may be impaired because individual workers make less effort (Fallon and Riveros 1990). On the other hand, the cost of dismissing workers encourages enterprises to invest in skills formation to make a more flexible work force (Carnoy 1990). Employment security, moreover, makes the work force less resistant to the adoption of new technologies that can enhance productivity (Aizenman 1987). Thus, job security measures give enterprises an incentive to invest in skills development, but they also encourage more capital-intensive development and slower employment growth.

Government interventions like these increase the cost of labor and encourage capital-intensive development in the same fashion as economic policies that reduce the relative cost of capital. By encouraging capital-intensive growth, these policies increase the uncertainty surrounding investments in skills development. An increase in capital per worker is conventionally expected to enlarge the demand for skills, and new technologies—and new machines that embody them—are seen as increasing the demand for skilled workers (McMahon 1988). The outcome, however, is more complex and depends on whether one evaluates a given job, an occupation, an industry, a sector, or the economy as a

Box 3-2. *Job Security Measures Can Discourage Enterprise Training*

The labor codes of developing countries frequently contain job security measures, which establish legal procedures and conditions under which employers can lay off individual workers or groups of workers. These procedures can be lengthy, costly, and troublesome for employers. But for workers, these procedures provide important protection from arbitrary firings or dismissals.

The job protection these measures afford can have a positive effect on the work force. The assurance of employment can instill workers with a sense of loyalty to the interests of the firm. Increased productivity may also occur when workers no longer fear that they will be displaced by new technology. The cost of layoffs to employers can encourage them to invest in skills training for workers to make the work force more flexible.

Job security measures can also have a negative effect on employment and training by enterprises. Using the United States as an example, Lazear (1990) estimated that an increase in severance pay from zero to three months would have two effects: it would raise the unemployment rate because employers would be more careful about hiring workers who could not be easily released, and it would increase the number of part-time and temporary employees who tend to be exempt from severance pay rules.

The substitution of part-timers and temporaries for full-time, permanent workers reduces the likelihood that employers will provide training because anticipated worker turnover lowers incentives to train. The work force becomes more fluid. High worker mobility raises the cost of training to the firm and acts as a disincentive to train. In addition, a mobile labor force can impede production, thus encouraging firms to meet their production needs by becoming more capital- and less labor-intensive. This means fewer jobs for the graduates of preemployment training institutions.

Source: Lazear (1990).

whole (Carnoy 1990). Studies from the United States and France involving the advent of information technology produced mixed evidence, showing that for every job that is upgraded, another is downgraded (Spenner 1985).

A study of computerization of the insurance industry illustrates the complexity of changing skills demand (Baran 1985). The study shows a considerable upgrading of some jobs, elimination of others, and creation of new jobs, especially in data processing and programming. Many of the lowest skilled clerical jobs were eliminated, but higher level accounting jobs and middle-level management jobs also disappeared. Higher level managers were required to perform many of the tasks previously

assigned to middle-level managers. A series of case studies of automation in the banking, engineering, electrical appliance, and printing industries in Asia showed similar findings (ILO 1988b).

The consequences of technological change for employment and skills development in the enterprise are shaped to a large extent by the labor legislation of each country. In Singapore and Sri Lanka, where job security laws make it difficult to dismiss workers, enterprises chose to retrain employees for new jobs. Studies of the banking industry in industrial countries produced similar findings (Bertrand and Noyelle 1986; Adler 1983). In Korea and the Philippines, however, where there were no job security laws, enterprises fired and replaced workers more frequently. The evidence suggests that labor laws and practices determine management strategies toward labor retraining, redundancies, and external recruitment (Carnoy 1990). The workers most likely to be dismissed when automation occurs are unskilled workers, but this varies by country and labor legislation.

The willingness of enterprises to train is thus shaped by a variety of economic policies. Enterprises are discouraged from offering general skills training when they are unable to shift the cost of training to workers in the form of reduced wages. Minimum wages are a potential source of this problem. The nature of training that enterprises offer changes when the scale of government interventions encourages growth in the informal sector. This shift increases the demand for general skills and reduces the demand for preemployment vocational skills, making apprenticeships the dominant mode of enterprise training in the informal sector. In the modern sector, job security restrictions encourage enterprise training but at the expense of job creation. Capital-intensive development and technological change in the modern sector, stimulated by policies increasing the relative cost of labor, encourage skills diversification but increase the level of uncertainty about the value of investments in skills development.

Summary

One of the few factors government policymakers can count on in contemplating the next ten years of development is the size, and rate of growth, of the pool of new entrants to the labor force. This feature of the policy landscape is of fundamental importance, however. The dozens of developing countries that have already experienced high rates of population growth face a continuing struggle to create employment opportunities. These countries must adopt growth-oriented economic policies that capitalize on the most abundant resource—the nation's human resources. The central challenge to training policy will be to support and respond to these policies.

In countries where rapid economic growth combined with effective demographic policies to produce potential labor shortages, the challenge is to make continuous improvements in productivity to maintain competitiveness in international markets. Policies that foster the acquisition and development of technology will play an important role. Occupations and skill needs will change quickly. The development of higher technical skills will be crucial to the success of these policies, as will successful programs to improve the productivity of the work force and to facilitate the flow of labor from lower to higher productivity sectors of the economy.

In both cases, however, developing countries will face considerable uncertainty about the nature of employment and the demand for skills. A flexible and adaptable work force will be needed to enable economies to respond to changing policies and opportunities. The economic prospects will be best for those workers who have a base of general skills that enables them to train and retrain.

Improving Signals and Incentives

Employers as well as private and public training institutions will have to provide efficient training to facilitate change and growth. To improve the efficiency of skills training, planners must not overlook the importance of the economic environment and the signals it provides that guide individual and enterprise investments in skills development. The fact that vocational graduates cannot get jobs may be due to inappropriate curricula, lack of practical training, or other matters within the control of a training system, but it may also be due to distortionary economic policies about which the system can do little. Without the discipline of a competitive economic environment, there is little reason a priori to expect schools and training centers to be efficient on their own initiative. Thus, a competitive economic environment is necessary for the efficient allocation of resources for skills development. The only occasion when an education and training system can afford to be inefficient is when it is sheltered from the discipline of the marketplace.

Competitive prices in product, financial, and labor markets will improve the efficiency of skills development. The alternative to getting the prices right is to seek second-best solutions that compensate for price distortions in the marketplace and encourage efficient behavior. Thus, for example, if wage rigidities prevent enterprises from shifting training costs for general skills development to workers, the second-best solution might involve offering subsidies to enterprises to increase their incentive to train. In evaluating the gain in efficiency, this solution would require an assessment of how the revenue is raised and the cost-effectiveness of alternative systems for skills training.

Reducing or Compensating for Distortions

Economic reforms may correct market distortions directly in cases where economic policies have been adopted without considering their effect on economic growth and the efficiency of skills development. The benefits of these distortionary policies can be weighed against the costs in reduced market efficiency. In other cases, however, the public may strongly resist policy changes. This resistance will come from a conscious consideration of the policy tradeoffs involved, and the choices made will reflect a society's balancing of these tradeoffs. In these cases, improving the efficiency of skills training will require attention to second-best solutions because markets will remain distorted.

The construction of effective second-best solutions to compensate for market distortions will not be an easy task for planners and policy-makers. As part of its social policy, Egypt encouraged wage compression in its large public sector during the 1980s, reducing the private benefits of higher education. This reduction, however, was more than offset by the provision of tuition-free education. In the early 1990s Egypt continued to produce more university graduates than the market could absorb. One might ask then why policies that create such distortions are adopted in the first place and why these policies and their distortions are not addressed directly through economic reforms? The answers can be found in a country's willingness to accept the tradeoffs that exist for economic growth and social equity. The adoption, for example, of a minimum wage to ensure an adequate standard of living for the working poor will in most cases involve a conscious public tradeoff of efficiency for equity. A similar tradeoff applies to the compression of wages by administered wage systems and taxes. Strong equity preferences drive the policy choices.

The role of government in skills development is thus shaped by the economic environment. The demand for government interventions in skills development is expected to correspond directly with government involvement in the larger economy. That is, where governments intervene and distort the operation of competitive markets, inefficiencies in education and training will be produced. Unless these interventions are reduced, governments will be drawn into second-best solutions to improve the efficiency of skills training by compensating for policy-induced market distortions. In other words, government interventions beget government interventions.

Increasing the Role of Market Forces

Competitive economic environments, on the other hand, reduce the need for government involvement in training strategies. Competition acts to

encourage efficiency. If government provides skills training, it, like other training providers, must be subject to market forces to ensure the efficiency of the training. If government schools, for example, are sheltered from market forces, there are no assurances these forces will guide the allocation of public resources in skills development. So long as government training institutions are forced to compete with other providers for support, there is nothing inherently wrong with government providing skills training. This competition can be generated through the financing of public institutions, making them dependent in part on the training fees they charge individuals and enterprises.

In a competitive economic environment, governments continue to be responsible for addressing market failures and equity issues. Market failures may arise where positive externalities exist for education and training. An example would be the development of a skilled work force that permits an economy to expand without increasing inflationary pressures. Such a work force benefits society but may not be valued by individuals. Market failures may also arise where rapid technological change makes the outcome of investment in skills development uncertain. In these cases, risk-averse individuals and enterprises would underinvest in skills. The market will fail to take into account the additional social benefits of skills development unless government intervenes to shift some of these benefits to individuals and enterprises. In addition to market failures, government continues to be responsible for ensuring that opportunities for skills development are distributed equitably.

Adapting to Changing Economic Contexts

Throughout Africa, Latin America, and more recently, Eastern Europe, countries have undertaken economic reforms to encourage economic growth. These reforms are removing protectionist barriers and opening economies to competition. In doing so, governments are changing the economic environment that surrounds the process of developing skills. Education and training systems that have functioned in distorted economic environments are encountering new pressures to develop skills efficiently. The failure to respond to these pressures may threaten the success of economic reforms by restricting the supply of skilled labor. The success of economic reforms and efficiency of skills training are thus jointly dependent. Structural adjustment and competitive prices are important to improving the efficiency of skills training, but improvements in training efficiency are also important to the success of structural adjustment.

The analysis in this and the previous two chapters lead to some important conclusions regarding policy objectives for vocational and

technical education and training. First, training by employers, both private and public, can be extensive, and it offers the trainee many advantages, including the availability of skilled workers and advanced production technology as teaching tools. The evidence indicates, moreover, that employer training is usually more cost-effective than pre-employment vocational education and training, in no small part because of lower training costs. Strengthening employer training is thus an important objective for public policy.

Second, the presence of different markets for skills argues for the specialization of preemployment training programs and institutions to meet these varying needs. In the modern sector, training must be closely linked to employment to adjust to the effect of changing production technologies and processes on the structure of occupations and the skill requirements of jobs. The evidence on the cost-effectiveness of training validates this argument and also highlights the importance of institutional responsiveness to changing training needs. Similarly, the effectiveness of training for the unemployed depends heavily on the extent to which it is linked to available jobs or opportunities for self-employment. In the rural and urban informal sectors, skills training can improve productivity if the complementary factors of capital, markets, and management are also put in place.

Third, preemployment vocational training is more effective when it is clearly oriented to employment and improved productivity. Supply objectives have proved elusive, in large part because they do not mesh with the dynamics of labor markets.

Fourth, the economic context is centrally important in determining the nature and pace of employment growth and thus the effectiveness of preemployment training in placing individuals in jobs that use their skills. Moreover, the economic environment shapes the incentives for employers and individuals to invest in skills development, and thus the potential of the private sector efficiently to assume a significant share of the training burden. Devising public training policies that are appropriate to a given economic environment is fundamental to their success and to economic growth. Because environments differ, and because they can change quickly, there can be no single prescription for public training policy. Instead, the role of the government in training has to be based on local conditions and informed by careful economic analysis. We deal with the role of government in more detail in the following chapter.

Notes

1. The harmful effects of labor market distortion on economic development are an underlying theme of this book. For a lively presentation of an opposing viewpoint, see Freeman (1992).

2. For example, if production remains constant with a 0.5 percent increase in labor and a 1 percent decrease in capital, capital is not a very good substitute for labor. The elasticity of substitution is constructed as a ratio of the two percentages and is, therefore, 0.5 in this example.

Part II

*Options for Public
Policy*

4. *Designing Responsive Public Training Policies*

Governments in virtually all countries have assumed an active role in developing skills. This chapter discusses the rationales that underlie this central role and considers ways in which it can be executed most effectively under different economic circumstances. Although an active government role may be appropriate, the nature of the government's involvement should evolve in tandem with institutional development and economic change. In particular, the balance of activities, between supportive services for training, of training provision, and of finance and subsidy, will need to change, reflecting changes in the justification for such intervention as the economy and its training needs change over time.

Adequate and stable financing for training is essential for both effectiveness and efficiency, as is sustainable institutional capacity for the implementation of public policies. This chapter also discusses ways to diversify sources of financing for training and to strengthen institutional arrangements for policy implementation.

Selecting Rationales for Government Intervention

Historically, the government's role in training has been a limited one; private training markets were far more important. It was the small enterprise that assumed the dominant role in skill creation, particularly in general training in transferable skills. Informal apprenticeships in craft trades were the primary training venue, but small enterprises offered training at other skill levels, including internships in accountancy and law.

In the financing of training, however, the role of the enterprise was minimal. Typically, trainees paid for their training, usually by receiving a lowered wage during training (the difference between the wage of a skilled worker and the trainee wage represents the implicit fee for training); alternatively, or in combination, the trainee paid the employer

a lump sum fee at the outset. In return for their investment in training, trainees expected enhanced earnings, reflecting their augmented productivity. The small enterprise, be it the master craftsman or a legal practice, assumed a dual role; in addition to serving its customers, it also sold training services to its employees.

This is a far cry from the situation today. Traditional private training markets have proved too limited in meeting the broader skill needs associated with economic development and growth. Government has emerged as a leading actor in the market for training in most countries in the world (although in the informal sectors of many developing countries, its role remains limited). Government has become a major provider of training courses (in vocational schools and specialized training institutions). Moreover, it now finances a significant share of training programs.

Government's active role in vocational training and skills development is displayed in three broad, but fairly distinct, activities: providing supportive services, providing training itself, and providing finances for training.

Supportive services are relevant at all stages of skills development, although coverage may vary. Among the wide range of supportive services the government may offer are measures to create a climate of opinion conducive to training, encourage tripartite collaboration among employees, workers, and government, and enhance the appeal of industrial careers and training (Castley and Alfthan 1986). The state (or a specialized agency) may also play a regulatory function through services that enhance the quality of training, such as testing and certification, research, and curriculum development; it may promote enterprise training by providing training assistance, know-how, and advisory services.

Yet, the main thrust of government intervention in preemployment training has been to provide training and financing. The government may provide training directly through public-sector training institutions and state vocational schools. Or it may finance, wholly or in part, a wide range of training activities, either by providing its own training courses at little or no cost to trainees or by heavily subsidizing training courses provided by nongovernment institutions, such as private vocational schools or enterprise-based training.

Although formally distinct, providing training and financing it are closely interconnected, a fact accounting for some lack of clarity in discussions concerning the appropriate role of government in the finance of training. This issue is of some importance because the rationale for government intervention differs in the two cases: a strong case for the government to finance training does not necessarily imply that the government should also provide training (and vice versa).

Can the active role that most governments assume in providing and financing training be justified in efficiency terms? What is the case for state intervention in training markets? Why not rely on the interplay of coordinating market forces, in the form of the private training choices of workers (or parents) as consumers, and the profit-maximizing activities of private training suppliers, to ensure the socially optimal amount of training? In short, does the state have to provide training? Must it finance training?

Sound institutional and efficiency reasons may justify a public sector role in providing training. Even where these reasons do not (or no longer) apply, government training programs may still be acceptable as long as they are effective and efficient in relation to other or potential suppliers of training services. This is particularly true where the objective of shifting the weight of the training effort more in the direction of greater enterprise-based training remains as yet unfeasible. Although some factors may militate against efficient government provision, there is no perception per se that the state should not train.

This is not the case with public financing of training. The benefit principle would appear to indicate that workers, not government, should finance the full costs of their training: because of their greater value in the labor market following training, workers could expect to receive enhanced earnings, sufficient to cover initial training costs.

But do workers capture the full benefits of their training? Are there additional reasons that justify state financing? Indeed, a wide range of arguments have been adduced to support a financing role for government in training. These are discussed under four headings: external benefits, market imperfections, weak private training capacity, and equity.

External Benefits

Individuals who decide to invest in training are motivated by expected higher earnings and other, mainly job-related, benefits; they will not capture, and therefore do not take into account, any broader benefits that may accrue to society as a whole from a better trained work force. From a societal point of view, individuals may not invest enough in training and therefore may not acquire sufficient skills. The positive benefits to society from ensuring an adequate supply of skills (external effects or externalities) are frequently cited to justify public financing of training. Indeed, the traditional justification for government financing of education in general is couched in terms of externalities. Positive externalities derived from general education include lower fertility, the facilitation of political and economic transactions, and intangible benefits stemming from more enlightened parents and citizens. In the absence of government subsidy, too little education would be demanded—and supplied.

Although relevant for training, the externality argument is likely to be less persuasive than it is for general education. Vocational education and training are more narrowly focused on providing skills that are relevant to a specific occupation or a job and are therefore unlikely to provide the full range of external benefits that are associated with general education. The more narrowly focused vocational training becomes, the fewer wider societal benefits will it provide and the weaker the case for public subsidy, as the training investor (usually the worker) captures a greater proportion of the total benefits of training.

Nonetheless, there are other external benefits of vocational education and training that are less strongly associated with general education. The absence of government training subsidies to encourage individuals to train more, would prevent the socially optimal level of training from being attained. The availability of a skilled labor force may contribute to the attainment of macroeconomic goals of society: these will be over and above the direct benefits of enhanced productivity stemming from (and mainly captured by) the trained workers themselves.

Vocational education and training develop a broad skilled and technical labor base that is able to meet the needs of rapidly changing industrial organization and technology as well as to engineer this process of growth and industrial change. Yet firms may not always be willing or farsighted enough to ensure that a sufficient number of people are being trained in transferable skills vital to the economy, that is, to meet national long-term needs rather than their own particular requirements over the medium term.

Some proponents of publicly subsidized training contend that it can help avoid shortages of workers with key skills in new or growing industries—shortages that could act as a brake on economic development. A more focused version (see Chapter 2) argues that establishing the capacity to train workers is a key element of incentive programs designed to attract new investment. An additional macroeconomic argument suggests that the provision of skilled manpower can strengthen export-related industries and thus help to mitigate balance of payments problems, earn scarce foreign exchange, and promote self-sufficiency objectives.

Overall, however, only a partial case for government intervention can be made on the basis of externalities. The main case is to be made in terms of market imperfections and weak enterprise training capacity, although equity considerations may also play a role.

Market Imperfections

If training markets work imperfectly, underinvestment in human capital will ensue, and the training system will fail to provide the economy with

the supplies of skilled manpower necessary for development. A major cause of such market imperfections is often said to lie in the propensity of enterprises to recruit or "poach" trained workers from other firms. This line of reasoning is flawed, however. Because recruitment of trained labor is nevertheless widely viewed as a cause of market imperfections, some attention will be given to explaining the nature of this "poaching illusion" (Lees and Chiplin 1970).

The poaching argument runs along these lines. To meet their skilled labor needs, firms can choose to train directly, recruit workers from outside, or opt for a combination of both. Firms that poach inflict costs on firms that train because of the greater wastage of newly trained workers to the poaching firms. Training firms will react by cutting down on their training effort, resulting in a general underprovision of skilled workers.

This argument, however, fails to take into account the important distinction between general training and firm-specific types of training (Box 4-1). Because firms have no interest in recruiting workers with skills specific to other firms, the poaching phenomenon is confined to generally trained workers. But poaching generally trained workers does not impose costs on the training firm because it is the trainee, not the firm, who finances training in general skills. Thus, subsidies or grants made for general training in transferable skills represent a reimbursement for training costs that are not in fact incurred by the firm. In contrast, grants for firm-specific training subsidizes training needlessly, in the sense that firms already find it profitable to train workers in the specific skills it requires.

Other sources of market imperfections, however, do merit remedial treatment by government. As we argued in Chapter 3, government policies relating to aggregate economic activity and the operation of individual markets shape a country's economic environment and affect incentives to produce and acquire skills. Broad social policies may unintentionally distort training markets by altering the benefits and costs of vocational education and training (VET) for individuals and enterprises. In such cases, second-best solutions, involving other government interventions, may be necessary to balance the resulting distortion of incentives in VET.

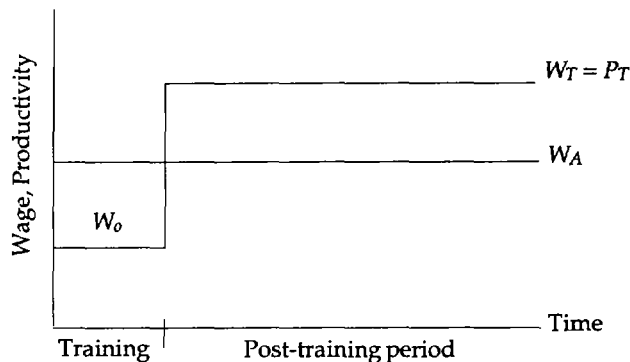
These arguments are particularly relevant to government labor market policies that adversely affect the efficiency of enterprise-based training. According to the Becker theory of training, workers are willing to assume a role in financing enterprise training in transferable skills (Becker 1975). As noted in Chapter 3, minimum wage legislation may thwart trainee-financed general training by preventing the training wage from falling sufficiently to pay for general training; this is particularly true if workers do not possess savings or other assets to finance the training, and

Box 4-1. Who Pays for Training?

Central to any discussion of enterprise-based training is the question who should pay for it. A perfectly competitive firm will compare the benefits from any investment in training with the costs involved and will invest in training only if the benefit to the firm is at least enough to cover the cost of the investment and the investment is at least as profitable as any other potential investment. A major uncertainty for any firm contemplating an investment in training is whether the trained worker will stay with the firm long enough for it to recoup its investment.

Building upon the seminal work of Becker (1975), economists answer this question by distinguishing between two types of training—general and specific. A worker that has received completely general training—word processing skills, for example—will be just as productive in another firm as in the firm that trained the worker. In contrast, training that is completely specific to the work of the firm will only raise the individual's productivity in the company providing the training.

Because general skills are transferable to all other potential employers, firms have no incentive to pay for general training if there is reason to believe that the trained workers may then leave the firm. If other firms offer higher wages to trained workers, for example, the training firm would also have to offer higher post-training wages. It therefore would face increased costs and would see no benefit to paying for training. For employees, however, the promise of higher future earnings makes paying for their own training a good investment. The wage and productivity relationships in a firm offering completely general training are illustrated in Box Figure 4-1.

Box Figure 4-1. General Training Case

W_A represents the average wage and productivity of untrained workers over the life cycle. During training, such a worker is paid less than would be received in another job with no training component (W_0 is less than W_A). The trainees' forgone earnings represent an investment, or the cost to them of training. The training cost includes lower productivity (because they are learning new skills), as well as training instructional cost. After training, the general skills and productivity level of the worker rises to P_T . Because the skills are general and easily transferable, the worker's new wage must also rise to the level $W_T = P_T$ greater than W_A . Although wages are seldom reduced in practice, it is common for entry-level workers to be paid much less during an initial training period and to receive an increase in pay, reflecting increased productivity, at the end of that period.

If training is completely specific to the needs of the firm, the worker's skills are nontransferable and there is no wage competition among firms. Trainees receive no wage benefit from training and consequently cannot be forced to bear any of the cost. The worker's actual lifetime earnings path would be the horizontal line W_A . In fact, the wage line would not be completely flat because the worker would probably be paid a wage after training that slightly exceeds the nonskilled wage to encourage the worker to stay with the firm. Worker productivity during training would be less than the wage. The total cost to the firm of the training includes both actual training expenses and output forgone. After training, the worker's productivity *in the firm* would be greater, but if the worker were to go to work for another firm, productivity would not be affected—it would remain at W_A .

The sharp theoretical distinction between general and specific training is much less clear in reality. Becker himself argued that almost all training includes general and specific elements so that the trained individual's wage cycle will lie somewhere between the steep wage trend of the generally trained worker and the flat lifetime wage line of the specifically trained worker.

Reality, however, does not dilute the essence of the distinction—workers have an incentive to pay for their own training to the degree that the newly acquired skills are generally marketable. Indeed, the most traditional form of general training, apprenticeship, demonstrates untrained workers' perception of their lifetime earnings profile. Young people apprentice with an artisan or in a craftsman's shop for months or years with little or no salary in order to reap the benefits of higher pay at a later date. In some environments, apprentices are even expected to pay for training, a clear acceptance of the notion that firms have no incentive to subsidize training if they have no guarantee of benefiting from the investment over the lifetime of the worker.

Source: Becker (1975).

recourse to loan markets is limited. A minimum wage can thus lead to a shortfall of generally trained workers. A parallel argument applies when strong union pressures prevent the wages of trainees from falling to cover training costs.

Administered wage systems and unduly narrow wage differentials for skilled workers discourage worker investment in general training because workers cannot fully recoup their training costs through higher earnings after training: private returns will fall short of social returns and the system will not train enough workers. In both cases, corrective training grants to workers (which may be administered by firms), are justified.

To the extent that generally trained workers are not freely mobile—the company town representing an extreme case of worker immobility—firms are willing to take on at least some of the financing of general skill development. Such financing counters the effects of policies discouraging worker-financed training and reduces the need for state financing or subsidy. One important barrier to the mobility of generally trained workers is that outside firms are not aware of the training workers have received; this reduced potential mobility of generally trained workers will make it feasible for enterprises to assume a sizable part of the burden of financing general training, with a consequent reduced need for government financial intervention (Katz and Ziderman 1990). Governments, however, in an attempt to achieve a greater overall labor market efficiency, frequently pursue policies that encourage worker mobility. A policy measure, currently much in favor, is the development of national training qualifications and certificates of training attainment. Yet such certification has a clear, and negative, effect on training: by facilitating worker mobility among firms, it reduces the incentive for firms to finance training.¹

Capital market imperfections and the deleterious effect of risk and uncertainty on worker-financed training also make a case for remedial action by the government. There is a limit on how much workers are willing to have their wages reduced in return for enterprise-based training. The larger the training cost and, given training costs, the shorter the period of training, the greater will be the required reduction in wages during training. Workers may not find it possible to sustain this loss in wage income during training, particularly if they are lacking in financial assets. Moreover, poorly functioning capital markets in developing economies deny to many workers the possibility of financing training through loans. Indeed, even in economies with better developed financial markets, loans to finance human capital investments may not be forthcoming. Unlike other investments that can constitute the collateral for the loans that finance them, human capital investments, embodied as they are in the trained workers themselves, are not readily accepted

as security by financial institutions. In these situations, workers may be forced to forgo training investments, even though they are intrinsically profitable.

Even where funding is available, workers are likely to underinvest in general training. Workers pay for training in anticipation of enhanced earnings that accrue over time. They therefore face a risk that these returns will not be forthcoming. These risks are considerably greater for the individual than for society, which can pool and diversify these risks. Workers are likely to display greater risk-averse attitudes than does society as a whole, and worker-financed training is therefore likely to fall short of the societal optimum.

Weak Enterprise Training Capacity

Shortcomings on the side of demand, particularly related to workers' ability to finance training courses, are not the only causes of underinvestment in training. Supply-side factors also may result in an inadequate market response. In particular, enterprises may prove unable or reluctant to discharge adequately their training role, thus justifying government intervention. Certainly, in those countries where the modern sector is underdeveloped, the size of enterprises small, and trade associations poorly developed, the enterprise base in a particular sector may not have the capacity to provide structured on-the-job training, particularly apprenticeship training, to meet the needs of that sector. Small firms may lack the managerial competencies and foresight to organize in-house training. They may also lack relevant personnel management capacity, and because they are unable to benefit from scale economies in training, costs may be high. These firms may not be able to afford external training providers or, in a small work force, to release individuals for outside training.

This lacuna would seem to provide a clear opening for the private sector to develop specialized training institutions or for industry to devise joint off-the-job training programs. Lack of know-how, suitable organizational framework, or capital may stifle such initiatives, particularly in low-income countries. There are exceptions, notably in middle-income countries: Brazil's national training institution was set up on the initiative of industry and financed by a levy on enterprise payrolls. Apart from providing training in public institutions, other intervention measures may include the establishment of group or industry training programs and the provision of technical assistance to promote company training.

The weak training capacity of enterprises may justify government intervention. But the case here is for providing services, not for financing them. While courses at state training centers are usually free or highly

subsidized, this cannot be justified in terms of the weak training capacity of enterprises.

Finally, in countries at all income levels, there are indications that non-profit-maximizing behavior by firms may lead them to undertrain their workers. Low levels of company training, however, do not necessarily indicate that firms are undertraining. In practice, small firms with simple technologies and low worker mobility may have minimal needs for formal training. Even in larger firms, the lack of extensive formal training courses may be veiling an extensive network of nonstructured training activities (Ziderman and Horn 1992). Governments have used training subsidies and incentives (perhaps in combination with such activities as training promotion and exhortation) when firms have not provided adequate levels of training. However, if weak or inefficient management was the underlying cause of low levels of training in the first place, the positive response to these government interventions may be small.

Equity Arguments

Vocational education and training is frequently viewed as playing an important social role in meeting the needs of disadvantaged and unemployed youth and serving the academically less able. Thus, it is argued that an expanded, open, and highly subsidized VET system could make an important contribution to improving the life chances of a significant section of the population. The question at issue, however, is whether these objectives are attainable. As documented in Chapter 2, the record has not been encouraging. The lack of employment growth in the modern sector in many developing countries makes the attainment of such objectives all but impossible. An overexpanded, overly subsidized training system that is not accompanied by increased opportunities for employment or enhanced wages will not improve welfare and is a needless waste of scarce resources. Economic growth and job creation are prerequisites for improving the living standards of the economically disadvantaged; a major contribution to equity would be the reform of distortionary economic policies that discourage employment growth and skills development.

A somewhat different equity argument is rather more persuasive. The large public subsidies for secondary and higher education in many countries are a major cause of inequity, in that they benefit those individuals who, because of their ability or social background, already have the best prospects for steady employment and job income. The equity argument for extending such subsidies to individuals enrolled in training courses is quite strong, particularly when preemployment training is directed toward less privileged students of lower ability.

There are, however, two caveats to this equity (or more correctly, parity) argument. First, in many countries the current high subsidies for secondary schooling are not justified in efficiency terms, and greater cost recovery measures, particularly tuition fees, are warranted; in this sense, the equity argument may be very much a second-best one. Second, the argument that extending subsidies to individuals undergoing training will improve equity is persuasive only to the extent that the overall secondary school enrollment ratio is high so that trainees tend to be drawn from the underprivileged sections of society. That is generally the case in high-income countries, but in low-income countries with low secondary school enrollment, the students enrolled in vocational courses often come from high-income families. In those situations, training subsidies add privileges to an already advantaged group, at the expense of those lacking a basic education; attempts to improve equity are thus undermined.

Designing Appropriate Policies

The appropriate governmental role in any particular country should be an evolving, adaptive one that responds to the country's training needs, which will change as the country's level of economic and institutional development changes. There is no blanket case for governments either to provide or to finance training. It might be appropriate for the government to provide training but not financing, and vice versa. The type and extent of the required government intervention will change markedly from country to country, depending on many factors such as those relating to the country's economic development, the quality of existing training institutions (on and off the job), and distortions in the economic environment that may militate against training development. Nevertheless, some general conclusions can be made regarding the role of government in training. (These are set out in Table 4-1.)

EXTERNALITIES. Of the arguments for a public role in the training market, the appropriate government response is clearest in the case of externalities. When private markets do not provide enough training (in the sense that the benefits from training that accrue to society are broader than the private benefits of the trainees) government subsidies can help correct this undersupply of skills. Under the benefit principle, the subsidies financed through general taxation are justified on the ground that society as a whole benefits (via its externality effects) from the extra training thus generated. Note, however, that externalities do not justify direct government provision of training.

Furthermore, this traditional externality argument justifying subsidies presents two practical problems. First, the elusive nature of many

Table 4-1. *Policy Options for Public Intervention*

<i>Reason for intervention</i>	<i>Kind of intervention</i>		<i>Complementary policies</i>
	<i>Finance training</i>	<i>Provide training</i>	
External benefits	Preferred	Not justified	None
Market imperfections	Second-best	Not justified	Preferred: deal with source of market imperfections
Weak private training capacity	Not justified	Second-best or preferred	Preferred: build firm training capacity
Equity	Second-best	Not justified	Preferred: reduce subsidies to trainees' peer groups. Introduce selective scholarships.

Source: Ziderman (1990).

of these externality benefits and the notorious difficulties associated with their measurement make it difficult to determine the appropriate size of the required subsidy. The danger of costly oversubsidization, and overprovision, of training is ever present. Second, these externality effects, particularly those in the macroeconomic context, should not be taken as a datum: they may be available only if appropriate training policies are pursued. Providing workers with the skills necessary for economic growth and technological change is contingent both upon identifying the needed skills and taking the appropriate steps to ensure that the training occurs far enough in advance of the need to make the effort worthwhile. Strengthening an economy's export sector requires that workers in the appropriate locations be trained in the appropriate skills. These examples point to the need to link subsidies for such programs to priority economic development strategies as well as to assessments of institutional efficiency in providing the services needed.

MARKET IMPERFECTIONS. As discussed in Chapter 3, government economic and social policies may distort the incentives individuals and employers have for investing in training. To the extent that distortions cannot be eased by modifying the policies in question, government finance may be justified as a second-best solution.

For example, minimum wage legislation is widely seen as an essential measure for protecting low-paid workers. Although it is unlikely that minimum wage laws would be repealed simply because they discourage individuals from investing in general training, some legislative compro-

mises may be possible. The granting of a special legal status to apprentices that would exempt their wages from the effects of minimum wage legislation is one possibility. In the absence of such arrangements, it might be appropriate to subsidize apprenticeship wages.

If for equity reasons wages are uncoupled from productivity and the wage-skill profile compressed, individuals will not invest enough in skills development. A second-best solution involves compensating for the distortion of economic benefits to individuals by reducing their costs for skills development. This can be done by giving individuals training grants or by subsidizing enterprise training.

The development of government-backed loan programs for training would be an appropriate response to imperfectly functioning financial markets, but the lack of a sufficiently developed administrative framework in many economies and the unwillingness of trainees to risk borrowing against future earnings could make such programs unfeasible. Again, in these circumstances, subsidizing trainee wages may be appropriate.

It has been argued that both externalities and market imperfections justify government financing of training programs. The two cases differ in one important regard, however. Whereas subsidies constitute the correct treatment for externalities whether in training or other markets, they are a solution to market imperfections only after more direct measures to deal with the sources of market imperfections have been ruled out (usually on administrative or political grounds).

WEAK TRAINING CAPACITY. To correct a shortfall in enterprise training due to weak training capacity of enterprises, the appropriate policy response is less clear-cut. Governments may decide that it is preferable to deal with the source of the problem than to offer palliatives. If non-profit-maximizing behavior of firms, stemming from inefficient or weak management, is the cause of insufficient enterprise training, then the appropriate response is a corrective, educative one. Training advisory services might have a role to play here. Yet, a positive response to such policies may not be forthcoming, precisely because management is ineffective. In this case, public sector provision of training is indicated, supported by the complementary promotional policies that may achieve some degree of success over the longer term.

In practice, many countries have chosen to use financial incentives to encourage enterprises to train; incentives include training subsidies, grants, and tax write-offs of training expenses. Although the available evidence is not extensive, many of these measures have not been very effective: they needlessly subsidize well-run firms that already train, while weakly managed firms either do not respond or respond by establishing training programs designed more to maximize financial

entitlement under the program than to contribute to relevant skill creation in the firm. These issues are discussed in more detail in Chapter 6.

EQUITY. We have argued that the main equity case for subsidizing trainees is really one relating to parity with peers receiving excessively subsidized education within the school system, rather than equity as such. Both groups are privileged in relation to other individuals of school age, particularly where school enrollment ratios are low. A training subsidy may be acceptable, but the preferred policy approach should be directed toward countering the privilege in the formal school system by reducing general subsidies both for training and general secondary schooling. If the vocational education and training system is in balance with skills demand, selective scholarship assistance for able, but disadvantaged, youngsters is an appropriate complementary measure.

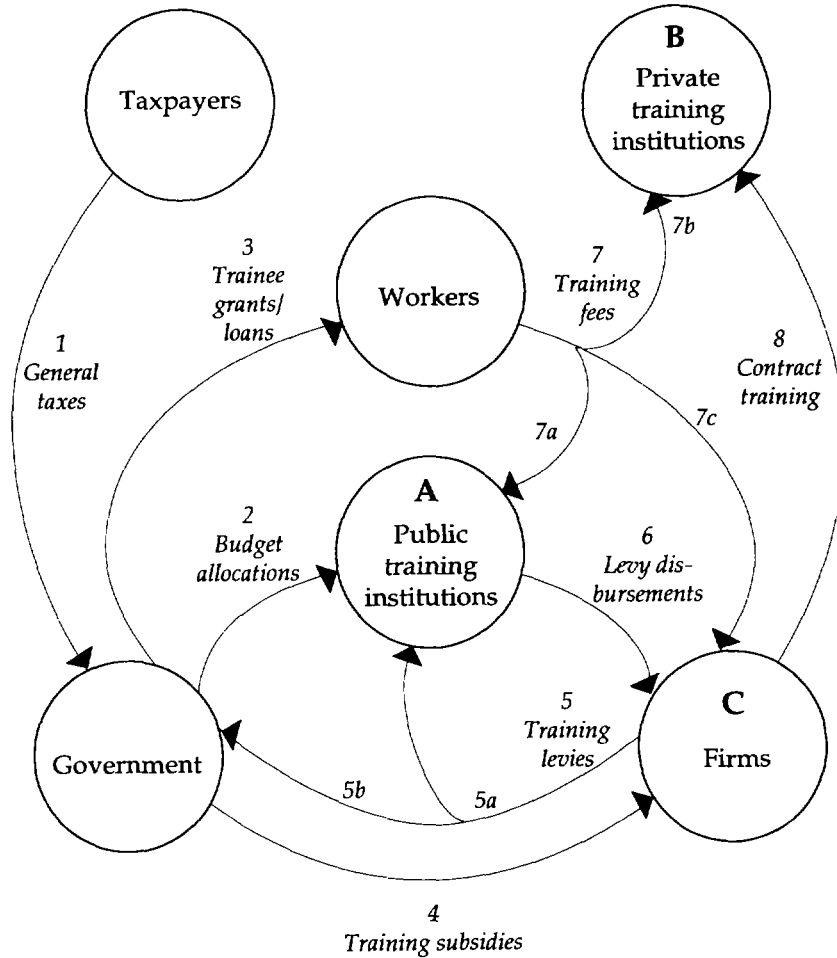
Diversifying Finance

Figure 4-1 shows a schematic view of training markets, highlighting the major providers of training as well as the major cash flows relating to the financing of training.² Training may be provided by public sector training institutions [Area A on the figure] or privately in proprietary training schools [B] and enterprises [C]; private training is discussed more fully in Chapter 6, while Chapter 7 focuses on public training. Public training institutions include training courses offered at vocational schools and at specialized training centers, run either by government departments or national training authorities.

In the market for formal education services the main financing issues concern the appropriate division of the cost burden between students (or their parents) and the state. In the case of VET markets the presence of a third actor, the enterprise, renders VET financing considerably more complicated, however. Not only does the enterprise vie with public and proprietary training institutions as an alternative mode for skill creation, but it also constitutes a financing source, whether for training provided on the job, through fees for sponsored training at specialized training institutions or, more generally, via payroll levies.

General tax revenues constitute the main source of government funding for training interventions [1]. Public expenditures for training fall into three broad categories. Budgetary allocations are made to operate or subsidize training institutions in the public sector [2], be they state vocational schools, specialized training institutions, or a national training authority (which in turn runs its own training centers). Public funds are also used to subsidize trainees via training grants or loan support [3]. Finally, governments finance training grants or subsidies to enterprises

Figure 4-1. Finance Flows in the Training Market



to encourage them to train; these funds are either transferred directly to firms [4] or through a national training authority (not illustrated in the figure). Some countries collect special training levies from enterprises, either to finance training at specialized public training institutions [5a], usually run by a national training authority, or to form an earmarked fund for disbursement to firms that provide training [6]. Alternatively, training levies may flow direct to government [5b], where they usually remain earmarked for the support of training.

Workers purchase training services [7], either explicitly from public sector training institutions [7a] and from private training institutions at full cost [7b] or implicitly from enterprises [7c], by accepting reduced wages during training. Firms may purchase training services directly

from private training institutions through contracts or fee payments on behalf of employees [8]; services may similarly be purchased from public institutions, along the line [5a]. In the past, when government involvement in the realm of training was minimal, only flows 7b and 7c (and perhaps 8) were relevant.

Sources of Finance

Developing the institutional capacity for effective public intervention in training markets requires constant and adequate funding. Yet, central government budgets may constitute a vulnerable source of finance—severe budgetary constraints and instability are typical in many developing countries. Public expenditure in many developing countries, particularly the poorer ones, relies heavily on indirect (commodity) taxation, such as domestic excise taxes on a narrow range of goods and taxes on international trade. The tax base is narrow. The broadly based tax system typical of industrial economies that relies on direct taxation of personal income may not be feasible in developing countries. Difficulties in taxing the urban informal sector and the large and widely scattered traditional rural population make the lack of administrative capacity all the more apparent.

How, then, may stable funding be secured for vocational education and training? A number of countries earmark the proceeds from certain direct taxes to finance training: Ecuador levies a 0.2 percent import tax on industrial machinery;³ while Hong Kong earmarks levies of 0.25 percent of the value of large construction projects and 0.03 percent on the value of clothing exports for training. A more comprehensive scheme operates in Kenya. Under the 1973 Industry Training Act, training committees established in each of the twelve main sectors are empowered to impose their own form of levy, as deemed appropriate. Thus, the training committee for building and construction imposes a levy on all large construction projects, the levy for timber is based on quarterly turnover and for sugar on tonnage of sugar produced.

These schemes have succeeded in generating training funds, but they have not been widely emulated in other countries. A number of predominantly middle-income countries impose payroll levies on enterprises, which have become a principal source of financing for skills training, both in specialized training institutions (usually under the aegis of a national training authority) or in enterprises. The payroll levies are attractive because they form a sheltered source of resources for training and, more generally, offer a means of mobilizing funds otherwise inaccessible to the public sector. These schemes have emerged as the most widely adopted alternative to government budgetary allocations—they are found in some thirty developing economies, as well as in some

Western countries. But because they raise some fundamental issues in public finance, they are also controversial.

Alternative Payroll Levy Plans

Developing countries use two basic types of payroll training taxes, each of which reflects a rather different objective, although in practice there are mixed models (Box 4-2). The traditional scheme—the so-called Latin American model—is essentially concerned with generating revenues to finance training provided by the public sector.⁴ The alternative levy-grant, or rebate, scheme encourages firms themselves to provide in-plant training. Thus, payroll tax rebates are offered to enterprises to set up, or broaden, established programs of in-service training.

A payroll tax plan may entail additional, complementary, objectives. Singapore's scheme, for example, was, at the outset, part of a broad economic restructuring program, aimed at upgrading skills throughout the whole labor force and, ultimately, at achieving a more capital-intensive, mechanized economy. Few developing countries have followed in the path of Britain, which adopted a flawed and now largely defunct levy-grant scheme to counter interfirm poaching of trained workers.⁵

Such broader considerations have been largely absent in motivating the establishment or design of payroll levy schemes in developing countries. The now discredited poaching rationale for government intervention in the training sector, however, does reappear on occasion: Mauritius constitutes a recent case in point (Mauritius Employers' Association 1987).

REVENUE-RAISING PLANS. Payroll levies in this category are designed to raise revenues that are earmarked to finance training provided by the state or a national training authority. First introduced in Brazil in the early 1940s, this type of levy is in place in a dozen countries in Latin America and the Caribbean. Revenues have been used to build up national training systems, usually run by a quasi-autonomous national training authority, which provide a wide range of preemployment entry and in-service training courses for manual workers, office workers, and managers.⁶

A variant of the scheme (operating in Brazil, Venezuela, and, more recently, Honduras), allows at least a partial exemption from the levy payment for those firms that provide an acceptable in-company training program. Thus, this option offers financial incentives to employers to set up their own in-plant training programs.

REBATE PROGRAMS. Payroll levies in this category are linked to disbursement schemes, in which firms receive grants related to the level of

Box 4-2. Geographical Distribution and Coverage of Payroll Levies

The table below shows the geographical distribution of payroll tax programs across developing countries by region and by type of program. Revenue-raising plans have not spread widely in the developing world beyond Latin America; the only other examples of pure revenue-raising payroll taxes seem to be those in Zaire and Morocco, where similar payroll tax systems are in force, and in Turkey, where one is planned. Rebate plans seem to be the preferred form elsewhere in the world.

Payroll taxes levied to finance training programs are typically found in lower- to middle-income countries, that is, those countries with a per capita gross national product between \$401 and \$1,635, as defined in the 1987 *World Development Report*; nearly half of all such countries have introduced payroll taxes of this type.

Most tax rates range from 0.5 percent to 2.0 percent. The tax rates have tended to be stable over time, although there are some exceptions. In Singapore rates were set initially at 2 percent and raised some months later to 4 percent of the payroll of low-paid workers only; the rate subsequently fell and is now 1 percent. In Nigeria the rate, which stood at 3 percent at the outset, fell quickly to the current level of 1 percent, while in Morocco the rate was recently raised from 1 percent to 1.6 percent.

Countries also differ in the sectors covered by the tax. In some cases agriculture and, more frequently, the public sector, is excluded. Generally, tax rates are the same across sectors, but in some countries (such as Colombia and Honduras) the government sector is taxed at a lower rate. In some countries, larger firms pay a higher tax (Colombia and Brazil levy 0.2 percent surtax on firms with more than 500 employees), while in others, small firms are exempt. Such exemptions are usually based on the number of employees (fewer than 5 workers in Honduras, Peru, and Venezuela, fewer than 10 in Colombia, fewer than 25 in Nigeria), while firms in Costa Rica and Honduras may be exempt because of the size of their capital assets.

designated forms of training they provide. Instead of funding public industrial training centers, the payroll tax revenues are distributed as rebates, up to a specified percentage, of the tax paid to firms who set up or broaden programs of in-service training.

Although it is analytically useful to look at which countries use the revenue-raising approach, and which use the rebate incentive approach, as with all institutional generalizations, the distinction should not be pressed too far. Countries may seek dual objectives from payroll levy schemes, which, in practice, may incorporate elements of both approaches.

Box Table 4-2. Earmarked Payroll Taxes Used to Finance Training in Developing Countries, by Region

<i>Region</i>	<i>Revenue-raising scheme</i>	<i>Rebate scheme</i>
Africa	Mauritania ^a Zaire	Benin ^a Botswana ^b Côte d'Ivoire Mauritius Nigeria Togo Zimbabwe
Asia		Fiji Singapore Taiwan ^c Republic of Korea ^d
Latin America and the Caribbean	Argentina Barbados Brazil Colombia Costa Rica Dominican Republic Ecuador Guatemala Haiti ^d Honduras Jamaica Paraguay Peru Venezuela	
North Africa and the Middle East	Morocco Turkey	Jordan ^b Tunisia

Note: El Salvador, Malaysia, Pakistan, and Senegal have all in recent years considered and rejected proposals for a payroll tax.

a. Revenues in practice not earmarked for training.

b. Planned, not yet implemented.

c. Not in operation since 1974.

d. Not, strictly speaking, a payroll tax scheme (see text).

Source: Whalley and Ziderman (1990).

Thus, in 1979, the Industrial Training Fund in Nigeria (the national training authority financed by the training tax), opened its first vocational training center with direct state-provided training; this center supplemented its major activity of encouraging enterprises to train through the offer of financial incentives. Similarly, in a number of Latin American countries, national training authorities, which are financed by payroll levies, have broadened their traditional role as leading training institutions to promote and guide training activities in outside enterprises (Ducci 1983). Colombia, Paraguay, and Peru provide examples of this dual, complementary approach.

ECONOMIC RATIONALE FOR PAYROLL LEVIES. Why are earmarked payroll taxes so widely used in the developing world? Payroll taxes for financing training are formally levied on enterprises, and it is widely believed that these same enterprises bear the burden of the levy, making these taxes appear to be "fair." But on whom does the ultimate burden of these levies fall? Do firms themselves indeed bear these taxes, or are they passed on to the consumer (and thus indirectly to labor) in the form of higher prices, or directly on labor in terms of lower net-of-tax wages?

These issues have not been examined empirically for developing countries, but the sizable literature on the economic effects of payroll taxes in industrial countries suggests that the incidence of payroll levies falls largely on labor in the form of lower real wages.⁷ If it is assumed that workers in developing countries also bear the burden of payroll taxes (Whalley and Ziderman 1990), then it follows that employees, rather than their employers, bear the burden of the training taxes.

The finding that the worker bears the burden of payroll levies in developing countries may provide a rationale for their use to finance training programs: this can be found in terms of a reverse social security argument. That is, workers receive the benefits of training while they are young and then pay the taxes through the rest of their working life to cover the training costs of workers who follow them (unlike national social security schemes, whose payments precede the receipt of benefits). Thus, transfers take place to younger workers from older ones through the tax financing training, but over the life cycle of workers, individual benefits approximate taxes paid.

A central issue is how closely individual tax payments match the training benefits received. Costs of training programs differ markedly by sector. Workers in the financial sector, for instance, clearly need very different training programs than workers in heavy manufacturing; these differing training programs are likely to involve substantially different training expenditures. Benefit-related taxation would suggest the introduction of appropriate differentiation in tax rates across industry to reflect these differences in training costs. While developing countries usually levy uniform payroll taxes, in some countries, notably industrial economies, the tax rate varies from industry to industry or is applied in some but not in others. In New Zealand the payroll training tax is in force in the clothing, textile, and engineering industries while individual industry boards were free to set their own levy rate in the United Kingdom. Because payroll taxes are proportional, with no ceilings, the larger absolute tax payments made by higher-earning workers are consistent with the positive relationship between the level of a worker's formal education (and therefore earnings) and the amount of training received on the job (Mincer 1974).

If workers ultimately bear much of the cost of payroll levies, then one must ask whether training opportunities are spread equitably among workers? The answer depends on whether the payroll tax is used to finance public training or to encourage on-the-job training by firms, as well as on the particular set of training programs that are financed by the tax. For payroll tax plans that finance public sector training centers, the question is whether training opportunities are well spread across the various sections of the labor force, by age, by skill and occupational category, and by education level. Presumably, workers from tax-exempt firms are entitled to attend public sector training courses financed by the payroll tax, thereby reaping the benefits of the scheme without contributing to its costs. Whether this constitutes a serious equity problem depends on the number of firms and workers involved.

Finally, the reverse social security argument requires that the payroll tax revenues indeed be earmarked for training: unfortunately that is not always the case. Revenues have been diverted to other uses in both Brazil and Singapore, for example; in some Latin American countries, Kenya, Nigeria, and Singapore, the revenues have not been spent but amassed as surpluses; and in Benin, Haiti, and Mauritania, for differing reasons, payroll tax revenues are not earmarked for training but rather enter public revenues.

PRACTICAL CONSIDERATIONS. Payroll levies have been a stable and adequate source of funding for training in a number of developing countries. These taxes have probably brought additional funding to the public sector and have in most cases been relatively easy to administer. They have proven to be a particularly useful device for institution building, especially in developing and strengthening national training agencies. Nonetheless, these levies and the national training institutions that they support have been criticized on several counts.

Because they are a tax on labor, payroll levies tend to raise the price of labor relative to capital. Thus, by encouraging, on the margin, a shift toward more capital-intensive techniques of production, payroll taxes may inhibit employment growth. Such effects are unlikely to be pronounced, however, given the moderate tax rate levels, and the possibility of incidence shifting (World Bank 1991b).

Payroll levies may constitute an *oversheltered* source of funding, leading to unspent surpluses. The initial tax rate may be set too high, generating more revenue than the administration can spend. That was the case in Nigeria where the rate, originally set at 3 percent in 1971, was reduced to 1 percent four years later. More often, a rate that may have been appropriate at one time is not revised downward as financing needs change. The surpluses may lead to inefficiencies and top-heavy, bureaucratic administrations; alternatively, surpluses

may lead to the use of payroll tax revenues for purposes other than training, thus considerably weakening the benefit rationale. The Colombian national training authority, for example, has been financed by a 2 percent payroll levy established in 1957. In recent years, surpluses encouraged the agency to expand training programs into other areas such as agriculture, construction, and self-employment that are only loosely tied to the firms that pay the levy.

This example highlights the basic dilemma: how to design a payroll tax program that is flexible enough to respond to changing expenditure requirements (and avoid surpluses) without forgoing the benefit of stable funding? One solution might be to review the tax rate periodically, perhaps every five years, but to guarantee a constant rate within the quinquennium. The training authority would then be free to plan for the medium term, but revenues would not move out of line with needs over the longer run.

Although a payroll training tax can be broadly justified in terms of the benefit principle,⁸ in practice, many schemes have permitted a considerable departure from this principle, thus undermining the economic rationale for the levy. Several points of principle, listed below, should guide the operation of payroll levy schemes, so that the benefit relation between levy payers and training beneficiaries is maintained.

- Levies should be subject to periodic review to prevent the accumulation of surpluses.
- Where possible, levies should vary across sector and industry to reflect differing skill composition of the labor force and training needs.
- Training authorities should not venture into extraneous activities.
- The range of training services and courses provided should be very broadly based, reflecting the range of the industry's need.
- Levies should be used to promote training by enterprises.

The desirability of using payroll taxes to finance training, compared with the other alternatives available to developing country governments, is likely to be contingent upon the stage of a country's development. Low-income countries may have only limited access to such broadly based taxes as value-added taxes and tend to rely instead on trade taxes and specific excise taxes. In such cases, where a government's financing options are limited, payroll taxes remain attractive, although they may not be administratively feasible. Mechanisms for tax collection may not be in place, and enterprises may resist the levy, as they did in El Salvador. Very few lower income countries resort to payroll levies to finance training.

For countries that have more broadly based financing alternatives available, genuine issues of choice come to the fore. The reverse social

security rationale for the use of payroll taxes and the ability to target payroll taxes by using differential tax rates by sector suggest that the payroll tax approach may be more attractive than alternative options such as value-added taxes. Most of the countries using payroll taxes to finance training are situated in the lower-middle-income range.

Alternative Financing Mechanisms

When other sources of revenue are limited, payroll levies are a useful device for developing national training institutions. But payroll taxes do not offer a permanent solution to the problem of funding training programs. As national training authorities gain firmer institutional roots, alternative sources of finance (particularly cost-recovery from students and enterprises) become feasible, and enterprises become able to meet more of their own training needs. In this changing environment, both the role of the authority and its financing needs will change; reduction in the levy rate is appropriate. To the extent that public sector provision of training remains necessary, the now institutionally more robust training authority could be required to compete for budgetary resources with other government departments and agencies. Alternatively, to the extent that charging for its services becomes feasible, the authority could be required to recover an increasing share of its costs. The United Kingdom and Sweden have both instituted such cost-recovery programs.

In practice, such a disengagement of the public sector would be in relative terms only; in many countries government training programs might well not diminish, but private training programs are likely to expand. However, trainees in government programs may be asked to assume more of the financial burden. Although market imperfections that inhibit workers from financing their own training may persist, innovative measures may be introduced to enable workers to meet training costs.

In particular, some attention should be given to the design of appropriate state-backed loan programs that have proved viable in the context of formal schooling (Box 4-3). That individuals are prepared to view self-investment as a viable proposition is illustrated by the flourishing market in proprietary training courses. Moreover, measured high private rates of return on training investment indicate that large numbers of individuals receiving subsidized training may be in a position to bear a larger share of training costs (Metcalf 1985). Any such measures to deal with the problem of capital market imperfections can make but slow inroads into the problem: no doubt they will have to be developed in parallel with the continued subsidization of apprentice wages.

Box 4-3. Training Loans

A strong motivation for offering institutional training at low (state-subsidized) fees is the inability of potential trainees to otherwise finance worthwhile training. The lack of financial assets and the difficulties of obtaining loans, whether from relatives, friends, or the financial market, may prevent workers from investing in training programs unless they are subsidized. Similarly, worker-trainees are inhibited from financing general training investments on the job. Much attention in recent years has been given to the development of loan funds (perhaps repaid on an income contingency basis) to finance education, particularly at the university level. Although such programs are in place in more than fifty countries, administrative difficulties persist (Albrecht and Ziderman 1991). Not the least of these concerns the problem of defaults.

The Philippines has developed a loan plan, which has not been specifically used to fund private individual vocational training but which has several promising characteristics. Individuals can borrow from their own account in the national social security fund for a variety of activities including payment of higher education tuition. Unlike social security systems in many countries, which are "pay as you go" programs, the Philippines system is fully funded. As a consequence, when one draws from the social security fund, one is in fact depleting his or her future retirement benefits. If, however, the loan is used to increase one's skills and thus future income, prospective contributions will restore or increase future retirement benefits. This system can easily be modified to allow individuals to draw against future social security payments to finance skills training.

Certain safeguards must be introduced for a social security-based funding program to be successful. First, it may be questionable whether individual workers will be able to distinguish good training programs from bad ones. Hence, it would be prudent to institute controls so that individuals only draw funds to pay for approved or accredited training programs. A second problem is that the loans will deplete the supply of savings available for investment in the economy. The question then, is whether the social return on the investment in training will be higher than the social returns on other investments that can be made with the social security fund. Information on this issue can help determine the appropriateness of this sort of financing scheme.

Direct income generation offers an additional revenue source to training authorities and individual training centers. In Latin America, the broadening of the activities of national training agencies to include consultancy and productivity-enhancing services and the sale of training services to public and private enterprises (specialized training courses,

training packages and systems) have supplemented the revenues derived from traditional payroll levies (World Bank 1991b). The sale of goods produced by training centers offers a limited, but underexploited, revenue source, as well as a useful market test of training quality. In Jordan, as in other Middle Eastern countries, such income generation is facilitated by "revolving funds," which individual training centers can use to finance the purchase of materials needed to produce the goods that are sold. But a balance must be struck between training and production for sale, lest the centers pursue revenues at the expense of training.

Encouraging the development of proprietary training establishments can parallel the development of enterprise training capacity. In many instances, this will require little more than deregulation, in particular the removal of ceilings on tuition and fees. A system of inspection and accreditation to ensure quality control, accompanied by public dissemination of information on approved training institutions, will protect consumers against unfair practices. To improve quality, the government may follow Korea's successful example and institute loan programs to private institutions that meet established criteria.

Cooperation between the government and the private sector is the cornerstone of the process through which the government role changes as development proceeds. The record suggests that evolution is a matter of decades, not years, and is well served by incremental strategies that strengthen private training capacity as the government role changes.

Building Capacity for Policy Implementation

Implementing economically appropriate public training policies requires a high level of institutional capacity for economic and policy analysis, planning, and management of public training resources. Under the usual organizational arrangement, the Ministry of Labor assumes operational responsibility for informal preemployment training at the vocational training centers it runs; formal vocational education remains a separate function administered by the Ministry of Education. Increasingly, however, the administration of informal preemployment training has been assigned to a national training authority or agency (NTA). NTAs are common in Asia, Latin America, North Africa, and the Middle East, and have recently begun to emerge in Sub-Saharan Africa.

NTAs are either largely autonomous, governed by tripartite boards representing industry, government, and education, or are attached with varying degrees of autonomy to a government department, usually the Ministry of Labor (Box 4-4). Most of these agencies provide broad industrial training throughout the economy, others are restricted to a particular sector.

Box 4-4. National Training Authorities

Although they share common functions—skills training, quality control, curriculum development, and testing—effective national training authorities are organized in different ways, depending on the institutional structure of the country. The National Industrial Apprenticeship Agency in Brazil was established by and continues to be governed by enterprises, who finance the agency through payroll levies. Its board also includes members who represent workers and the government. The agency is heavily decentralized to regional levels to permit adjustments to local skill needs.

The Board of the Vocational Training Corporation in Jordan is linked to the prime minister's office. Chaired by the minister of labor, it includes representatives of other ministries, employers, and workers. Core financing is provided by government budgetary allocations, with significant cost-sharing from enterprises. Individual training centers have considerable authority over curriculum and enrollments.

In Singapore the Economic Development Board administers four industrial training centers focused on strategic technical skills in cooperation with industrial firms and foreign governments. It also manages the Skills Development Fund, which began by providing grant reimbursement, financed by a payroll levy, to approved training in enterprises, but which increasingly focuses on the development of corporate training plans and support to smaller enterprises. A separate Vocational and Industrial Training Board focuses on preservice training of skilled workers. The country, which enjoys a tradition of cooperation between the public and private sectors, also has several polytechnics and more than sixty proprietary training institutions.

The Industrial Training Fund in Malawi is part of the Ministry of Labor. It controls enrollments in the technical colleges so that enrollments do not exceed apprenticeship places, and it finances apprentice wages from a levy collected from employers. A joint public-private advisory committee exists but has yet to take an active role, in part because the small size of the country and the annual survey of employers and supervision of apprentices both facilitate a reasonable level of communication.

Sources: Herschbach and others (1985); Eng Fong and Salome (1986); and World Bank data.

Most NTAs operate informal skills training centers, but their responsibilities and influence on the training market as a whole go well beyond this. Many provide a range of training services including consulting with enterprises, helping them to develop their own training capacity, and supervising skills testing and certification. All national training agencies play some role in training, monitoring and planning, and developing training policy.

NTAs have played an even broader role in skills development in middle-income countries. These agencies have been able to develop national training systems with strong links to industry, high quality training, and considerable flexibility and responsiveness. Strong representation of employers on the agencies' boards of management—indeed, some were established at the behest of industry—as well as stable funding are largely responsible for these achievements. While most of these agencies receive general government funding, a large number are financed through payroll levies. This mechanism, which is not regarded simply as another tax but gives employers a real say in deciding how these funds are used, has worked well in providing a framework for dialogue and cooperation between firms and training institutions (ILO 1988a).

Although the functions of NTAs evolve as economic development proceeds, these agencies will likely retain in all cases a planning, monitoring, and regulatory role. A key function will be identifying strategically important skills in conjunction with economic planning and policy, and using incentives to stimulate both public and private institutions to train workers in those skills. To improve the flexibility of public training institutions in responding to changing markets for skills, the NTAs will also have to improve the flow of information on the costs and benefits of training. These issues are taken up in the subsequent chapter.

Summary

Throughout the world governments play a substantial role in financing and providing training. Nonetheless, in any given country it is important to evaluate both the need for and efficacy of the government's intervention in this sphere. We have argued that a case for a strong government financing role can be made on efficiency grounds, in terms of externalities and market imperfections. Yet, these arguments are more relevant for certain levels of economic development and institutional settings than for others. Moreover, the benefits from government intervention in training markets stemming from market imperfections must be set against possible social costs and inefficiencies of government bureaucracy.

Thus, the nature of public training policy in a given country should be based on a pattern of rationales that fit the economic environment. Where market imperfections distort incentives for employers and employees to invest in private training, a first option should be to minimize these negative effects. But if that is not feasible, compensatory policies are needed. These second-best policies should generally be seen as transitional arrangements, however, and thus be subject to periodic review as the economy, and institutional capacity, develops.

In many countries the government's financing role has become more pervasive than efficiency grounds alone can justify. Here, efficiency

considerations call for a greater use of student fees for training received off-the-job, such as in vocational training centers. Yet governments, particularly in low-income countries, may be reluctant to employ user fees for both practical and equity reasons. Substantial user fees may be impractical where incomes (and savings) are low and post-training employment prospects uncertain; in such circumstances, heavy reliance on student charges may discourage the very people toward whom the training courses are targeted. User charges would also lead to serious inequities between trainees and their counterparts in the highly subsidized schooling system.

The development and subsequent strengthening of national training authorities represents a vital part of the process of building training institutions in low- and middle-income countries. The potentially important role that payroll levies can play in providing stable financing and industry involvement in training is well illustrated by experience in Latin America. There is, however, a general predisposition that such earmarked forms of taxation are unnecessarily constraining on governments. Against that, one must weigh the view that earmarked taxes can act as an insulator against economic uncertainty and budgetary parsimony over the long term. Financing training for the skills required to facilitate economic growth and for technological change is an example of the long-term view we have in mind.

Yet, payroll levies should be regarded as a useful medium-term expedient rather than as a permanent source of funding for training programs. As central training authorities and the training institutions they run become more firmly established (a process that may take decades rather than years), other sources of finance should gradually replace payroll levies. Training authorities could be required to compete for funding from the general government budget, but the preferred direction is toward increasing self-generated income, by selling training services to industry, government, and individuals.

As a country's industrial base expands, and the preferred training mode shifts full circle in the direction of enterprise-based training, it may not be socially expedient to rely solely on private markets to provide and finance training. Problems of market imperfections and scale economies may lead to an inadequate supply of enterprise-based training in transferable skills. Fearing the loss of trained workers to their competitors, firms may be reluctant to pay for training; minimum wages and capital market constraints may prevent workers from financing their training through forgone earnings. Firms can be encouraged to provide training by a range of subsidy or incentive schemes, financed by government revenues or payroll levies. When conditions have been favorable, these programs have been successful; however, the general efficacy of such measures remains doubtful.

With the process of further economic and institutional development, financing alternatives that would be inappropriate at lower income levels become available. Attacking market imperfections directly, for example, through government guarantees for worker training loans if liquidity is a problem, may be one way forward. Tuition-paid programs might be feasible, with at least part of the costs recoverable through fees or a student loan program. General government revenues and payroll levies remain active options as vehicles for financing vocational education and training for many developing countries. But as they become feasible, nontax measures and a greater emphasis on private training markets should be considered, and appropriate moves taken in their direction.

Notes

1. These ideas are developed more fully in Katz and Ziderman (1990); it is nevertheless true that certification has important practical benefits.

2. Figure 4-1 provides only a broad-brush picture that highlights the main elements of a system that is in practice considerably more complex. Yet very few countries possess even the minimal information on the training flows that are shown in this simplified chart.

3. Such a tax may be rationalized on the basis of complementarity between imported machinery and trained manpower as inputs in the productive process; the users of capital goods are thereby required to finance the cost of complementary manpower training (Zymelman 1976).

4. For a good discussion of the Latin American experience, see Kugler and Reyes (1978).

5. For critical accounts of the British payroll levy plan, see Lees and Chiplin (1970), Ziderman (1978), and Dougherty and Tan (1990).

6. In revenue-raising schemes, payroll levies are the sole source of finance for the national training authorities in Brazil, Paraguay, and Peru. They are the dominant source of funds for the national training authorities in Colombia, Costa Rica, Honduras, and Venezuela and are one of several sources of funding for the training authorities in Ecuador and Guatemala. The levy accounts for only a small percentage of the financial sources of the Argentinian training authority (Kugler and Reyes 1978).

7. See Levin (1983) for a recent reiteration of this view. The authoritative source of this empirical result is the study by Brittain (1972) of the payroll tax as a financing vehicle for the wider social security system in the United States. Brittain's conclusion—that firms do not bear the burden of a payroll tax but shift it entirely onto labor—has been repeated in further research (for example, Vroman 1974). Other studies, however, show a less than full shifting onto labor in the short run. For example, only 75 percent was shifted in the United Kingdom (Parkin, Sumner, and Ward 1976), 50 percent in Ireland (Hughes 1985), and Sweden (Holmlund 1983). One limitation of the Brittain study, in the present context, is that it was unable, statistically, to distinguish between backward and forward shifting.

8. A recent endorsement of this view is provided by Bird (1984).

5. *Establishing Market-Oriented Manpower Planning*

If governments in industrial and developing countries are to continue their involvement in the financing and delivery of training, those training operations must be economically efficient. Costs have to be kept under control, and the training offered must meet market needs. Improved planning techniques are necessary both to achieve these objectives and to provide the information that enables training systems to respond to changing economic contexts and to the demand for different kinds of skills. Improved planning is also important to the effective operation of a market economy where information about skills demand and supply is required as a guide to the efficient allocation of private spending on education and training.

If manpower planning is to serve as a guide to both public and private spending on education and training, labor markets and training incentives must be monitored. Manpower planners need to become labor market analysts. This chapter introduces techniques for manpower planning that accommodate the dynamic nature of market economies. The chapter rejects manpower requirements forecasting, which many agencies continue to use as a tool for planning, and in its place, proposes the use of labor market signals developed by monitoring movements in wages and employment at the local level and by evaluating training programs. The chapter stresses the importance of integrating manpower planning with economic planning.

Roles of the Manpower Planner

The manpower planner guides public sector expenditures on training. In a market economy, however, the planner can assume another useful role: providing the information needed to guide private training decisions,

improve the management of training systems, and identify impediments to competitive labor markets. Most training decisions in market economies, for example, are made by private individuals and training providers, including enterprises, without need for public sector interventions. The analysis and dissemination of information on the balance of skills demand and supply is sufficient to guide these decisions. Centralized planning is unnecessary. By producing measures of the benefits and costs of skills training and prospective changes, the planner can alert individuals and training providers to changing market incentives.

The importance of manpower planning and the involvement of the public sector in this activity will persist in market economies. Experience in industrialized countries reveals that private markets do not adequately meet the training information needs of individuals, enterprises, and training institutions. The “public good” aspect of much of this information results in the absence of market incentives for its production. Leaving the production of this information to private markets also may raise equity issues, particularly where consumers cannot afford to pay for the information. In these circumstances, the public sector and manpower planners play an important role in overcoming a market failure. No industrial economy relies exclusively on private markets for the training information needs of individuals, enterprises, and training institutions.

Guiding Market Training Decisions

Manpower planners can analyze and disseminate information on training incentives—information that is essential to well-functioning labor markets. Without it, prospective trainees and managers of training institutions are left with only informal networks for exchanging information on earnings and employment trends, training costs, and other market factors influencing choices in skills training. These informal networks may function efficiently as a guide to private investments in skills training but almost certainly limit equity in the choice of training for individuals and groups who do not have access to these networks.

Strengthening the Management of Training Systems

The manpower planner is a source of information for strengthening the management of training systems. Information on the demand for and supply of skills can be used to single out skill qualifications where demand is growing and where it may be declining. Because manpower planners track the introduction of new technologies and industries, they are also a source of information on market demands for new skills. By studying training costs as part of evaluating economic returns to alter-

native investments in skills, planners can produce valuable information on cost norms that are useful to managers of training programs. The information can help program managers better match skills supply to demand and improve the quality of skills training.

Improving Labor Market Efficiency

Manpower planners can identify labor market bottlenecks affecting the development of skills by tracking measures of demand and supply for specific skills and their determinants. The analysis of these bottlenecks and their determinants provides policymakers with an early warning of market imperfections or failures requiring corrective public interventions. As described in the previous chapter, markets may not always get the training incentives right. Government policy interventions designed to achieve diverse social and economic objectives can distort market prices and alter training incentives from competitive levels. Market failures arising from economic externalities, for example, can impede efficient skills development. Thus, the manpower planner is a potential monitor of labor market performance as well as of market signals for skills training.

Planning Public Investments in Training

Finally, even in a market economy, the manpower planner continues to plan for public investments in education and training. The scope of planning, however, can be reduced by rationalizing the public sector's role in delivering and financing skills training. This rationalization, explained in the previous chapter, calls for public interventions in skills development only where labor markets fail to anticipate and deliver accurate signals involving the demand for skills, where access to education and training involves fairness and equity issues, or where private sector education and training capacity is insufficiently developed. This rationalization narrows the conditions under which planners are responsible for guiding public investments in education and training.

Abandoning Manpower Requirements Forecasting

A wide range of planning techniques is available to the manpower planner (Psacharopoulos and others 1983). Of all these, however, one technique—manpower requirements forecasting—has become synonymous with manpower planning. Over the past two decades, this technique, with its precise quantitative estimates of training capacity needs, has so dominated the field of manpower planning that the two terms are frequently used interchangeably. As a planning technique, however,

manpower requirements forecasting has failed. The flaws are found in the model's underlying assumptions about economic behavior. The technique also suffers from its requirement for timely, detailed labor market information covering the demand for and supply of skilled labor.

The manpower requirements forecasting model as usually practiced has four steps: first, overall economic output is estimated for a given time period; second, the output is allocated across industry sectors, and the labor requirements to produce this output are estimated; third, the labor requirements are translated into educational requirements, assuming each job corresponds with a specific occupational level and type of education; and, fourth, the forecast of educational requirements is compared with the stock of educated labor, adjusted for attrition and new entrants, to estimate the need to expand or contract the education system.

The criticisms of the model focus on its assumption of a fixed relationship between labor and the quantity of goods produced and between labor productivity and the level of education. In practice, the relationship between labor and the quantity of goods produced is not fixed. Goods and services can be produced with more or less labor and with labor of different kinds as dictated by economic conditions and the relative prices of labor and capital. Manpower requirement ratios do change in response to economic circumstances. The mechanical use of these requirement ratios in manpower forecasting ignores the potential and incentives for the substitution of expensive labor or capital and can lead to erroneous estimations of labor requirements.

The conversion of labor requirements by occupation into educational requirements is also inconsistent with experience. This approach is based on a misunderstanding of the labor supply function for many occupations. Reverse tracer studies for occupations show the diverse paths by which people arrive in occupations (Ziderman and Horn 1992). Formal education serves as the principal entry point for only a small number of occupations. People perform the same jobs with various levels and types of education and training. Thus, expanding formal education programs is only one of many ways to meet predicted skill shortages. Except in occupations with well-defined education requirements, the manpower requirements model can lead to overinvestments in formal education in response to projected skill shortages (Box 5-1).

The weaknesses of the model for forecasting skill needs are most evident when it is used for long-term forecasting. That is because, given adequate time, employers find ways to adjust to skill shortages and rising wage costs. With time, they can develop and employ capital to do the work of skilled workers who are in short supply. Employers are able to adopt new production technologies that require different skill mixes. They are often able to respond to skill shortages by finding more cost-

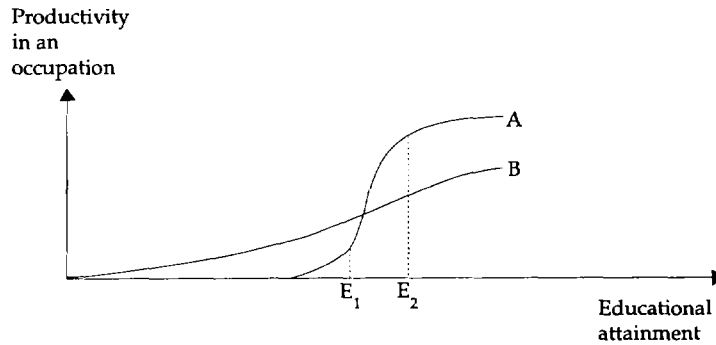
**Box 5-1. Forecasting Skill Requirements:
The Shape of the S-Curve**

The manpower requirements approach to educational planning requires that forecasts of future labor requirements by educational categories be converted into requirements by educational attainment. The notion that an appropriate educational qualification can be defined for each occupation is basic to the manpower requirements approach; yet, apart from a few specialized occupations with legal or strongly entrenched traditional entry qualifications, such a connection may not hold in practice.

Two hypothetical cases connecting education with occupations are shown in Box Figure 5-1; the two cases apply to any specific occupation. Educational attainment is measured on the horizontal axis and productivity, or performance in the job, on the vertical axis. Case A corresponds with the fixed-coefficient model of manpower requirements forecasting. The productivity curve is S-shaped, rising steeply after educational attainment level E_1 and leveling off after E_2 . With less than E_1 education, the job cannot be performed satisfactorily; additional education above E_2 would be economically wasteful. The appropriate level of education for the occupation is defined within the narrow range E_1 to E_2 .

In case B the S-curve is much flatter. Productivity initially rises continuously with education, perhaps at an increasing rate, and subsequently levels off, as in the diminishing returns case familiar to economists. If situations similar to case B are typical, no "appropriate" level of education can be defined for the occupation: it will be necessary to compare the extra benefits and costs of additional education—the rate of return approach (Chapter 2). The central issue here is the shape of the S-curve in practice. The flatter the S-curve, the less appropriate will be the manpower forecasting approach to planning skills provision.

Box Figure 5-1. The S-Curve



Source: Blaug, Peston, and Ziderman (1967).

effective means to increase the supply of skills. In many cases, these efforts bypass lengthy formal education, reducing the need for large public investments in schools and training centers. It is not surprising to find that manpower requirements forecasting, which discounts the likelihood of these adjustments, often produces large forecasting errors.

Nonetheless, many developing countries continue to use the technique. A recent review found that seven out of ten market economies in Asia used manpower requirements forecasting (Amjad 1987). The popularity of the technique is even acknowledged by its critics. Having demonstrated that "making long-term projections of manpower supply and demand on the basis of general economywide methods is not likely to be a very fruitful exercise for a developing country," Psacharopoulos and others (1983: 69) conclude that, "unfortunately, in many developing countries this is precisely the activity which has taken up most of the time and resources of manpower planning groups." Dougherty (1983: 48) concedes that "the view that planning consists of the preparation of detailed forecasts of supply and demand may be deeply entrenched even where the approach is patently impracticable."

Despite abundant evidence of the technique's failure to forecast accurately the need for skills training, the technique has remained popular for a number of reasons. The methodology is transparent and appeals to common sense. The technique is straightforward, its data requirements and assumptions easily grasped. The concept that economic growth creates a demand for skilled labor that can be balanced with the supply of this labor is intuitively logical on the surface. People like the precise numbers produced and the appearance of certainty over uncertainty. Moreover, most countries that use the technique do not have a system of accountability for failure. The political process in these countries pays little attention to yesterday's decisions and errors.

Until a change in recent years in practice, the World Bank encouraged the technique's survival—even gave it additional credibility—by using it to justify most requests for educational loans and project appraisals (Psacharopoulos and Woodhall 1985). Donors also used the technique to justify projects. As a result, borrowers became familiar with the methodology, and its use spread. Even though international agencies, the World Bank among them, no longer use manpower requirements forecasting, it continues to be popular in the planning ministries of developing countries. A better approach to planning is available, however, one that employs labor market analysis and market-based measures of skills demand and supply.

Introducing Labor Market Signaling

In competitive market economies, movements in wages and employment signal changes in the demand for and supply of particular skills and trades. The careful monitoring of these signals by manpower planners is one way to identify trends in the demand and supply of skills. An increase in the wages paid a machinist relative to other trades, for example, or a rising number of unfilled job vacancies for computer analysts, or the inability of trainees in a carpentry program to find employment are each labor market signals concerning the balance of skills demand. They reflect, respectively, a shortage of qualified machinists and computer analysts and a possible surplus of carpenters. This information is valuable in weighing the benefits and costs of alternative training options, for both prospective trainees and the managers of training programs.

Labor market signaling requires planners to focus on education and training qualifications rather than on occupational classifications (Godfrey 1991; Psacharopoulos 1992). The reasons relate to the quality of occupational statistics, the effect of technology on the concept of an occupation, and the practical link between academic specialization and occupational placements. The quality of labor force statistics is generally poor in developing countries, and as suggested in the discussion of manpower forecasting, occupational statistics are of even poorer quality. In many situations, these statistics are available only in highly aggregated form, for example, managers, professionals, technical workers, and so forth. Lack of specifics means the statistics are poorly suited to the needs of a planner who is attempting to capture the balance of skills demand and supply. Technological change by itself undermines the very definition of an occupation. In Japan, for example, workers' roles are rapidly changed as needs arise (ILO 1988b). Skills, rather than occupations, become the central issue in this context.

Perhaps the weak link between skill specialization and occupational placement provides the most important reason to focus on education and training qualifications in manpower planning. A study of the Philippine labor market found that, among those employed, only 73 percent of the recent graduates in applied science and 47 percent of the liberal arts graduates were actually working in their field of academic specialization (Arcelo and Sanyal 1987). In allocating training resources, the important point to be considered is how a particular training program affects productivity, not how the program affects occupational placement. Instead of emphasizing occupations in the allocation decision, as manpower requirements forecasting does, labor market signaling emphasizes economic outcomes, measured in terms of wages, employment, and the costs of specific education and training programs.

Identifying and deciphering labor market signals requires a basic understanding of demand and supply analysis as applied to labor markets. To develop and analyze these signals, manpower planners need to be firmly grounded in analytical techniques such as multiple regression analysis, survey research methods, and basic inferential statistics. The planners' job will be easier if an infrastructure of labor market information exists. As explained below, however, even when this infrastructure is missing or of poor quality, relatively inexpensive techniques are available for developing labor market signals. These signals can be used in all phases of planning (Box 5-2).

Market Training Decisions

Labor market signals are produced by monitoring labor force activity and the movement of wages and employment for workers with specific levels of schooling and participation in training programs. These movements, interpreted through demand and supply analysis, are indicators of the labor market's assessment of the need for additional investments in schooling and skills training. Thus, an increase in the wage or employment opportunities for one level of schooling or training program relative to others signals a demand for the skills associated with that schooling or training. The rise in wages or employment opportunities in relative terms signals an excess demand for the skills involved, while a decline in wages or employment opportunities in relative terms signals excess supply. Similar signals are provided by examining labor force activity and unemployment rates by skill level. Job vacancy rates linked to skill requirements can also be used as a labor market signal.

In addition to measuring the level of job vacancies, the amount of labor force activity, and the movement of relative wages and employment, planners should also follow the trends in these indicators. A decline in job vacancy rates, a rise in unemployment rates, or a slowdown of employment growth among workers with specific levels of schooling or training can signal a downturn in the need for the skills associated with the workers' level of schooling or training. This signal conveys important information to prospective students and trainees and to managers of education and training institutions concerning the value of future economic benefits for public and private investments in these skills. Labor market signaling, as such, is thus focused on the dynamic nature of skills demand and supply, distinguishing it from the technique of manpower requirements forecasting.

Planners can develop other market-based signals by monitoring the placement of graduates. Schools and training centers that follow graduates into the labor market for a year or two with tracer studies gathering information about their earnings, hours of work, and spells of unem-

**Box 5-2. Togo's Training and Employment Observatory:
A Model Information System**

In 1990 Togo established a training and employment observatory (OEF) as part of a World Bank-supported technical and vocational training project. The OEF could serve as a model information system for other developing countries without a well-developed infrastructure of labor statistics. Located within the Ministry of Technical Education and Vocational Training, the OEF was set up to gather information on labor and training markets that public agencies and private individuals could use to make decisions involving training and employment. To avoid the expensive process of gathering information already available from other sources, the OEF is expected to focus first on existing sources of data in Togo before generating new data. The information gathered is expected to cover the public sector, state-owned enterprises, modern private sector, and informal urban and rural sectors. Training information is to be collected from training centers, apprenticeship programs, and other sources.

Changes in public sector employment by occupation, pay grade, and salary are to be studied every six months, using administrative data on the civil service from the Directorate of Finance. Special ad hoc surveys to trace the changing match between training and employment are to be conducted. Social security information on employment, the main source of time series information for state-owned and modern private sector enterprises, is to form the basis for a sample of firms for regular surveys of preemployment and in-service training needs. Regular analyses of the informal urban and rural sectors are to be carried out using periodic censuses, ten profession-specific studies each year, and in-depth studies of some thirty firms in the professions studied.

The regular use of tracer studies of graduates from training centers and programs is to provide a main source of information to the OEF. This information would inform resource allocation decisions in both the public and private sectors. A household survey, conducted as part of Togo's Social Dimensions of Adjustment project, is to be used to study patterns of education, training, employment, and income. New training needs are to be identified by studying investment project dossiers submitted to the Ministry of Planning and applications from firms to participate in the Free Trade Zone.

The OEF is expected to produce three kinds of products:

- Charts summarizing the training and employment situation in Togo. Training fund managers would use these charts to make resource allocation decisions.
- The collection and analysis of data and studies on training and employment for publication.
- The distribution of the publications to as wide an audience as possible, including schools, training centers, and employers.

ployment can link this information with the skills acquired to produce a market-based measure of the economic benefits attached to the skills involved. Such surveys are useful not only to prospective students and trainees, but also to managers of other schools and institutes who face curriculum and staffing decisions.

Still other market signals can be developed by examining enrollment data for institutions, programs of study, and even individual courses. High market demand is signaled when specific schools and training centers or particular programs of study or courses have more applicants than they can admit. By comparison, low applicant-to-admission ratios and half-filled training centers or classes indicate low demand, a signal school and training center managers should use in making curriculum and staffing decisions.

Yet another source of information can be derived from tracking "help-wanted" advertisements in newspapers and professional journals and monitoring the introduction of new industries and production technologies. Employer surveys in markets near education and training institutions can provide useful assessments of the quality of skills training provided, the introduction of new technologies, and projected skill needs.

Regular monitoring of these signals by manpower planners, followed by timely dissemination of the findings to parents and students and to school and training center counselors and managers, are important tools for guiding public and private investment decisions in education and training and improving the quality of schooling and training programs.

In setting priorities on spending, however, costs need to be considered alongside the economic benefits of schooling and training. To do that, the labor market outcomes of additional schooling or training are expressed in monetary terms, and the monetary benefits are then compared with the cost required to obtain these outcomes. Cost-benefit estimates expressed in the form of ratios, net present values, or internal rates of return for society and private individuals provide the signals needed to set priorities on public and private spending on education and training (Box 5-3). (Practical aspects of the technique are discussed more fully in Chapter 9.) If labor market outcomes cannot be conveniently expressed in monetary terms, cost-effectiveness measures can be produced for comparing alternative training programs and making training choices.

Managing Training Systems

In a market economy, training courses for skills that require only a few weeks or months to acquire do not need to be centrally planned. The managers of these training programs can make more effective decisions

Box 5-3. Labor Market Signals for Education in Indonesia

Recent experience in Indonesia illustrates the advantages of using labor market signaling techniques. The Indonesian economy experienced sharp growth in the 1980s. Manufactured exports, primarily in low-skill, labor-intensive textiles, garments, footwear, lumber and wood products, processed foods, and agricultural products, led this growth. The opening of the economy to trade expanded employment opportunities for unskilled and semiskilled workers, particularly women. Labor market signals show a changing balance of demand for skills by level of education, a change

Box Table 5-3. Returns to Education in Indonesia

<i>Level of education</i>	<i>Market signals for 1988</i>			<i>Manpower requirements 1989-93 (thousands)^a</i>
	<i>Real rate of return (percent)</i>	<i>Unemp. rate 26-35 yr. olds (percent)</i>	<i>Median job search time (months)</i>	
Primary and under	13	0.7	1.0	-5,217
Junior secondary	13	2.6	1.2	-289
Senior general	13	3.7	2.0	+779
Senior vocational	10	2.0	2.0	+491
University	6	7.8	2.0	+457

a. - denotes projected shortage; + denotes projected surplus.

about trainee intake, enrollment, and graduate output with the information developed for guiding market training decisions or simply by building good linkages between training institutions and enterprises. Training institutions can be made more flexible and more responsive to changing local labor markets by shifting the locus of decisionmaking and financial responsibility to the managers of these institutions and involving local employers in the design, management, and financing of the training programs. In this context, where managers of training institutions use labor marketing signaling to plan curriculum and staffing needs, manpower planners need not worry about precise estimates of training needs; the false precision of manpower requirements forecasting is unnecessary.

Manpower planners can, however, assist managers of training programs and trainees in choosing cost-effective training strategies. In most occupations that require training there are many alternative ways to acquire skills (Ziderman and Horn 1992). These paths include combina-

that is not fully captured by manpower requirements forecasts (see Box Table 5-3). The labor market signals used include social rates of return, unemployment rates for 26-to-35-year-olds, and median job search time, broken down by level of schooling.

Trends in the real rates of return from 1982 to 1988, not provided here, reveal a sharp drop in the returns to a university education from approximately 11 to 6 percent. The returns to other levels of schooling also fell but remained above the average return to physical capital of 9.1 percent. Unemployment rates for university graduates rose during the decade, reinforcing the trend observed in the returns to a university education. The reduction of public sector employment as the economy adjusted to the decline of oil revenues reduced employment opportunities for many university graduates.

The forecast of manpower requirements for the five-year planning period, 1989-93, projects a large shortage of primary graduates, a smaller shortage of junior secondary graduates, and a surplus of graduates above this level, particularly among senior general secondary graduates. Labor market signaling, focused on real rates of return, provides a different picture of emerging skills demand in Indonesia. It calls for a more balanced allocation of spending on primary, junior secondary, and senior general secondary education than does the manpower requirements forecast, which fails to anticipate the strong demand for general secondary graduates, as reflected by the 13 percent rate of return to this level of schooling. Both approaches support relatively less spending on higher education.

Sources: McMahon and Boediono (1991).

tions of general and technical schooling, full-time and part-time vocational training inside and outside the workplace, and on-the-job learning (Godfrey 1991). To identify these training strategies, planners can use reverse tracer studies. This planning technique identifies an occupation for which a training program has been designed and surveys a sample of those employed in the occupation (Dougherty 1988). Respondents are asked about previous schooling, employment, and training. The information is used to construct an occupational map illustrating the sources of training and diverse paths of entry into an occupation. Planners can then measure the labor market outcomes and costs associated with each of the alternative paths into a particular occupation. Reverse tracer studies thus provide signals about the cost-effectiveness of alternative training strategies.

The availability of many cost-effective training alternatives for a particular occupation signals that markets are working well, and public interventions are unnecessary. In making this judgement, the measure-

ment of training costs is important. Manpower planners can improve the functioning of labor markets and skills development by producing cost estimates of the alternative training programs, for use in rate-of-return estimates and cost-effectiveness measures, and disseminating this information as a public good.

Cost estimates of education and training programs can signal managers that they need to improve the internal efficiency of education and training programs. Both direct and indirect costs must be measured. Direct costs are the sum of out-of-pocket costs for resources used in the education or training program. Indirect costs represent the market value of resources that require no direct outlay of funds, such as the value of a trainee's time spent in skills development or the value of a facility owned by an education or training institution. Considering both direct and indirect costs allows a comparison of programs that use different proportions of these resources.

Labor Market Efficiency

Wage and employment trends can be used not only to guide schooling and training decisions but also to evaluate how well labor markets are performing their allocation function. Analysis of these and other trends can identify bottlenecks that inhibit wage flexibility and labor mobility, impede the adjustment of labor markets to macroeconomic shocks, and distort the signals given to education and training. Competitive labor markets are expected to link wages with productivity. Observing the movement of wages and value added per worker in an industry sector, for example, provides a signal regarding the flexibility of wages. Mazumdar (1990) notes that real wage growth outpaced productivity growth in manufacturing in Malaysia during the early 1980s and thus contributed to higher unit labor costs and less competitiveness in international markets. A rapid adjustment to bring real wages in line with productivity growth and to thus restore export competitiveness, was important, he argues, to the economy's quick recovery from its mid-decade recession.

After evidence of noncompetitive wage behavior has been identified, manpower planners can try to isolate the underlying factors. Rising unemployment among educated and trained workers is a signal that the labor markets may be noncompetitive. One underlying factor may be rigid real wages that fail to adjust downward in response to an excess supply of skills. Another explanation may lie in the public subsidies available to individuals for training or schooling. Direct study grants or indirect subsidies through free or reduced fees for training can increase the private economic incentive for schooling or training and thus produce an excess supply of trained workers. Inflexible wages combined

with an excess of supply can exacerbate the unemployment problem. If wages are flexible, however, they are likely to adjust downward in response to the excess supply of skills. In centrally planned economies that guarantee employment, the excess supply may accentuate downward pressure on wages as an adjustment mechanism.

Planners also need to look for signals of labor market segmentation and other barriers to labor mobility. Segmentation implies a constraint on labor mobility that impedes the productive use of labor and sends the "wrong" signals for education and training. The segmentation may occur, for example, between large and small enterprises, urban and rural areas, or different demographic or ethnic groups. Wage differentials between these segments that are unexplained by productivity-related factors are a signal of labor market segmentation. Earnings functions provide a tool for studying labor market segmentation. Earnings are regressed on schooling, training, and other possible correlates of productivity to determine the importance of these measures in explaining the variance in market earnings. Differences in the explanatory power of the model and the effect of productivity-related measures on earnings for labor market segments are a signal of possible segmentation. Neuman and Ziderman (1986) provide a recent study for Israel.

Wage differentials unrelated to productivity are the most authoritative indicator of labor market segmentation. A careful examination of a country's labor market policies, however, can highlight the presence of policies that are regularly associated with labor market segmentation. (Many of these policies are described in Chapter 3.) Any labor market policy that effectively reduces wage flexibility or impedes labor mobility is a possible source of segmentation. The most frequently observed policies in developing countries with these effects are public sector wage and employment policies. Administered wage systems in the public sector, for example, are used to redistribute income and ensure equity and thus frequently become detached from productivity. When these systems create a high-wage sector, they are associated with queuing for public sector employment, high levels of measured unemployment, and wage depression in the informal sector of the economy. Evidence of this can be found by monitoring the wage differentials between workers in the public and private sectors with similar skill qualifications.

Other policies may indirectly signal the presence of segmentation. A study of labor codes often highlights job security regulations that impose costly restrictions on hiring and firing. These regulations may require enterprises to use only public employment services in hiring; an enterprise that wants to fire a worker may find itself involved in lengthy adjudicatory procedures. In some instances, wage differentials may actually be codified, inhibiting their use as market signals of skills demand. The enforcement of these and other policies determines their

effect on labor markets. In many cases, government enforcement capacity is limited, which itself may be an indirect signal of labor market segmentation and its distortion of labor market efficiency. The backlog of uninvestigated regulatory complaints, the number of enterprises per labor inspector, and the number of adjudicated cases relative to complaints are examples of these signals. Where effective enforcement does exist, it is usually limited to large enterprises that are more cost-effective to regulate. Monitoring wage differentials between workers in large and small enterprises can indicate the presence of effective enforcement.

By examining labor market policies, planners can identify threats to wage flexibility and labor mobility and study their effect on segments of the work force. Labor mobility across urban and rural markets, firms and industries, and occupational groups can signal the existence of barriers to this mobility, with consequent wage effects. The lack of housing markets, for example, can reduce geographic mobility and create persistent geographic wage differentials that distort competitive labor market signals for education and training. The role of the manpower planner is to identify these signals and bring them and their economic cost to the attention of policymakers. Where labor market policy reforms are resisted for diverse social and economic reasons, the planner can help managers of training institutions design policies that compensate for the market inefficiencies.

Public Investments in Training

Increasingly, countries are relying on, and responding to, market forces to improve the efficiency of resource use. The outward-focused economies of East Asia continue to show rapid growth. Eastern Europe is adopting the market model. Chile and Mexico have also pursued market solutions. More than two dozen countries in Africa are engaged in adjustment programs to reduce government reliance on central planning. In market economies, public sector interventions and the planning of public investments in training can be reduced to situations where markets fail to perform their allocation task, as described in Chapter 4.

If left uncorrected, market imperfections, that distort competitive market prices, including wages, can lead to distortion of labor market signals and misallocation of resources for education and training. Imperfect information may also prevent markets from anticipating new employment growth or technological changes that require skills taking several years to acquire. The absence of appropriate wage signals reflecting these changes will impede timely private investments in these skills and create potential skill bottlenecks. Market failures may also arise.

Market failures occur, for example, when the net private benefits of skills development fail to equal the net social benefits, and individuals therefore do not choose socially optimal levels of skills training. Skills that are of strategic importance to the development of an industry without which other jobs may not be created provide an example. The failure of individuals to realize the social benefits created by these strategic skills can lead to underinvestments in skills training.

Inadequate private training capacity can also justify public sector interventions in training. This situation applies primarily in low-income countries and countries moving from centrally planned to market economies where private training capacity is limited. Public sector intervention can be used as a transitional mechanism to ensure adequate capacity for skills training while encouraging the development of the private sector. And finally, public sector interventions are appropriate in the interest of promoting fairness and equity in access to schooling and training on the basis of family income, residence, or ethnicity.

The absence of adequate private training capacity can be determined by surveying public and private training institutions, their curricula, and training capacity. Manpower planners can gather this information when they conduct cost studies of schools and training institutions or tracer studies. The more difficult task is determining whether labor markets are correctly anticipating structural changes in the economy and attendant effects on labor market signals and skills development. The ability of labor markets to predict accurately the emerging skills requirements of new industries and production technologies is critical for skills that require long lead times to acquire and which are of strategic importance to economic development. These are important areas of potential market imperfections and failures justifying public interventions in schooling and training.

Manpower planners can anticipate changes in the demand and supply of skills by monitoring sectoral employment shifts, production technologies and innovations within sectors, new investor activity, and trade and investment policies. Armed with this information, manpower planners can monitor labor market signals to determine if markets are properly anticipating future skill needs and putting the appropriate economic incentives for skills development in place. If not, then planners can take note of these signals and advise policymakers on appropriate public investments in schooling and training. The scope of this task is narrower than that undertaken by central planners using manpower requirements forecasting.

The rationalization of the public sector's investment in schooling and training requires the examination of a broad array of labor market signals. Measures of the balance of skills demand and supply, market imperfections and failures, private training capacity, and structural

changes involving strategic skills that require long lead times for acquisition are needed to inform this rationalization. The manpower planner who uses labor market signals relies on a more comprehensive array of measures to guide public investments than that provided by manpower requirements forecasting. Reliance on a composite of labor market signals, rather than on a single forecast, allows the planner to form judgments on the basis of the weight of market evidence rather than on point estimates provided by manpower requirements forecasting. As a result forecasting errors are likely to be reduced.

The dynamic nature of labor markets and the frequent monitoring of the signals they send also permit a more flexible approach to public budgeting for schooling and training. Rigid five-year plans can be replaced by a series of rolling budgets, which are adjusted annually at the margin in response to shifting labor market signals. Incremental planning and budgeting can increase the flexibility of training systems. Economies opening to trade and subjected to the forces of global change will be able to compete in world markets only if they are able to sense and respond quickly to the skill needs produced by movements in the demand for goods and services, the adoption of new production technologies, and the entry of new industries. Manpower planners who use labor market signals to produce timely information involving these skill needs will make possible a more flexible response to public spending on schooling and training.

Possible Objections

The advantages of using labor market signaling for manpower planning are many. The central focus is on signals related to skill qualifications, not occupations. These qualifications are taken from actual education and training programs where public and private investments in skills development have to be made. The objective is not to forecast skill shortages or surpluses or to provide precise estimates of training needs, but to estimate whether there will be upward or downward pressure on the economic returns to investments in specific skills. Planners can monitor labor market conditions and evaluate training programs, reporting their findings to individuals, enterprises, and managers of these programs. If necessary, planning efforts can be focused on skills that are of strategic importance to economic development and that take a long time to acquire. In contrast to rigid manpower forecasting, this approach to manpower planning is more modest and realistic.

It is possible, however, to anticipate objections, particularly to the use of cost-benefit and rates-of-return analyses. The principal objection to these analyses are their underlying assumptions that wages are a good measure of productivity and that the economic benefits of education and

training can be assessed by monitoring wage growth. The public sector, for instance, may choose to follow egalitarian wage policies rather than adopt productivity-based wages. Elsewhere, wages may be distorted upward or downward from their competitive levels by market imperfections and failures. Some wage growth may also be a product of innate characteristics that are closely correlated with education and training, which unless controlled for in the cost-benefit analysis, will lead to an overstatement of the social profitability of education and training.

Wages may provide a good measure of the private benefits of education and training, but they may not adequately reflect the social benefits needed to guide public training expenditures. These indirect effects of education and training must be taken into account in deciding whether to make public investments in skills acquisition (Ziderman 1969). The *displacement effect*, for example, occurs when an educated or trained person takes a job that would have been filled by a person without the education or training. The opposite occurs with the *replacement effect*, in which a worker moves to another job after training and the job left behind is filled by a person who otherwise would have remained unemployed. There is also the *demonstration effect*, whereby the skills acquired by trainees are later diffused to others who have not undergone the training. Other indirect effects of training include *social effects*, such as the reduction of fertility levels, and *dynamic effects*, such as the opening of employment opportunities for complementary workers who would otherwise be unemployed.

These indirect effects are appropriately described as positive and negative externalities. Together with labor market imperfections that lead to wage distortions these factors mean that manpower planners need to use their informed judgment in adjusting estimates of social returns to education and training. Moreover, these judgments and assumptions need to be made clear unless the criticisms of precise manpower projections be extended to rates of return to education and training. In making these judgments, planners need to get out of their offices and develop a feel for the relevant training programs and labor markets by keeping in touch with educators, trainers, employers, employees, trainees, job-seekers, and other knowledgeable observers of labor markets. Planners must also be knowledgeable about trends in technology and international product markets that affect the future structure of the economy. Judgments should not be based solely on rates of return, but on a composite of labor market signals. In contrast to most manpower forecasting, which tends to be a one-report affair, this approach has to be a continuous process with information about rates of return and expected structural change updated regularly.

Sources of Labor Market Information

The tasks of perceiving, interpreting, and responding to labor market signals will be much easier for those manpower planners whose governments have invested in labor market information systems. These systems should include national household and establishment surveys. These surveys, found throughout industrial and developing countries, are conducted annually, quarterly, or even monthly. The information they provide is needed to identify structural changes in the economy and movements in relative wages and employment by skill qualification. These data can also be used to analyze the operation of labor markets and their performance and to develop and evaluate macroeconomic policies.

Earnings data from respondents in household surveys are frequently analyzed statistically with respondents' educational qualifications to

Table 5-1. Key Data Sources for Manpower Planning

<i>Data source</i>	<i>Type of data</i>	<i>Purpose</i>
National household survey	Population Labor force activity Employment Unemployment Incomes and wages Education and training Other demographic characteristics	Rate of return studies Wage and employment trends Labor market analysis
National establishment survey	Employment Industry Earnings Firm size Value added	Wage and employment trends Productivity and labor market analyses
Social insurance administrative data	Employment Unemployment Earnings Industry	Wage and employment trends
Tracer studies	Employment Unemployment Earnings Occupation	Rate of return studies (benefits)
Cost studies	Capital costs Recurrent costs Enrollments Training capacity	Rate of return studies (costs)

estimate rates of return to different levels of schooling and fields of study. Rates of return to training programs can also be estimated from data collected by type of training and source. National household and establishment surveys provide a uniform framework for estimating and comparing rates of return to alternative levels and types of education and training. Although most developing countries already conduct these surveys, adapting them to the needs of manpower planning may require additional investments to improve the quality of the data collected, the concepts and detail provided, and the timeliness of their collection and presentation.

***Box 5-4. Working with Limited Information:
The Peoples' Democratic Republic of Laos***

Laos began economic reforms in 1986 in an effort to move from a centrally planned to a market economy. Because privatization of public enterprises and civil service reforms were expected to lead to the announcement of labor redundancies, attention was focused on retraining workers for new jobs. Effective retraining requires an understanding of the skills workers already possess, the skill needs of the emerging market economy, and the capacity of training institutions to meet these needs. But Laos had only limited information on these issues. A decennial census had been completed in 1985, but the information it contained on labor force activity and employment had not been fully analyzed as of early 1991. Even if completed, the analysis would have provided at best only a benchmark for the changes taking place at the close of the decade. More recent information on the balance of skills demand and supply from household or establishment surveys was unavailable.

The situation, however, did not demand an immediate large-scale investment in labor market surveys. In the small country of Laos, other less costly strategies could be adopted initially. Because the major restructuring of employment would be in urban areas, principally Vientiane, The United Nations Development Program funded several small-scale studies to aid the government in assessing retraining needs. A census of government workers was planned to gather information on their skills; a second survey examined the expected skill needs of a restructured civil service. A small survey of private establishments in the Vientiane area was planned to gather information on employer assessments of skill needs. And finally, a survey of public training institutions was planned to assess the training capacity and performance of these institutions. The judgements formed from this information were expected to guide public spending on training for the restructured economy. The government, meanwhile, sought further technical assistance to improve its manpower planning capacity.

In addition to national household and establishment surveys, a comprehensive labor market information system would include the capacity to conduct surveys of local labor markets or other areas of special interest for education and training. Tracer and cost studies, usually conducted as part of the process of evaluating training programs, are also important sources of information for broad training decisions. Table 5-1 summarizes the data sources that might be used in manpower planning and the type and purpose of data to be collected from each source. Managers of training programs can develop their own sources of data on skills demand and the success of training in meeting those demands simply by establishing good relationships with enterprises. Creating a permanent pipeline of market information on the demand for skills and their supply is crucial as a guide to improving training quality and efficiency.

Countries that lack a comprehensive labor market information system can still benefit from a labor market signaling approach. Regular tracer studies of the employment and wages of graduates of education and training programs can provide effective signals of the balance of skills

Box 5-5. Integration of Economic Development and Manpower Planning in the Republic of Korea

Since the early 1960s Korea has been among the fastest growing countries in the world. Its gross national product per capita grew at an average annual rate of 6.7 percent, reaching a level of US\$2,370 in 1986. This growth rate was higher than those of Japan and other industrial market economies and was exceeded in upper-middle-income countries only by Singapore. Korea's development strategy was outwardly focused. Its exports grew at an annual rate of 27.3 percent from 1965 to 1980, before dropping to 13.1 percent from 1980 to 1986. That rate was still higher than that of any other industrial or upper-middle-income country.

This growth took place in a macroeconomic environment with modest policy-induced distortions of prices in labor and capital markets and with careful consideration of technology choices and human capital needs in economic planning. Korea's first economic plan was prepared in 1962. The strategy involved a process of developing domestic industry capacity at a certain technology level and then shifting the industry's focus to the export sector once it had developed and expanded to a sufficient degree. A new group of industries at a more sophisticated level of technology was then developed domestically and eventually shifted to exports.

This strategy linked increasing technological sophistication in production with expanded levels of education and training. The first industries selected for development in the late 1960s were textiles and electrical goods. The labor-intensive, low-skill nature of these industries was com-

demand in local markets. Periodic surveys of employers in these markets can yield valuable information on expected changes in skill needs, assessments of preemployment training, and barriers to the productive utilization of skilled labor. Laos provides an example of this rudimentary approach to the use of labor market signaling (Box 5-4).

Connecting Manpower and Economic Planning

In market economies open to global competition, rigid five-year economic plans are of limited value and should be replaced with incremental planning. Economic planners need to focus on developing policies consistent with flexible markets. In this context, economic planners must be aware of how market policies affect incentives for skills development and the capacity of economies to adjust to external market shocks. The alignment of the economy and skills training depends on the effective integration of manpower and economic planning (Box 5-5). Getting the training incentives right entails not only an understanding of the

patible with a labor force that already had access to universal primary education. In the early 1970s development shifted to more capital-intensive production in steel, electronics, and ship building. Educational opportunities were expanded to complement this development. Enrollment rates in secondary education rose from 35 percent in 1965 to 56 percent in 1975 and included substantial growth in vocational education and training.

This pattern continued into the early 1980s with emphasis on chemicals and heavy industry. The shift to higher levels of production technology was accompanied by continuing growth in education and a new emphasis on enterprise training. Enrollment rates in secondary education rose to 95 percent in 1987. Approximately one-third of this enrollment was in vocational education and training. The numbers enrolled in two-year vocational colleges and in four-year universities also grew. In 1974 Korea made training mandatory for enterprises with 500 or more employees. This number was reduced to 200 or more employees by 1981.

The story of Korea's development success is, of course, more complex than simply restricting the pace of technological development to the pace of human capital formation. Its reliance on competitive markets in which labor's costs were kept low was important, as were the emphasis on exports and the presence of an ethnically homogeneous population with a strong work ethic. Korea's experience illustrates, however, the merits of economic planning that acknowledges the level of skills present in a country's work force and recognizes these skills as a constraint to successful economic development. The integration of economic development and manpower planning in this context was instrumental to the country's growth.

economic environment and its influence on training incentives, but also a framework for rationalizing economic policies that distort the incentives of individuals and enterprises to invest in skills training.

Acknowledging the Economic Environment

Countries that seek to improve the alignment of the economy and training need to acknowledge the influence that the economic environment has on training incentives. This recognition encourages manpower and economic planners to quantify the economic cost associated with economic policies that distort the competitive operation of labor markets. In many developing countries both economic and manpower planners overlook the effect of market distortions on training incentives. Policymakers are generally not given information about how alternative development strategies and economic policies are likely to affect the supply of labor and skills. The failure to acknowledge this relationship can lead to the inefficient use of training resources and slow economic growth.

Understanding this relationship should give planners a clearer view of their options. It seems clear, for example, that if the wage compression found in many countries for egalitarian reasons cannot be restored to market levels, then planners and policymakers should retreat to a second-best approach and provide economic incentives to reduce the private cost of skills development. Such incentives may be necessary to achieve the levels of training that enable a country to meet its growth target. Likewise, if market distortions that favor capital investment cannot be reduced, planners should encourage training centers either to shift their focus to the needs of the informal sector or to adjust their training capacity to the expected lower growth rates of modern sector employment. Technological change accompanying capital-intensive development may require shorter, more flexible modes of training and possibly an increased emphasis on general skills training.

Developing these and similar compensatory measures for policy-induced distortions requires the integration of manpower and economic planning. In a distorted economic environment, planners have a responsibility to lay out the social costs of the distortions to policymakers. At issue are the tradeoffs in efficiency of skills development that are associated with different economic policies. An integrated planning process would make as explicit as possible the effect of individual policy distortions on employment growth, training effectiveness, and costs. Such information is important both to correct policy-induced distortions and to develop strategies that compensate for distortions that resist reforms.

A Framework for Planning

An integrated planning process can be difficult to achieve when the economic planners are located in one ministry and the manpower planners in another. Several countries offer examples of how this integration might be achieved. In Singapore, for example, responsibility for planning and promotion of industrial development is combined with responsibility for skills training in the Economic Development Board (Eng Fong and Salome 1986). In Costa Rica, the National Training Institute is closely linked with the Ministry of National Planning, with which it coordinates its policies, and on which it depends to a great degree for approval of its investment projects (World Bank 1991b). A proposed skills training policy for Mauritius would place responsibility for training, economic planning, and policy development in the office of the prime minister.

Turkey's experience illustrates how this integration can take place without bureaucratic upheaval and costly, new planning structures. At the initiative of the director of social planning in the State Planning Office, a joint committee of training agencies was formed consisting of representatives of the Ministry of Education, the Ministry of Labor, and the Council for Higher Education. These agencies were represented by persons with the title of director general or higher. The joint committee initiated a series of planning studies, which included an assessment of labor laws and regulations affecting training and other studies covering labor market information, accreditation and certification programs, and manpower planning techniques. As these examples show, more than one approach to integrated economic and manpower planning is possible.

Summary

By monitoring the operation of labor markets and training incentives and by providing information on labor trends to individuals, enterprises, and managers of training institutions, manpower planning can improve the efficiency of training and the performance of labor markets. Achieving these objectives requires the use of planning techniques that balance the social benefits with the costs of training and that are responsive to changing economic conditions. Except in planning to ensure a supply of strategic skills that take a long time to acquire, manpower planners can focus their energies on providing information about the demand for skills. Training is also likely to be more efficient if manpower and economic planning activities are integrated so that the economy and training incentives are more fully aligned.

6. *Mobilizing Employer and Private Training*

A comparatively small part of a nation's skills is acquired before employment through publicly financed and provided vocational and technical education and training. The largest share of training is provided during employment by private and public employers. Even very small firms in the urban and rural informal sectors provide a great deal of training through traditional forms of apprenticeship. In addition, nonprofit and for-profit training institutions offer both preservice and in-service training.

Governments face two policy issues concerning employer and private training. First, to what extent can this training substitute for expansion of public preemployment vocational and technical schooling and training? Second, to what extent can employer and private training respond to the training needs created by international competition and the spread of new technologies and management processes? To answer these questions governments need to assess both the quantity and quality of training that employers and private institutions provide.

This chapter reviews the evidence on the potential contributions of these nongovernmental modes of training. The review suggests that they can be a significant and efficient means of skill development. Governments, however, can play a substantial role by helping to reduce constraints on the mobilization of these training resources.

Training by Private Employers

Training by private employers can have both economic and institutional advantages. Employers and employees share costs and benefits. The issue of matching training supply and demand does not arise: firms train only for needed skills. Enterprises are responsible for most in-service training. Because most technological innovation enters developing

countries through enterprises, employers have the equipment and technical information needed to develop new skills. Accountability for the results of training is direct, and firms may be expected to train as quickly and as efficiently as possible to minimize costs.

Thus, the *prima facie* case for the cost-effectiveness of enterprise-based training is strong. The evidence discussed in Chapter 2 shows that employer training is more cost-effective than preemployment training alternatives. Enterprises can effectively provide training as a complement to new investment in plant and equipment or in support of changed management and production processes. Studies of the introduction of new technologies in rapidly industrializing economies in Asia show that enterprises provide—or pay external trainers to provide—the training their workers need to adapt to expanded or entirely new jobs (ILO 1988b).

Although the extent of employer training has been documented in a number of studies, quality—especially in the provision of general skills—has not been studied directly. Data often indicate whether training is given on the job, formally organized, or purchased from external providers. Lacking other measures, it is reasonable to assume that the latter two kinds of training are more likely than on-the-job training to provide broader, general skills.

Training by private employers has been criticized on two grounds: first, that firms do not provide training on a scale adequate to meet society's needs for skills; and, second, that firms provide only narrow training specific to their short-term productivity objectives. As discussed in Chapter 3, the rate of economic growth and the prevailing patterns of incentives for investment in worker skills are the fundamental determinants of both the quality and quantity of the training that private employers finance or provide. But the evidence also shows that two kinds of market imperfections frequently limit the extent and quality of employer training. First, low levels of basic education in the labor force increase the cost to firms of achieving satisfactory levels of skills in their work forces. Second, small firms, which tend to train less, and less formally, than larger establishments, are predominant in most developing economies.

Low Levels of Education

Virtually all skilled jobs require some level of competence in estimation, measurement, and both written and oral communication. Interpersonal skills, especially the ability to work in teams, are also important. The value of these skills grows as new technologies and accompanying changes in the organization of work increase the level and complexity of jobs.

Mathematical and communications skills can be learned efficiently through good basic and general secondary education. Basic education provides an adequate foundation for much semiskilled and skilled work in small firms and traditional industries. But secondary education is increasingly needed for skilled and technical work in the modern sectors of rapidly evolving economies.

Employers recognize the importance of their workers' educational backgrounds. In both industrial and developing countries, higher levels of education increase the probability that an employee will receive in-service training. A study in Peru, for example, found that the probability of receiving training was 25 percent higher for male workers with some secondary schooling than for workers with no secondary schooling, 52 percent higher for those who had completed secondary school, and 63 percent higher for those with some postsecondary schooling. The study also noted that in-service training increased earnings (Arriagada 1989a). A survey of enterprises in Thailand found that training in large and medium-size firms was oriented toward quality control and management; managers and professionals were more likely to receive such training (Middleton and others 1990). The probability that workers would be promoted to higher paying supervisory and management positions increased with the level of formal education: 30 percent of the secondary vocational graduates were section managers and above, while 45 percent of those with two years of postsecondary technical education held such positions. And higher-level employees were more likely to receive formal training in external institutions at company expense. This finding was confirmed by data on enterprise training in Taiwan, showing that 40 percent of managers, engineers, and high-level technicians, but only 15 percent of skilled workers received training outside the firm (San 1990).

Low levels of basic and secondary education in much of the developing world mean that employers have to provide compensatory basic education in addition to specific skills training, thus raising training costs. Alternatively, employers can design the production process to minimize skill needs. In either case, the amount of training provided is likely to be less than socially desirable, constituting a failure of the training market.

Low school enrollments are a particular problem in low-income countries. In 1988 gross primary enrollment ratios¹ in lower income countries were 75 percent; secondary enrollment ratios were 25 percent (World Bank 1991c, Table 29). Gross primary enrollment ratios in middle- and upper-middle-income countries exceeded 100 percent, but secondary enrollments were 55 percent and 58 percent, respectively. High levels of dropout and low levels of learning achievement make the situation at all levels worse than enrollments alone indicate.

Firm-Specific Imperfections

Low levels of worker education alone do not fully explain the varying extent to which private employers are willing to provide training for their workers. The size of the firm is often held to be the principal cause of inadequate training investment. But training in firms of all sizes can be constrained by imperfect capital markets, undeveloped human resource management capacity, and lack of information on and access to externally provided training services.

FIRM SIZE. Although employer training in developing countries can be extensive in larger firms, in most countries firms are predominantly small. Generally over 80 percent of firms employ fewer than 100 workers and a third or more of all workers work for firms with fewer than 100 employees (in smaller countries, that figure reaches 60 to 80 percent). It is often argued that owners of small firms do not see the need for training, lack information about training opportunities, face higher costs per worker because of the lower training volume, and are unable to afford either the direct costs of training or lost production during training time. In these circumstances, the volume of training is likely to be less than socially desirable and, given low levels of existing technology and management capacity, certainly inadequate to the task of improving skills rapidly.

Smaller firms not only tend to provide less training than larger firms, but the intensity and quality of their training also tends to be lower. This situation does not necessarily constitute a problem: the skill requirements in small firms often (though not always) can be achieved through informal, on-the-job training. Often, however, more and better training could increase productivity. Small firms are particularly vulnerable to three forms of market imperfection. First, firms (and workers) have difficulty borrowing to finance investments in training. Second, human resource management practice is generally undeveloped. Third, small firms often do not have adequate information about the value of training to productivity or about the availability of external training opportunities.

When they do train, small firms are more likely to use on-the-job training than more formal methods. In Ghana, as early as 1967, regulated apprentices were found in half of those manufacturing firms that had more than 200 employees, but in only a third of those with fewer than 50 workers (Peil 1970). Of sixteen large and medium-size firms in Thailand in 1988, twelve either had well-developed internal labor markets and personnel policies or were in the process of establishing them. Larger firms with better personnel practices provided the average worker with ninety-three days of training, mostly on entry, and mostly

on the job. Smaller firms without formal personnel systems provided an average of twenty-six training days. Only larger firms provided formally organized training or purchased training from external providers; small firms provided only informal on-the-job training (Middleton and others 1990).

This relationship between firm size and the propensity for formal training has also been found in Taiwan (San 1990). In Indonesia large state-owned firms in the electronic industry provide significantly more training than smaller, private enterprises (Sanyal and Moegiadi 1989). In Hong Kong's highly developed economy, thirty-seven of seventy-three firms surveyed had a training budget, twenty-eight employed a full-time training officer, and thirty-one had dedicated training facilities. Formalized training was most prevalent in the banking industry, with eight of nine banks having training budgets and facilities. Smaller firms offered much less formal training (Hong Kong Productivity Council 1986).

In Zimbabwe large firms provide training through apprenticeships, formally organized courses, and purchase of training from external providers (King 1989). Studies in smaller countries in West Africa indicate that the small size of firms and economic circumstances limit the amount of formal in-service training that is offered, although informal on-the-job training is widespread (Achio 1987; Charmes 1987; Paul 1987). Elsewhere in Africa, both small and large firms provide organized training. An analysis of enterprise surveys in Kenya and Tanzania found that firms of all sizes provided formal training to nearly a quarter of their employees. In Kenya enterprises trained 29 percent of their skilled manual workers; in Tanzania, 14 percent. Somewhat more than half of the workers in each case were trained in institutions outside the firm, the rest in the enterprise. About half of the courses were less than six months in length, some 30 percent lasted six months to a year, and 20 percent lasted more than a year. About three-quarters of the workers in both countries who received training attended the training courses full-time, and more than 90 percent of these received full pay during training. Half of the workers received a pay increase after training. Trained workers achieved somewhat higher pass rates on national trades tests than untrained workers did; passing these tests had a significant positive effect on earnings (de Beyer 1990).

Enterprises in Latin America have relied on vocational training institutions funded by taxes on employer payrolls for the bulk of entry-level training. Formal in-service training in cooperation with vocational training institutes is widespread. In-service training, often delivered on firm premises, accounts for nearly three-quarters of total enrollments in the vocational training institutes of twelve Latin American countries (World Bank 1991b). A study of Jordan found that larger enterprises with well-developed internal labor markets provided a great deal of

structured training of high quality; this training was driven in large part by high labor turnover because so many Jordanian workers migrated to other countries in the region. Smaller firms, however, relied much more on the graduates of public vocational schools and training centers (Herschbach and others 1985).

The size of the firm particularly affects its capacity for apprenticeship training, which, by design, has the potential for broader and deeper skill development than firms customarily provide. Apprenticeship may be more efficient at low volumes of training and less so at high ones. Training a small number of apprentices may not affect output and may require only a relatively small diversion of equipment and the time of an experienced worker. But the cost of output forgone can become substantial as the number of trainees increases. Theoretical training is weak unless on-the-job learning is supplemented by self-study or formally organized instruction. The organized framework of apprenticeship (including certification standards), combined with the length of courses, tends to restrict flexibility. Strong supervision is needed to ensure that firms provide the broader skills training required under apprenticeship contracts. There is some evidence that lengthy terms of apprenticeship are leading firms to retreat from this mode of training in many circumstances (Dougherty 1989).

Finally, small firms are especially reluctant to provide higher technical education, if only because these skills are so highly transferable. They are also costly and time-consuming to provide, requiring a strong component of general theory and several years of full-time preparation. Workers can achieve technician status through a combination of in-service training, evening study, and job experience, when external training opportunities are available.

INABILITY TO FINANCE TRAINING. Access to credit financing is a general constraint on small firms and poor workers. Even large firms and workers with assets find it difficult to borrow for training investments. Indeed, the concept of credit financing for education and training is thus far restricted primarily to student loans for higher education. Workers are not only constrained by the direct costs of training that they incur, but also by the income forgone for the intensive off-the-job training often needed for higher productivity occupations and improved earnings.

UNDEVELOPED HUMAN RESOURCE MANAGEMENT. Firms can be as inefficient in improving human resources as in improving other aspects of production. In developing countries the capacity for effective personnel and training management is often weak. Even large enterprises in Korea have been criticized for using outdated employment practices that base salary decisions largely on seniority and levels of formal education

rather than on productivity (Lee 1983; Ouh 1988). Smaller firms in less developed economies may be less likely to link performance with pay. Where personnel systems are weak, the productivity benefits of training are likely to be comparatively low, and firms and individuals consequently less willing to invest in training (Box 6-1).

Box 6-1. *Private Training Markets in Zimbabwe*

With nearly a quarter of its gross domestic product coming from manufacturing, and more than a million workers in wage employment, Zimbabwe has one of the largest markets for modern sector skills training in Sub-Saharan Africa. Macroeconomic factors, however, have hampered growth in the modern sector, and employment has remained stagnant. As a result, public training has encountered difficulties. Out of the 110,000 applicants for apprenticeship positions in 1986, only 1,000 could be placed. Low wage scales have made it difficult to retain qualified instructors in public technical colleges and the polytechnic. A rebate scheme operated by the Zimbabwe Manpower Development Fund (ZIMDEF) to encourage employers to provide training has yet to function smoothly. In 1987 only 77 firms received rebates, covering the training of 640 employees. The fund has accumulated a substantial surplus.

At the same time, a vibrant private training market has developed, driven by increasingly high levels of general education and traditions of self-improvement through education and training. Correspondence colleges enroll approximately 200,000 students. Several thousand of these are enrolled in technical fields such as electronic engineering, and even more students are enrolled in commercial and banking fields, where their fees are reimbursed by ZIMDEF and by employers. In addition, more than forty private colleges offer general commercial and some technical courses at times convenient to working students, enrolling several thousand students willing to pay for their instruction. The colleges have also ventured into the market for upgrading the skills of already employed workers. In 1987 more than 1,000 workers from 350 firms were willing to pay for intensive courses in specific business skills.

The government polytechnic has also entered the private market, providing technical and engineering courses in the evenings for a fee. Enrolling 600 to 700 students at a time, these courses generate revenues sufficient to pay high salaries to well-qualified part-time instructors and to return a profit of 20 percent to the polytechnic. Finally, private training consulting and management firms, international accounting companies, and manufacturing companies with excess training capacity have entered the management training market. These courses are not eligible for ZIMDEF reimbursement.

Source: King (1989).

INADEQUATE INFORMATION. Weak training capacity requires firms either to hire from the labor market or to purchase external training services. In the latter case, lack of information on the benefits of training or on the availability of training services can pose a major constraint. For example, a survey of small enterprises in Thailand found that few were aware of the existence of public industrial extension services (Marsden 1984). These constraints also operate for larger firms, although the evidence suggests that they are better able to finance external training, including paying workers during the training period. As noted, however, workers with higher levels of basic and secondary education are most likely to benefit from such opportunities.

Public Interventions to Strengthen Private Employer Training

The presence of market imperfections calls for selective public interventions to increase the extent and quality of training by employers in the private sector. Expanding and improving general education is the most important form of intervention. In addition, governments have implemented focused incentive programs designed to deal with market imperfections. To overcome imperfections in credit markets, governments have subsidized workers' wages and employers' training costs. A variety of technical assistance programs have been adopted to improve human resource management and training capacity. In practice, measures to overcome financing constraints are often combined with technical assistance.

WAGE SUBSIDIES. Public subsidies for trainee wages are appropriate when potential trainees are unable to finance otherwise worthwhile investments in general training. A clear case occurs when the wage reduction the employer imposes to recover the costs of training falls below the level of earnings the worker needs to maintain an adequate standard of living. Even if training wages are adequate, subsidies can offset training costs for both workers and employers. Subsidy of trainee wages is most appropriate for entry-level and apprentice training, where training is more easily standardized and trainees most readily identified.

Subsidies for trainee wages are found in a wide range of countries, including Australia, Fiji, India, Malawi, Nepal, New Zealand, Nigeria, and Sri Lanka; the subsidy varies from 40 to 100 percent of the trainee's wages. Only a few studies on the effects of these subsidies have been conducted. Analyses in Australia suggest that the effect may be positive, if weak, although there are indications that subsidization of apprentices has led to displacement of other, unsubsidized, workers.

TAX EXEMPTIONS. Several countries indirectly subsidize training by granting tax exemptions to firms that provide approved training programs. One such incentive, for example, offers a partial exemption from the tax on profits, over and above the usual deduction firms may take for expenses incurred in providing training. Such arrangements are found in Argentina, Brazil, Chile, Fiji, Pakistan, and the Philippines. The actual formula used differs from case to case. In Chile training expenditures equal to 1 percent of payroll may be deducted from the firm's profits tax liability. Brazilian enterprises may deduct double the expenditure on approved training, up to a maximum of 10 percent of profits tax liability. Firms in the Philippines, with some limitations, may deduct 150 percent of training costs in the computation of taxable profits.

Although literature on the effectiveness of these measures is scant, studies of the effect of parallel tax incentive schemes for research and development are not encouraging (Mansfield 1985; Eisner 1982). In Chile and Brazil, where some evaluations have been carried out, the main beneficiaries are those large enterprises in the more dynamic sectors of the economy that are located in the more developed regions (World Bank 1991b). Chile promotes joint training by small and medium-size enterprises in a given sector so that these firms may individually take advantage of fiscal incentives through economies of scale. As with other forms of subsidy, these subsidies may represent a windfall gain to the firm and a needless loss of revenues to the country's treasury. Because only firms that make profits benefit from these measures, it is likely that these firms are efficient and already train sufficiently.

SUBSIDIZING TRAINING EXPENSES. Direct reimbursement of training expenditures is most appropriate for in-service training, which is often characterized by training of varying duration and intensity. In setting up these subsidy programs, it is important that criteria for eligibility be flexible so that a range of in-service training activities can qualify for reimbursement. Compensatory basic education, for example, may be the most needed form of training in some circumstances, while in others a variety of short technical courses may be needed to accompany changes in technology and work organization.

As argued in Chapter 4, incentive programs should generally be seen as a second best alternative to the elimination of market imperfections. However, these imperfections are difficult to eliminate entirely, even in the most developed economies. In Japan, traditions of lifetime employment and exceptional enterprise management have greatly strengthened employer training, but strong government credit and technical advisory services have been kept in place to assist small firms. In Germany, financial constraints are managed through careful regulation of apprenticeship wages and public financing for the general component of train-

ing, and training quality is assured through publicly financed regulation, examination, and research and development services.

Direct subsidization of training expenses is found most often in middle-income industrializing countries in Asia and Latin America. The evidence indicates that such subsidies can increase the amount of training enterprises provide, although the effect on quality is uncertain. When subsidization programs are flexibly implemented to adjust to changing circumstances, substantial numbers of smaller firms can be reached (Box 6-2). Subsidies can also have an important initial stimulus on firms. For example, a subsidy program accompanied by an information campaign and some technical assistance in Taiwan in the early 1970s led to a 400 percent increase in the volume of training in two years. When the subsidy was terminated a year later, training volume fell to a level twice that of the presubsidy era but rose steadily thereafter (San and Chen 1988).

Some evidence from Latin America, however, indicates that small firms gain little benefit from reimbursements. Moreover, there are a number of fundamental problems with the reimbursement of training costs. Not least is the possibility that firms will repackage existing training programs so that they will be reimbursed, with no net increase in provision (Dougherty and Tan 1990). If procedures for reimbursement are too cumbersome, many firms will not participate. Yet, protection against repackaging requires the government to implement some form of administrative control and monitoring, which may be costly where many firms provide training in-house. Monitoring the costs of sending workers to external training institutes is easier and permits firms to take advantage of scale economies in training costs.

A second fundamental problem concerns the amount of training. In countries at all income levels, there are indications that firms do not provide enough training because of poor management practices. Where the underlying cause of inadequate training is weak or inefficient management, the positive response to subsidies, even in combination with training promotion and exhortation, may be small.

Faulty designs for subsidy programs can have negative consequences for the amount and quality of training that private employers provide. A Korean program introduced in the early 1970s established training targets for enterprises, which had the option of paying a training levy rather than providing the training. The government also established rigid criteria that enterprise training programs had to meet. The net effect of this disincentive scheme was to discourage enterprises from participating (Box 6-3).

TECHNICAL ASSISTANCE. The effectiveness of any form of subsidy ultimately depends on the management capacity of the firm. Several

Box 6-2. Training Subsidies in Singapore

With a low rate of population growth and rapid industrial expansion, Singapore developed a strategy to improve productivity by raising the level of technology in production, reducing low-paid unskilled jobs, and upgrading the skills of the work force. Administered by the Economic Development Board, the scheme rests on improved public-private cooperation. A government program for reimbursement of company training expenses is a major component of the strategy.

A levy on the wages of unskilled workers goes into a Skills Development Fund, which is used to upgrade the work force through training grants to enterprises. By most measures, these training grants have been successful. By 1985 the fund had awarded grants to 23,000 enterprises. Training reached 240,000 workers, or 21 percent of the labor force. Larger firms were the initial beneficiaries of the program, but aggressive efforts to make small firms aware of external training courses and to provide support for industry associations has increased the number of smaller firms participating in the program (Box Table 6-2).

The steady growth in the use of the fund can in part be attributed to an incremental strategy of implementation. In the first two years, efforts were focused on creating awareness of the fund among employers, with ad hoc reimbursement of approved courses. In the second stage, priority was given to in-plant training, and reimbursement increased to 90 percent of costs as an additional incentive. The third stage encouraged the development of corporate training plans by paying grants in advance of expenses, thereby reducing interest costs to firms. In the current stage, the focus is on reaching smaller enterprises and improving training quality.

Box Table 6-2. Profile of Companies That Received Grants from the Singapore Skills Development Fund

<i>Number of employees</i>	<i>FY86</i>		<i>FY88</i>	
	<i>Number of grants</i>	<i>Percent of companies receiving grants</i>	<i>Number of grants</i>	<i>Percent of companies receiving grants</i>
10	50,405	2.2	60,536	8.0
11-49	9,862	22.8	10,287	53.0
50-99	1,183	66.4	1,319	100.0
100-199	603	87.0	616	100.0
200-499	367	99.7	358	100.0
500 +	217	100.0	224	100.0

Sources: Eng Fong and Salome (1986); Skills Development Fund (1989).

Box 6-3. Financial Disincentives in the Republic of Korea

Attempts to encourage enterprise training in Korea through the use of financial disincentives have encountered significant problems. The 1974 Special Law for Vocational Training required companies with 500 or more employees to offer in-plant skill training to a percentage of their work force, the percentage being based on estimates of national manpower needs. Employers could waive their training obligation by paying a training levy, which was determined by the Ministry of Labor on the basis of the previous year's actual training cost as calculated by the ministry.

Initially, training expanded—from 13,000 workers in 1975, the year the program was introduced, to more than 90,000 annually in the peak years of 1976 and 1979. But in 1980 the number of workers trained under the system began to decline, falling to 23,500 in 1985 (in a much larger work force). The roots of the decline lay in the structure of the program and its administration, which together created a disincentive to train. The government insisted that approved training programs last a minimum of six months, a standard that did not conform to enterprise views of the time required to train. Second, the fine imposed for not training was less than the training cost, encouraging firms to pay rather than train. Employers resisted government attempts to raise the amount of the fine to encourage training, further divorcing the size of the disincentive from costs. An increasing number of firms, under these conditions, elected to pay the fine and invest only in the amount and quality of training the firms believe they needed and could afford while still keeping wage costs low. The quality of training provided by firms under the scheme was, on average, significantly lower than that provided in public vocational training institutes. As measured by competency tests, public institute graduates consistently outperformed enterprise trainees at all levels of skill.

Among the larger firms electing to pay the fine rather than train under government specifications, there were a number that continued to provide extensive and high quality training, as documented by case studies. These were typically found in larger manufacturing enterprises.

Source: Kim (1987).

countries have developed public programs to build the capacity of their private enterprises to manage human resources and training. Such technical support has been particularly well developed by the vocational training institutes of Latin America. In the first stages, these institutes delivered training on enterprise premises in addition to providing external in-service training courses. In the middle stages, government specialists trained enterprise training staff and helped develop training departments and courses. The package of services is currently broaden-

Box 6-4. Dual Training in Jordan

Jordan's Vocational Training Corporation (VTC) has a well-established dual system of apprenticeship training. Students spend two years in combined center-based study and work experience, followed by a year of apprenticeship. Training off the job includes general education and, where enterprises have twelve or more apprentices, is conducted in enterprise facilities by in-plant instructors assisted and supervised by a VTC training officer. This officer also supervises the on-the-job apprenticeship through checklists and apprentice logbooks. By 1985 the VTC was working with 1,000 employers, large and small, and graduating 2,000 apprentices annually.

Formal apprenticeship contracts are established. The Ministry of Education approves the technical content of the curriculum, which is developed by the VTC in conjunction with employers. Assessment of trainee learning and performance is a joint effort by employers and the VTC.

The system was developed in response to demands for skilled labor and the high costs and lengthy training time required in conventional vocational education institutions. An additional objective was to enable training to adjust to the needs of different employers. The program addresses all three objectives by placing trainees in part-time employment and by conducting a large part of the training in the firms themselves, where the trainees can use the employers' equipment.

While the unit capital costs for VTC apprentices and students in Ministry of Education vocational schools are comparable, the recurrent unit costs of the VTC are about 50 percent less, even with the added costs of in-plant training and supervision. Although no formal evaluations have been completed, employers report high levels of satisfaction with the system. One element of success is the quasi-autonomous status of the VTC, which enables it to move quickly to adjust training to demand. Individual VTC centers have latitude to adjust the content of training to meet local employer needs. The VTC is linked to employers through a high-level, tripartite board of governors with direct access to the prime minister.

The program is not problem-free, however. The VTC has increasing difficulty in placing apprentices in larger firms. It has tried to compensate by placing more apprentices in small firms, but the administrative burden of supervising one or two apprentices in each of many small firms is heavy, and the training provided in these enterprises is often of lower quality. Furthermore, large employers who do train apprentices have no obligation to hire them, and most are not retained by the firm after training. Many are reported to have gained employment in neighboring countries.

Source: Herschbach and others (1985).

ing to include productivity consulting, management and supervisor training, and assistance with acquiring and installing advanced technology. In middle and later stages, modifications in the training payroll levy system, which allows firms to use a portion of their tax payments to fund specific training contracts, have encouraged enterprises to continue their training efforts (World Bank 1991b).

Cooperation between training agencies and firms through dual training systems offers the most highly organized basis for combining training subsidies and technical assistance to firms (Box 6-4). Such systems offset capital market imperfections by subsidizing the theoretical component of training and address weak human resource management in firms through supervision of in-plant training activities.

Despite positive examples, technical assistance for enterprise training has not always been successful. It has been particularly difficult to reach large numbers of small firms. The formation of enterprise training associations is one option for strengthening training in small and medium-size firms. Governments can assist in the establishment of these associations and training operations through technical assistance. In the formative stages partial subsidization may be justified to leverage private investment and establish quality standards.

Good examples of enterprise training associations are found in Latin America. At the large end of the scale is the National Industrial Apprenticeship Service, which is owned by the Brazilian Confederation of Industries and which serves the nation's manufacturing sector. Elsewhere subsectors of industry share the cost of specialized training institutions. Examples of such specialized training associations are found in petroleum and petrochemicals, textiles, and banking in Venezuela; and in the construction, textile, and shoe industries in Mexico (World Bank 1991b).

IMPROVING TRAINING INFORMATION. Targeted subsidies for external training should be matched by policies that encourage the growth of training markets. At a most basic level, public provision of information on the benefits of training and on the availability of both public and private training opportunities can be helpful at low cost. Enterprise associations are often useful channels for information of this type. In Malawi, for example, an association of the personnel officers of large and medium firms meets regularly to exchange information on employment and training practices.

Training by Public Employers

Training provided by public agencies and state-owned enterprises is an important source of vocational and technical skills. The state is often the

largest employer, and the cost-effectiveness of public employer training is thus of considerable importance in developing the work force. Although training by public employers is rarely evaluated, case data suggest that it can be of good quality and provide an important source of skilled labor for private employers.

Public employers offer two principal forms of training provision: entry-level training and in-service upgrading. The latter often takes the form of project-related training—short-term, temporary training intervention to provide the skills that complement capital investment. Governments also incorporate “start-up” training services in packages of incentives designed to attract new private investment. Capitalizing on the short time required to develop most skills, public training agencies collaborate with an identified investor to use existing capacity to develop the work force for a new enterprise. The approach is best developed in the United States, where state governments compete to attract industry (Langen and Thomas 1979; Russell 1980). But it is also found in developing countries with rapidly evolving export markets, such as Mauritius and Singapore.

Governments have created a variety of institutional arrangements to provide training during employment. Most often, individual ministries provide entry-level and in-service training, frequently at skilled worker, technician, and management levels. Public employees often attend “free-standing” public training institutions that specialize in preparing workers for a particular sector, for example agriculture. These are usually an extension or expansion of existing ministerial training operations, and they provide training to both public and private organizations (the latter often with cost-recovery mechanisms). World Bank support for such institutions has increased significantly in recent years. Before 1980 the Bank had assisted in the development of four such institutions; by 1988 it had helped to establish another sixty-six, half in agriculture, and the balance spread across other sectors, primarily health, manufacturing, and construction. Several Bank-assisted projects support institutions that provide training in skills, such as management and accountancy, that are useful in most sectors (World Bank 1988b).

Project-related training has been a major form of human resource investment for most assistance agencies. In recent years project-related training, including investments in sectoral training institutions, has varied between \$300 and \$500 million a year and accounts for 3 percent of total World Bank lending. Other donor agencies have also invested heavily in training of this type.

The World Bank rationalizes its investment in training agencies that serve both public and private organizations by arguing that these agencies have good information on training needs by virtue of their specialized relationship with employers, thus improving effectiveness.

Training for all levels of skill increases the coherence of training programs and improves the effect of training on organizational efficiency by ensuring that skills at different levels are complementary. Sectoral training agencies emphasize in-service training and closely link training of newly hired workers to employment plans of a relatively limited number of employing agencies or firms. And the potential for innovation in instructional approaches can be high. Through its sectoral training system, the state-owned Brazilian telecommunications industry, for example, has introduced modular, competency-based training for workers at all levels. In trial runs, the system, which focuses on developing only those skills necessary to the industry, reduced training time by 66 percent while raising output (Romiszowski and Machado 1978).

Problems with Project-Related Training

Numerous problems have plagued project-related training. Several World Bank reviews in the early 1980s identified consistent themes: weak national capacity for managing and delivering training, lack of incentives to organizations and employees to undertake training, and lack of coordination among national training organizations. Project-related training investments that relied heavily on external consultants to design and deliver training failed to overcome these limitations, and the results of the investments were mixed, at best. Moreover, research highlighted the difficulty of developing effective project-related training where base levels of education are low: where literacy was less than 50 percent, returns to project-related training investments suffered sharply (Mingat and Tan 1987).

Sectoral training agencies often lack the fiscal accountability of profit-making organizations, and efficiency requires both strong management and on-going evaluation. Government salary regulations may make it difficult for sectoral training agencies to hire the best qualified instructors. The professional and administrative overhead requirements can be high, especially for agencies that train for a wide range of occupations and skill levels and serve many agencies and organizational units. Inadequate financing can weaken a number of activities, including assessment of training needs, curriculum and materials development, the training of trainers, and monitoring and evaluation. The potential advantages for quality and flexibility can quickly be lost.

Using Public Employer Training Capacity

Training by public employers can make important contributions to productivity, not only in state agencies but also through the sale of training services to private employers and the outflow of trained work-

ers to the economy. The key training challenges facing most public employers appear to be capacity improvement and utilization.

Strengthening the professional and managerial capacity of public training operations can improve performance. Perhaps most important, capacity for assessing cost-effectiveness is needed to improve accountability and efficiency. Competent national training agencies can move more strongly into project-related training, using competitive contracting—perhaps with preference to local bidders and to partnerships between local and international training organizations—to channel resources toward strengthening training capacity in both public and private training organizations.

The training capacity of public employers can be used effectively for special training operations, such as programs to train dislocated workers or to support growth in a particular sector of the economy. Sri Lanka mounted a special program to support the construction industry, which trained 45,000 workers in five years. And as Indonesia discovered, there may be opportunities to train beyond the immediate needs of the organization to prepare workers for private employment (Box 6-5).

Traditional Apprenticeship

In North and West Africa, and to a lesser extent in Latin America, traditional apprenticeship in small firms, often in the informal sector, is a major source of skill formation (Fluitman 1987; Hallak and Calloids 1981; Sethuraman 1981). Its strengths in enabling individuals to acquire the broad range of technical and managerial skills necessary for self-employment are increasingly recognized. And in an era of scarce resources for education and training, the fact that apprentices finance their own training is increasingly appreciated. At the same time, the limited capacity of apprenticeship to raise the level of technology in informal sector production is acknowledged.

In many countries, apprenticeships are the principal mode of training for traditional crafts such as blacksmithing, leathercraft, and herbal medicine, as well as for more modern, technical trades such as automobile, appliance, and radio repair. These apprenticeships exist wherever a small business owner is willing, for a fee, to teach a skill or trade that is in demand. Entry is open to anyone who can pay the training fee and meet other qualifications, such as ethnic or clan identity. The training period varies in length, depending on the technical difficulty of the trade and how quickly apprentices master the body of skills. In some cases, a written contract, stating the master's obligation to train the apprentice in exchange for a fee and work by the apprentice, is drawn up for the apprentice's family. The apprenticeship usually ends either when the master or the apprentice decides that the apprentice is sufficiently com-

Box 6-5. Training in a State-Owned Enterprise

In the early 1980s the government of Indonesia targeted electronics as a strategic growth industry. A key element of the strategy involved telecommunications, which in turn involved the national telephone organization (PERUMTEL) and a number of small state-owned and private computer hardware and software firms.

The development of skilled manpower needed to complement capital investment in telecommunications equipment was given high priority. It was clear that employers would have to play an important role in rapid, large-scale skills development, if only because of the concentration of expensive expertise and technology. PERUMTEL provides both entry-level and continuing in-service training at central headquarters in Bandung and at twelve regional centers. New workers enter a training and career ladder at different steps, depending on their levels of education. They receive twelve to eighteen months of formal entry-level training. A combination of four years of work experience and successful upgrading training enables unskilled workers with elementary education to advance to semiskilled status, the normal entry point for lower secondary graduates. The same pattern holds for continuing advancement to skilled tradesman, higher technician, and manager-professional status. Experience and enterprise-provided training substitute for formal education outside employment.

Between 1983 and 1987 PERUMTEL provided entry training to more than 25,000 workers, 13,000 of whom successfully completed their course. In-service upgrading was provided to more than 23,000 workers, 22,000 of whom successfully completed their training. Training accounted for 2 percent of the total PERUMTEL budget. By comparison, public and private technical education programs in all fields, in provinces where PERUMTEL was located, trained fewer than 4,000 people in 1986-87; public and private technical high schools trained 73,000 workers. Clearly, PERUMTEL training makes a major contribution, not only to the enterprise itself, but also to other companies through the outflow of employees who are trained but do not meet PERUMTEL's exacting performance standards at the end of qualifying training.

Source: Sanyal and Moegiadi (1989).

petent. Typically, youths enter apprenticeships in their mid-teens, and the training period often lasts three to five years for a technical trade such as auto repair.

Apprentices receive their training almost exclusively by working on actual commercial assignments and contracts. They learn by observing the techniques of older, more experienced workers, asking questions, and participating in work routines to the extent that they are competent.

Little or no school-like instruction takes place, although some literate apprentices do read trade textbooks on their own to further their understanding. Apprenticeship is often followed by some sort of paid journeyman employment in the master's workshop. Masters view this post-training employment, when their fully trained apprentices finally become of some economic value to them, as a payoff for the long period when the apprentices' work was far less productive and competent. Many journeymen also see this employment as a necessary incubation stage to save money to buy tools, build up a customer base, and find suitable locations for their own businesses. Masters may reward long and devoted service by their journeymen by buying them a set of tools or assisting them in setting up their own shops.

In the past apprentices had little or no education. Because primary education has expanded at the same time that wage employment has contracted, levels of education for apprentices have risen substantially. A sample survey in the Côte d'Ivoire found that more than 40 percent of the individuals who had recently completed apprenticeships had finished four or more years of primary school and more than 10 percent had some secondary education (Grootaert 1988). A majority of the automotive apprentices interviewed in a Ghanaian city had completed at least lower secondary school, in contrast with their mostly unschooled masters (McLaughlin 1979).

Recent research in Ibadan, Nigeria, demonstrates that apprenticeships play a central role both in enabling individuals to enter informal sector employment and in providing low-cost labor in small enterprises (Birks and others 1992). Selected data are shown in Table 6.1. With the exception of a few low-skill trades, such as meal preparation, 80 percent or more of firm owners in the informal sector had been trained in traditional apprenticeship. The typical firm had only one paid worker and as many as six apprentices. Training fees run as high as 1,000 naira a year in more profitable trades, equivalent to the monthly salary of a university lecturer. Even with average fees of about 200 naira, training is clearly an important source of income to firm owners. That is confirmed by the recent appearance of small firms that primarily sell apprenticeship services, operating as informal, low-cost training schools.

Younger entrepreneurs in Ibadan were better educated than their older counterparts; this was especially true in high-skill businesses, such as radio and television repair, engine repair, and furniture making, where 40 percent or more of the younger firm owners had at least some secondary education, and virtually all had completed primary school. These entrepreneurs were much more likely than older owners to use electric power (70 percent, compared with 13 percent). Most kept written accounts, and more than half (96 percent of those in radio repair) used calculators in their business.

Table 6-1. Sources of Skills for Owners of Firms in Selected Industries, Ibadan, Nigeria

	Furni- ture	Engine repair	Radio and TV repair	Tailor- ing	Meal prepa- ration	Soap making
Firms						
Average number of wage workers	2.6	0.7	0.3	0.3	2.4	1.1
Average number of apprentices	6.4	5.5	4.9	8.2	0.0	0.5
Owners						
Median age	32.0	35.0	32.0	33.0	37.0	43.0
Percent female	0.0	0.0	0.0	62.3	94.4	87.5
Prior wage employment (percent)	88.0	74.0	78.0	47.2	40.7	35.0
Owners' education (percent)						
Less than primary	2.0	4.0	0.0	1.9	22.2	55.0
Primary	46.0	48.0	26.0	47.2	22.2	17.5
Any secondary	46.0	42.0	70.0	43.4	48.2	17.5
Postsecondary	4.0	0.0	4.0	7.5	3.7	5.0
Owners' training (percent)						
Pre-service (Skill used)	20.0 (14.0)	24.0 (18.0)	54.0 (54.0)	13.1 (3.8)	33.3 (14.8)	10.0 (2.5)
Apprenticeship	96.0	98.0	80.0	88.7	14.8	90.0
In-service	4.0	4.0	30.0	15.1	64.8	2.5

Source: Birks and others (1992).

Among Nigerian entrepreneurs, the extent to which education and traditional apprenticeship either complement or substitute for each other depends on the nature of the skills required for success. In furniture making and engine repair, the relationship is complementary. In addition to high levels of manual skill, these trades require the ability to use conceptual knowledge to read and draw blueprints and diagrams. Ninety percent of entrepreneurs in these businesses have completed primary education, and more than 40 percent have some secondary education. Virtually all have completed traditional apprenticeship as well. Education and apprenticeship are also complementary in the tailoring trade. Preservice training is relatively unimportant, which is not surprising given the dominant role of apprenticeship in the trade.

There are indications, however, that formal education does substitute for apprenticeship in the most modern trade, radio and television repair, which, unlike engine repair, for example, requires knowledge of electronics. Entrepreneurs in radio and television repair are much more

likely than those in other trades to have some secondary education (70 percent versus 42 percent) and to use skills gained in preservice training (54 percent versus 24 percent).

Meal preparation and soap making are businesses owned primarily by women. Levels of education in these trades are substantially lower than in higher skill occupations. In soap making, the occupation requiring the least skill, apprenticeship clearly substitutes for formal education. Women can easily enter the business of meal preparation, using skills they often learn informally at home. Only 15 percent of the entrepreneurs in this trade served apprenticeships.

Apprenticeships were not the only way that firm owners in Ibadan acquired their skills. More than three-quarters of the owners of high-skill businesses had previous wage employment. Twenty percent of furniture makers, 24 percent of engine repairers, and 54 percent of radio and television repairmen had some form of preemployment vocational training, and most used the skills learned there. Only about 4 percent of those who owned furniture and engine repair businesses received in-service training in formal institutions. That figure was much higher (30 percent) for entrepreneurs in occupations dealing with more complex technologies, such as radio and television repair. Interestingly, in-service training was also high in women's hairdressing (30 percent)—not shown in the table—and in meal preparation (65 percent). These figures suggest that consumer preferences and product change can also provide incentives for skill acquisition during employment. Owners have to keep up with changing hairstyles and new menu items to compete effectively.

Less formalized forms of apprenticeship training are often found where formal apprenticeships do not exist (King 1977). In these informal arrangements interested learners arrange for a skilled artisan to teach them the essentials of a trade or other productive activity in exchange for work. Unlike many formal apprenticeships, such informal arrangements are usually not bound by a written contract, nor are they invested with any particular ceremonial or cultural significance, although in some cases the trainer may levy a training fee. Training in these informal arrangements tends to be briefer and even more improvised and less systematic than in traditional apprenticeships.

Empirical evidence indicates that apprenticeships can have a positive effect on employment and earnings and that they benefit poor and rural individuals in particular. An early economic evaluation of apprenticeship in northern Nigeria found private rates of return as high as 62 percent in some trades. The returns to graduates of government trade training centers, none of whom were found to be working in the informal sector, were higher. But the higher costs of the formal government programs led to social rates of return favoring apprenticeship—32 percent versus 24 percent (Mabawonku 1979). A study in the Côte d'Ivoire

found that a year of apprenticeship increased annual earnings by less than 2 percent in urban areas but added 17 percent to annual wages in rural areas (Grootaert 1988).

Government Support

Although governments have usually left traditional apprenticeships alone, high levels of unemployment and limited training resources are leading to increased interest in exploiting apprenticeships as a path to self-employment. The government of Nigeria is currently seeking to expand apprenticeships through fee subsidies and direct payments to masters to take on more apprentices. Theory classes are being provided. The experiment has encountered some problems in making payments and in delivering classes (Birks and others 1992), but it merits continued monitoring.

Constraints

Masters can teach only what they know, and seldom is any formal theory taught (although this may be changing as better-educated entrepreneurs enter the sector). Without any supplementary learning, skill transfer is simply a replication of the master's skill and knowledge. The absence of any formal instruction or more systematic ways of organizing training tends to favor acquisition of practical skills vital to production, sales, and management and limit theoretical understanding to a level just adequate for commercial survival. Traditional craftsmen, however, are often able to adapt quickly to new technologies, as illustrated by the informal sector tailor in Zaira (Nigeria) who "is likely to sew and embroider on a Spanish machine; use cloth produced by large multinational concerns ...; and sell his goods on a market, the characteristics of which are determined by a highly inflationary, oil-based, and internationalized economy" (Allen 1982: 129).

Rising levels of education suggest that theoretical knowledge of both masters and apprentices could be improved by giving them technical information, perhaps through development and sale of texts in basic trades. Theoretical knowledge might be further increased through correspondence courses or perhaps through evening and weekend classes in public training institutes. But these interventions should be modest, and care must be taken not to upset the master-apprentice relationship that is central to the effectiveness of the system.

Apprenticeships are also limited by the number of masters and the number of apprentices each master is willing to take on. And, of course, traditional apprenticeship does not exist in many countries.

Traditional apprenticeship enables some of the poor to improve their livelihood. For example, less than 20 percent of the parents of apprentices

in Côte d'Ivoire held wage employment. Less than 30 percent of urban and 20 percent of rural apprentices were women, however. The Nigeria study clearly shows gender stratification across lines of business: there were no female firm owners in furniture making, engine repair, or radio and television repair, but they dominated the soap-making, meal preparation, tailoring, and meat-selling businesses. No income data are reported in the study, but it is likely that the male-dominated businesses lead to higher incomes.

It can also be difficult for workers in informal enterprises to move into better paying wage employment in larger firms, in part because of social stratification in labor markets. A study in Coimbatore, India, showed that only 21 percent of casual and self-employed workers could name someone from an extended family that held a permanent wage job, suggesting the isolation of such workers from wage employment (Penouil and Lachaud 1986). In the Côte d'Ivoire study, some older individuals with apprenticeship training worked in modern public and private enterprises, but such work was much less likely for younger apprentices, indicating that as formal education becomes more widespread, apprenticeship training does not lead to modern sector wage employment in that economy.

Private Training Institutions

Governments assessing capacity for skills formation often overlook private training institutions. In a number of countries, however, schools and centers operated on a nonprofit basis by nongovernmental organizations (NGOs) and other volunteer associations or on a for-profit (proprietary) basis provide a large share of skill formation. Private schools enroll 46 percent of vocational students in Bangladesh, 38 percent in Colombia, 62 percent in Indonesia, 44 percent in Lesotho, and 43 percent in Thailand (at secondary and postsecondary levels) (World Bank sector studies; Middleton and others 1990). Governments regulate and subsidize these schools to varying extents.

The large majority of private vocational schools, colleges, and centers in developing countries offer courses in commercial and business occupations with comparatively low capital costs and relatively abundant supplies of instructors. Schools are quite flexible in their operation, providing courses at times convenient to students and typically offering shorter, more intensive courses that reduce the time that students are out of the labor market.

Conceptually, private training has much to recommend it. Freedom from civil service salary regulations and government curriculum control can make private institutions more flexible in responding to changing patterns of employment and skills demand. Prices should adjust to

Box 6-6. St. Joseph School for Industrial Trades

Established in Dhaka, Bangladesh, in 1954, the St. Joseph School for Industrial Trades is operated by a religious order. Each year it admits sixty boys who have completed eighth-grade into courses in machine shop, fitting and welding, electrical wiring, engine repair, and carpentry. Over three years, each boy receives 135 weeks of training. Trainees spend half of their time in courses and half in production work in school workshops. Students pay about 7,000 taka a year in training and board fees and can earn up to 1.50 taka an hour for overtime work in their second and third year. The school is self-supporting from fees and income from production.

Because of the quality of training and the placement efforts of the school, virtually all graduates are placed in the occupation for which they are trained. In contrast, the annual per-student cost in residential government vocational training institutes, which provide a total of ninety weeks of training, is 9,500 taka a year, placement rates are around 30 percent, and social rates of return to investment are close to zero.

Source: World Bank (1990b).

demand, and accountability to consumers should be enforced through market mechanisms.

Very few studies of the cost-effectiveness of private schooling exist. Analyses of household surveys in Peru indicate that although training in private academies was extensive, it had no effect on the earnings of men or women, while in-service training or postsecondary technical education improved earnings significantly (Arriagada 1989a, 1989b, 1990). Anecdotal and observational evidence suggests that the quality of private vocational schooling and training varies greatly. Much of it is undoubtedly low, but many private technical schools, both proprietary and church or NGO-operated, produce superior students in high demand by employers (Middleton and others 1990; Cuervo, 1985; World Bank 1990b). St. Joseph School for Industrial Trades in Bangladesh is an example (Box 6-6).

Government Support

Government support for private training has been restricted primarily to schools supervised by the public agencies, usually the ministry of education. Private schools in Thailand are required to follow the official curriculum and thus benefit indirectly from government investments in curriculum development, although the requirement reduces their flexibility in introducing new courses. Subsidized loan programs for equip-

ment and staff development improved private technical junior colleges in Korea, and the government of Mexico makes equipment grants to private institutions to expand capacity in needed skill areas.

Constraints

Lack of information on the extent and quality of private vocational schooling and training is a major constraint on public policy. For example, a recent survey of private vocational education and training in ten Asian countries concluded that, other than incomplete and outdated enrollment numbers, little information existed (Wilms 1990). Without information, consumers are unable to make wise choices. Governments often are unable to allocate the resources needed for effective supervision. The ability of the schools themselves to improve quality, to move into more expensive technical fields, or to expand is often limited by lack of access to capital and by tuition ceilings that restrict income and competitiveness.

Encouraging Private Training

With all of these constraints, the potential advantages of private schools do not come automatically. Quality is often suspect. Because private training institutions provide a source of needed skills, however, government should encourage these institutions while helping to overcome their weaknesses.

Private schools will flourish when labor markets are conducive to private spending on training and when the schools are free to operate in conditions of minimal regulation. These conditions facilitate flexibility to adapt quickly to changing labor market demands and stimulate competition. Yet profit-seeking behavior combined with a lack of regulation carries the danger of putting many fee-paying students at risk through dishonest practices, expensive advertising, and low-quality training. Thus, regulatory and enforcement policies must be sparing but fashioned to encourage schools to operate effectively while avoiding some of the excesses evident in many countries. Good consumer information, both on the quality and stability of the proprietary training institutions as well as on the relevance of courses to labor market needs, presents an opportunity for effective government intervention.

In general, regulators should not impose tuition ceilings because they too rigidly limit the ability of proprietary institutions to enter new markets, especially those with higher investment and recurrent costs. Private institutions should be eligible for the same incentives and subsidies and adhere to the same performance requirements as public institutions, ideally on a competitive basis. Where private provision is

extensive, governments may find it more efficient to subsidize expansion, particularly in strategic skill areas, rather than build or expand public institutions.

An additional priority is to improve the information base on private training of all types. Reverse tracer studies, which determine the education, training, experience, and earnings of currently employed workers in different occupations provide a good general overview of the alternative paths to skilled employment. Enterprise surveys can provide supplemental information on the type and amount of training provided. With properly drawn samples, periodic surveys of this type are feasible.

The upper tier of well-established private training schools can be encouraged and assisted to conduct their own periodic tracer studies of graduates. This is less feasible for smaller, for-profit training centers, but where governments require proprietary schools to register, periodic sample surveys can identify enrollment patterns across occupations.

Summary

Improving levels of general education will contribute substantially to the effectiveness of employer and private training and to project-related training; it has also been shown to complement traditional apprenticeship in the informal sector. Higher levels of general education improve a worker's chances of receiving both employer training and access to higher skill opportunities in the informal sector. In all sectors, higher levels of general education improve the trainability of workers and their flexibility in the face of changing employment opportunities. Improving levels of general education should have first priority in government policy.

On balance, there is reason to be optimistic about the capacity of both private and public employers to provide entry-level training and the training needed for work force adjustment. Where policies encourage employment growth and incentives to individuals and employers to invest in training, these capacities may be mobilized with modest government support in the form of better information on the benefits of training and the availability of training services. Where lack of information or weak incentive structures has limited training provision by private employers, more direct intervention may be required as a stimulus. Here the evidence suggests that reimbursement for costs of external training, combined with technical assistance to enterprises and support for external training providers, both public and private, may be needed to foster the development of an effective training market.

Mobilizing employer and private capacity for ongoing training tasks requires governments to implement a range of complex interventions, among them improved information systems, technical assistance to

public and private employers, administration of incentive schemes, and monitoring of private training providers. Organizing temporary programs, such as retraining workers in adjusting economies, project-related training, and “start-up” training, requires strong professional expertise and coordinating capacity. As argued in Chapter 4, strong national training authorities are likely to be needed if the efficiency benefits of employer and private training are to be realized.

Expanded employer and private training can meet much of the need for expanded training. Indeed, employers have inherent advantages in in-service training. But the continuing prevalence of small firms with limited training capacity indicates that the need for public training will continue in most countries. The issue is how to improve the efficiency of public training institutions and improve their quality.

Note

1. A gross enrollment ratio is the number of students enrolled in a particular level of schooling, as a percentage of all persons in the age group that should be enrolled in that level. When most students in the age group are enrolled and there are significant numbers of under-age and over-age students due to early enrollment and repetition of grades, the percentage can rise to more than 100.

7. *Improving Responsiveness and Efficiency in Public Training*

Mobilizing employer and private training resources can add substantially to the quantity and quality of skilled workers. But the presence of underdeveloped employer and private training capacity is likely to require that governments in most countries continue to provide skills training for workers in the modern sector. This is especially true where much of the modern sector wage employment is in small firms. In theory, there is no reason why the state should not provide training—as long as societal returns are competitive with alternative investments. Obtaining a good return on training investments, however, requires not only efficiency in the use of training resources, but also high levels of effectiveness in placing trained workers in jobs that use their skills.

Four decades of investment have established public training systems in nearly all developing countries, although with considerable variation in both effectiveness and efficiency. In most countries the first challenge is to improve the use of this existing capacity through policies and practices that capitalize on the strengths of each element of the training system. Where high job vacancy rates, rising wages, increasing job mobility, and direct information from employers indicate skill shortages in growing sectors of the economy, selective expansion of public training systems may also be required.

Better integration between economic and training policy and planning, diversification of training finance, and market-driven planning for skill supply can provide a stronger and more dynamic framework for public training. The capacity of public training institutions of all types to respond efficiently within this framework is uneven, however, and in many countries needs to be improved. The first step in this reform

process often involves a reassessment of the rationales under which various kinds of vocational institutions and programs were established.

This chapter examines policies and practices that, in practice, have improved flexibility and efficiency of public training for wage employment. The focus is on overcoming barriers to efficiency in preemployment training and in job training for unemployed youth and adults.

Constraints on Individual Training Modes

In addition to providing training in their role as employers, governments finance or provide training for two main purposes. One is to prepare young people for future employment in the course of their progression through the formal education and training system. The second is to provide employment training for unemployed youth and adults who are largely outside of the formal education system.

Schools, training centers, polytechnics, and employment training programs are similar in some respects but vary in the purposes for which they are established and the ways in which they are organized and administered. As a result the types of barriers on training effectiveness and efficiency vary across institutional modes, although some are common to most forms of training. These common constraints assume special importance as institutions of different types seek to improve their performance in a range of increasingly similar training tasks (Dougherty 1989).

Diversified Schools

In many developing countries secondary education has expanded more rapidly than wage employment and access to postsecondary education, leading to high rates of unemployment among educated youth, whose aspirations have made them reluctant to accept blue-collar employment. This has led policymakers to question the relevance of the curriculum of the academic secondary school for those graduates who do not enter the university. Because university and secondary school graduates are among the unemployed, many people believe that an academic education alone is insufficient preparation for employment. In addition, many people believe that academic education leads to a disdain for manual labor, thus exacerbating the difficulties of absorbing school leavers into the work force. Academic secondary education has thus been diversified in an attempt to equip students with “practical skills”—knowledge of how to make or do things—and to create positive attitudes toward blue-collar work.

The evidence shows that curriculum diversification has not achieved these noble objectives. There is no evidence of an employment advantage, and although there is some evidence of changed attitudes and

aspirations, graduates of diversified secondary schools continue to enroll in higher education in the same proportion as graduates of academic secondary schools. Diversification has not met its objectives for two main reasons: a faulty rationale, and the difficulties of effective implementation.

The initial rationale for diversification was based on the assumption that academic secondary education is inappropriate for employment, because the content is "more theoretical and less practical; experience drawn on is more universal and less local; and cognitive, or purely mental, skills are emphasized over attitudes and manual, social and leadership skills" (World Bank 1974). Practical courses, it was also assumed, would overcome these weaknesses, improve employability, and thus meet with the approval of parents and students. Finally, it was assumed that diversified courses could be delivered within academically oriented schools.

As discussed in Chapters 1 and 2, however, most entry-level jobs require little in the way of specialized skills. The prevocational skills provided in diversified curricula do not provide much of an employment advantage because employers still need to provide additional training. Larger modern sector employers care less about whether young school leavers have practical skills suitable for entry-level jobs and more about whether the students have the broad conceptual and communication skills that support continued learning. These latter skills, of course, can be developed at comparatively low cost in good quality academic secondary programs. Completion of a limited number of vocational courses does not enable students to move to the head of the unemployment queue (and even if they did, it would have little effect on overall unemployment levels). To the extent that vocational courses have substituted for more thorough preparation in broad, general skills, a diversified curriculum may even reduce a graduate's chances for employment. And if graduates of diversified schools are hired, the large number of graduates available on the market and the low levels of skills required for entry make it unlikely that employers would pay them the higher wages that would justify the higher costs of their education.

Because opportunities for wage employment are so limited in many countries, educators have begun to justify diversified curricula as preparing students for self-employment in the rural or urban informal sector. In the harsh economic climate facing them, some school leavers do accept informal sector employment, even if reluctantly; most of this work requires few specific skills. School leavers are unlikely to be capable of starting up small businesses, especially those in more technical lines of work where skill requirements are relatively high. Such start-ups require both capital and advanced skills, which are typically gained through previous wage employment or informal apprenticeship. More-

over, the few practical courses provided in diversified schools are not intended to develop high levels of occupational competency and are in any case usually oriented to the technologies and skill needs of formal sector employment, not the very different conditions and skill requirements of informal sector work. Finally, there has been an understandable tendency to put diversified curricula in elite secondary schools where the capacity to implement the program is stronger. Yet, the large majority of students in these schools qualify for higher education, and their aspirations (and family background) make acceptance of informal sector work unlikely. The effect of these factors is seen even in vocational schools with more skill-intensive curricula in countries such as Thailand and Indonesia, where students prefer to wait for wage employment rather than accept informal sector work (Middleton and others 1990; Clark 1983).

The difficulty of selling diversification to the principal actors affected by these education innovations is an added constraint. Students and their parents are concerned that time devoted to vocational courses might cut off opportunities for further academic education. A university education has traditionally provided access to the best employment possibilities. A secondary education that appears to limit opportunities for further academic study seems to many participants to be a poor economic choice. The lack of evidence that a practical course of study provides school leavers with any significant labor market advantage reinforces parents' and students' preference for academic education, especially where employment opportunities are limited.

Implementation of diversified courses places complex burdens on school administrators accustomed to the more routine management of traditional academic education. Workshops need to be built, supplied, and maintained. Special (and often expensive) teaching materials are needed, and teachers require additional training. The ability of school administrators to carry out these tasks varies substantially. Research in Sierra Leone, for example, suggests that the implementation of a diversified curriculum proceeded more smoothly in schools with a tradition of offering vocational subjects than in purely academic schools (Wright 1988). Diversified schools subject to government wage scales have had difficulty paying the salaries required to attract and retain qualified teachers.

Because of these and other problems, many diversified systems in developing countries have been of poor quality (Haddad 1987). And the poor quality has confirmed the suspicions of parents, students, teachers, and employers regarding the second-class nature of diversified education. In turn, the status not only of vocational courses, but also of skilled work has been reduced. These effects can be intensified when vocational and academic programs are offered in the same school (Box 7-1).

Box 7-1. Building Positive Attitudes toward Craftsmanship

A good craftsman or technician not only is adept at handling the tools of his or her trade, but also understands and is imbued with the values of precision and patience. For that reason experienced observers contend that vocational training is effective only when the values intrinsic to the training are taught together with the skills.

Academic teaching takes place in the strong traditional ethos of formal education. The importance of intellect, memory, erudition, and abstraction is taken for granted in the value content embedded in academic instruction. In a stratified society the prestige associated with academic pursuits establishes academic education as the ideal, in comparison to which all other forms of instruction seem inferior.

In education systems with vocational and academic tracks, vocational education is seen as second rate to the dominant culture of academic schooling. In particular, in comprehensive schools (those offering vocational and academic courses) the dominance of academic values over technical values is intensified. Being a vocational student is to be branded as inferior. Academically weaker students choose or are driven into the vocational streams. Not only does this reinforce the prejudice, but it also prevents the development of the values necessary for quality vocational education to take place. It is not possible to train good technicians in an atmosphere that denigrates the skills and attitudes they need to acquire.

It is also argued that the conflicting values associated with vocational and academic education warrant separate systems. The less tradition and respect for the trades, the greater the separation required. The most successful vocational programs tend to be operated as separate systems dedicated to vocational education or as specialized schools within the standard education system.

Successful vocational institutions must be organized to strengthen positive attitudes toward craftsmanship. Close contacts with labor markets, which offer value referents and role models, and programs that focus on specific skills and trades are two necessary components of programs that help vocational culture to flourish.

Source: de Moura Castro (1988).

The view that an academic secondary education is inappropriate preparation for work has not gone undisputed. Twenty-five years ago, research in West Africa documented the value of academic secondary education in enabling students to find employment, especially in public service (Foster 1965). As Heyneman (1987: 65) notes, "the single most common error in educational planning has been to assume that a curriculum in science, mathematics, history and language . . . is 'impractical'

for those who do not continue [to university].” A good grasp of subjects commonly considered academic may well provide the most appropriate preparation for employment.

Vocational Schools and Training Centers

In principle, secondary vocational schools have several advantages. Greater emphasis in the curriculum on occupational training can lead to a relatively high level of skill acquisition, enabling students to succeed at higher levels on graded skill examinations. Scale economies can be achieved if schools are sufficiently large and well utilized. The general education component of the curriculum can increase the flexibility and further trainability of graduates. New skills can enter the training process through curriculum reform and teacher training.

At the same time, the long length of programs, combined with the formal qualifications typically required by ministries of education, limits curriculum and enrollment flexibility, especially in centralized systems. Instructional innovation is difficult to achieve in institutions locked into semester scheduling and credit accumulation. Civil service salary scales make it difficult to hire qualified managers and instructors. The combination of general and practical curricula and the bureaucratic tendency to make vocational schools run on the same schedules as academic schools mean that workshop facilities and equipment are often not fully utilized.

Agricultural schools have an additional curriculum challenge because the conditions and patterns of cultivation vary significantly. Many agricultural techniques are specific to crops, climate, soil and water conditions, and market access. To be effective, agricultural curricula should be adjusted—often significantly—to address these differences.

Less tangible but nonetheless important factors limit the flexibility and quality of vocational schooling, especially in producing the skills that directly complement development strategies. These stem in large part from the placement of vocational schools within ministries that must give primary attention to general education, where efficiency is achieved through stability and curriculum reform is a comprehensive effort, undertaken infrequently. The perspective of planners is focused inward on the education system. The efficient development of strategic occupational skills, by contrast, requires frequent curriculum change. The perspective must be outward toward employers.

Vocational schools often encounter the same difficulties as diversified schools in establishing an environment that places a high value on precision and craftsmanship and thus on the occupations for which students prepare. Moreover, as the research demonstrates, many of the students in vocational schools do not want to be there, recognizing the lower status of the occupations for which they are preparing. This results

in lower motivation, less learning, and lower probabilities that students will enter the occupations for which they have been trained.

In a number of middle-income countries, vocational schools, especially those with a narrow technical focus, have been able to overcome these limitations, establishing good links with employers and acquiring the capacity to adjust curricula and enrollments as demand changes. Favorable employment outcomes increase student demand for the courses and improve motivation. These schools typically have a high degree of autonomy; often they are privately owned.

Shorter courses and freedom from the time-serving and certification requirements of formal education give training centers greater potential flexibility in curricula and enrollments than vocational schools typically have; these centers therefore can incorporate changing skill demands more rapidly than vocational schools can. These institutional characteristics have been well developed in the vocational training institutes of Latin America (Box 7-2). Centers can often accept individuals with varying levels of prior education, and they can more quickly change the occupations for which they train to meet employer demand. Flexibility in course design extends to scheduling, yielding advantages in participating in "dual" systems, developing innovative instructional systems, and using part-time instructors. Shorter courses lower the costs of training, most importantly the costs of forgone earnings, increasing efficiency. The potential for scale economies rests on institutional size and the extent to which scheduling is exploited to increase the intensity of facilities use. The terminal nature of most of these programs increases the chances that student interest in and motivation for skilled occupations will be higher.

Because of these inherent characteristics, many skills training centers are more responsive than vocational schools to the in-service training needs of enterprises. This capacity is enhanced when centers are able to pay salaries adequate enough to attract the highly qualified staff necessary to obtain and hold enterprise confidence. The centers operated by the national training agencies of Latin America have moved significantly in this direction. These centers were initially established to provide preemployment training of several years duration. Today the large majority of their trainees (70 percent, on average) are enrolled in short-term, in-service courses (World Bank 1991b). They have also shown the capacity to respond quickly to the retraining needs of industries or firms undergoing adjustment and to develop a wide range of productivity support activities.

Dual Training Systems

In principle, employers and training institutions that share responsibility for operating training systems achieve scale economies in training off-

Box 7-2. *The Latin American Model of Vocational Training*

In 1987 vocational training institutes in twelve Latin American countries enrolled more than 3 million people, equivalent to 37 percent of total secondary school enrollments in the same countries. The National Industrial Apprenticeship Service in Brazil enrolled nearly 1 million people alone. Founded in 1942, the Brazilian national training agency is the prototype of the "Latin American model" of vocational training that is marked by dynamic relationships with employers, high-quality training, and responsiveness to rapidly changing and competitive environments.

Independent of formal education systems, vocational training institutes are financed by levies on enterprise payrolls (see Chapter 4). They are governed by representatives of workers, employers, and the government. Autonomy has allowed them to respond flexibly to the needs of employers, the stability of payroll tax financing has nurtured autonomy and training quality, and tripartite governance has strengthened accountability. The training institutes specialize to serve specific sub-sectors of the economy and industries, such as textiles and petrochemicals, often with financial support from industry associations.

Workshops hold center place in the institutes, with classrooms appended. Modular learning units are continually updated through occupational analysis; theory is taught in both the workshop and the classroom. Emphasis is placed on discipline, precision, and adaptation. Instructors are qualified craftsmen and technicians with industrial experience; formal teaching qualifications take second place. Engineers manage the institutes.

Vocational training institutes have diversified their services to meet changing needs. In-service training to upgrade skills now accounts for two-thirds of enrollments. Training is delivered on the premises of employers, and the institutes help both large and small employers develop their training capacity. Management consulting and support for the introduction and adaptation of new technologies is provided under contract.

The payroll tax financing scheme, which led to strong employer participation, is changing as well. Modifications in legal arrangements enable employers to hold back portions of the levy to use to contract directly for services, improving accountability. In Chile a system of competitive contracting for training services to the public and private sectors replaced the levy-based subsidy. In Colombia payroll tax funding for vocational training institutes is expected to end soon, forcing them to compete for public funding.

Source: World Bank (1991b).

the-job and can capture the efficiency of apprenticeship where sufficient apprentice places are available. The flexibility of center-based training can be exploited to incorporate changing skill demands in the training system. Coordination to ensure that the employer and the training center are working toward the same goal requires strong management, however. And the capacity of enterprises to train must be established and supported. In cases where these problems of implementation have been overcome, the dual system has been flexible and cost-effective. Among the factors leading to success are mutual incentives to employers and training institutions to make the program work and strong government support.

Postsecondary Technical Education

Postsecondary technical institutions are typically managed by ministries of education or higher education. These institutions have the same inherent advantages and disadvantages with respect to flexibility, quality, and efficiency as secondary vocational schools do, although those managed by ministries of higher education often have more autonomy and flexibility and can often pay higher salaries than secondary vocational schools. Evaluations of postsecondary institutions indicate that these institutions typically have better links with employers than do secondary schools and have often achieved high levels of training quality (Middleton and Demsky 1989).

Postsecondary schools exist midway between secondary schools and universities, which often makes their status unclear; frequently, newly established postsecondary institutions have trouble securing a market niche with employers. Students and parents, sometimes supported by ambitious administrators and instructors, often pressure these schools to provide a more academic education (Lee 1983; Herschbach and others 1985). Although employers eventually learn to evaluate the skill levels of graduates, pressures for more academic status can reduce the technical content of courses and can also lead governments to expand capacity beyond employment opportunities.

These institutions are very often oriented toward the development of higher-level skills that are (or can be) economically strategic. This focus increases the need for development and updating of curricula and for in-service training for instructors. A number of countries have successfully established specialized centers to provide these services. In Indonesia, for example, the Polytechnic Education Development Center played a major role in preservice teacher training for an expanding system of polytechnics and in developing curriculum and materials. With staffing largely completed, the center is now turning its attention to in-service upgrading for faculty.

Employment Training

Helping unemployed youth and adults find jobs has been a persistent and difficult challenge in both industrial and developing countries. Skills development has figured prominently in most strategies. The rationale behind this training assumes that a significant share of unemployment results from a mismatch between the skills required in available jobs and the competencies of the unemployed. Thus, the success of training strategies depends heavily on both the existence of employment opportunities and the capacity of training programs to identify and develop the correct skills.

As discussed in Chapter 3, when labor supply greatly exceeds the number of available jobs, the value of preemployment vocational schooling and training is likely to be marginal. In addition, a large proportion of available wage jobs in many developing countries are unskilled, and another significant share requires completion of secondary or tertiary education. In Zimbabwe in 1985, for example, more than half of the modern sector labor force was unskilled, a quarter semiskilled, 13 percent skilled, and 6 percent professional. Vocational training programs that prepare youth for semiskilled employment aim at a small part of a larger target.

Policymakers who favor large-scale vocational training as a measure to address youth unemployment often point to the experience of OECD countries—particularly Sweden and Germany. Sweden enrolls just under half of its secondary students in vocational programs, Germany two-thirds, and both systems have been effective in enabling young people to enter employment. It is far from clear, however, that the external conditions that contribute substantially to the effectiveness of these systems are present in most developing countries. These conditions include a high degree of industrialization in dynamic economies, low rates of population growth, and high social values placed on vocational and technical competence, all of which combine with well-developed employer training and promotion policies to prevent vocational preparation from leading to dead-end careers.

A lack of jobs in the modern sector is often the principal constraint on employment training in developing countries. This limitation is intensified where information on employment opportunities is not widely available and where programs are centrally administered, making it difficult to link trained individuals with jobs.

Common Constraints

As is the case with many public services, isolation from market forces is the main threat to effectiveness and efficiency in public training. Public

training that responds to information and incentives by producing appropriately trained workers improves cost-effectiveness substantially. To the extent that public training does not rely on the market for financing resources, it must rely on effective surrogates to provide market signals and the capacity for efficient response. This in turn requires policymakers to address key constraints on quality and responsiveness, chief among them inadequate financing, weak information links with employers, fragmentation of training systems, and constraints at the level of individual institutions. Reviews of research and experience indicate that these constraints can be overcome for all modes of skills training except diversified schools (Dougherty 1989; Middleton and Demsky 1989).

The Effect of Inadequate Financing

In many countries, training capacity exceeds both employment demand and the capacity of governments to provide adequate financing. The result has been not only a substantial mismatch between overall supply of and demand for skilled labor, with consequent low levels of external efficiency, but also a heavy burden on the scarce public resources allocated to training. As a result, training systems and institutions have been underfinanced, which has had a severe effect on both flexibility and training quality.

WEAK TRAINING SYSTEMS. In such circumstances, countries have had trouble mobilizing the resources necessary to build efficient and sustainable training systems. After teachers are paid, little is left to improve system planning and management, to provide the professional services—curriculum development, teacher training and retraining, testing and certification—needed for effective adjustment to new skill demands or to respond effectively to new training challenges, such as developing enterprise training capacity and retraining workers displaced by economic adjustment. Vocational education and training institutions settle into routine provision of standardized programs of generally poor quality.

LOW TEACHER QUALIFICATIONS. The effects of underfinancing are particularly noticeable when it comes to teacher qualifications. Good vocational training requires instructors who have technical skills, industrial experience, and pedagogical skills. These requirements are considerably higher than those for teachers in general education, and they are costly to develop or attract. A review of World Bank-supported vocational education and training projects found that unqualified teachers adversely affected training quality in two-thirds of the countries studied

(Middleton and Demsky 1989). The inability to pay competitive salaries was a major factor in all cases. Similar findings emerged from another study, which noted that the problem is most acute when economies are expanding (Thompson 1988). Conversely, when alternative employment prospects are poor, and instructors are available at low wages, the need for training is also lower.

A common strategy to overcome low salaries is to train teachers in both technical and pedagogical skills. This raises the cost of teacher training, and, if done well, also qualifies teachers for higher-paying positions outside of education and training. The net effect for those countries that cannot afford competitive salaries is loss of qualified instructors when economies expand, use of unqualified or inexperienced teachers, or vacant posts. In Thailand vocational teachers are well qualified in terms of education but very few have industrial experience. As the manufacturing sector expands, private enterprises are bidding younger teachers away from the schools (Middleton and others 1990). In Pakistan 40 percent of the technical teaching posts are reported to be vacant (Thompson 1988). Many countries, moreover, have been unable to establish effective teacher training institutions and programs. Where it is difficult to attract and retain technical instructors, it is even more difficult to find and hold highly qualified teacher trainers.

Many smaller countries have found a temporary solution to the problems of teacher and teacher-trainer supply. Nine of the thirteen African systems studied in the review of World Bank-supported investments have relied on expatriates. Even when subsidized by bilateral donors, these instructors are very costly. Moreover, such a continuing dependency relationship limits the possibilities for developing a sustainable national training system.

CONSTRAINED RECURRENT COST BUDGETS. Weak financing of recurrent costs also leads to significant deterioration in the base of materials, equipment, and facilities needed for practical training. Civil service regulations in public vocational institutions make staff reductions extremely difficult. Under such conditions budget cuts fall most heavily on nonsalary operating costs, such as maintenance, spare parts, and consumable materials and supplies (World Bank 1987b; Herschbach 1985). At the extreme workshops might have non-functioning equipment and no supplies: training will be reduced to lectures and the practical skills component of the curriculum to a large extent will disappear. When the costs of secondary vocational education and training in the industrial trades approach those of general education, little effect on post-training employment can be expected. In Peru inadequate financing kept unit costs for general and vocational education virtually the same for nearly a decade. Eighty percent of vocational teachers were

unqualified, equipment maintenance and consumable supplies were largely nonexistent, and most teaching was by "chalk-and-talk" lectures. Not surprisingly, vocational and general graduates obtained the same types of jobs (Moock and Bellew 1988).

Weak Information Links with Employers

Improving the match between the size and occupational distribution of employment demand on the one hand and the volume and content of training on the other depends crucially on information links. When these links are strong and dynamic, preemployment training can be cost-effective. When they are weak or absent, institutional inertia, compounded by resource weaknesses, can lead to routine programs that are increasingly divorced from employment reality.

INSTITUTIONAL LINKS. Cooperation between public training institutions and employers has been difficult to establish in the public training systems of many developing countries. Two fundamental problems—lack of incentives and lack of capability—lie at the heart of the issue. These operate on both sides of the relationship. Training institutions are accountable to a government ministry, and then only for routine administration; effectiveness in placing trainees in jobs is rarely a criterion for obtaining either a larger budget or a promotion.

Furthermore, systems and institutions with few resources, little capacity to develop curricula, and rigid controls on curricula are unable to respond to information from employers, even when it is available, or to establish job placement services or dual training arrangements. Regulations often do not allow public training institutions to retain revenues from training contracts. Employers find little reason to invest time or resources in collaborating with training institutions that are unable to respond to their needs. This indifference increases when the quality of training is poor. And many firms, especially small ones, have neither the resources nor the appreciation of the value of training to participate effectively (Herschbach 1985).

TESTING AND CERTIFICATION. Effective testing and certification systems can lead to improved training quality by providing important information to training system managers and to employers on the skills achievement of trainees. Such information may also be used to assess the instructional effectiveness of individual training institutions. Employers benefit from credentials that reduce hiring costs by reducing the need for initial testing or trials on-the-job, and employees gain because they have more job mobility. The government of Korea, for example, used information from a national testing and certification system to exempt

students scoring above a standard criterion from military service, providing a strong incentive for enrollment in vocational courses. The information was also used to monitor the effectiveness of different modes of training. One useful finding was that the test scores for students in one-year labor training centers were equivalent to those of graduates of three-year vocational high school courses, even though the latter were better prepared for the cognitive aspects of the tests. Training center graduates studied on their own to overcome their lack of formal preparation (Kim 1987).

Certification systems open to all enable individuals to demonstrate competency regardless of how they acquired their skills. The standards set by testing give institutions a target against which to measure their quality improvements. Institutions can also use the testing standards to experiment with ways to reduce training time and costs while maintaining a constant level of quality.

Trades testing can have negative effects. Increased employee mobility can reduce the incentives of firms to train, because a skill certificate enables an employee to move to a new company more easily (Katz and Ziderman 1990). Individuals who cannot take the tests because they are not widely or frequently available may be put at an unfair disadvantage. And employers may be reluctant to see employees pass tests for trades that are linked by government wage policy to pay levels. Nevertheless, the mobility, accountability, and information offered by testing and certification are likely to outweigh these considerations, especially during the early and middle stages of the development of training systems, when these factors are of prime importance. In later stages, when institutions are well developed and their capacities well known by employers, trades testing becomes less important. Moreover, in such situations economic change is likely to require constant updating of standards and tests, a cost most countries cannot afford.

LABOR MARKET INFORMATION. As discussed in Chapter 5, systems to develop information on labor markets and to monitor training are necessary to adjust quickly to changes in skills demand. Often, however, such systems are not well developed at national levels and are even weaker at regional and local levels. Without such information, flexibility in adjusting to short-term changes in demand is severely limited.

Fragmented Training Systems

Training systems in most countries are highly fragmented. Not only are there many different vocational schools and training centers, operated by different authorities for different purposes, but frequently different

agencies manage training institutions that prepare individuals for the same occupations.

Much of this fragmentation results from historical accretion under successive waves of reform. It is relatively easy to create new institutions in response to changing needs, but it is much harder in many countries either to close or to modify inefficient ones, especially if management of the institution is divided among several different agencies (McGinn, Barra, and Harris 1985). Fragmentation has seriously impaired efficiency. The proliferation of many small training institutions reduces economies of scale, raising the costs of training significantly (Box 7-3).

Equally important, training policy and planning is diffuse and uncoordinated. No one agency speaks for training in the economic policy and planning process. Coordinating committees established for this purpose have very often failed to find common interests and consensus.

Box 7-3. *Fragmented Training in Three Countries*

In many developing countries, responsibility for public training is divided among several authorities, which often leads to duplication of effort and inefficiency. In Egypt, for example, formal technical education is administered by the Ministries of Education, Higher Education, and Industry and Mineral Resources. In addition, informal training is offered through the training organization of the Ministry of Development, Housing, and Land Reclamation. In at least two cases, two ministries are running separate programs that produce the same level of skilled workers who are employed in the same jobs for the same pay.

Fragmentation in Thailand has occurred as the vocational education and training system has changed to meet the country's evolving training needs. The 1970s opened with two public vocational education agencies in place and closed with four, all offering the same range of certificate and diploma level courses. In addition, private vocational schools offer similar programs that follow one of the two curricula offered by the public vocational schools, and the labor department operates skills training centers.

Bangladesh faces a somewhat different problem. Its formal vocational education and training system is coordinated centrally, but a multiplicity of small training centers spread across the country make economies of scale almost impossible to obtain. The problem is especially pronounced for informal vocational education and training programs, which seldom have more than twenty trainees in any one course, making use of instructors and equipment highly inefficient.

Sources: Egypt—World Bank data; Thailand—Middleton and others (1990); Bangladesh—World Bank (1990b).

Lack of coordination impedes strategic adjustment in the use of public training resources, to meet retraining needs caused by structural change, for example. Employers find it difficult to interact with the training system at national and regional levels.

Institutional Constraints

Inadequate financing, weak information links with employment, and fragmented systems all make it difficult for individual training institutions to be flexible and to achieve acceptable levels of quality. Unfortunately, there are additional limitations.

CURRICULUM RIGIDITY. The quality of vocational education and training depends a great deal on the ability of institutions to adjust the content of training to meet changing skill needs. Sustainable capacity for curriculum development and revision is a characteristic of flexible and high-quality training. It provides the mechanism through which new technologies and techniques can enter the training process. Indeed, this characteristic is often cited to justify formal preemployment training.

Many countries have been unable to establish this capacity at national levels, and more have been unable to do so at the level of the school or training center. This problem is particularly acute in small countries, where the size of the system makes the overhead costs of such capacity very high in relation to operational costs. Where central curriculum development capacity does exist, the resources for ongoing occupational analysis, curriculum research, and materials development are often lacking. The curricula of schools and centers become obsolete, basic learning materials become unavailable, and staff lack the capacity to effect improvements locally. In many centralized systems, curriculum change at the institutional level requires central approval, which can take months or even years to obtain, further discouraging adjustment. These rigidities also restrict institutions from attempting more innovative and flexible approaches to vocational instruction.

WEAK MANAGEMENT. Managing an effective training institution is challenging. Expensive and complex facilities and equipment must be maintained. Instruction is delivered in classrooms, workshops, laboratories, and, under dual training arrangements, in the facilities of employers. Institutional links with employers must be established and maintained. Job placement and follow-up of graduates is needed. Curricula and materials must be constantly adjusted and upgraded, and the most effective institutions are likely to use flexible and innovative instructional systems that require a high level of planning and managerial attention.

Attracting and training effective managers is not easy for weakly financed training systems in countries where management skills are at a premium. Management training is rarely provided, and then it only occasionally reaches to the level of department chairpersons and instructors (Herschbach 1985; Auerhan and others 1985).

LACK OF AUTONOMY. The inability to attract good managers and qualified staff has combined with traditions of centralization in many countries to restrict the autonomy of individual institutions. This is manifest in centralized curriculum decisions, regulations that discourage entrepreneurship in revenue generation, and adherence to civil service rules and salary scales in teacher recruitment and compensation. Even where administrators and instructors want to be more flexible and to improve quality, these traditions and regulations greatly restrict their ability to do so.

Improving Responsiveness and Efficiency

A central tenet of this book is that a stronger policy framework can substantially improve the cost-effectiveness of public training. The main elements of this framework are expanded and improved general education, better integration of economic and training policy and planning, market-driven planning to guide skills supply, and the establishment of national training authorities to implement policy. Yet these measures alone are not sufficient. Economic uncertainty and the need to use scarce public training resources efficiently call for training systems that are capable of overcoming the constraints on training institutions.

The evidence from developing countries suggests that these constraints can be overcome for all institutions that have skills development as a central purpose. Diversified schools, which provide only limited amounts of skill training, are a different matter. For these schools the fundamental problems with the assumptions underlying the design of such institutions and curricula make employment outcomes problematic, even if institutional constraints are overcome.

The key policy options are separating academic education and vocational training, improving basic and secondary education, strengthening vocational schooling and training, and linking employment training to jobs.

Separating Education from Training

Education and training place different demands on systems, institutions, instructors, and administrators. Both are essential to productivity, yet they are difficult to administer effectively within the same institutional framework. Clear separation of education and training provides advan-

tages to both, enabling educators to concentrate on their essential mission and trainers to develop the specialized technical and managerial capacity needed to link training more closely to the economy.

One way to separate training and education is to concentrate skills training in public institutions that are not managed by the education ministry. This approach is most clearly needed in training for self-employment because of the high level of specialized institutional knowledge often needed to help trainees establish small businesses in varying circumstances. Specialized technical schools oriented to wage employment can be run within the ministry of education, if bureaucratic procedures can be modified to give the program the flexibility needed. Another way to achieve separation within education ministries is to concentrate vocational training at the end of the secondary school cycle. That would enable students to choose among occupations a year or less before they seek employment, when they are more mature and when the current state of the labor market can inform their choice. In general, enabling students to choose a vocational course after completing the highest level of general education possible improves educational equity and student motivation alike.

Improving Basic and Secondary Education

Strengthening general education at primary and secondary levels is the first priority for public policies to improve the productivity and flexibility of the work force. In addition to generating broad benefits to society, general education directly increases worker mobility and productivity and increases the access of the poor and socially disadvantaged groups to training and wage employment. The importance of basic education as the foundation for further education and training has long been recognized and recently emphasized (WCEFA 1990; Lockheed and Verspoor 1991). Training in specific skills is more effective when trainees have strong literacy, numeracy, and problem-solving skills.

Primary and lower secondary education provide the foundation of basic skills for many traditional crafts and trades. Especially in modern sector manufacturing and services, where the conceptual content of jobs is already high and increasing, the skills gained through quality academic secondary education are important not only to immediate productivity, but also to the ability to learn new skills over the course of a career. Secondary education also improves the productivity of the self-employed.

Although diversified secondary education has not been a viable means of improving the employability of young people, the question of what will improve their employability remains open. Because international economic trends and new technologies have made it extremely

difficult to predict the kinds of expertise that will be needed in the medium and long term, an academic secondary education may be the best preparation. It most certainly requires the least amount of innovation and experimentation. Academic secondary education as currently configured contributes substantially to individual productivity and trainability by developing student capacity to learn, to use mathematical concepts to solve problems, and to communicate verbally and in writing. Scientific knowledge is fundamental to understanding both the natural environment and the artificial world of technology. Improving the quality of secondary education—especially in science, mathematics, and languages—is an enormous challenge to most developing countries, and meeting that challenge would be a significant contribution to economic and social development.

Improving student knowledge of modern technologies, production processes, and the place of technology in society is an important educational objective. Technology education—mathematics and science curricula that stress the application of knowledge to local problems and conditions—offers a comparatively low-cost educational approach to this objective, one that fits easily into the academic curriculum and may be a priority in many countries (Box 7-4). With careful curriculum design and effective teacher training, technology education may also provide a strong applied context for student learning of basic conceptual skills. Experimentation in developing countries may be warranted. But the approach should be cautious, incorporating effective methods to measure educational achievement and taking costs fully into account.

Many educators in developing countries view practical courses in secondary schools as the most viable way to introduce students to the tools, machinery, and materials of the modern sector. It is argued that, unlike students in more developed countries, students, particularly those in rural areas, do not encounter these materials in the normal course of events and that the school is the most effective place for their introduction. The argument makes considerable sense from an educational point of view: a society may indeed decide that this sort of familiarization is an important pedagogical objective. Courses geared to such objectives are not the same as those seeking to develop employable skills, however, and care should be taken not to make promises to parents or students regarding the immediate economic value of such courses. In addition, treating these purposes as educational objectives, not as training in job skills, releases schools from the need for expensive facilities and equipment and highly skilled instructors. In short, an educational approach to technology can be much less expensive than a vocational approach, although the direct costs and opportunity cost of student time should be kept in mind in deciding to implement such courses.

Box 7-4. *Technology Education: Fad or Future?*

To many educators, neither traditional academic secondary education nor the practical and manual skills of vocational courses adequately prepare youth for increasingly technological societies. Traditional science is considered too theoretical and abstract. Practical occupational skills are too narrow and lack the conceptual content needed for continuing learning.

These inadequacies have led to experimentation with a range of alternative curricula, loosely known as "technology education." These run roughly along a continuum with traditional science education at one end and traditional craft courses at the other. Closest to traditional science are courses that seek to strengthen the technology content of science courses, principally by increasing the amount of application examples and objectives that help students to understand the way science affects everyday life. Included in this category are courses on the impact of technology on society, including the political and economic choices posed by technological change. Somewhat further along the continuum are courses that use scientific principles to teach students how technology works. For example, principles of the physics of electricity, mechanics, pneumatics, and hydraulics are taught as part of a unit on power supply in society.

Closer to traditional shop courses is "craft, design, and technology," which draws on all three traditions in seeking to develop student ability to define technological problems and to design and make products that help solve the problem. In their broadest form, the problems and products are not confined to traditional subject matter, but include design of systems for controlling inventory, quality, and the like. The emphasis is on learning an integrated process, with scientific principles in a supporting role. Moreover, in place of the routine crafts of traditional courses, students create individual products. For example, student response to the problem of constructing low-cost seating would be as varied as design creativity and available materials allow.

These newly emerging educational concepts have several elements in common. First, they seek to strengthen student understanding of how science and technology function in society. To varying degrees, they encourage students to be creative and flexible in finding solutions to problems. From a practical point of view, they all require new curricula and extensive teacher training, and these needs increase as courses move further away from traditional science.

Will these courses make a difference? It is simply too soon for any serious evaluations to have been conducted and thus too early to know. However, much of the rationale is logically appealing, and despite the risk that the courses may prove to be more of a fad than a permanent improvement in secondary education, experimentation is clearly warranted.

Sources: British Council and the World Bank (1989); Walberg (1989).

In sum, policymakers have four options regarding diversified schools and practical courses. The best option is to phase out, or at least contain, the expansion of prevocational courses, using the resources thus freed up to improve the quality of or access to general and academic secondary education. Second, additional resources can be allocated to improve implementation of practical courses. Fundamental weaknesses in the assumptions of institutional and curriculum design, however, make it unlikely that diversification will improve employment outcomes sufficiently to justify the cost. Third, through curriculum reform and teacher training, technology education can replace practical courses. Fourth, the curriculum intensity of occupational preparation can be increased, moving diversified schools toward a vocational training model. In this option, of course, policies and practices that have improved the cost-effectiveness of vocational training should be followed.

Strengthening Vocational Schooling and Training

Vocational and technical schools and vocational training centers can all be cost-effective if constraints on responsiveness to changing skill needs, on the quality of training outcomes, and on efficient use of resources can be overcome.

Responsiveness to skill markets can be improved by establishing or strengthening national training authorities (as discussed in Chapter 4), managing by incentives, improving links between training and employment, creating specialized institutions to meet the needs of different skill markets, and increasing institutional autonomy and accountability.

STRENGTHENING NATIONAL TRAINING AUTHORITIES. To respond to the needs of the economy, public training systems demand a degree of freedom from short-term bureaucratic control that is difficult to achieve in line ministries. National training authorities (NTAs) can be effective in this respect. In addition to managing training institutions, NTAs can play key roles in planning, providing professional services, organizing temporary training systems in response to emerging needs, and developing private training capacity.

A competent NTA policy and planning unit can represent the training system in economic policy development and planning. Ideally with participation from workers and employers, this unit should develop strategic plans for training programs that complement key economic strategies and translate these general directions into annual plans and budgets. The planning unit should also be responsible for the labor market analyses and training program evaluations needed to adjust training to economic needs. Development and maintenance of a

database on private and public training provision is essential to estimate supply capacity.

Centralization of key professional support and quality control functions in a national training authority offers scale economies that are especially important during the initial development of a training system, when professional capacity in individual institutions is low. Functions that can be centralized effectively include research and evaluation, experimentation with instructional innovations, development of curriculum and materials, training of instructors and support staff, testing and certification, and dissemination of professional and technical information to training institutions.

Temporary training systems frequently must be developed to meet particular, periodic needs such as economic adjustment programs and special projects. NTAs should develop the capacity to design and finance such training, using existing training facilities and expertise. Funneling project-related training resources through NTAs to the extent possible will further strengthen national training capacity.

A key task for NTAs is to develop training capacity in private enterprises and in the private training sector. Training subsidies are likely to be more effective when they are accompanied by technical assistance to firms from professional trainers with experience in various industries and in firms of different sizes. NTAs are also well placed to supervise quality in private training.

MANAGING BY INCENTIVES. To adjust to changing training needs requires flexible use of resources for curriculum adjustment, staff development, new equipment, and on occasion renovated or new facilities. Organizing temporary training interventions, such as employment training to facilitate economic change, requires similar support. Experiments with new training approaches, such as by NGOs for the rural sector, may also need government subsidies. Training funds managed by NTAs have proven useful in this regard in such countries as Singapore, Côte d'Ivoire, Chile, Mexico, and Malawi. Training funds typically provide grants or subsidized loans to institutions in response to specific proposals. Funding should be available to both public and private training providers. Accountability can be enforced through contracts and supervision. Broadly representative oversight of the fund (public and private sector, workers, NGOs) can help avoid special interests in fund administration.

IMPROVING LINKS WITH EMPLOYERS. Close cooperation between employers and training institutions is critically important to developing the information needed for training of all kinds. Cooperation can take many forms, but all of them depend on strong commitment from the

government to a real and substantial role for private employers. This commitment is embodied in the statutes governing the training system, but it is implemented through allocation of resources to the process of cooperation. At a minimum this means building the capability of individual training institutions to undertake cooperative efforts.

Vocational guidance and placement services in schools, colleges, and training centers are a first element in building links with employers. These need not be elaborate to be effective. Aptitude testing as practiced in some developing countries, for example, is much less important than training managers and staff regularly in methods for working with employers to find out what jobs are available, and obtaining feedback on the performance of graduates. The headmaster of a technical college in Mauritius, for example, has had considerable success in placing students in jobs by posting job opportunities he has learned about in visits to local employers on a bulletin board near the entrance to his school. Job fairs, which bring students and prospective employers together, have been effective in many countries. In countries with underdeveloped employment services, there is every reason for schools and centers to take on this responsibility—even though in some countries, such as Thailand, bureaucratic regulations have made it difficult for schools to do so.

Involving employers in the design of curricula is especially important in industries subject to rapid technological change. Advisory and curriculum committees have had mixed success but perform best when training institutions are able to make the adjustments employers want. Such committees may also work best where dual training systems exist because employers and training institutions must jointly design and implement training programs. Enterprise associations can strengthen links between small firms and training institutions. Research in the United States has found that at the junior college level, instructors develop the best links with employers on matters of curriculum and job placement (DePietro and others 1989). Skilled workers who teach part-time can provide another link.

Experience in World Bank projects suggests that links are more effective when several mechanisms are used together (Middleton and Demsky 1989). For example, placement services linked to advisory committees and instructor visits to enterprises have been more effective than any one of those approaches on its own. Creative school managers, given sufficient autonomy, can be adept at setting up a network of supportive relationships with employers (Box 7-5).

MEETING THE NEEDS OF DIFFERENT SKILLS MARKETS. Responsiveness improves when training institutions develop specialized expertise for, and institutional linkages with, different skill markets. Institutions have

Box 7-5. Building Links with Employers in China

China has an extensive and complex system of technical and vocational schools, financed and operated by technical ministries, public enterprises, and municipal governments. In the Chinese system of command planning, graduates of most types of schools are assigned to nearby state enterprises, where they are paid on a fixed national wage scale. This system assures graduates of employment, but the absence of wage signals leads to considerable rigidity and, in many cases, the supply of skills does not match demand.

In the early 1980s the government began to expand vocational schooling. A new category of secondary vocational school was created by converting a large number of general high schools to vocational curricula. The new schools, however, do not participate in the labor assignment process, and graduates must find their own jobs. At the same time, headmasters of these schools have more flexibility in matters of curriculum and school management than do administrators of other types of schools.

In the industrial provinces of Anshan and Hubei, headmasters have responded with energy and creativity to the need to help their graduates find jobs. Links with local employers have been central to their strategies. Courses are tailored to the skill needs of employers; those needs are identified through surveys and periodic meetings between school and factory personnel. The school and the enterprise jointly develop curricula, enterprise staff teach on a part-time basis, and companies often provide training equipment for use in the school. Many schools appoint a leading industrialist as an "honorary principal," who visits the school regularly to meet with students and staff, and who serves as an ambassador to the industrial community. Annual job fairs, where students display their best workshop products, provide an opportunity for students and employers to meet. Schools that have established these kinds of links with local employers regularly place more than 90 percent of their students in the first year after graduation.

Source: Noah and Middleton (1988).

a natural advantage in serving local industries. Specializing in clusters of related occupations, however, or in sectors of the economy, is also possible, depending on the size of markets and the capacity of individual training institutions. Both approaches have been followed in Korea. Enterprises have been encouraged to manage vocational schools to meet local needs. As the economy has changed, clusters of technical schools in high demand have been identified for curriculum reform and specialization in such areas as precision machining, chemical industries, and information sciences.

The sectoral training organizations in many Latin American countries provide another example of specialization to particular skill markets. Typically financed and managed by enterprise associations, these centers provide preservice and in-service training for such industrial sectors as textiles, petroleum, chemicals, and construction (World Bank 1991b). Similar training operations are being planned in Malaysia.

Specialization is a viable option when modern sector employment is large enough to create sufficient specialized demand. In smaller economies training institutions must serve several markets to generate the business needed to achieve reasonable scale economies in their operations.

Specialization in strategic skills is an important role for selected post-secondary technical institutions. By definition, both the technology and training expertise for these skills are found primarily in industry. Dual training systems, which rely on schools and colleges to provide basic technical education courses and on enterprises to provide specific training, are an efficient way not only to overcome shortages of instructors, but also to share operating costs and expertise in curriculum development. This approach is well developed in Singapore, where the government has established polytechnics in new technology areas such as electronics through cooperation with industry and certain industrial countries (Eng Fong and Salome 1986).

Another option for vocational schools is to train skilled workers in core occupations—such as secretary, bookkeeper, motor mechanic, and maintenance electrician—that are in demand throughout the economy. To be cost-effective, however, the training system must be able to hire qualified instructors, to monitor training outcomes, and adjust enrollments and courses as demand changes.

INCREASING AUTONOMY AND ACCOUNTABILITY. Regardless of the sector of employment or the type of institution, training institutions need to become more effective. They can do that only if they are given a greater degree of autonomy, if their professional staff is specialized, and if there is investment in the management and professional capacity of staff. Accountability for results and use of resources can be improved by monitoring and inspection systems and by building incentives for job placement and other indicators of outcomes into budget allocations. Local employer councils can provide important feedback on institutional performance. Consistently poor performance caused by imbalance in skill supply and demand is a signal for a review and modification of curricula.

Experience in a wide range of countries, such as Brazil, Colombia, Jordan, and Malawi, shows that public training centers outside of the education system have been more flexible and efficient than schools. Not

tied to rigid certification requirements, they have more freedom to develop courses of varying length, minimize training time, offer evening courses, provide training services to enterprises, and use part-time instructors. Because of these advantages, training centers are the better venue for expanding public training of skilled workers, providing productivity support to small and medium enterprises, and responding quickly to needs for retraining and training to complement new investment.

PROVIDING ADEQUATE SALARIES AND TEACHING MATERIALS. To be responsive to skill markets, training institutions must produce a good product. Developing vocational and technical skills costs much more than general education, but inadequate budgets lead to inadequate outcomes. If skills are not developed, however, productivity will not increase, and the benefits to society and individuals will not materialize. Meeting the recurrent costs of paying well-qualified managers and instructors, supporting functional workshops, and providing up-to-date teaching materials are the *sine qua non* of quality.

Professional instructors with good technical and pedagogical skills are central to quality. Most countries have had difficulty paying salaries high enough to attract and retain such instructors, especially those with occupational skills in high demand in the private sector (which also happen to be the skills where the need for training is the greatest). In Egypt salaries are so low that teachers in vocational schools must hold two or more jobs, often at schools that are distant from each other. Inadequate pay not only reduces the quality of teaching, but shows students how little society values the trade they are learning.

Rigid civil service salary regulations and constrained budgets erect significant barriers against better teaching. If the government cannot afford to pay market rates across the board, it should at least let wages rise for instructors in those occupations that are in greatest demand, allowing for market scarcity in differentiated salary systems. Some success has been achieved by offering improved benefits such as housing or exemption from military service. A further option is to use part-time instructors drawn from enterprises.

In all cases, continuing in-service training and upgrading, together with periodic opportunities for work in enterprises, is required to maintain the technical knowledge of teachers. Especially important for strategic occupations and higher technical skills, in-service training should be a major function of selected teacher training institutions, with support and guidance from national training authorities and employers.

Textbooks, practice materials for workshops, and other instructional materials are essential to good training, as is effective maintenance of facilities and equipment. These factors contribute substantially to the high recurrent costs typical of good quality vocational programs.

Materials development for vocational training can be expensive because of the need for frequent revision and expansion in rapidly changing occupations. Materials for occupations in the modern sector can be adapted from models used in industrial countries. In new and rapidly changing occupations, close cooperation with employers is needed to adapt existing materials. Training materials for self-employment generally must be developed to incorporate skills that are specific to local products and technologies and that include business management skills that fit the local regulatory and market environment.

Developing countries have shown considerable interest in the potential of various educational technologies to overcome the lack of skilled instructors and to reduce unit costs. Videotapes that demonstrate complex manipulation skills are increasingly used as hardware costs fall and local software production becomes more feasible. More advanced technologies, such as computer-aided instruction, are much less feasible, however (Box 7-6). Nevertheless, in countries or sectors of economies

Box 7-6. *Scale Economies in Training Technology*

An effective way to teach complex skills is to link computers with carefully programmed audio and visual materials. Students work alone at a learning station, listening, observing, and responding to questions and problems; the technology evaluates and corrects the response. A single work station can cost US\$10,000, however, and a custom-developed program US\$200,000. Analysis in industrial countries shows that the cost-effectiveness of enterprise training can be improved if these technologies are highly utilized and substitute for costly instructors. For example, using Canadian salaries, a forty-hour, instructor-taught class for thirty students would cost \$117 per student. If half of the instruction were to be delivered with low-cost videotape courses, instructor costs would be reduced by half, and unit costs would approach conventional levels at 120 students. With higher-cost, customized, interactive video-disc courses, and assuming that hardware were available four times as long each day, costs would approach conventional instruction with an enrollment of 360 students. Further increasing utilization by assuming a 50 percent reduction in student time reduces the break-even point to 210 students. Achieving these utilization rates in institution-based preemployment training depends on the establishment of individualized training systems that enable students to study at their own pace. Equipment would have to be available up to eighteen hours a day to increase student utilization rates.

Source: Stahmer and others (1991).

where computer technology is widely used and expertise in software development available, experimentation is clearly warranted. Experience in Brazil, for example, shows that effective computer-based training systems can be developed, although information on cost-effectiveness is lacking (Romiszowski 1987).

Ensuring adequate funding for equipment maintenance is yet another essential element of training quality. In many countries, instructors and students are expected to do most maintenance work, as well as minor repairs. Where inexperienced instructors are the norm, maintenance suffers. Mobile maintenance services have been established in Korea and some other countries. Dual training arrangements, in which much of the equipment is owned and maintained by employers, offers another option.

IMPROVING INSTRUCTIONAL EFFICIENCY. Improving the responsiveness and quality of training in currently underfinanced systems will be costly. One way to cope is to consolidate training into fewer, better quality institutions. Consolidation can be achieved by converting vocational schools to lower-cost general curricula schools, or turning schools over to organizations—such as enterprises, enterprise associations, and nongovernmental organizations—that have the information and financial resources necessary to run them effectively. Consolidation is particularly attractive where the supply of skilled workers from poorly financed and inflexible institutions greatly exceeds effective employment demand or where training institutions are too small to achieve scale economies.

Costs can also be trimmed by reducing the duration of instruction and by utilizing facilities and equipment more fully. Shorter, more intensive training periods are worthy of consideration because they not only reduce the opportunity costs to trainees of being in training instead of at work, but also enable training institutions to achieve a higher rate of use of equipment, facilities, and expensive instructors. The same number of course hours provided on a part-time basis over three years in a vocational school can be delivered intensively in one year or less after school is completed. In some trades, training time can be reduced through occupational analysis that distinguishes the skills needed for entry into a given occupation from those best learned on the job. Restricting formal preemployment training to essential skills can reduce training time considerably (Herschbach 1989).

Modular curricula, which break programs into self-contained skill development units, are fundamental to individualized instruction, which permits enrollment and labor market entry at any time during the school year (Box 7-7). Dual training programs offer further efficiency gains. The expertise and current production technology that employers

Box 7-7. Individualized Instruction in the Euvaldo Lodi School

The Euvaldo Lodi School in Rio de Janeiro is one in a network of training centers operated by Brazil's national training agency SENAI. Training is based on periodic analysis of market demand for skills and of different occupations in surrounding industries. Learning materials are organized into modules of worksheets and activities that combine theory and practice for a defined series of tasks. Student skills are evaluated after each module is completed. The final stage of learning includes a period of supervised training within enterprises.

Beginning in 1965 the Euvaldo Lodi School sought to address three problems by individualizing this methodology. First, the school wanted to provide appropriate training to students who entered the school with different skill levels and aptitudes. Secondly, it wanted a highly flexible curriculum structure that could keep pace with rapidly changing labor markets. Third, it wanted to reduce dropout rates and the consequent cost of unused capacity.

All three of these objectives were achieved by reducing the interdependence between modules. Students can enroll at any time during the year and are tested for placement in the series of modules. They then complete modules at their own pace and are tested for competency on completion. No lectures are provided; instructors offer only guidance and testing.

These changes have reduced the time required to complete training by as much as 75 percent in some cases, significantly increasing utilization rates. The system provides strong instructional support for slower students. The school operates year-round, with no long holidays, matching the rhythm of the factory. Students who complete training can enter the labor market throughout the year, and the school's intake and output can be controlled in response to information on student placement and employment opportunities.

Source: Oliveira and de Moura Castro (1988).

bring to such programs offers considerable potential for reducing the training institution's staff and equipment costs.

Linking Employment Training to Jobs

When unemployment is high, training programs for young people who have left school are generally more effective if they are part of job creation policies and programs. As discussed in Chapter 3, incentive strategies include promoting labor-intensive industries, reducing the cost of labor relative to capital, and instituting labor market policy reforms to increase employer flexibility and lower the cost to employers of job creation.

Training can play an important role in these strategies, but only if it is flexible, efficient, and linked to job opportunities.

The industrial countries increasingly are decentralizing their employment training programs to permit training to be linked with local employment opportunities. Market forces are being introduced by channeling central government grants to joint private-public councils at local levels for purchase of training services from a variety of sources, both public and private (Cardell 1986; Parkes 1989; Job Training Partnership Act: 101-03).

The United Kingdom, for example, has created Training and Enterprise Councils that are governed largely by employers, with representatives from local education, training, and government organizations. These councils use government funds for training programs for youths and unemployed adults and to support small business programs. The Skills Training Agency, formerly a government agency, has been sold to private investors who will in turn market training services to the councils and other training users. The Training and Enterprise Councils are loosely modeled after the state Job Training Coordinating Councils and local Private Industry Councils established for the same purposes under the Job Partnership and Training Act in the United States a few years earlier.

In Sweden the training services of the national employment service have been taken off the public budget. Public employment offices are free to purchase needed training services from any source, creating a market in which the former training service must now compete.

Trainees in these programs receive stipends during the training period and benefit from well-developed information on job opportunities, job counseling, and placement services. These important features, of course, raise the cost per participant substantially.

These policies move the task of identifying clients and employment opportunities—and consequent training needs—to local levels where information is most readily available. National policy is implemented through the structure of grant allocations and through accountability measures. In the United States, for example, block grants are allocated for three general purposes: training for adult and youth unemployed, retraining for adult workers dislocated by economic change, and training for the socially and economically disadvantaged. Mechanisms for adjusting the resources for retraining dislocated adult workers to the level of unemployment are built into the grant program. States are required to match federal grants as long as the unemployment level is equal to or less than the national average. But the amount of matching funds required declines by 10 percent for each percentage point that the state jobless rate exceeds the national level.

The Job Training and Partnership Act leaves decisions on the type of training and means of delivery to the states and local councils. Continued

funding, however, is dependent on meeting federally mandated standards. Youth must achieve skill competency levels, enroll in further training, complete formal school or equivalency programs, or enter military service. Standards for adults include job placement, retention in jobs threatened by dislocation, increased earnings, and decreased welfare payments.

Although the approaches in the United States, the United Kingdom, and Sweden are too new to have been extensively evaluated, they have been designed to overcome rigidities that led to unsatisfactory results in earlier programs. (Preliminary evaluations do indicate a positive effect on salaries for participants in the U.S. program.)

Complex, decentralized programs of this nature can be expensive, and they require substantial professional and administrative capacity. They are thus infrequently found in developing countries. There are, however, notable exceptions. Mexico has instituted a program of employment services and skill training for poor semiskilled and unskilled workers displaced by economic adjustment. Cost-of-living stipends are provided during the training period. In Chile the National Training and Employment Service provides training grants and fellowships to finance training for unemployed youth and adults at more than 400 public and private training institutions. Both trainees and occupational areas are identified at the local level. In 1987 more than 9,000 unemployed workers were retrained through this decentralized mechanism.

National programs are not the only approach to training for the unemployed. Smaller efforts targeted on selected clients, industries, or enterprises can have beneficial results in retraining for workers dislocated by economic change (Box 7-8). Key to any of these approaches is the existence of a flexible training capacity that can respond quickly to short-term needs and be dismantled when training needs are met.

Summary

The complexity of the agenda for improving the contributions of public training to productivity and economic growth suggests again the advantages of separating training from general public education. The need for responsiveness, quality, and efficiency in serving varied and changing skill markets creates organizational, professional, and managerial requirements far different from those created by primary and secondary education. Ministries of education can meet these requirements but only at the cost of creating training authorities within the ministry that have greater autonomy and more resources than other parts of the organization do. It is extremely difficult for education bureaucracies to handle the resultant tensions. Moreover, as discussed in Chapter 4, stable financing is required to develop the

Box 7-8. Job Training for Economic Change

Governments can use job training to promote or cope with economic change: three examples follow.

As part of a strategy to develop the metals manufacturing industry, the government of Singapore established a board in the 1970s to administer a range of incentive programs designed to attract foreign investment in new manufacturing. Training was provided to enable workers to shift from lower-skill employment in other industries to higher-skill jobs in metals manufacturing. After several years, the strategy paid off; the industry had grown substantially, and the board was phased out.

In Uruguay the National Railways Association asked a national branch of an international nonprofit training organization for training support for an ambitious program of restructuring that included new technologies and reorganization of the work force. The training center quickly developed a comprehensive training plan and modular training materials. It also provided some of the financing for the program. The program increased labor union support for restructuring, and retrained employees have been flexible and productive in their new jobs. Over a three-year period more than 300 employees were retrained, many in computer skills.

Faced with the movement of manufacturing jobs to lower wage locations abroad, the state of California instituted the California Employment Training Panel to finance training that would either improve productivity to prevent plants from relocating or enable displaced workers to acquire new skills and jobs. The program was financed by an earmarked share of the state's unemployment insurance fund. Both enterprises and public and private training providers could apply for financing by submitting a training plan showing expected employment outcomes. Training organizations were reimbursed for the unit costs of training only when individual participants were shown to be employed and paying into social security funds ninety days after training was completed. The program has successfully stimulated public-private cooperation, drawn on existing training capacity, and provided strong financial incentives for quality and efficiency.

Sources: Duscha (1988); Moore (1988).

organizational capacity needed, and ministry of education budgets are very often unstable from year to year.

Building training systems requires time and sustained support. Indeed, World Bank experience shows that a decade or more is necessary to establish effective training organizations (Middleton and Demsky 1989). But the effort must be forthcoming if the skills required to support economic growth in the modern sector are to be available.

8. *The Role of Training in Poverty Reduction*

Most of the poor in developing countries are found in rural areas and in the urban informal sector. Their principal asset is their labor, and their main road out of poverty is to improve their productivity and earnings. Progress along this road initially requires not training, but reform of policies that discourage economic and employment growth. Such reforms are especially important for poor women and minorities, who often bear an additional burden of social discrimination that holds them even deeper in poverty.

In developing countries with excess labor and low levels of basic education, training for wage employment in the modern sector is not a viable policy option for the most economically disadvantaged citizens. As discussed in Chapter 2, formal preemployment vocational education or training is largely beyond the reach of the poor, who lack the foundation of basic or lower secondary education needed to gain access. Low levels of education also reduce the chances that poor workers will receive employer training. Poor youth are often further handicapped by high levels of illiteracy, low self-esteem, and values and aspirations that are inconsistent with employment in the modern sector (Montrichard 1987). Few poor students can afford to be out of the work force to attend three- or four-year training programs.

In the Republic of Korea, Thailand, and other rapidly industrializing countries with large and expanding modern sectors, universal primary education, and high levels of enrollment in secondary schools, pre-employment vocational training and schooling have enabled students who do not have academic aspirations to enter wage employment. Vocational training, with its shorter and more intensive courses, has been most helpful for poorer students. It is not clear, however, that narrow training at the expense of broader education in basic skills will continue to be the most effective way to train the poor for employment,

particularly in the face of pressures in these countries to improve international competitiveness and to acquire new technologies.

Formal preemployment vocational preparation can also enable women to enter wage employment if jobs are available, although often the available jobs are in traditional "pink-collar" occupations. Targeted training that heavily involves employers can help women enter higher-paying, nontraditional occupations (Box 8-1). But these programs are seldom available to very poor women, who have even less access to education than men, who are often the main source of earnings in female-headed households, who must bear the responsibilities of child-

Box 8-1. Training Women in Nontraditional Skills

Special efforts to recruit and train women for nontraditional occupations can be successful. In a program begun in Morocco in 1979, special efforts were made to place women in industrial training programs that in theory were open to women but that had attracted few candidates and accepted none. Revised recruitment announcements explicitly called for female applicants and were widely disseminated through newspapers, radio, and schools. A strong guidance counseling service and informal placement arrangements were established. Female instructors were recruited and trained. Female enrollments rose sharply and have been sustained since the project was completed. The job placement rates for women are higher than for men.

In Jamaica, a small project to train women for employment in the construction industry led to placement rates of more than 90 percent in such occupations as plumbing, carpentry, masonry, electrical installation, and steelworking. Women's earnings increased, and employers were reported to be very pleased with their performance. A key factor in the program's success occurred before training, when employers made a commitment to hire the women on a "job audition" basis following interviews with candidates.

Similar positive results were obtained through a targeted project in vocational schools in Chile. Girls were trained in chemical technology, computer programming, textiles trades, mechanics, and electronics. Girls had higher job placement than boys in those occupations, and employer satisfaction was high.

All projects have not been successful, however. In the Dominican Republic a program aimed at preparing women for nontraditional trades failed because it lacked an aggressive counseling program and the staff was not committed to the importance of training women for these occupations.

Sources: Lycette (1985); Kudat (1989); Borcelle (1985); White and others (1986).

care, and who continue to face social and legal obstacles to participation in the modern sector work force.

Expanded access to basic and secondary education and improved learning achievement are the highest priorities for the use of public education resources in the fight against poverty in most low-income countries. More and better basic education not only improves individual productivity, but also brings with it substantial external benefits to society in the form of better health practices, lower birth rates, and improved educational chances for the next generation.

Skills training in the rural and urban informal sectors may contribute more to the alleviation of poverty than training for modern sector wage employment. Most of the poor are self-employed; they combine small amounts of capital with their labor and skills and take the risks inherent in entrepreneurship. The great majority are farmers, but substantial numbers own or are employed in very small, unregulated enterprises in rural as well as urban areas. In 1980 more than 60 percent of workers in developing countries were found in agriculture; in low-income countries the figure was more than 70 percent (World Bank 1988c). The International Labour Office estimates that more than a quarter of the workers in Latin America, Asia, and Africa are self-employed in businesses outside of agriculture; these include family workers and workers in the urban informal sector (ILO 1990b). Other data show that, for seventeen countries in Sub-Saharan Africa, the informal sector accounts for 60 percent of urban employment (ILO/JASPA 1989).

Including smallholder agriculture, the rural and urban informal sectors thus provide the bulk of income-earning opportunities in developing countries other than those upper-middle-income countries that are industrializing rapidly. The extent to which people are self-employed outside of agriculture is clearly a function of the level of economic development. In the late 1980s, 37 percent of the nonagricultural labor force in low-income countries was self-employed. That percentage was 25 percent in lower-middle-income countries, 18 percent in upper-middle-income countries, and 6 percent in high-income industrialized countries (ILO 1990b). Many of the self-employed in lower-income countries are poor, and improving their productivity, income, and welfare is a high priority. With modern sector economic and employment growth stagnant in many countries and declining in some, the capacity of the rural and urban informal sectors to generate productive employment is of intense policy interest.

As is the case with the modern sector, this interest extends to the potential role of training in improving productivity, economic growth, and job creation. Skills development in rural areas has a long history, principally through agricultural extension, but also through integrated rural development and informal adult education programs. Nongovern-

mental organizations (NGOs) have played a major role in rural skills development. By contrast, training for employment in the urban informal sector has only recently received much attention, in part because the informal sector was long considered a way station where people worked only until they could find a job in the modern sector employment, and in part because traditional apprenticeship efficiently supplies needed skills. But these views have changed substantially. Indeed, governments and international agencies have shown rising interest in intervening in the urban informal sector. But this interest is balanced by concern that such interventions may be wasteful or even damaging to traditional forms of skills development.

This chapter reviews the evidence to identify promising policies and practices in improving the contributions of training to the productivity and earnings of the poor in the rural and urban informal sectors.

Acquiring Rural Skills

Good general education forms the foundation for increased rural productivity, both on and off the farm. But farmers, the self-employed, and the individuals who occupy more specialized jobs in the rural economy all need additional skills. Farmers and the self-employed acquire many of their work skills through informal means, including traditional apprenticeship. The introduction of new knowledge and skills to the rural sector, however, has required organized programs, such as agricultural extension, agricultural schools, and training for rural self-employment.

Agricultural Extension

Agricultural extension services seek to link farmers and researchers through information networks that help farmers learn to use new farming technologies and that help researchers learn from the experience of farmers. There are various approaches to extension, but under current best practice extension agents receive periodic training in new techniques and make frequent visits to farms. Increasing use is being made of mass media, notably radio, to reinforce the training and visit system (World Bank 1990a). In some countries specialized extension systems serve particular subsectors of agriculture, such as fisheries or forestry.

By emphasizing farm visits and integrating information and skills development with farming inputs and technologies, extension agents in effect deliver on-the-job training that is closely tailored to work requirements and conditions and to the needs and abilities of learners. In short, the extension model fully incorporates the key elements of effective

training. If for no other reason, extension is thus the most effective form of skill development for farmers.

The effectiveness of extension, however, rests heavily on the training of field agents. Both agricultural schools and sectoral training agencies managed directly by ministries of agriculture provide preservice training. The need for continuing in-service training and upgrading for extension staff has led to considerable development of these sectoral training agencies. Training is highly specialized; extension agents must learn communication and monitoring skills as well as technical skills. Training of extension managers is also important.

Agricultural training agencies are most effective when training is closely tied to job requirements and opportunities for promotion, thus contributing not only to job performance but also to staff motivation and morale. These elements are, of course, characteristic of good training in any endeavor.

Agricultural Schools

Vocational training centers and schools have been established to prepare individuals both for self-employment as farmers and for wage employment in private, state-owned, or government agricultural organizations. In many countries, postsecondary agricultural colleges prepare technicians for wage employment. Thus these institutions by design train for different segments of the agricultural labor market.

Training oriented toward wage employment in agriculture has had much the same record as that which prepares students for commercial or industrial employment. Where supply and demand are in reasonable balance, graduates can find employment and returns can be acceptable (Psacharopoulos and Loxley 1985; Gittinger 1987).

The fact that wage employment in agriculture is often largely found in government ministries eases the problem of predicting demand in the short term. As Thailand has recently discovered, however, schools established to train entry-level extension agents and agricultural technicians can rather quickly become socially inefficient when the agricultural service is fully staffed or when government hiring is constrained. In these circumstances the specialized nature of the training may mean that graduates have less labor market flexibility than do individuals with broader occupational credentials or general secondary education. As industrialization proceeds and the size of the agriculture sector decreases, agricultural schools may become redundant and need to be converted to other programs. Korea has taken this step in the past decade.

Formal vocational education and training for farmers has not been particularly successful. The contributions to productivity can be questioned because of the difficulty of identifying the varying skill require-

Box 8-2. *Adjusting Formal Training to Self-Employment in Rural Areas*

Case studies show that formal vocational education and training institutions can adjust the objectives and content of their training programs to improve support for rural self-employment, on or off the farm.

The Thaba-Kupa Ecumenical Centre in Lesotho, set up by the Christian Council of Lesotho, has established 65 percent of trained primary school leavers as farmers. Entrants must have a written declaration from parents or the local Land Allocation Committee allowing them to take up at least 2.5 hectare of land upon graduation. After passing an initial probationary period of six to eight weeks, students take intensive courses in agriculture, home economics, and rural crafts and manage their own vegetable plot and poultry pen. Produce is sold through the school marketing system to enable trainees to begin to acquire capital. The course takes eighteen months to complete. After graduation students receive three or four extension visits during their first two years of work.

In Thailand, informal education programs run by the Ministry of Education provide a range of short courses in agricultural productivity and vocational skills. Evaluations indicate that the courses have had no impact on agricultural productivity, but that they have raised family income by enabling individuals to engage in nonfarm economic activities.

The Legruki Vocational Training School in Tanzania has been established by the community with support from the Lutheran Church of Arusha. The objective is to prepare primary school leavers to enter self-employment. In the beginning, conventional training in carpentry and masonry was offered to enable students to pass national trades competency tests. Evaluations showed that the curriculum, which was oriented toward modern sector wage employment, did not adequately cover the multiple skills and technologies required for success in self-employment. Following a market survey in the local area and staff debate, the curriculum was revised to shift from single to multiple skills, build from local market opportunities, incorporate useful traditional skills, and increase the flexibility of course offerings. A tracer study of about half of all graduates since 1980 found more than 90 percent employed. Of these, more than half were self-employed in villages or in both villages and urban areas.

A similar approach is in use in the Rural Trade School in Malawi, which has as an objective to establish a house builder and a multiskilled mechanical/electrical repair person in each village. Youth are trained in technical skills and business management, provided with a small amount of capital and tools, and assigned in pairs. Limited follow-up assistance is provided. Although there have been no formal evaluations, the success rate is reported to be good.

Sources: Ishumi (1988); Fowler (1990); World Bank data.

ments of different farming contexts. Change comes slowly in subsistence, smallholder agriculture (Welch 1978). Well-organized extension services can provide the steady on-the-job training support needed for incremental improvement. General education that increases a farmer's ability to communicate complements extension, and research has demonstrated strong productivity returns to general education for farmers (Jamison and Lau 1982). As the pace of technological change increases, higher levels and better quality of general education increase the positive effects extension services have on productivity (Cotlear 1986). The advanced technical skills taught in agricultural schools and centers are likely to be useful only in technologically advanced, large-scale farming and thus in employment that closely parallels wage employment in the modern sector.

Formal vocational education and training institutions in rural areas have in some cases been able to redirect their objectives and curricula to conform more closely to the skill needs of individuals entering self-employment in farming as well as in manufacturing and services. This reorientation generally involves analysis of market opportunities and training in the multiple skills needed for market access. Although this type of training has not been comprehensively studied, case examples indicate that considerable institutional flexibility is required, and that NGOs can be effective in developing and administering such programs (Box 8-2).

Training for Rural Self-Employment

Many different training strategies have been used to prepare youth and adults for rural self-employment. Program strategies for disadvantaged rural residents encounter special hurdles. The limited availability of skilled instructors may require that skill training be an integral part of the activities of production cooperatives; greater use of transfer of skills among peers than with urban disadvantaged groups may also be required.

Some countries have initiated training programs for rural youth intended to develop employment skills pertinent to the rural nonfarm economy (O'Regan and Hellinger 1981; Brigades Coordinating Secretariat 1986). Perhaps the best-known examples are found in Africa, with the Botswana Youth Brigades being especially prominent. Although some of these programs have succeeded in giving young people technical skills, there have been problems in translating those skills into jobs located in rural areas. Trainees have often exerted strong pressure to redirect training toward urban-oriented trades and to formalize training so that they can improve their chances of finding work in modern sector firms. Because they generally lack the capital and technical assistance to

start up rural enterprises, graduates often have no other choice than to migrate to larger towns and cities in search of employment (Kaduru, Chage, and Oivo 1985). Recent studies indicate that in expanding economies this search can be successful and profitable to both the student and society. In 1988 in Botswana, whose economy was growing rapidly, social rates of return to Brigades training was 26 percent, but in Kenya, where modern sector employment is lagging, a similar youth training program was much less successful (Hinchliffe 1990; Kukler 1987). Trades testing and certification systems have facilitated this transition by increasing the mobility of graduates.

The concepts and approaches of the Brigades have spread through a number of countries, primarily in eastern and southern Africa, under the aegis of the Foundation for Education with Production. A principal objective of the foundation is to generate revenue from school farms and workshops. The foundation's curriculum, a form of secondary school diversification, is designed to enable students to pass the same academic examinations as students in academic schools. There is, however, a strong commitment to integrating productive work with the curriculum, based on a clearly expressed educational philosophy that emphasizes learning of theory and concepts through practical application. The foundation aims to provide a balanced education that enables students to gain practical experience and to develop "appropriate perceptions, creativity and confidence" (International Foundation for Education with Production 1990).

Evaluations of this approach are scarce. A survey of thirty schools in Tanzania found that, on average, sales from productive activities provided 45 percent of school income. However, school principals found it difficult to manage both the school and a productive enterprise, and the business aspects of the schools—such as strategic planning and costing—were often poorly developed. In Tanzania's highly centralized system, the revenues earned were considered government revenues, which reduced incentives to the institutions. The schools also had trouble finding and retaining qualified staff (Athumani 1990). Similar tensions have been reported in other countries (Conradie 1989). Employment outcomes from well-managed schools can be very good, but more research on employment outcomes—especially rural self-employment—would be useful in evaluating this approach.

Conventional Training Modes for the Urban Informal Sector

Most skills used in the urban informal sector are acquired through existing, or conventional, modes of training. These include traditional apprenticeship, employment in modern sector enterprises, and formal vocational education and training institutions. Targeted training inter-

ventions are a more recent phenomenon, and, as will be discussed, often seek to redress perceived weaknesses in conventional means of skills delivery. The evidence indicates that conventional training modes contribute substantially to skill acquisition in the informal sector, but could be improved. The cost-effectiveness of sponsored intervention strategies is less certain.

Although there is considerable variation across countries, modern sector firms are an important source of entrepreneurs and skilled workers for upper-tier firms in the informal sector. And despite an orientation toward wage employment, graduates of formal vocational education and training institutions do work in the informal sector when entry is not limited by government regulation, although they often experience a relatively long period of open unemployment during which expectations adjust before making the shift.

Training in Modern Sector Firms

Such diverse organizations as state-owned and foreign-owned factories, large automobile dealerships, and government public works and mechanical workshops conduct in-house training to meet their own manpower needs. The skills that workers acquire sometimes closely parallel the skill profiles of informal sector trades. Although compensation in these modern sector firms is usually sufficient to prevent loss of trained workers to the generally less remunerative informal sector activities, it is often not high enough to prevent very experienced workers from leaving their firms to tap the potentially lucrative earnings of self-employment in highly technical trades. As a result, in-house training by large modern sector firms acts as an indirect source of skill training for the informal sector.

It is difficult to determine exactly how effective this training mode is in supplying skilled labor for the informal sector. Modern sector training prepares workers for the specialized organizational roles and competence levels that are typical of modern firms but less common in the informal sector. Workers are expected to adhere to more uniform procedures and higher quality control standards than are comparable informal sector workers. To the extent that these qualities have a functional application, they may help to raise overall quality standards in the informal sector. But, in a large sense, the actual body of job-related skills and knowledge, with the exception of a greater orientation toward power-driven equipment, is congruent in most respects with that of comparable trades in the informal sector.

There is little doubt that in some countries significant numbers of entrepreneurs in the informal sector acquire their skills in formal employment (Herschbach 1987), but until recently data confirming that

impression have been scarce. The recent study in Nigeria, cited in Chapter 6, found, for example, that 70 percent of informal sector entrepreneurs in more modern occupations such as car repair, furniture construction, and tailoring had previous wage employment, while less than a third of those operating in more traditional businesses such as weaving and soap making had ever worked for a wage (Birks and others 1992). Structural adjustment in stagnating economies is likely to increase the flow of wage earners into the informal sector, although the overabundance of some types of production and service enterprises may curb that flow.

Training in Formal Institutions

Several factors limit the capacity of formal vocational education and training courses to supply large quantities of skilled labor to the informal sector. First, young people enrolled in these programs aspire to wage employment. Evidence indicates that when it is financially feasible and socially acceptable, graduates prefer to wait for a wage job, especially public sector jobs with high wages (Clark 1983; Middleton and others 1990). Second, young people who might be predisposed to informal sector work are often unable to bear the costs of forgone earnings and often high tuition of long, formal programs. They are equally unlikely to meet the educational prerequisites of such programs. Finally, because instruction in these institutions is oriented toward more modern technologies and processes, graduates may not be adequately prepared for the more practical nature of work in informal sector establishments.

Young people who do attend formal vocational education and training institutions will work in the informal sector if other opportunities are closed to them. In Thailand 18 percent of the graduates of formal institutions work in the informal sector, although unemployment rates among graduates of about 12 percent attest to the preference and ability of many to wait for better jobs (Middleton and others 1990). About 12 percent of individuals with secondary vocational schooling in Abidjan in the Côte d'Ivoire are self-employed or employees in the informal sector, although more than 30 percent of the graduates report that they are unemployed or inactive (Grootaert 1988). Recent tracer studies in Togo and Cameroon found that government labor market policy can combine with changing graduate expectations to encourage or discourage a shift to work in the informal sector (see Box 2-2).

Finally, there is evidence from Peru and Colombia that the self-employed will take advantage of in-service training in formal institutions. In Colombia the evidence further shows that the in-service training has a positive effect on earnings (Arriagada 1989a, 1989b; Horn and Jimenez 1987).

The willingness of the self-employed to undertake in-service training in formal institutions signals the potential for reorienting these institutions to provide these services. The costs of tuition and forgone earnings, however, are likely to make long formal courses impractical for most of the self-employed.

Sponsored Interventions

The conventional modes of training for workers in the informal sector have been supplemented by a wide array of “sponsored training interventions” in recent years. The term encompasses a wide array of specially organized training programs intended to meet the needs of identified groups of beneficiaries. Sponsored training programs that support the informal sector have been justified on three main grounds: to overcome an inadequate supply of training, to improve equity, and to meet new expectations arising out of changing economic conditions.

In many developing countries conventional training modes are considered incapable of meeting the demand for trade skill training. The number of people seeking traditional apprenticeships often exceeds the number that masters are willing to accept, and openings for on-the-job training in modern sector firms are dependent on available jobs in those firms. As noted, access to formal public training is limited by costs, educational prerequisites, and, increasingly, policies that gear the size of enrollments in modern sector training programs to effective employment demand in the wage sector.

From an equity perspective, it is argued that sponsored interventions can better provide access to training and income-producing possibilities for disadvantaged, marginal populations, even though fees are often charged. Sponsored interventions are targeted to specific groups and do not discriminate against those with lower educational qualifications.

Economic change generally leads to displacement of workers in the modern sector. Most visible are civil service retrenchment programs as governments seek to become more efficient in their operations. As the structure of economies change, some workers must shift to new sectors and industries. In the medium term, such factors can result in a rapid rise in the number of unemployed persons, many of whom seek informal sector employment. These workers form yet another potential beneficiary group for sponsored training interventions.

Sponsored training interventions are generally most effective when they take into account the great variation in circumstances and needs that informal sector entrepreneurs and workers face. Firms in the informal sector are at many different levels of formalization, which means that the characteristics of successful training in the informal and modern sectors are quite different (Box 8-3). The goals of sponsored interventions

Box 8-3. Differences in Training for the Informal and Formal Sectors

<i>Training for work in the informal sector</i>	<i>Training for work in the formal sector</i>
<p>Aims and objectives of training</p> <ul style="list-style-type: none"> • As a solution for manpower surpluses • Preparation for self-employment in micro-enterprise • To meet local consumer demand • To increase low levels of productivity and income • To achieve a marginal change in working behavior (task, skill) • Immediate results expected 	<ul style="list-style-type: none"> • As a solution for manpower shortages • Preparation for wage employment in medium or large firms or government • To meet demand in national/international markets • To contribute to the growth of the "modern sector" • To achieve a quantum jump in working behavior • Medium- and long-term results expected
<p>Organization and management</p> <ul style="list-style-type: none"> • Nongovernmental initiative • Important role for NGOs • Decentralized planning and decisionmaking (bottom-up) • Participation of target group in decisionmaking • Depending on local resources • Needs assessment based on micro-level, community and market opportunity surveys 	<ul style="list-style-type: none"> • Governmental initiative • Little role for NGOs • Centralized planning and decisionmaking (top-down) • No participation of target group in decisionmaking • Depending on national resources • Needs assessment based on macro-level manpower planning exercises
<p>Characteristics of the trainees</p> <ul style="list-style-type: none"> • Relatively many • People already working including apprentices • Broad age range • Often from among the under-privileged • Not necessarily literate, may be school dropouts • Motivated: trainee sees training as (only remaining) road to self-improvement 	<ul style="list-style-type: none"> • Relatively few • Youngsters outside the labor force • Narrow age range • Rarely from the under-privileged • Literacy demanded, must have school certificate • Not so motivated: trainee would prefer an academic curriculum

Box 8-3. (continued)

<i>Training for work in the informal sector</i>	<i>Training for work in the formal sector</i>
<p>Characteristics of training</p> <ul style="list-style-type: none"> • Broad concept/definition of training • Emphasis on retraining • The training comes to the trainee • On-the-job, workplace-based, "hands-on" instruction • Practice-based learning • Reliance on visual/oral messages • Modular approach • Flexible sequence • Competency-based • Short courses • Individualized curriculum • Learner centered • "Must do/must know" orientation • Training materials adapted to trainee • Training in the use of local technology and resources • Trainer is often practitioner (artisan, entrepreneur) • Trainer from within community • Training is part of a package of support measures (e.g. credit, extension, marketing) • Low cost per trainee • Higher cost to trainee • Modest facilities 	<ul style="list-style-type: none"> • Narrow concept/definition of training • Mainly job-entry training • The trainee comes to the training • Off-the-job classroom-based "hands-off" instruction • Theory-based learning • Reliance on written messages • Textbook approach • Predetermined sequence • Fixed time • Long courses • Standard curriculum • Trainer centered • "May have to do/nice to know" orientation • Trainee adapted to training materials • Introduction to exogenous technology and resources • Professional trainer not involved in production • Trainer from outside community • Training unrelated to other support measures • High cost per trainee • Low cost to trainee • Ample facilities

Source: Fluitman (1989).

in the informal sector usually extend beyond training. Most fall in one of three general categories (Boomgard 1989). For those not yet engaged in the economy, the goal of the intervention is simply to help individuals gain entry, either by finding a job or creating a small enterprise. For those already in the informal sector, the goal is to increase their income by expanding the sales, production, or employment of the firms they own or in which they work. For owners of firms at a somewhat higher stage of development, the goal is to transform their firms into more complex operations that generate greater income through production or sale of new or higher value-added products.

Gaining Entry into the Informal Sector

Most entry-level employment in the informal sector is in the lower tier of economic activity where skill and capital requirements are low. Entry at higher skill levels is also possible. First-time employment seekers can be categorized according to the personal assets they bring to the employment search. Those who are handicapped in some way by their gender, religion, caste, tribal group, or income level have different training needs in achieving entry from those who have received formal education and have not been impeded by any personal or social barrier. The differences in the routes the two groups follow in achieving their employment goals and the kind of support they require along the way are great enough to warrant separate analysis of training as an intervention strategy.

DISADVANTAGED ENTRANTS. The major training need for individuals living in poverty who have limited access to basic education or to formal preemployment training is acquisition of sufficient technical skill to produce, sell, or repair a marketable good or provide a service, either working alone or in a small firm. These individuals are also likely to need other support, such as credit and technical assistance in conducting feasibility studies, purchasing raw materials, and marketing products. Disadvantaged individuals seeking entry into the informal sector are unlikely to have sources of start-up capital or access to government officials who control the allocation of credit and raw materials. They are also unlikely to be familiar with distant markets and the mechanics of wholesaling, which puts them at a disadvantage in competing with established entrepreneurs in marketing their products.

Social norms frequently limit the employment opportunities of disadvantaged individuals. In some societies individuals are barred by custom from engaging in vital aspects of their own production or commercial operations. Traditional potters in Nepal, for example, refuse to market their wares because by custom that function was assigned to members of another caste (Harper 1984). Females in many societies are

forbidden to enter certain craft trades. In some parts of India, women cannot touch a potter's wheel (although they can mold clay), put grain in a roasting oven, or handle a carpenter's saw (Kelkar 1985). Female work in general, whether it is performed inside or outside the home, is often perceived as an extension of household work that has little economic value.

The very poor are further handicapped by low levels of education and lack of familiarity with productive work. Technical training must therefore often be supplemented by instruction in basic literacy and numeracy skills, community-organizing, and confidence-building. Often, the objective is to assist individuals to visualize themselves in an income-earning activity and to identify and take the first step in realizing that goal. In some societies this process may involve a critical examination of the social-political circumstances of the group combined with some degree of consciousness-raising. But in many other settings the intervention is nothing more than a politically benign empowerment of the group to realize its economic potential. The importance of group solidarity to disadvantaged individuals may make it desirable to structure the income-generating activity as a group or cooperative venture, where the participants share equally in decisionmaking and profits, rather than as an individually owned enterprise (Box 8-4).

In most cases disadvantaged individuals will benefit most from training of modest technical difficulty that prepares them for income-producing activities that require little start-up capital. Training in more technically difficult skills may be appropriate, however, if educational deficits can be made up and if support for the activity is forthcoming from the family or community. Gender or ethnic preferences for certain skilled activities will not be surmounted easily. The technology in which participants are trained should probably be simple (for example, a hand-powered brickmaking machine); the capacity of the technology to circumvent traditional work patterns and social barriers by creating an entirely new activity (building fuel-efficient clay stoves, for example) can contribute to program effectiveness.

Evaluations of programs operated in some countries by NGOs and international voluntary organizations suggest that they have helped marginal groups to enter the informal sector (McLaughlin 1989; Boomgard 1989). Part of the success appears to lie in the organizations' high levels of commitment to assist the "poorest of the poor" and their capacity to tailor programs to the needs of these populations. In many respects, these programs have performed better than government programs, which are burdened with levels of bureaucracy and staffed by individuals who have little knowledge of the special barriers faced by their clients. It remains to be seen whether governments, with their broader mandates and inevitable bias toward populations with greater

Box 8-4. Attebubu Rural Women's Artisan's Association

The Attebubu Rural Women's Artisan Association of the Brong Ahafo Region of Ghana is a product of the technical assistance efforts of the Association of People for Practical Life Education (APPLE), an indigenous nongovernmental organization that has operated in Ghana since 1977. The women's association illustrates how rural technical skills can be transferred from experts to learners and how the innate handicaps faced by rural women in starting income-producing activities can be overcome.

The women's association consists of rural artisans and trading groups that include bakers, beekeepers, salt sellers, seamstresses, welders, and blacksmiths. Each group acts as separate producer or commercial industry for purposes of the actual operation of members' businesses, which may be organized either as group or individually owned enterprises. The industry groups cooperate to purchase raw materials, negotiate with government officials, or market their products in urban areas. In this regard the women's association has borrowed the best features of both cooperatives and private enterprise.

Skill training is conducted by both members of the group and by APPLE staff. Technical skills are transferred from experienced to inexperienced workers through an informal peer teaching process, and business management skills through short workshops and ad hoc group arrangements organized by APPLE. Because of the seasonal nature of many rural activities, members often migrate between activities as the market and raw materials dictate. Some entrepreneurs deploy wide networks to sell their products in surrounding villages.

Members are also entitled to receive a start-up loan from the association's revolving loan fund. Recent promises of additional capital from a local commercial bank reflect confidence engendered by the high repayment rate and the high quality of the association's management training. APPLE has also recently been granted a loan from multilateral development assistance monies to train additional beekeepers and further develop this activity as a rural industry in Ghana.

political influence, will be able to assist their marginal populations in similar ways.

Although additional inputs are often necessary for successful training, an integrated, multiservice program package is not necessarily the most effective model for delivering them. There seems to be an important trade-off between simplicity, which can improve implementation, and comprehensiveness, which is needed to attack the multiple problems of the poor. Research suggests that programs which attempt to deliver only a single service, such as technical training or credit, or serve a single beneficiary group, such as urban garbage collectors, benefit their clients

(Tendler 1987). Multiservice programs run by NGOs, often with funding from bilateral aid sources, have encountered a number of problems. The relatively small number of beneficiaries and the inability to replicate easily the highly localized design of these programs limits their overall impact in many societies. Also, their relatively high costs, sometimes rising to more than \$1,000 a beneficiary, raise questions about their cost-effectiveness, at least at the experimental stage of their development and when the programs are located in remote areas.

EDUCATED ENTRANTS. Many individuals begin their search for informal sector employment with at least a primary and often a middle school or secondary education. Many are adults with work experience who have been displaced by economic adjustment. Their schooling gives them some general learning useful in a work setting and perhaps even some exposure to business-oriented subjects. They may or may not possess a coherent body of skill and knowledge that allows immediate employment or self-employment in anything other than easy-entry activities. The need to generate or maintain an income makes attendance in lengthy formal vocational courses impractical.

The major training goal for these individuals is to master enough job skills and knowledge to establish their own businesses or to secure employment in an existing firm. Most sponsored programs that provide preemployment technical skill training use a center-based training mode. Some programs are classroom-based, while others may combine classroom and on-the-job training with external apprenticeships or "attachments" to private commercial establishments.

Although many programs provide training only in technical job skills, there seems to be a trend among those that serve the highly educated to also include business management and entrepreneurial training. One such example is the Malawi Entrepreneurship Development Institute, which provides technical skills upgrading and business management training to adults who are carefully screened for entrepreneurial capacity. Trainees develop skills in producing a salable product or service, such as hand carts, roof tiles, welding, and building; they must keep records of materials used and reimburse the institute for costs, a procedure that in itself provides valuable training in cost management. The final test of their competency is their ability to sell their product in the rural area where the institute is located. Once a trainee has completed this aspect of the program (and the time on entry level skills), bookkeeping and business management training is provided. The institute's staff helps entrepreneurs to apply to specialized government credit programs and provides consultation during their first year of operation. Although no formal evaluations have been conducted, the institute reports a 75 percent success rate in establishing new businesses and says that grad-

uates are sending new employees for training. Information on costs is not available (USAID 1986; World Bank 1989f).

Some formal vocational institutions have begun to address the demand for informal sector skill training by offering special noncertificate courses in the more technical, highly capitalized informal sector trades. These "training only" approaches do not include broader courses in small business management and are often targeted to individuals with lower educational qualifications who might ordinarily have entered traditional apprenticeships. A special class of private preemployment training programs, known as "backstreet colleges," has also sprung up in large urban centers of countries without large traditional apprenticeship training systems (King 1987). These for-profit programs seek to deliver training in skills that can be used in both modern and informal sector firms. Finally, some international voluntary agencies are beginning to reorient their preemployment training programs away from the technical skills needed in the modern sector toward those used in the urban informal sector.

Some of the programs tailored to informal sector employment can be held up as models of effective center-based, preemployment training. But, unfortunately, many still seem more appropriate for the modern sector. They tend to be too theoretical, use too sophisticated equipment, and are too certificate-oriented for informal sector application. Others do not have adequate resources. Their equipment may be outmoded or inoperative, or there may be no electricity to operate it. Some backstreet colleges offer reputable training, but others charge a fee for delivering training taught by unqualified staff in ill-equipped facilities.

A common result of these defects is that graduates are unable to find immediate employment in informal sector establishments. Employers often do not believe that the skills and knowledge of graduates of these programs are sufficiently developed; some employers are unwilling to hire graduates that they believe are more interested in the management aspects of the business than the physical work. In still other cases, graduates may not find employment simply because there is a surplus of skilled workers in their chosen trades.

The better preemployment training programs seek to overcome both the problem of poor program design and oversupply of labor. The former is best addressed by creating a learning environment that avoids being too "school-like." Such programs are not overly reliant on literacy, are systematic but not didactic, use actual commercial examples to teach problem-solving, and emphasize practical application by working closely with operating enterprises if necessary (Grierson 1988). Instruction draws heavily on equipment and tools currently in use and on mock-ups that simulate real tasks in informal sector workshops. Business management training should be given only to prepare trainees to

establish their own businesses and not at the expense of the technical training. To avoid an oversupply of labor, sponsors can identify job vacancies for their graduates or assist them with entry into employment in group cooperatives (Box 8-5).

Fees for these programs may be prohibitively expensive for some individuals, whose lack of money may have caused them to drop out of school in the first place. Traditional apprenticeships historically have been the preferred choice for individuals who cannot afford the fees, but they may not exist or be oversubscribed. In these cases, subsidization of the individual or the sponsored program may be the only way to make such technical training available to poor youth.

One promising alternative is a program in Nigeria to expand the training capacity of the traditional apprenticeship system. By careful use of subsidies, owners of small enterprises are encouraged to accept more than their usual number of apprentices. This approach takes advantage of an already culturally acceptable and popular training mode that is reasonably effective in preparing workers for many informal sector trades. The program, however, may reduce the efficiency advantages of traditional apprenticeship as trainees begin to expect the government, and not their families, to pay for training. Also, the incentive for small businesses to participate in the program may be offset by other government actions, such as minimum wage regulations and more rigorous enforcement of business registration and tax payment laws. Market saturation may also be a problem, making masters unwilling to train, as competition from former apprentices increases.

Box 8-5. Training as a Component in Cooperative Development

The large numbers of unemployed secondary school graduates pose a major challenge in Zimbabwe. The Bulawayo City Council has instituted a program to develop construction cooperatives that will enable young people to take advantage of income-earning possibilities created by large public construction projects. The council provides training in building skills, financial management, and compliance with government licensing and building regulations.

Upon completion of training, graduates are organized into cooperatives, and members are provided with six months of technical and management supervision, a six-month loan of tools and a rudimentary site shed, access to a revolving loan fund for materials, and shared use of a project truck on a rental basis. Eight cooperatives employing ninety-five graduates have been successfully established.

Source: World Bank data.

Several countries are expecting both vocational and general secondary schools to offer entrepreneurship education to prepare youth for self-employment in the informal sector. It is far too soon for any evidence on the effectiveness of this approach to be available. There are, however, reasons to be concerned about its potential, among them the absence of complementary inputs such as credit and technical advice, the lack of maturity of many young people, and the relative unwillingness of academic secondary school students to enter the informal sector. Limited course work is unlikely to change these attitudes; certainly, the failure of more intensive diversified secondary curricula to alter aspirations and patterns for modern sector wage employment gives little reason to expect more from less intensive education. At the same time, the fact that some graduates of formal vocational institutions are moving into the informal sector warrants some optimism. Evaluation of the outcomes of these programs will be important.

Expanding Existing Enterprises

Clients for programs aimed at expanding existing informal sector enterprises are difficult to classify. They might include the owners of firms with as many as ten workers or the one- or two-person family businesses that represent the bulk of informal sector operations. Clients can also include individuals involved both in low-technology, low-capital, subsistence activities and those in more capital-intensive repair and manufacturing activities. They also can reflect a wide variation in age and levels of education. Whatever the size and activity of the firm and the personal characteristics of the owner, the main purpose of any training program for this development goal is to enable owners to overcome any barriers to increasing the scale or volume, and thus the profitability and employment-generating capacity, of their businesses. Training in both technical and business skills may be necessary to accomplish this goal, and the appropriateness of each is best considered separately.

TECHNICAL TRAINING. Owners of enterprises whose activities require little technical skill do not need preemployment or in-service training. Expansion of their operations depends more on credit and marketing advice. Trades of a highly technical nature are a different matter, however, because improved technical capacity might be one way to expand the business.

The lack of theoretical knowledge among workers has often been posited as one of the chief causes of the lower productivity level of highly technical operations in the informal sector. It is not uncommon for an illiterate mechanic to be able to disassemble and reassemble mechanical equipment without being able to explain how the equipment works.

Indeed, such mechanics are legendary in many communities. This inability to understand technical processes and systems might seem inconsequential at first glance, but it is evident in the frequent misdiagnoses of malfunctioning equipment, the waste of parts, and the loss of time to both the mechanic and the customer. Lack of technical knowledge results in similar inefficiencies and waste in manufacturing enterprises.

Sponsored programs designed to provide in-service training specifically to small enterprises can be either center-based or organized on an extension basis but in either case should be held after hours to avoid interfering with the daily work schedule. Extension programs are more popular with owners because they can discuss individual problems with extension agents when they visit.

Center-based courses sponsored by the national training agency in Colombia have increased the incomes of the self-employed (Horn and Jimenez 1987), but the record on extension training is mixed. Industrial extension services aimed at small businesses in Thailand have not been especially effective (Marsden 1984), although studies of programs in other countries suggest that extension services can be cost-effective (Harper 1984).

Technical extension programs do have inherent weaknesses that make their use questionable. The need for elaborate equipment, power sources, and mock-ups can make the programs expensive, as can the need for the relatively scarce instructors who combine practical competence, extensive technical knowledge of the trade, and familiarity with working conditions in the informal sector.

BUSINESS TRAINING. Improvements in management can also improve a firm's profitability and expansion potential. Firm owners in the informal sector rely on much the same trial-and-error means of arriving at management decisions as they use in grappling with technical problems—perhaps more so, since business skills are acquired through an even more indirect and less explicit process than technical skills. Furthermore, problems related to the business aspects of the firm may be of more concern to owners than any real or assumed technical inadequacy. For these reasons business management training is likely to be a more appropriate intervention for this client group than technical training.

Management training is most effective when it is focused on specific management deficiencies that cause real and immediate hardship for owners (Anzalone and McLaughlin 1984). This is necessary since management deficiencies perceived by planners sometimes are cleverly circumvented by the owners and, therefore, do not actually require remediation. Failure to take these circumventions into account in planning a training intervention will likely result in a curriculum that trainees

see as uninformed and irrelevant, leading to low enrollment or high drop-out rates.

In recent years, programs that deal with the management and financial problems common to small enterprises have been initiated in many countries (Boomgard 1989; Tendler 1987; Ashe 1985). Some of the interventions simply provide training, but most combine training with one or more other inputs such as credit, technical assistance, policy changes, infrastructure development, or political advocacy to overcome what are viewed as multiple barriers to growth and sustainability. Government-sponsored programs sometimes address these needs in the most comprehensive manner. Inputs supplied by NGOs are, of course, limited to the resources of the sponsoring organization and to its political leverage in obtaining the necessary government support for inputs beyond the organization's control.

Some programs focus on individuals who have demonstrated entrepreneurial inclinations, on the assumption that such individuals are more likely to utilize the services provided than others who are more risk-averse in their business instincts (Box 8-6). Many of these programs have broad mandates to help create new enterprises and expand existing firms and to serve clients ranging from marginal, entry-level operators to relatively technically sophisticated and well-connected entrepreneurs. The largest block of clients, however—30 to 50 percent according to one study—appear to be owners of existing businesses (Patel 1986).

A common element of many of these programs is the provision of credit, which is often conditioned on the client's participation in a management training program. For example, as a prerequisite to applying for a loan, clients may be required to take a small business accounting course in which they learn how to maintain a simple income-outflow cash book.

Limited evidence suggests that both credit-only and multiservice programs have succeeded to some extent in assisting small enterprises to expand. Eighteen USAID-supported loan programs, half of which also provided training or technical assistance, led to increases in income, decreases in underemployment, and sometimes expanded employment in the participating small enterprises (Boomgard 1989). Other international voluntary organizations also report that their projects, all of which include training and technical assistance, resulted in increased income, employment, production, or sales among their beneficiaries (Small Enterprise Education and Promotion Network 1988).

A controversy has arisen, however, over whether the gains in enterprise expansion should be attributed primarily to the credit portion of these programs or to the training and technical assistance. Small entrepreneurs have repaid credit supplied by the Grameen Bank in Bangladesh at a remarkably high rate even though no explicit training

Box 8-6. Entrepreneurship Development in India

The Entrepreneurship Development Program (EDP) in the Gujrat State of India is one of the oldest and best known of this kind of program in the developing world. Since its inception as an innovative credit scheme in 1968, the EDP has evolved into a comprehensive package of services directed to developing entrepreneurial talent in all small-scale economic activities. Over fifty agencies in more than twenty states in India now run EDPS.

The EDP model assumes that not everybody is meant to be an entrepreneur. Selection is made by a combination of screening, testing, and interviewing. Successful candidates then undertake a ninety-day evening program if they have work experience or a six-week, full-time, residential course if they do not. These courses cover such topics as achievement motivation, market environment, financing, product selection, marketing, skills development, management, production, procurement, personnel, legal systems, and letter writing. Trainees prepare project reports, go on field trips to selected industries, receive any necessary technical training in a local industry, and receive intensive one-to-one counselling. A trainer-motivator assists graduates in applying for loans, obtaining land and facilities, and marketing their products.

In its first fourteen years of operation, nearly 8,000 new entrepreneurs have been trained and 3,000 new industrial enterprises, employing three to five people, have been established. Of the forty enterprises that have been surveyed, 80 percent have been profitable after five years of operation. Roughly 60 percent of the trainees who complete the program start businesses. The cost per trainee is about \$200, and the cost for creating an enterprise in Gujrat is about \$350.

Source: Patel (1986).

is conducted in conjunction with the loan (Yunus 1988). The success of Grameen and some other small loan and grant programs is often cited as proof that credit should take precedence over training and technical assistance for expansion purposes.

The degree of explicit training in a multiservice program appears to depend on the effectiveness of any informal, contextual training that is likely to take place. Informal training that is so deeply embedded in the fabric of the intervention as to be practically invisible can be crucial to the achievement of the program goals. Although loan officers for the Grameen Bank do not overtly train borrowers in management skills, the practice of granting a loan to a group, known as a tontine, rather than to an individual borrower, results in an informal transfer of management skill among members of the borrowing group. The members of the

tontine rely on such informal training or indoctrination to ensure that the actual user of the loan possesses a viable business plan and the skills to implement it. On the other hand, explicit training that might seem indispensable may turn out to be less effective than presumed. For example, small entrepreneurs frequently abandon bookkeeping practices they were taught as a prerequisite to acquiring the loan soon after receiving the loan. Although the entrepreneurs may fully repay the loan, it is difficult to argue that repayment is due to their newly acquired skills in modern bookkeeping.

Management skills are less expensive than technical training because no costly physical investments are required for success. Program costs can increase, however, as activities become more diverse and physically dispersed and if special materials are needed for illiterate participants. Generic skills and knowledge that can be administered economically to heterogeneous groups of entrepreneurs may overcome some of the apparent need for specially tailored, trade-specific training. Business management skills are more easily transferred this way than are technical job skills.

Transforming Existing Enterprises

Sponsored interventions that seek to transform businesses into qualitatively different operations capable of generating more income and jobs usually focus on small manufacturing firms rather than on commercial or service activities. Generally such interventions target larger firms in the informal sector that use relatively sophisticated but conventional production technology.

The transformation is accomplished by introducing innovative technology that allows the same products to be produced at lower costs or that allows new products to be manufactured. For developing countries that are not rapidly industrializing, new technology does not refer to microelectronics, bioengineering, or materials development, but to technologies imported from industrial countries that have been or could be adapted for local production using indigenous labor and local raw materials (Alfthan 1986). New products might include those that can be made from the waste materials of modern sector firms (the conversion of brewery waste into chicken feed, for example), or from raw materials currently allocated to modern sector firms. They can also include products that can be made with older but still functional machines imported from industrial countries (for example, nuts and bolts made with imported machine tools). Often these innovations may simply be extensions of existing trades and crafts into previously unexplored product lines (traditional metalworkers may learn how to make simple farm machines).

The diffusion of an innovation, either technological or organizational, appears to proceed in two stages. First, a cadre of pioneer entrepreneurs are trained to adopt the innovation on a limited prototype scale; second, other commercial operators and their workers are trained to spread the innovation within a community large enough to sustain the operation. In addition to center-based training and extension-based technical assistance, these transformation interventions require a unit to research and develop the new technology, an incubator unit to refine and adapt it for commercial use, credit, marketing assistance, and possibly policy changes. Because of the complex coordination involved, transformation interventions appear to be appropriate only if the individuals being targeted possess the required combination of personal qualities and if all the necessary inputs are present or certain to be provided.

Potential clients often have more formal education, experience, or innovative flair than the average small business owner. Many applicants tend to come from the ranks of retired or recently unemployed civil servants who may or may not own a small business but seek a new means of earning a living. Ideal candidates appear to be owners of existing small industries who have already demonstrated their entrepreneurial potential or the capacity to understand and the willingness to adopt new technology and more sophisticated business management skills. Owners of existing enterprises may already have the self-employment experience and the necessary technical skills that prospective entrepreneurs may first have to acquire through something resembling preemployment skill training.

The need for training as a component of these transformation programs seems to be strong. New technology and organizational innovations can play a transforming role only if they can be adopted and diffused on a truly commercial scale, and this diffusion can occur only if the human factors associated with the innovation are developed alongside the technology. Entrepreneurs in these programs thus need to be taught how to mobilize resources for purchasing equipment, tools, and raw materials; coordinate technology and work skills; establish and maintain necessary standards of quality and output; and identify and supply markets for any new products or services that may be generated. Although the more basic business skills relevant to expanding an enterprise apply here, the management and organizational skills implicit in these functions clearly involve a more complex and demanding level of operation.

The Birla Institute of India (Box 8-7) and the Technology Consultancy Centre in Ghana are two of the organizations that operate successful transformation programs. At the same time, many other intervention programs have found it difficult to convert successful laboratory innovations into commercial-scale industries (Gamsler and Almond 1988;

Box 8-7. Birla Institute of Technology in India

The Birla Institute of Technology and its spinoff organizations, the Birla Institute of Scientific Research and the Small Industries Research, Training, and Development Organization, assist entrepreneurs in turning technology developed at the institute into successful commercial operations. The institute's innovative technologies span a range of products including roof trusses, grills, coal feeders, motor housings, control devices, chemicals, and pharmaceuticals. Other efforts have attempted to revive ailing industries.

The institute's approach includes three components: training entrepreneurs, developing and promoting profitable small firms, and developing a research and development model that can be replicated elsewhere. Beginning with only four entrepreneurs in 1978, the program put seventy-five entrepreneurs through its three entrepreneurial courses in the next two years. Forty-seven of these have started small businesses of which all but two are thriving. Success is attributed to the highly practical nature of the technical courses, the extended training at the "nursing" stage, and the emphasis on developing a new class of "techno-entrepreneurs" who are more concerned with solving technical problems than with profit.

Twelve prototype industrial units have been developed, each of which employs an average of fifteen workers, and have been able to produce high-quality goods at prices lower than those charged by larger Indian factories. Although profits were low or nonexistent in the early years, most firms now turn a profit. The replicability of the model is uncertain at this point, but similar research and development units are now in existence or under development.

Source: Carr (1981).

Tiffin and Osotimehin 1988). In Nigeria, for example, a number of new agricultural technologies have been developed, but less than a handful have moved beyond field testing to even the small-batch production stage and fewer still have been commercialized. Similar results have occurred with Kenya's effort to breed small but technologically innovative industries. The government's massive financial and technical support to industrial estates has resulted in the creation of only 102 small industries over eleven years, and these involved mostly conventional industries using simple technology. Despite being buffered from almost every risk, the entrepreneurs who participated in the industrial support programs have shown remarkably little capacity to sustain innovative ventures even in the short run. The government's willingness to assume all the major financial risks and perform all the essential functional steps in getting the industry off the ground, rather than devolving them to the entrepreneurs themselves, has been cited as the cause of the unduly high

failure rate of new industries. In particular, the government has been blamed for failing to acknowledge the gross inadequacies in the participants' routine management ability and for placing unrealistic expectations on the innovation itself.

Several explanations have been advanced for the general failure of transformation programs to fulfill the mission expected of them. Some small operators are simply averse to assuming the risk of adopting a new technology, especially if it involves making a new product for which the market demand is unknown. Part of the problem seems to lie in the relationship between the unit that develops the technology and the entrepreneurs expected to adopt it. Development units are usually part of a scientific or academic setting that is far removed from the vagaries and the risks of the informal sector. Informal sector operators may suspect that the innovation may not be as viable in their own workshops as it is in the closely monitored industrial nursery where equipment malfunctions and technical glitches are eliminated by teams of engineers and technicians and ample stocks of raw materials are maintained by educated officials with political clout.

The evidence shows, however, that the failure of many well-supported small businesses can be explained more by internal management factors than by factors external to the firm's operation. This finding suggests the importance of training in mastering both the technical aspects of the innovation and the managerial skills needed to assimilate the technology on a commercial scale.

Even when successful, transformation-oriented programs are expensive to operate. A large part of the cost supports the group of engineers, scientists, and technicians who develop, test, and refine the technology. Costs also increase if innovation relies on expensive imported equipment and raw materials or requires a lengthy research and development process. Finally, the task of diffusing innovative technology among commercial producers requires the program to hire an expert who both comprehends the technology and the human dynamics of its successful adoption; such experts are relatively scarce and therefore command high salaries.

Costs of Sponsored Interventions

Obtaining accurate data on the costs of specific intervention programs is still problematical. Although many sponsoring organizations now conduct evaluations that include unit costs of their support programs, these figures are not always released to the general public, nor are cost-effectiveness analyses conducted. Moreover, the simple per-participant cost figures for training that are reported do not always include the full cost of other components of the intervention. Projecting the costs of

future interventions from the costs of existing programs is at best a rudimentary exercise. Furthermore, because of the great variation in their purposes, designs, and client groups, the costs of specific programs cannot easily be compared. A seemingly minor variation in a design feature may result in a significant difference in the results of two generally similar programs.

Nevertheless, it is possible to make comparisons of cost averages among general *classes* of strategies. Data compiled for thirty-six USAID-funded projects show that the average cost per beneficiary was \$948 to create a new enterprise, \$575 to expand an existing enterprise, and \$2,549 to transform an enterprise (Boomgard 1989).

It should be borne in mind that these figures include not only training costs but the costs of other inputs; in some cases, training was not part of the intervention. Despite this qualification, training and technical assistance appear to have added to the high costs of the business formation and transformation programs. All five of the formation programs and eleven of the thirteen transformation programs evaluated included training and technical assistance while only nine of the eighteen expansion programs offered this component. These data might lead one to conclude that the qualitatively different processes of initiating or transforming an enterprise—especially the latter—involves significantly more one-on-one monitoring, nurturing, and ongoing consulting than does expanding an enterprise.

The cost behavior of informal sector training interventions seems to follow a general rule of thumb: costs increase as the intervention moves out from an urban center, deals with disadvantaged groups, provides more than training, and seeks to initiate or transform, as opposed to expand, an enterprise. Costs also vary depending on the program's stage of development. An intervention that is still an experimental prototype has a higher per-participant cost than a refined, production model.

The benefits of offering training must be weighed against the opportunity cost of not using the same resources to provide some other input—notably credit—that may contribute more directly to achieving the desired development goal. This is hardly a trivial matter when resources are scarce. Except to assist disadvantaged entrants to form businesses or proven entrepreneurs to transform their operations, one school of thought argues, the benefit-to-cost ratio for training of any sort will be lower than simply turning over those same resources to small operators in the form of a cash grant or credit (Harper 1988). According to this view, credit, more than any other intervention, may be the "single missing ingredient" that can make the difference between success and failure, at least for those interventions designed to expand enterprises.

Implications for Public Policy

The sheer diversity of employment conditions, skill requirements, and alternatives for skill development in the rural and urban informal sectors makes the development of training policy extremely complex. Insufficient research and evaluation, especially regarding training for rural and urban self-employment, makes the task even more imposing. Yet these are the sectors where most developing country citizens earn their livelihoods and where poverty is most widespread and persistent. Policy is needed, and effective programs are needed even more. But public policy does not necessarily translate into public provision of specialized training. Indeed, the evidence suggests broadly that targeted training, whether provided publicly or privately, is most productive when it is buttressed by two fundamental policies: one that creates a supportive economic environment and a second that improves access to, and the quality of, education.

Creating a Supportive Economic Environment

The first policy is one that creates a supportive economic environment. The viability of rural nonfarm economic activities, for example, are dependent on agricultural prosperity in general. In the lower tier of the urban informal sector, market saturation in stagnant economies can threaten successful entry into self-employment. Lack of credit and other inputs and excessive government licensing and regulation can constrain the establishment or expansion of more productive, upper-tier enterprises. These barriers not only limit the access of socially and economically disadvantaged groups to better incomes, but they are often accompanied by overt and subtle forms of discrimination, especially against women, that make the climb out of poverty even more difficult. For training policy and interventions to be effective, these barriers must be addressed.

Improving the Availability and Quality of Basic Education

The second policy is to improve the availability and quality of basic education. This is arguably the single most important human resource development contribution to rural and urban informal sector productivity. Completion of basic education is especially important for socially and economically disadvantaged groups; their ability to develop skills and generate income is significantly handicapped when they are denied equal access to basic education. This is especially true for women, and more so for female farmers, but it is also true for the very poor generally.

Access alone is not enough. The quality of basic education is also important. Investments in the quality of primary education can have substantial payoffs (Lockheed and Verspoor 1991). In particular, school science curricula need to emphasize application of concepts and theories to problems and tasks in the local environment. Where literacy levels are low, especially among younger adults, compensatory education programs offer a low-cost way to improve employability and productivity. Government financing is clearly justified on equity grounds, although provision of basic education by nongovernmental and community organizations with insight into the needs of the disadvantaged may in some cases be the most effective delivery mode.

Providing Complementary Training

Skills are also important. But the evidence suggests that training is most effective when closely tailored to the needs and employment conditions of clearly specified target groups. Training contributes when it is a supportive element of a more comprehensive strategy that takes the environmental factors into account. Existing mechanisms, such as traditional apprenticeship and agricultural extension services, provide a great many of the skills needed in the rural and urban informal sectors.

Where these mechanisms are in place, there is thus no *a priori* case to be made for specialized training interventions. Because many rural and informal sector workers may not have access to these modes of training, however, other options must be explored. The evidence suggests that higher priority should be given to those policies that make the best use of existing training capacity and that are likely to have the greatest equity impact. Thus, marginal use of formal vocational institutions should merit careful consideration. Sponsored interventions are more risky, though there is a stronger case for some than for others.

In the rural sector agricultural extension deserves high priority as the human capital investment that can best improve the productivity of small farmers and increase rural incomes, the two factors that are fundamental to increasing opportunities for rural self-employment. Direct training interventions to stimulate rural self-employment are unlikely to be cost-effective where agricultural incomes are depressed.

Rural vocational schools can effectively train for self-employment where curricula are closely adjusted to local employment opportunities. This requires a relatively high degree of institutional autonomy in curriculum development. Schools run by nongovernmental organizations appear to have advantages in this respect. Standard trades courses tied to urban occupations and trades tests are less likely to be effective.

Policymakers should recognize, however, that the pull of higher-paying urban work poses a major threat to the effectiveness of these institutions.

In the urban informal sector training is likely to be appropriate or feasible only when a precise client group and a development goal have been identified. Moreover, training should be included in an intervention only when it appears to have a comparative advantage over other inputs, is a necessary component of a comprehensive support package, or contributes to an important equity objective. Although glaring skill deficiencies do exist in informal sector operations, especially compared with the more efficient modern private sector, the apparent shortfall of skill does not necessarily portend a problem for the deficient individuals nor a demand on their part for remediation of those deficiencies.

The skills needed for productivity in the informal sector are often efficiently acquired through traditional apprenticeship. Where this form of training is underdeveloped, governments may wish to consider alternative or additional approaches to training. The need to manage costs suggests that first priority be given to better use of existing vocational education and training institutions. Sponsored interventions are more risky, but careful investment may be warranted, especially to expand existing small enterprises.

FORMAL VOCATIONAL INSTITUTIONS. The evidence indicates that the flow of graduates of formal vocational institutions to the informal sector may be increasing. Corrections in policies that artificially raise formal sector wages may further increase this flow as incentives to wait for formal employment are reduced. Although it is often argued that the level of training, technology, and specialization of formal courses is inappropriate for the informal sector, it is undoubtedly the case that individuals can adapt their skills to the demands of the small firm. The principal issue is thus one of costs and benefits. The high costs of long formal programs, combined with comparatively low earnings in the informal sector, are likely to lead to low net returns.

Shorter, more intensive programs are a different proposition. The research indicates that the educated self-employed worker will take advantage of these courses and that they increase earnings, with the effects greater for those with less education. Formal institutions can be encouraged to provide such training at times convenient for informal sector workers. Formal institutions probably have a particular advantage in training for technical skills in the basic trades and crafts. Although it may be desirable to tailor courses to the level of technology in informal sector firms, the additional costs may not justify marginal gains in training effectiveness. Low-cost courses in business management would

also be appropriate, but instruction should be tailored to the needs of small firms. A training unit dedicated to this purpose might thus need to be established. In some cases, it may be more effective to allow NGO and community training organizations to use the facilities of formal institutions for course delivery.

SPONSORED INTERVENTIONS. As discussed earlier in this chapter, traditional apprenticeship does not always meet individual demand for training, and even the short courses offered by formal vocational institutions are not accessible to the very poor, those with low levels of education, and those not in close proximity to a school or center. In many countries, additional interventions will be needed if training opportunities are going to be equitably available. For sponsored interventions, however, the base of information for policy and practice is less certain.

Basic education is likely to be the most cost-effective investment for the educationally disadvantaged seeking entry into income-generating activities. Interventions aimed at this group of people may need to include compensatory education aimed at increasing employability. These programs should also take into account the need for many participants to earn some income at the same time. The diversity of circumstances, urban and rural, and the need to deliver services in flexible ways suggest that small programs provided by NGOs and community organizations will be more effective than large-scale government operated programs.

Skills training alone is less likely to enable the poor to successfully enter urban informal sector employment than more complex programs that include credit, technical advice, and similar inputs. Costs can be very high, and although some income-generation programs in rural areas have been successful, little is known about the cost-effectiveness of these strategies generally. Cautious experimentation is the recommended line of action, with government playing a supportive financing role but not taking a direct hand in provision.

Integrated small business development programs aimed at helping educated clients set up their own business activities have been effective in several countries. The key elements of success are careful selection of trainees, and a combination of market analysis, technical skills development, business and management training, access to credit, and technical support during the start-up phase. These programs contribute to employment of the disadvantaged principally through job creation. A high level of specialized expertise is needed to establish and maintain this sort of intervention program, and successful programs are thus most often found in specialized institutions. The complexity of the programs suggests that they are unlikely to be effective as add-on efforts in vocational schools and training centers. Small market size and little demand may

also limit their effectiveness. Close monitoring of the business success of graduates is thus necessary to adjust the products and business objectives as markets become saturated.

The record for "training only" strategies is mixed. Youth brigades can be effective if they are community-based and if there is strong leadership. In other circumstances, they have been less successful. Small training operations that lack complementary inputs have been even more problematic. Thus, while a case can be made for youth organizations (and these can be socially and politically very important), other stand-alone training strategies are much less promising.

Strategies to expand or transform existing businesses focus primarily on their owners, who are likely to have comparatively high levels of education, technical skill, and income. They are thus better able to take advantage of a variety of in-service training opportunities, and the record suggests that training in management, not technical, skills would be most appropriate. These individuals are thus potential customers for public and private in-service training opportunities. Cost-recovery policies would be appropriate for this clientele. In general, sponsored training interventions are less important to this group than are credit and access to technical information. Training that is embedded in credit programs is likely to be adequate, although there may be local exceptions.

Improving the flow of technical information to owners of small manufacturing and repair enterprises has received comparatively little attention. Yet educated entrepreneurs are undoubtedly able to use such information effectively, as their participation in a variety of in-service training programs demonstrates. Some thoughtful experimentation on means to increase access to product and process information (newsletters, small enterprise associations) seems worthwhile.

The diffusion of technology adapted to the needs and abilities of entrepreneurs in the informal sector has been difficult. Links between the research and development organizations and the potential users of the technology appear to be particularly important. The record suggests that, where these links are strong, where educated informal sector entrepreneurs have access to credit and technical information, and where regulations do not restrict initiative and competition, technological innovations might be successfully marketed, as opposed to diffused through purposive programs. Technology development organizations that have to sell their products to small entrepreneurs are likely not only to pay more attention to feasibility issues, but also to package innovations with the most efficient amount and type of training.

PROGRAM IMPLEMENTATION. The diversity of client groups and work environments, as well as the systematic and significant differences be-

tween training for informal and formal employment, indicate that training programs aimed at the informal sector need to be highly flexible. Consider, for example, the different requirements of compensatory basic education for the very poor, targeted programs of income generation for women, and small business development programs for educated individuals seeking to start a business. A top-down, centralized program approach is much less likely to be effective in meeting these needs than a strategy that emphasizes decentralization and institutional autonomy. Nor is it entirely clear that formal vocational training institutions oriented to the modern sector have the expertise needed, especially for more complex small business development programs.

Nongovernmental and community organizations have compiled a good track record in administering sponsored interventions. In many cases government support of such interventions offers an efficient alternative to programs directly administered by public authorities. There is a clear equity case for government financing for such programs, but governments must take care not to impose too much central control. Whether governments should also provide training or administer small business development programs depends on the institutional capacity of training and development organizations. Financial support for these organizations through government training grant programs may well be a more efficient model than direct government administration.

Summary

The idea that preemployment vocational education or training can contribute significantly to alleviating poverty does not appear to be substantiated, except in the most advanced developing countries. Even there, this strategy is likely to be effective only if the general characteristics that make preemployment training effective are in place, as discussed in Chapter 6.

Improving the earning power for the poor and for women is, in the first instance, a matter of creating a supportive economic environment. Demand factors are crucially important. Improving access to better quality basic and secondary education is the most important policy on the supply side.

Training is also required in the rural and urban informal sectors. Training should complement other inputs critical to generating income and creating jobs, should be adapted to the opportunities and needs of clients, and should be extremely flexible in administration. Governments can play a useful role in subsidizing and stimulating training of this nature. Nongovernmental organizations can play important roles in program delivery.

Part III

*Strategies
for Policy Reform*

9. *Planning for Policy Reforms*

Throughout the world a consensus is growing on the need to focus training on efficient responses to economic change and to strengthen the role played by employers and private training organizations, objectives that most existing training policies and institutions do not address (Box 9-1). The challenge is to move from policies dominated by social and supply objectives and programs financed and provided by governments to policies and programs that respond to market forces and promote employer and private training, and that establish appropriate complementary and supportive roles for the state.

Many countries will need to undertake sustained reform efforts to meet this challenge. Fortunately, the experiences of others offer a rich source of ideas about those approaches most likely to be successful. Translating these ideas into effective policy and institutions requires strategies to develop and implement policy reforms. This chapter outlines both the strategies and the range of analytical techniques that are useful in planning for policy and institutional change.

Developing Policy Strategies

The analytical base for training policy and investments has traditionally included an assessment of skills demand, most often through a manpower requirements forecast, and a plan for expanding skills supply, generally through construction of public training institutions. Though useful in some respects, this kind of analysis misses completely the more dynamic aspects of the economic environment, including distortions in incentives for employers and workers to invest in skills training. It also ignores the actual and potential contribution of employer and private training.

An expanded analytical approach is necessary to develop integrated strategies that address both the economics of skills demand and the

Box 9-1. A Call for Training Policy Reform in Sub-Saharan Africa

In May 1990 ministers and senior policymakers representing labor, education, and vocational training from sixteen Sub-Saharan African countries met in Turin, Italy, to identify major issues confronting them in vocational education and training, to formulate priorities, and to propose a framework for improved coordination between national reform strategies and international donor assistance.

Most participants agreed that existing vocational and technical education and training had not met their countries' skill needs efficiently. Past expectations that skills training could effectively combat high unemployment had largely been abandoned as unrealistic. Rigid administration and severe budget constraints had reduced the quality of training and impeded responsiveness to labor market opportunities. Most countries lacked a strategy for balanced development of public and private training systems.

Four main policy conclusions were reached. First, training policy should shift its emphasis from achieving social objectives to meeting the demands of the labor market. Second, conferees recognized the importance of establishing a macroeconomic environment conducive to job creation. Third, cooperation between government, the private sector, and labor organizations should be improved to strengthen both the financing of training and the efficiency with which training resources are allocated. Fourth, international assistance agencies were called on to respond flexibly to nationally developed strategies for reform, including enhanced cooperation between developing countries.

Source: ILO (1990a).

dynamics of training supply in the private and public sectors. A comprehensive and detailed methodology cannot be developed at this stage, nor is such a methodology necessarily desirable. The conditions of analysis vary enormously across countries, depending particularly on the size and complexity of the economy and the training system and on the availability of information. Moreover, there is considerable scope for innovation in the development of methods and approaches.

However, a general framework that identifies the key questions and the kinds of information needed to answer them may provide a useful starting point. There are three crucial policy questions. What is the economic context of employment and skills demand? How extensive and effective are the various forms of training? Are current training policies and planning practices able to adjust training supply to a

changing economic context? Answers to these three questions form the basis for building a country's policy strategies.

Analyzing the Economic Context

Establishing market-oriented planning capacity is a first objective of policy reforms. The analytical techniques of this approach should also be used to analyze the economic context in which training will occur.

The elements of a market-oriented approach to planning for skills training have been developed in Chapter 5. Traditional manpower requirement forecasts need to give way to a range of labor market analyses that produce information needed to guide private training decisions, identify impediments to competitive labor markets, improve the management of training systems, and determine the most appropriate roles for the government. Labor market signals and education and training qualifications become the key tools in planning. Strong analytical links between economic planning and training planning will help identify the effect of economic policies on incentives for investment in training; where these incentives are distorted, this analysis helps determine an appropriate pattern of public intervention to ensure an adequate supply of skills.

Three main questions should be asked about the economic context of training in developing initial policy reform programs. What skills are likely to be needed over the medium term, say, three to five years? What kinds of jobs are likely to be available if rapid structural change in the economy leads to large-scale dislocation of workers, and what is needed to move workers into them? How do social and economic policies affect incentives for both individuals and employers to invest in skills training?

For preemployment training, anticipating the need for skills is a matter first of anticipating structural shifts in the economy, caused by both external and internal factors, and then forecasting the effect these shifts will have on employment growth in different subsectors and industries. External factors include patterns of international trade and changes in the technologies of production. Growth trends in the economy as a whole, and in specific sectors and industries, provide important indicators of probable changes in employment patterns. Additional internal factors include economic policies, such as the degree to which protectionist measures shield the economy from competition, and strategies, such as those that target specific industries or sectors for accelerated growth.

If labor has been dislocated by rapid structural change, the analysis must be extended to identify sectors and industries where the potential for labor absorption is highest in the near term. The geographical location of jobs likely to be available and their requirements for education

and training must then be identified. Although this analysis cannot be precise, enterprise surveys and case studies of industries that are attracting new investment can indicate the demand patterns for skilled and unskilled workers in different regions. The potential for self-employment or small business development as mechanisms for productive redeployment of dislocated workers should be also investigated. Equally important is analysis of the characteristics of displaced workers. Do they have other sources of income, such as family farming, that can support them during a job search, relocation, and, where needed, retraining? What levels of income maintenance are required for survival? What kinds of education and training do workers have? What training needs emerge when existing competencies are compared with likely opportunities?

A first step in mapping the impact of economic and social policies on employment and training is to catalog existing policies that affect employers and workers. This analysis requires examination of legislation, most notably labor codes and regulations, as described in Chapter 3. The second step is to determine the actual effect of these policies, particularly how actively they are enforced. Surveys of employers and workers and assessment of the enforcement capacity of labor market institutions can develop this information. The third step is to determine the likely benefits and costs of proposed policy reforms. Will the reform improve training efficiency? Are there political costs that must be considered? If policy change is not feasible, the analysis can guide the design of appropriate compensating public policies.

Evaluating Training Supply

Much traditional analysis focuses on evaluating the supply of training, although most of it concentrates on training offered by public institutions. Policies would be improved if all sources of training—employers and private and public training institutions—were analyzed.¹

MAPPING SOURCES OF TRAINING. A crucial ingredient in formulating training policy is a comprehensive view of the various ways in which workers acquire skills. What is the relative share of training provided by employers and by private and public training institutions? Occupational mapping studies plot the sources of skill acquisition for current workers in the modern sector; in-depth surveys supplemented by intensive studies of enterprises of different sizes and kinds serve the same function for the informal sector (Box 9-2). Another source of information comes from those trades testing agencies that routinely collect information on individual training backgrounds. These data on sources of skills can be balanced by data on enrollments in and graduation from public and private training institutions of different types and levels.

Box 9-2. Occupational Training Maps

It is not uncommon for some sources of training to be overlooked when the type of training required for a specific occupation is considered. Occupational training maps, which systematically outline the available training paths, help overcome this narrow vision. Their use is especially valuable in the informal sector where skill acquisition comes from many sources.

Data collection for occupational training maps may be obtained through household surveys. To contain costs, appropriate training questions can be formulated and attached to a survey already being undertaken for a different purpose. A subset of the population may be used. The household survey is the preferred method because it allows countrywide information to be collected, reveals training paths to different types of employment, and covers many industries, but because a large sample must be taken to obtain an adequate number of responses, household surveys may not always be feasible or affordable. In that case, a reverse tracer study, focused on workers employed in those occupations of interest, is an alternative (and more frequently used) approach. Reverse tracer studies are less costly than household surveys and are comparatively easy to carry out quickly. Depending on the size structure of the sample of firms, however, the results may be limited to certain sectors, industries, or types of firms. In either approach, the following questions should be asked:

- What is the respondent's current occupation, wage, and gender?
- What levels and types of education has the respondent completed?
- What kinds of training have been undertaken? (Multiple responses are allowed, and both formal and informal training are considered.)
- Which types of training have been most useful?

An advantage of the reverse tracer study based on firms is that it facilitates the surveying of managers and supervisors, eliciting their opinions regarding the relative effectiveness of workers in similar jobs but with different types of training backgrounds. Examples of occupational training maps for Colombia are provided in Ziderman and Horn (1992); see also Box 1-2.

Mapping in the informal sector requires additional information on the capitalization and products of the enterprise, on traditional apprenticeship, and on the nature of previous wage employment.

Sources: Dougherty (1988); Birks and others (1992).

EMPLOYER TRAINING. What is the extent and quality of training by employers? This assessment should cover both public and private employers. In the public sector the training operations of ministries and state-owned organizations should be inventoried, and the outcomes and costs assessed, with the objective of determining both the capacity to

train and the extent to which trained employees are moving to other sectors of the economy.

Training by private employers in the modern sector can be assessed through enterprise surveys that obtain information from managers and workers. These surveys may be integrated with occupational mapping exercises or conducted separately, using the results of mapping exercises to identify areas of strength and weakness in employer training. They will normally be sample surveys, with the structure of the sample determined by key issues. Sampling criteria thus may include the size of the firm as measured by capitalization and number of employees, geographical location, the presence of foreign investment, whether the firm produces for export, and the nature of technology in use. Information should be collected on personnel practices, occupational and wage structures, procedures for personnel evaluation, and the type and duration of training provided to workers at different levels of skill. Even though true estimates of training costs are difficult to obtain, the effort should be made. The effect of training on productivity, as reflected in post-training job assignments and wages, should be assessed where possible.

Many countries gather a great quantity of information through routine establishment surveys, which can often be strengthened by modifying instruments and analysis procedures. More intensive case studies of a smaller number of enterprises, selected for important characteristics, can supplement survey data or, if large surveys are not feasible, provide a useful—if partial—view of training by private employers.

TRAINING INSTITUTIONS. Three basic questions should be asked regarding private and public training institutions. What are their costs and benefits? What is the quality of their training? What are the constraints on improving flexibility and efficiency in different kinds of institutions? Much can be learned through thoughtful and well-organized visits to training institutions. If there are too many institutions to visit individually, stratified samples should be chosen to include institutions of different types in a range of locations. If prior information on the effectiveness of institutions is available, both highly effective and less effective ones should be visited. Data gathered through observations can be used directly and as the basis for designing surveys to develop information on a larger number of schools and training centers.

Measuring the benefits of training consists primarily of gathering data on post-training employment and earnings.² Tracer studies are the most common way to collect this information, but other approaches are possible. Social security records can be used to trace post-training wage employment, for example (Ziderman 1989). Household and labor force surveys may also provide information that permits estimation of earnings for individuals with different training histories.

These methods are most useful for measuring societal benefits where wages are competitively set, thus reflecting the marginal productivity of the trained worker. They are less accurate where wages are separated from productivity, for example, in public employment with artificially compressed wage schedules; however, the methodology of shadow pricing can enable the analyst to adjust wage information to reflect productivity. And wages do not fully reflect the external benefits of training, such as benefit derived when trained workers teach their skills to co-workers. Although not entirely satisfactory, using wages as a proxy for the effect of training on productivity is nevertheless an acceptable device for estimating societal benefits. Finally, placement rates by type of training can provide a measure of demand for workers with specific qualifications, although not necessarily of the value of training in improving productivity.

Cost data for different kinds of training are the other essential element of cost-benefit analysis, with the unit cost per student year or per graduate being the best measures. These costs include annual recurrent costs, the depreciated costs of facilities and equipment, and the opportunity costs to trainees of earnings forgone during training. (Technical issues are associated with calculating depreciation, measuring the opportunity costs, and differentiating between private and social costs.) Care must be taken, however, because comparisons of the unit costs of different modes of training and of institutions of varying size may be extremely misleading (Box 9-3).

Underutilization of training capacity is a principal cause of high unit costs. Here a number of measures may be used, including traditional measures of drop-out and repetition rates. Other ratios, such as the proportion of available workshop time actually used and number of student years of instruction delivered as a proportion of theoretical capacity, provide useful indicators on utilization.

Improvements in productivity attributable to training can be measured directly or by examining the earnings differentials between employees with different levels of qualification. Employment rates for graduates provide a complementary indicator. Trades test results are a useful indicator when the tests measure achievement of the objectives of the curriculum and when the curriculum is adjusted to the demands of the workplace. When these characteristics are missing, trades test results are less reliable. Employer opinions can also offer insight into the quality of training, and questions on this issue can be built into enterprise surveys. Care should be taken, however, to obtain information from supervisors: senior managers may not always be well informed about the relationships between worker training and productivity. In large modern enterprises it may be possible to develop information from personnel records and performance evaluations. In general, analysts

Box 9-3. Comparisons of Unit Training Costs

The *expenditure method* for measuring the unit costs of training is usually relevant only for institutional training modes in the public sector, not for enterprise or on-the-job training. In this method total expenditures by all parties (mainly the government, but also others such as trainees or their parents) are aggregated for a particular form of training, say, that which occurs at vocational schools. Aggregate expenditures are divided by the number of trainees to give a unit (or average) cost per trainee; alternatively, unit costs for course completers can be computed. Expenditure-based cost estimates of this type offer little guidance about the relative cost of alternative training modes. They do not show planners whether the mean value for unit costs is typical of institutions in a given training mode or whether unit costs vary widely from institution to institution.

The *microdata* method of unit cost estimation, based on accounting data for actual training institutions, may appear to correct for these deficiencies. But the particular institutions surveyed may not be typical of all institutions of that type. For one thing, unit costs for vocational education and training vary with the scale of training. Cost functions are the appropriate technique for probing issues of economies of scale. Unit cost comparisons for alternative modes of training may indicate differences for a number of reasons, including the method of instruction (whether, for example, it uses more or less capital-intensive techniques), the extent that training facilities and equipment are underutilized, and the scale of training.

Unit cost information on alternative training modes, even when based on micro-accounting data, may not provide hard information about relative costs. Consider the unit cost information relating to two different types of training institutions, depicted in Box Figure 9-3a. Is training mode *B* of lower cost than mode *A*, as appears to be the case?

To answer this question, broader information on the underlying average cost function for each mode is required. As illustrated in Box Figure 9-3b, the average cost function shows how the unit cost of training varies with the size of training institution because of economies of scale. Thus at position *x*, unit costs could be lowered if the size of the training institution increased, as at *y*. Theoretically, *dis*-economies of scale (and higher unit costs) could set in (as at position *z*), if the training institution grew too large and became unwieldy. In this case economies could be achieved by a more intensive utilization of the facilities, but these economies are more limited than those associated with scale.

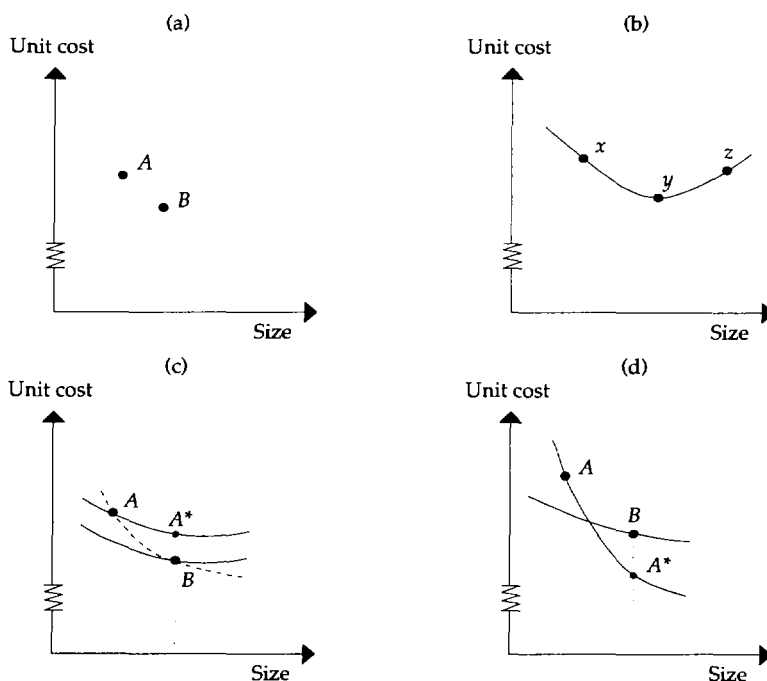
The importance of identifying the average cost function is shown in Box Figure 9-3c. If *A* and *B* lie on a common cost function (as depicted by the dashed curve), then *A* is not intrinsically more costly than *B*. Rather, the issue would be one of increasing the typical scale of mode *A* institutions which in turn may require identifying any factors that may constrain growth in size of *A*. On the other hand, *A* might lie on a higher (more costly)

cost function than *B* (as shown by the two solid curves). Even if the typical size of *A* could be increased to that of *B*, taking advantage of scale economies (*A**), it would remain the more costly mode.

Box Figure 9-3d also shows different average cost functions for *A* and *B*, but the function for *A* is more strongly subject to economies of scale than the function for *B*. In this case increasing the size of training institution *A* to that of *B* would lower unit costs for *A** to below those of *B*.

Finally, even if the underlying costs structures are like those described by the solid curves in Box Figure 9-3c, they should not be accepted at face value as favorable to mode *B*. The central issue is why the average cost function of *A* lies above *B*. The average costs functions may differ because mode *A* is intrinsically more costly. But it is also possible that the average cost function for mode *A* reflects inefficiencies that, if corrected, could send the curve downward, as depicted in the lower solid line in Figure 9-3c. Alternatively, *A* may be costly simply because it provides training of higher quality than *B*; this fact would be identified only in a broader comparison of relative benefits and costs of *A* and *B*.

Box Figure 9-3. Interpreting Training Costs



should seek to combine information of various kinds to reach a judgment on training quality.

Measuring the availability of inputs alone is not a satisfactory indicator of quality but, in combination with measures of output, can yield insights into causes of low quality. As with all education operations, teacher-student ratios, the amount of time learners spend on tasks in different areas of study, the availability of texts and other training materials, and teacher qualifications and experience should be assessed. For workshop training, the quality of equipment, practice materials, and maintenance are additional indicators.

The ability of training institutions to respond to skill needs with good quality training is central to efficiency. Are public (and private) institutions adequately financed? Are salaries for instructors and managers sufficient to attract and retain good staff? Do institutions, central training authorities, or private agencies have the professional capacity to develop and revise curricula? To experiment with instructional innovations? Are the information links between employers and trainers well developed? Do they include vocational guidance and placement services, advisory councils, and testing and certification systems? Are institutions able to specialize in the training needs of local industries or subsectors of the economy? Do institutional managers have the authority to modify enrollments and courses of instruction to meet local needs? Can they retain earnings from sale of training services to invest in institutional quality?

Also important are questions about the efficiency of the public training system. Has it been overexpanded, creating opportunities for consolidation into fewer, better quality institutions? What costs would be associated with consolidation? For example, would redundant staff have to be retrained and placed elsewhere? Can the efficiency of instruction be improved by reducing the length of training, developing modular courses, or establishing dual training systems?

Assessing Training Policies and Planning

After the economic context and the provision of training have been evaluated, attention can turn to an assessment of existing training policies and planning practices. The key question here is whether these enable training supply to adjust to a changing economic context. This analysis should take into account the following considerations.

POLICY EVOLUTION. Before attempting reforms, it is advisable to know how existing policies and institutional arrangements came about, if only to identify groups in society with special interests in training policies and institutions. Among the key questions: Why have present training policies been established? Have there been previous attempts to change

policies and institutional arrangements? Did they succeed or fail? Why? What roles have international assistance agencies played?

TRAINING GOALS. For preemployment vocational education and training, the principal issue is the degree to which training is justified by supply objectives. If preemployment vocational education is overtly addressed to reducing youth unemployment, diverting youth from higher education, or reducing poverty, the analysis must assess the extent to which training has been effective in achieving any or all of these goals. Under favorable economic conditions, the external efficiency of preemployment training may be high, with achievement of these goals a byproduct of training that is closely linked to labor market demands in an expanding economy. The analysis should focus on the real contributions of training to these social objectives, seeking to separate them from the more important effects of employment growth. For example, most graduates of vocational schools may be getting jobs and thus policymakers may assume that poverty is being reduced; however, many vocational students may not have been poor in the first place. Under unfavorable economic conditions, preemployment vocational preparation is not likely to achieve social objectives. This, however, needs to be well documented so that policymakers can justify a change in goals, not only among themselves, but also with the public.

FINANCE AND PROVISION. What rationales justify current policies on public finance and provision of training? Market imperfections? Externalities? Weak private and employer capacity? Equity? Are these policies economically appropriate in the given economic context? Is cost-recovery from employers and students encouraged; if the latter, is it equitable?

PUBLIC POLICIES ON PRIVATE TRAINING. The effectiveness of any public policies designed to encourage training by private employers should be evaluated. Are training subsidies leading to repackaging of training that firms would otherwise provide without reimbursement? Are training funds being used effectively? Are training extension services reaching small and medium-size enterprises?

Similarly, the nature of government policy affecting private training institutions should be assessed. A review of licensing, tuition control, and curriculum regulations for private schools is an obvious first step. The views of private school owners and managers should also be taken into account; these can sometimes help identify policy constraints that are less than obvious. For example, until recently, schools in Thailand were forbidden to operate job placement services, this function being reserved to the Department of Labor. The effectiveness of any existing subsidy programs for private schools should also be examined.

Public policy toward nongovernmental organizations (NGOs) also merits scrutiny. Are there rules that limit their operations? Are positive policies, such as subsidies or incentives to participate in large development projects, effective?

PLANNING APPROACHES. Current approaches to planning need to be assessed and new approaches considered. Are economic and training policy and planning well integrated? Are manpower requirements forecasts used to establish targets for the education and training system? How are they developed? Are they accurate? If other approaches are used, what are they and how effective have they been?

The nature and quality of systems for collecting labor market information and monitoring training should have high priority in this part of the analysis. Labor market information comes from periodic labor force surveys; surveys of enterprises in specific sectors, industries, or geographic locations; household surveys; records on vacancies and placements in employment exchanges; and job vacancy advertisements. These sources generally vary in accuracy, timeliness, and comprehensiveness; thus several sources should be used to develop a picture of employment trends and current conditions. Information on training outcomes is most often obtained through tracer studies.

The capacity of various institutions to perform these functions should also be assessed and steps identified to improve the quality and timeliness of information for planning and management. These institutions include the national statistical services and research institutes as well as formal labor market and training monitoring units within public ministries. Organizations charged with monitoring public employment, such as civil service commissions, should also be included. The key questions are: What data are produced, and when? What is the capacity for survey research, data retrieval, and analysis? How are reports disseminated? What formal or informal links exist between these organizations and units charged with developing training policy? If formal data development systems are rudimentary, what is the potential for development of informal methods, such as analysis of vacancy rates and employment advertisements? Are data routinely collected on training costs and outcomes and on social demand for training?

The routine planning and budgeting procedures of public training systems should be included in the assessment. How are enrollments determined? How are the budgets for individual institutions established? What are the incentive or disincentive effects of the budgetary process? For example, allocation of budgets on the basis of the number of students enrolled encourages expansion irrespective of employment prospects. How are institutions held accountable for outcomes in the budgetary process?

Building Policy Strategies for Different Contexts

Analysis identifies the initial conditions for policy development. These conditions, and the structure and pace of subsequent policy reform strategies, will vary widely from country to country. The skill needs and incentives for investment in training in outwardly oriented industrializing countries, for example, will be different from those of largely agricultural societies, those with small modern sectors, and those with high levels of domestic protection. Institutional capacity for training also differs across countries in both the public and private sectors. Policy reform is thus more likely to be successful if it is based on policy strategies that take these varying factors into account.

Designing policy reform for an individual economy requires great flexibility. Not only do economic policies and rates of growth change, but training policy and practice must respond to changing skill needs and incentive patterns as reform proceeds. Although policy reform strategies should be tailored to the particular circumstances of each country, most should include measures to build a sustainable and economically efficient training system. Such a system generally would entail a significantly increased role for employers in developing and implementing training policy and the development or strengthening of the institutional capacity for policy analysis, market-oriented planning, and responsive management in public training. Illustrative strategies for three prototypical country contexts highlight how policy strategies might be devised.

Small, Low-Income Countries

In economies where the modern sector is small, economic policies distort the marketplace, and private training capacity is weak, the central government must play the key role in financing and providing training. This situation applies to many low-income agricultural economies that face serious resource constraints. Similar conditions may also be found in less developed areas or sectors of countries with a higher overall level of development. Improving access and quality in basic education is the highest priority. The immediate objective of training policy may be to build a small but strong base of training capacity by improving internal efficiency and training outcomes. The need to respond effectively to different skill markets, as well as to use training capacity efficiently, calls for the establishment of training authorities with strong participation by workers and employers. Public funds can be effective in organizing training to support economic stabilization and adjustment programs, NGO training, and specialized small business development programs, and to develop technical information for traditional apprenticeship. If public training systems have been overextended, consolidation of pro-

grams could help generate the needed revenues. Stronger monitoring of labor markets and training supply and better institutional links between employers and trainers will be needed to enable the training system to respond to short-term skill needs (Box 9-4).

Box 9-4. Training Policy Reform in Togo

The economy of Togo has traditionally relied on subsistence agriculture and the export of cocoa, cotton, and coffee. Seventy-three percent of the work force of 1.4 million work in agriculture, 21 percent in the urban informal sector, and 6 percent (76,000) in the modern wage sector. Economic policy reforms in the early and mid-1980s have opened the economy to international competition, reducing policy distortions and reversing a long period of negative growth. The economy is still vulnerable to rapid changes in commodity prices, and the government is seeking to diversify the economy by expanding foreign investment in labor-intensive light manufacturing.

The public vocational and technical education system was developed in the 1970s to meet social objectives. Lower and upper secondary technical schools and vocational training centers managed by the Ministry of Technical Education and Vocational Training (MTEVT) enrolled about 3,800 students by the late 1980s. Private vocational schools and centers enrolled 2,400 more. Traditional apprenticeship is well established in the informal sector. The public system was rigidly administered and inadequately financed, however, and both quality and efficiency were low. Practical training was especially weak. Much private training was also of low quality. This system was clearly not capable of meeting skill needs efficiently in a changing economy, and the government has thus launched a significant program of training policy reform and institutional development.

The reform has two objectives. The first is to build a flexible private-public training system responsive to the demands of the economy. The second is to improve quality by making formal training more practical and by strengthening the theoretical content of apprenticeship. The reform has three main elements:

- Strengthening the capacity of the MTEVT to monitor and analyze the labor market. Specific measures include the establishment of a Training and Employment Observatory to monitor employment opportunities and the effectiveness of training, and to publish the results regularly (see Box 5-2).
- Training for managers and instructors using "twinning" arrangements with overseas training institutes.
- Establishing a national training fund administered by a private-public management committee to allocate financial resources to public and private training projects that meet predetermined criteria. Traditional apprentice masters are eligible to apply for grants to upgrade skills.

Source: World Bank data.

Middle-Income Countries

Middle-income countries and those low-income countries with large industrial sectors may have additional priorities. If basic education is well established, attention should concentrate on improving access and quality in academic secondary education. Training policy analysis and planning capacity must be further strengthened to enable training managers to participate in formulating economic policy as well as to adjust training systems to more frequent changes in demand and incentives. As distortions ease, incentives and technical support for the development of enterprise training capacity can be helpful in accelerating expansion and improvement of training, as are policies that encourage private training institutions. Training services with cost recovery features could be considered as a way to build training expertise in small and medium enterprises. Public provision and financing of professional services to improve quality in both private and public training become more feasible. Where external efficiency is acceptable, governments should maintain the existing level of vocational schooling they provide and focus any expansion efforts on general schooling at the secondary level. Where vocational school systems are too large and inefficient, consolidation strategies should be considered. Better applied science and mathematics education, and possibly technology education, will improve worker flexibility and ability to learn on the job. Government financing of training programs for strategic skills at higher technical levels and for increasing specialization to sectors or industries should assume greater importance, with ministries of education playing a key role in most countries. Cost recovery from students, balanced by scholarship assistance, should be encouraged. The capacity for flexible and efficient response to project-related, start-up, and in-service training needs should be strengthened.

These increasingly complex challenges argue for the establishment or strengthening of national training agencies to manage central quality control and specialized training functions. To be effective in adjusting supply and demand, these agencies need control over resources, such as training funds, to provide grant and loan incentives to institutions to finance adjustment to changing needs and to reward outstanding performance. Management capacity and autonomy should be gradually developed at the institutional level, and operations decentralized in larger countries. Autonomy should be accompanied by accountability for training quality and placement success. Links between public and private training and employment need to be diversified. Payroll levy financing can provide stable financing for this phase of institutional capacity building, as well as an axis around which public-private cooperation can be strengthened (Box 9-5).

Box 9-5. Training for Productivity in Mauritius

Mauritius is a small island nation with a population of just over 1 million. Traditionally, the economy was based on sugar exports; however, economic policy reforms in the late 1970s and early 1980s opened the economy to international trade. The government created a highly successful export processing zone, which enabled entrepreneurs to capitalize on low-cost, well-educated labor to build profitable low-technology exporting industries, principally in garment manufacturing. Manufacturing and an expanded tourism industry now account for more than half of all economic activity, and growth has been sustained for a decade.

Successful population policies and rapid economic expansion have led to high levels of employment and a significant increase in female participation in the work force. But these same factors are beginning to lead to labor shortages and rising wages. Continued economic growth requires not only diversification of production to meet changing market opportunities, but also significant increases in productivity, through higher levels of technology and a more skilled work force.

On-the-job training has been a major source of skill development. Building on this tradition and a small public training system, the government has initiated a series of policies to foster cooperation between the private and public sectors in training for increased productivity. The reform includes:

- Formation of an Industrial and Vocational Training Council consisting of employer representatives and an equal number of public ministry members, chaired by the Minister of Economic Planning and Development to develop and monitor training policy.
- Creation of a program to provide training to school dropouts. The program is financed by a 1 percent levy on payrolls, matching funds from the government, and additional public resources, for the training of school dropouts. A special board monitors training needs and outcomes and registers private and public training institutions; is mandated to organize training to meet identified needs, either in enterprises or in external training institutions; and has the power to approve employer training programs for grant assistance and rebate against the training levy.
- Rehabilitation and reorganization of public training institutions.

The reforms were launched with a joint private-public planning exercise that identified skills in current demand as well as those that will be important to the government strategy for industrial diversification.

Sources: Parsuraman (1990); World Bank data.

Rapidly Industrializing Countries

In rapidly growing, outwardly oriented economies where incentives for private investment in training are not distorted, the largest share of occupational-specific skill training can be provided privately. Governments may still provide training, especially for strategic technical skills, but workers and employers can assume a greater share of the financing. A range of options can be explored to increase the positive effect of market forces on training efficiency. The government can shift from routinely providing annual budgets to training institutions toward competitive purchase of training services from private and public training institutions. Schools and centers not essential for strategic skills development can be devolved to enterprises or employer associations for operation, and their subsidies reduced over time. The government would continue to play a central role in quality control and monitoring, and in policy development (Box 9-6).

Planning for Implementation

High levels of political and economic uncertainty can make the best conceived policy strategy difficult to implement. Trying to change too much or too quickly can also lead to failure. Planners, however, are not without tools for addressing this problem. Research on education reforms in developing countries shows that the likely effects of uncertainty and innovation can be assessed and the implications built into the organizational and managerial elements of reform programs.³

Managing Uncertainty

The policy environment for vocational education and training is generally much less certain than that for other areas affecting human resources, such as basic education and health services. This high level of uncertainty is a function of two factors. The first is the degree of complexity, which increases with the number of organizations, power groups, and kinds of beneficiaries with direct interests in the policies to be changed. Complexity also increases as economies become more diversified and market forces play a greater role in allocating resources. Vocational education and training involves a large number of diverse organizations and beneficiaries, including youth, workers, and the unemployed. It serves several sectors of the economy and should be increasingly responsive to market forces. It is a highly complex, and therefore uncertain, phenomenon.

The second factor relates to stability, or the pace and degree of change. Rapid change in the economy—through technological advancement,

Box 9-6. *Changing the Private-Public Training Balance in Chile*

Policies that seek to increase the role of the private sector in training are not without problems. The experience of Chile shows that such policies can be implemented in an urbanized, middle-income industrial economy, but that the government must pay attention to the quality of private training and be prepared to modify policies to address issues raised by the reforms.

By the 1970s secondary vocational education in Chile was highly centralized, inflexible, and low in quality. Vocational training was primarily provided by a national training institute, INACAP, which was financed by appropriations from the public budget.

In the middle of the decade, the government began a long-term effort to increase private sector participation in the financing and provision of vocational education and training. The first policy changes came in the area of vocational training. To stimulate the private training market, a tax exemption scheme was introduced that enabled enterprises to deduct authorized training expenditures from earnings. At the same time, government budgetary support for INACAP was reduced at the rate of 20 percent a year to encourage the agency to compete for direct training contracts from enterprises. The National Employment and Training Service developed a program of training scholarships for youth and unemployed adults and certified some 400 public and private training organizations (including INACAP) as eligible to compete for public training

increasing international competition, and economic restructuring accompanied by worker dislocation—further increases uncertainty in the policy environment for training. Instability in the political environment, through frequent changes in government, for example, increases uncertainty for all kinds of policy development, as do high levels of turnover in administrative leadership.

High levels of uncertainty in the economy cannot be avoided; indeed, many of the policy and institutional reforms discussed in previous chapters are predicated on the need to improve the capacity of private and public training systems to respond to a changing economic environment. But political uncertainty can be reduced and managed by building commitment to reforms during the analysis and planning stages and maintaining that commitment as reforms progress.

BUILDING COMMITMENT. Many different groups have an interest in skills training. Employers have direct economic interests. They would, for example, be likely to prefer free, high-quality public training to paying for training themselves. Policymakers in different parts of the

contracts. INACAP was also authorized to provide higher technical education. The measures achieved their primary objective: much of the purchased training was now provided in enterprise facilities. Among other effects, INACAP enrollments fell overall, but higher technical education grew to account for a third of its students.

In the early part of the 1980s the government began to transfer management of public vocational secondary schools to nonprofit enterprise associations, which were given the facilities and equipment free of charge, along with an annual budget equivalent to that of the previous year. Instructors were given full severance pay and the choice of private employment at prevailing government wage rates, private employment under terms negotiated with the association, or early retirement if they had accumulated twenty years of public service. Twenty schools were transferred before the reform was halted by budget constraints during a severe recession in 1982–83.

The reforms have not been without problems. Tax exemptions for training expenses benefited primarily larger firms able to complete cumbersome paperwork and did little to help individuals who were not employed. In response, the government increased the size of public training purchases for youth and the unemployed, including programs to support self-employment, and assisted in the formation of small enterprise associations to encourage training.

Sources: Castenada (1986); World Bank (1991b).

government have policies to defend and different constituencies to satisfy. Ministries of education are generally committed at some level to vocational and technical education; labor ministries and training agencies to vocational training. These implementing agencies have both public and staff constituencies. Economic planning agencies look at skills training in the context of national development plans and strategies, and finance ministries see it as one of many competing claims on public funds. Teacher and student organizations and NGOs have their own claims to press to protect or improve their stake in training resources.

Parents and students may hold mixed views regarding skills training, depending on the overall employment situation, the social status accorded to blue-collar work, and a host of other factors. They may or may not be well informed about the relative value of training for employment and earnings in comparison with other investments of time and money. Sectarian interests may be at stake, with students, parents, and others demanding equitable access to training opportunities. Or perhaps they are seeking just the opposite—protection against placement in perceived second-rate educational opportunities.

These often conflicting interests are resolved in part through the political process. The enormous variation in the way these processes work in different countries, and at different times in the same country, results in equally significant variation in the effectiveness with which the claims are resolved. Moreover, vocational and technical education and training are rarely the most important items on the political agenda, if only because they serve a relatively small share of the populace, usually one with less influence than the economic and political elites for whom skills training is less important than higher education.

Because of the complexity of the situation, one may ask whether reform is possible. The answer is yes, provided sufficient time and resources are provided to enable planners to find out what the various claims are and why they are made. It is not necessarily the case that all, or even some, of these constituencies will be satisfied with the status quo. Extensive consultation is very likely to identify groups that are interested in change and improvement. For others, analysis may develop the information needed to convince them of the need for change.

Consultation is not, however, merely a process of convincing interest groups to support a preconceived reform strategy. It can be an important source of ideas on what to do, how, and when. In fact, consultation may be effective only when the views of interest groups are fully recognized. This does not and usually cannot mean that each group will get what it wants—but it can mean that each group has not only the satisfaction of receiving a hearing, but also a clear explanation of why some or all of its claims will not be addressed—immediately, or later—in the reform effort.

Beyond the clear need for extensive consultation, much remains to be learned about implementing vocational and technical education reforms. But experiences with general educational reforms suggest a few guiding principles. First, the necessary political and legislative support must be generated. Second, the top leadership in the implementing agency must have not only sufficient scope and authority for action, but also a firm commitment to change. Third, reforms should seek to establish positive benefits for affected groups.

Building political commitment is fundamentally an educational process, one that seeks to improve understanding of complex policy issues. Effective policy education thus can depend significantly on the extent to which initial analysis demonstrates the need for reform and the viability of the proposed changes. Often, policymakers have only an imperfect understanding of labor market dynamics, the nature of demand for different levels of occupational preparation, and the variety of ways in which workers acquire their skills. The quality of analysis and presentation of findings is important, but equally valuable is early and continuing involvement of the policymaking community, which gives the analysis process status and legitimacy. Policymakers can be involved in several

ways, from sitting on informal policy committees to serving on more formally structured commissions and boards of inquiry. These structures can help establish cooperation between the public and private sectors early in the reform process.

In smaller countries and in those with a national training authority, identifying a central implementing agency will be straightforward. In many cases, however, a large number of agencies share responsibility for training policy, making it more difficult to identify a lead agency. The establishment of interagency coordinating committees to manage training reforms has not been particularly successful, in part because of competing interests and in part because these committees are often weakly financed and staffed. Identifying and strengthening a single lead agency is likely to be more effective. This strategy does not imply that all training should be centrally controlled. But the lead agency should eventually be able to use resources flexibly to encourage responsiveness from other elements of the training system.

Support from interest groups can be obtained by protecting or improving their interests. Current students, of course, should not lose their places in reforms. If training institutions are to be consolidated and the number of students reduced, the cutback should come through reduced intake, or, where geographically feasible, by redirecting students to consolidated institutions. Most reforms should invest in improving the quality of training, and the positive benefits to students should be stressed. If cost-recovery programs are to be introduced, they should be phased in, with appropriate protection for needy students.

Equally important, administrators and faculty should be protected. In consolidation strategies, staff redundancy should be accompanied by retraining, job search assistance, and, where local practice permits, severance pay. The many positive aspects of reforms—such as staff training, better working conditions, and better salaries—can provide strong incentives for cooperation if they are well understood and implemented as promised. For employers, reforms can offer a variety of benefits, including a stronger role in training policy, support for their own training efforts, and better preemployment training. Reforms that remove restrictions on or provide positive support for their operations benefit private and nongovernmental providers of training.

MAINTAINING SUPPORT. Commitment needs to be sustained during implementation. Employers, administrators, and other key stakeholders can continue their involvement through participation on advisory committees and oversight boards that administer training funds or perform other similar functions. Continuing public information and education programs, using the press and community groups, can keep parents and students informed of progress.

Organizing for Innovation

In many countries policy reforms will require significant innovation in the way organizations operate. The level of innovation can be especially high in those countries seeking to move from supply policies and a central role for government toward policies that increase the responsiveness of training to the economy and that achieve a more efficient balance of private and public sector training. If the amount of change required is too great, or the pace too swift, staff will have difficulty making the transition, and implementation will suffer.

The degree of innovation required is determined along four dimensions. The first two relate to the nature of the tasks needed to implement the new policies. The more varied those tasks are and the more difficult they are to analyze, the higher the level of innovation required. For example, paying instructor salaries does not require a great deal of innovation. But establishing and administering a training fund for the first time is highly innovative. Building another training center is less innovative than converting a vocational secondary school into a center intended to meet a variety of informal sector training needs.

The second two dimensions relate to the overall amount of change required. The first is the scale of innovation. Other things being equal, more institutions, greater geographical scope, and more components in the reform program increase the effect of innovation on the training system. Reforming one institution, for example, is easier than revamping several levels of an extensive training system at once. The second is the extent to which the changes deviate from current practice. Policies that require only marginal adjustments in some countries may call for fundamental changes in others.

Dealing with innovation is principally a matter of achieving a fit between the demands that innovations will place on implementing organizations and the existing or potential capacity of those organizations to respond effectively. To find the appropriate fit, planners first identify the management strategy needed to implement the reforms; the policy analysis will have suggested some starting points. The capacity of existing organizations to implement this strategy is then assessed. If a significant gap is found between the level of innovation to be attempted and management capacity, planners have several options to achieve a workable level of congruence. These include building management capacity, modifying the level of innovation, or some combination of both.

IDENTIFYING A MANAGEMENT STRATEGY. The choice of a management strategy for implementing policy reforms depends on the degree of uncertainty in the project environment and the degree of innovation envisaged. Routine tasks can be effectively carried out in a highly certain

environment with a mechanistic strategy that uses familiar hierarchical bureaucratic structures and processes. Routine administration of basic education programs in stable political and economic circumstances is a case in point. As uncertainty and innovation increase, management strategies must become more adaptive to enable institutions to respond to changing environments, to learn from experience as innovations are put in place, and to adjust operations as experience accumulates.

These contrasting approaches require very different management processes and organizational structures. Moreover, the ability of staff to adjust to changes in the exercise of power and authority and to tolerate ambiguity and uncertainty must be taken into account in designing a management strategy. In general, adaptive strategies require very flexible management processes. Incremental planning, decentralization of decisionmaking, and participatory forms of authority and leadership are central to flexibility. Mechanisms for management control—communications, coordination, and monitoring—emphasize learning and adjustment. For these processes to be effective, organizational structures must become less hierarchical and more open to information and to staff initiative at all levels. These “organic” structures focus more on performance and much less on conformance to rules and standard operating procedures. To function effectively within adaptive management structures, staff members need a high level of professionalism and the ability to work effectively under ambiguous and uncertain circumstances.

Mechanistic and adaptive management strategies define opposite ends of a continuum of approaches, and in practice most organizations use elements of both, depending on the tasks to be accomplished. An institution charged with managing a highly innovative program of services, for example, is likely to use mechanistic strategies for routine administration and more adaptive approaches in the elements of the organization that manage research, development, and service delivery.

Training organizations are clearly more effective when they are operated adaptively. Much of the success of the vocational training institutes of Latin America can be attributed to their ability to acquire and use information, to adjust operations to serve changing training markets, and to a high level of professionalism. And many of the difficulties encountered by vocational schools run by ministries of education stem from their mechanistic management system, which, although appropriate for many of the tasks of administering mass public education, is not well suited to the high levels of uncertainty and innovation characteristic of effective training.

ASSESSING MANAGEMENT CAPACITY. The capacity of implementing organizations to manage adaptively is thus critically important and must be carefully assessed in designing implementation strategies. This is true

not only for national training authorities, but also for the various institutions and organizations, private and public, that make up a country's training system.

In general, assessment is a matter of analyzing management processes to identify patterns of current management practice. Organizations that have a mixture of management processes are generally better positioned to move toward adaptive management practices than those that are more fully mechanistic in style. Organizations that already operate in a largely adaptive manner are usually capable of effective and rapid change.

Specific questions must be addressed in assessing the management capacity of training organizations. Is there a national training authority? Are employers and workers represented in its governance? Is the agency adequately financed? Does it have the professional capacity needed to manage and support flexible policy strategies? Does it have the authority and resources to manage the training system through incentives, such as training funds? If a national training authority is not in place, how effective is coordination among public and private training organizations? Is there duplication of functions? Does this duplication lead to healthy competition, or wasted resources?

How effective are the various information systems that help training managers identify needs and opportunities? Are links between training and employment in place? How well do they function? Do training managers have access to labor market information and the ability to use it?

In larger countries what is the extent of decentralization of decisionmaking to states, provinces, or lower administrative units? Is responsibility at different levels matched by authority over resource allocation? Is the professional and managerial capacity of the provincial and local implementing units commensurate with responsibility and authority?

ACHIEVING A FIT BETWEEN INNOVATION AND CAPACITY. When a gap is found between current practices and the requirements of adaptive management, planners must decide whether to develop the organization, modify the level of innovation, or do some of both. In most cases organizational development should be incorporated in the reform, not only to improve the chances of successful implementation, but also as a longer-term investment. Assessments that indicate the management processes, organizational structures, and staff values where change is most needed are helpful in building organizational development strategies. These strategies are most effective when they recognize that management processes are interrelated. For example, building an incremental planning capacity that enables managers to respond to changing training needs has to be matched by a more decentralized and collegial pattern of decisionmaking and accountability systems that

emphasize performance. Organizational structures may have to be modified to facilitate new decisionmaking patterns, and a combination of training and performance-based incentives put in place to enable and encourage staff to perform effectively.

To provide the time needed to build adaptive management capacity, planners may need to reconsider the level of innovation to be attempted initially. Innovation can be reduced in several ways. Restricting reforms to a few institutions or a limited geographic area is the most common way of reducing the scope of innovation. Often this strategy takes the form of a pilot project that enables planners to concentrate resources, to use the pilot program as a training vehicle, and to learn from experience before expansion. The degree or pace of change can also be reduced. For example, attention might be given first to improving the responsiveness and efficiency of public training, with the development of mechanisms to encourage training by employers coming in a second stage of reform when stronger public training agencies are better able to provide technical support services.

If implementing agencies already have a high capacity for adaptive management, comprehensive and rapid reforms may be feasible. Often, however, a combination of organizational development and careful phasing of reforms offers the most practical approach. This incremental approach requires sustained effort, which, of course, brings planners back to the fundamental importance of building and sustaining political and social commitment to the goals and procedures of the reform.

Notes

1. For an excellent review of techniques for assessing training systems and institutions, see Hunting, Zymelman, and Godfrey (1986).
2. Ziderman (1978) offers a discussion of cost-benefit analysis methodologies as applied to training; the handbook by Hunting, Zymelman, and Godfrey (1986) is good on the practical side.
3. This section draws heavily on Rondinelli, Middleton, and Verspoor (1990).

10. *International Assistance*

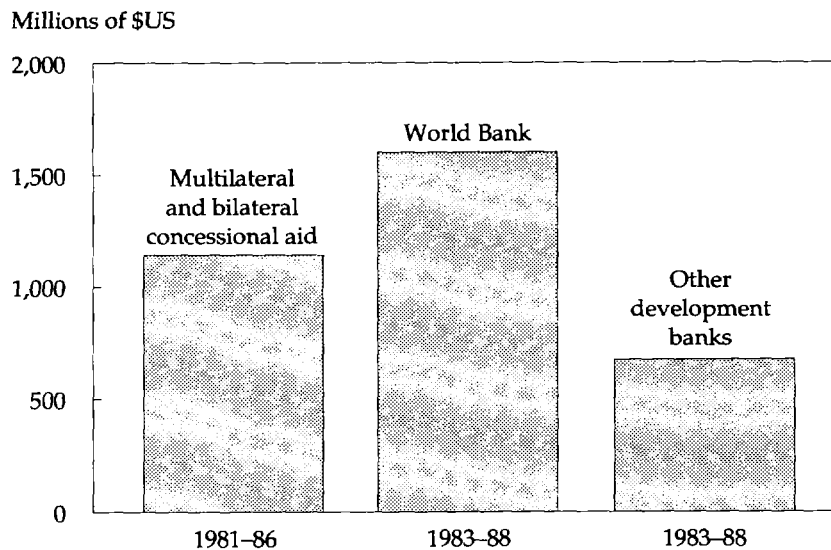
Virtually every developing country has received support for the development of vocational and technical education and training systems and institutions from international assistance agencies. The World Bank alone has financed some form of vocational program in ninety-five countries. Analysis of past patterns of international support shows that investments in training have been accorded a higher priority than investments in basic education. Individual donor countries and international development banks also provide different levels of aid for different purposes, which can have a significant effect on the vocational education and training programs that recipient countries can provide. International financial and technical support will continue to be needed, most especially in those countries seeking to develop market-oriented training systems. Finally, there is a continuing—and important—agenda for research in the field.

Patterns of International Support

In recent years, aid from bilateral agencies and such multilateral sources as the United Nations agencies and the European Community (but excluding the development banks) accounted for about a third of aid flows for vocational and technical education and training; since most of this assistance was provided on concessional terms in the form of grants or low-interest loans, we shall refer to such multilateral and bilateral aid as “concessional aid.” The remaining two-thirds of total aid were provided by the development banks, of which less than 10 percent came in the form of concessional low-interest loans from the International Development Association (IDA) of the World Bank. We refer to this as “development bank aid.” The World Bank was the largest single source of assistance, providing about 45 percent of all assistance (Figure 10-1).

The volume of aid provided has been substantial. Between 1981 and 1986 annual multilateral and bilateral concessional aid disbursements for vocational projects averaged US\$190 million (Orivel and Sergent

Figure 10-1. International Assistance for Vocational Education and Training



Source: Appendix II, Table 3; Orivel and Sergent (1990).

1990). Between 1983 and 1988, nearly 40 percent of all assistance to education and training from the World Bank and regional development banks supported vocational and technical education and training. (This figure does not include support for project-related training.) This averaged about US\$375 million in new commitments annually. In contrast, total aid disbursements from all sources for primary education averaged US\$181 million a year for the same period (Lockheed and Verspoor 1991). The relative impact of these differential aid flows, as well as the relative costs of different kinds of education, are suggested by per pupil aid figures for Sub-Saharan Africa for the 1981-86 period. These were \$1.30 for primary schools, \$10.50 for general secondary schools, \$222.00 for technical secondary schools, \$57.00 for teacher training institutions, and \$427.00 for institutions of higher education (excluding enrollments in foreign universities) (Orivel and Sergent 1990).

Bilateral and Multilateral Assistance

About half of the concessional training aid in the 1981-86 period went to African nations, about 20 percent to Asia, and the rest to other regions (Table 10-1). In nominal terms, disbursements increased by about 15

Table 10-1. Bilateral and Multilateral Aid to Vocational Education and Training by Region, 1981–86 Disbursements (US\$ millions)

<i>Region</i>	<i>1981</i>	<i>1982</i>	<i>1983</i>	<i>1984</i>	<i>1985</i>	<i>1986</i>	<i>Total</i>	<i>Annual average</i>
Sub-Saharan Africa	88	105	85	76	100	110	564	94
Asia	43	32	39	36	46	60	256	43
Latin America/Caribbean	30	35	25	27	23	17	157	26
Europe, Middle East, and North Africa	28	22	32	24	28	29	163	27
Total	189	194	181	163	197	216	1,140	190

Note: Includes concessional aid from multilateral organizations.

Source: United Nations Development Programme data as reported by Orivel and Sergent (1990).

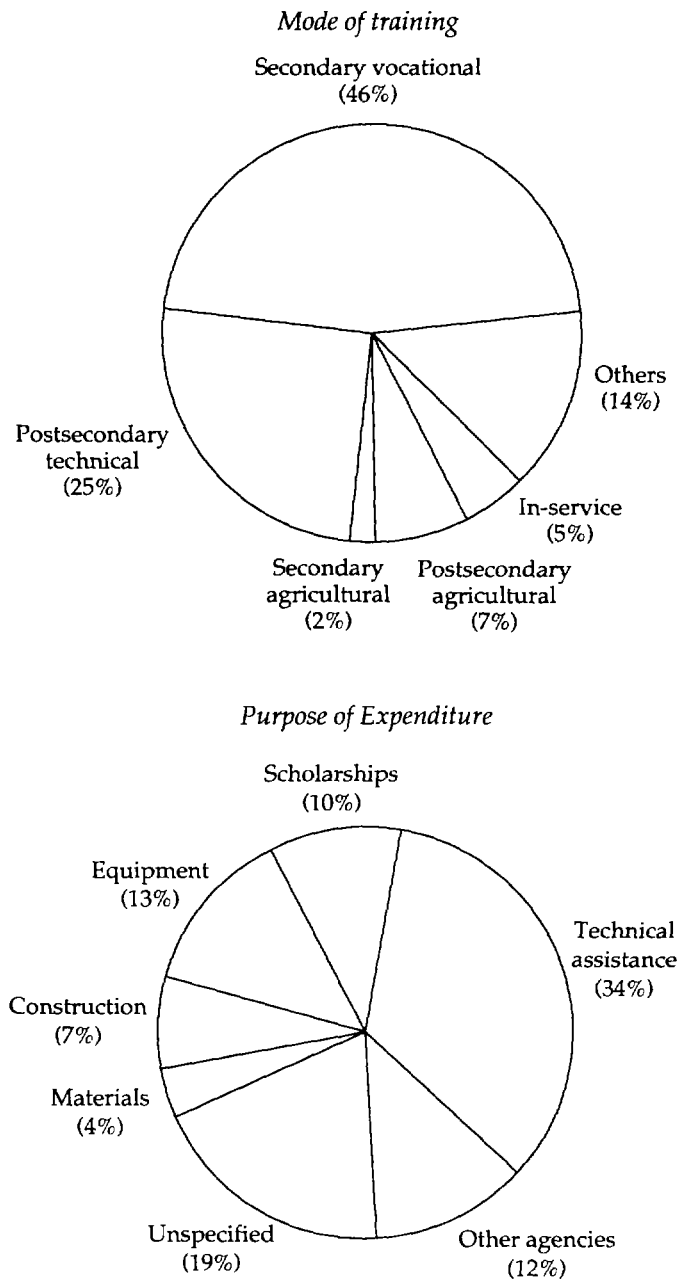
percent over the six-year period. This increase, however, was well below the annual rate of inflation, which was about 5 percent in developed countries, and much higher in most developing nations.

Thirteen countries provided 70 percent of the aid. France was the largest donor, contributing 18 percent of the total, Belgium and Germany each contributed 7 percent, Japan 6 percent, the United States 5 percent, Italy and the former U.S.S.R. 4 percent, Switzerland, Canada, Australia, and the United Kingdom between 3 and 4 percent, and Denmark and Sweden about 2 percent each. Concessional aid from multilateral organizations accounted for another 30 percent, with the United Nations Development Programme (UNDP) being the largest single donor in this group at 6 percent.

Most concessional aid supported preemployment preparation for wage employment in the modern sector (Figure 10-2, top). Secondary vocational education oriented toward wage employment in industry and services accounted for about 46 percent of concessional disbursements in 1981–86; postsecondary technical education added an additional 25 percent. Secondary agricultural education accounted for 2 percent, and postsecondary agricultural education about 7 percent. In-service training received only 5 percent of concessional aid during the period.

Support was also granted for a variety of purposes (Figure 10-2, bottom). The overall picture, however, is one in which technical assistance and scholarships for training abroad dominate, accounting for about 44 percent of the total. Unspecified aid and general budgetary

Figure 10-2. *Bilateral and Multilateral Aid by Mode of Training and Purpose of Expenditure, 1981-86 Disbursements*



Source: Calculated from Orivel and Sergent (1990).

support totaled 19 percent, equipment 13 percent, construction 7 percent, and instructional materials only 4 percent. These data suggest that bilateral and multilateral aid during this period was focused primarily on rehabilitation and use of existing training capacity, with considerably less support for system expansion. It should be noted, however, that aid contributions for construction may have been matched by local funds.

Patterns of assistance varied substantially among bilateral agencies, indicating significant differences in agency objectives and policies (Figure 10-3, left). In training for industry and services, secondary vocational education was a high priority for Sweden, Australia, France, and Belgium. In contrast, secondary vocational education received relatively little support from the United States and Germany. Italy, the former U.S.S.R., and Switzerland split most of their assistance between secondary vocational and postsecondary technical education, and Germany directed the largest share of its assistance to the postsecondary level. More than half of the aid provided for postsecondary agricultural education came from the United States and Belgium; another third came from Germany, Denmark, and Canada.

More than a third of all concessional aid was earmarked for technical assistance. Aid from France, Belgium, and Australia was heavily concentrated in this category, at 80, 70, and 50 percent, respectively, of the total each provided during the period (Figure 10-3, right). The data show that 70 percent of French aid supported expatriate teachers. Much of this assistance was provided to staff or otherwise support secondary vocational schools. Only three other countries—Canada, the United Kingdom, and Denmark—approached the 10 percent level in providing assistance for expatriate technical teachers (Orivel and Sergent 1990). With the exception of Japan at 6 percent, other major bilateral donors fell into the 20 to 30 percent range for technical assistance.

Equipment was the second largest aid category, accounting for 13 percent of the total. Nearly three-fourths of Japanese aid was for equipment purchase; that accounted for a third of the total US\$145 million provided for equipment in 1981–86. Germany provided another 20 percent of the total, Italy 11 percent, and Canada 7 percent.

Scholarships and fellowships for training abroad received 10 percent of concessional assistance. Six countries provided 80 percent of this total. The former U.S.S.R. was the largest donor in this category, providing a quarter of the total, or nearly US\$28 million. The next three largest donors, the United Kingdom, France, and Australia, each provided about US\$12 million, and the United States and Germany each contributed US\$8 million.

Construction aid comprised only 7 percent of the total. More than half of this aid came in the form of concessional assistance from various multilateral agencies. In absolute terms the primary bilateral donors of

funds for construction were Japan, the United States, Switzerland, Italy, and Canada, which together accounted for half of bilateral funding for construction.

The generally low level of support for instructional materials is notable. Only Italy and the former U.S.S.R. provided more than 10 percent of assistance for materials. France, Sweden, Japan, the United Kingdom, and Australia all provided less than 4 percent of aid for this purpose. General budgetary assistance exceeded 4 percent only for Switzerland and Sweden. Finally, support for facilities maintenance is not shown separately in Figure 10-3, right, because it was so small: only Sweden earmarked more than 1 percent of its bilateral aid for facilities maintenance.

Development Bank Assistance

Data on development bank aid for vocational education and training are available for the 1983–88 period, and reflect new loan commitments, rather than disbursements (Table 10-2). The period is roughly comparable to the 1981–86 period for concessionary aid, especially since the amounts of this aid did not vary much from year to year.

Table 10-2. Development Bank Assistance to Vocational Education and Training by Donor and Region, 1983–88 Commitments (US\$ millions)

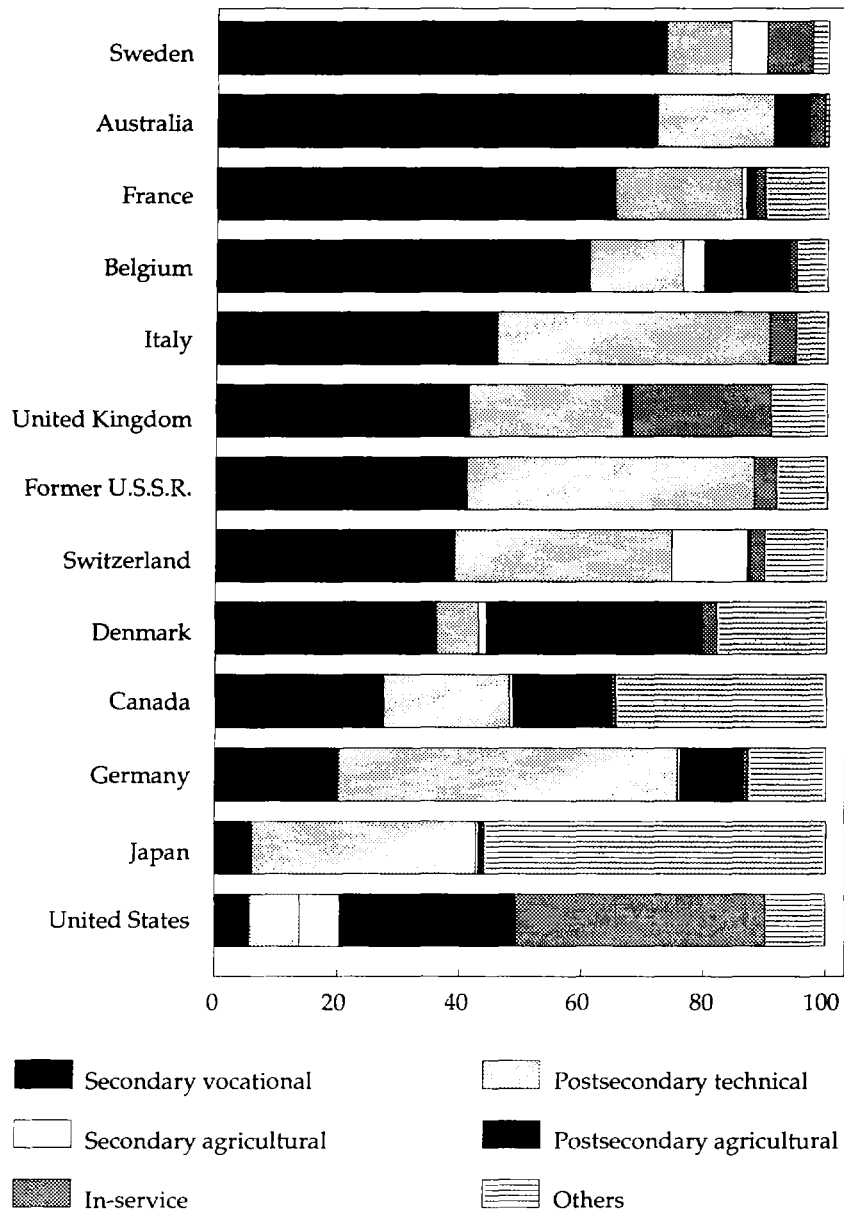
<i>Donor</i>	<i>Sub-Saharan Africa</i>	<i>Asia</i>	<i>Europe, Middle East, North Africa</i>	<i>Latin America, Caribbean</i>	<i>Total</i>
World Bank					
IBRD	57.0	579.8	515.6	273.5	1,425.9
IDA	46.8	116.2	55.3	n.a.	218.3
Asian Development Bank					
African Development Bank	108.1	n.a.	67.9	n.a.	176.0
Inter-American Development Bank	n.a.	n.a.	n.a.	162.3	162.3
Islamic Development Bank	5.9	8.3	17.4	n.a.	31.6
Caribbean Development Bank	n.a.	n.a.	n.a.	8.8	8.8
Total	217.8	996.6	656.9	444.6	2,315.9
Annual averages	36.3	166.1	109.5	74.1	385.9

n.a. Not applicable.

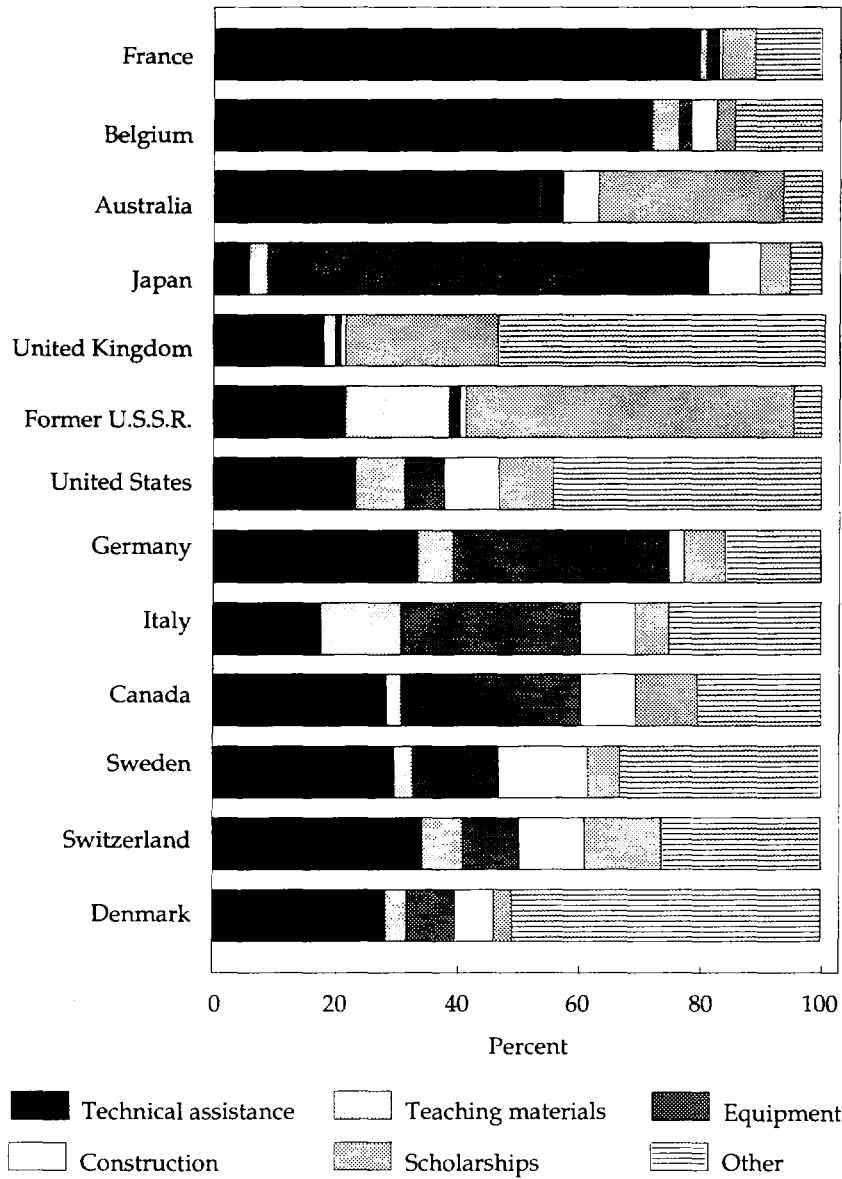
Source: Appendix II, Table 3.

Figure 10-3. Bilateral and Multilateral Aid by Donor, 1981-86 Disbursements

By mode of training



By purpose of expenditure



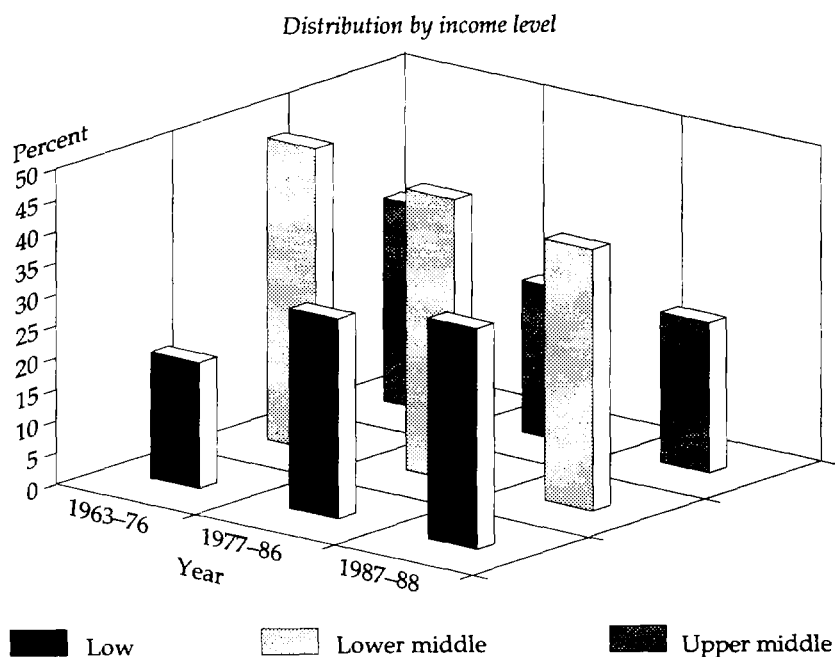
Note: Other includes general financial assistance and nonspecified expenditures.
 Source: Calculated from Orivel and Sergent 1991.

In Sub-Saharan Africa assistance from the development banks to vocational education and training amounted to about US\$220 million between 1983 and 1988, or US\$36.3 million annually, on average. This was somewhat more than one-third of the annual average of US\$94 million in concessional bilateral and multilateral assistance to Sub-Saharan Africa in the 1981–86 period, reflecting the preponderance of low-income countries within the region with a greater need for concessional aid. Elsewhere in the world, lending from development banks significantly exceeded concessional assistance.

Detailed data on patterns of lending assistance are available only for the World Bank. Since the World Bank accounted for about 70 percent of total nonconcessional multilateral aid, and half of all aid, these patterns are worth examining.

Over a twenty-five-year period the proportional distribution of World Bank assistance to education, including vocational education and training, shows a relative increase in assistance to low-income countries, with declines in middle-income countries (Figure 10-4). Within these totals support for general education in low-income countries increased, while

Figure 10-4. World Bank Investments in Education and Training, 1963–88



assistance to vocational projects declined in more recent periods. These patterns reflect the Bank's expanding commitment to primary education in low-income countries. Lending for that purpose increased from 6 percent of all World Bank lending in 1963-76 to 21 percent in 1981-86, with most of this support going to low-income countries. More recent data shows that World Bank lending for primary education reached 29 percent of all lending for education and training between 1987 and 1991; the average annual amount of lending in these years was about US\$480 million (World Bank 1990e, 1991d). Support for higher education, primarily in middle-income countries, also grew as a share of lending.

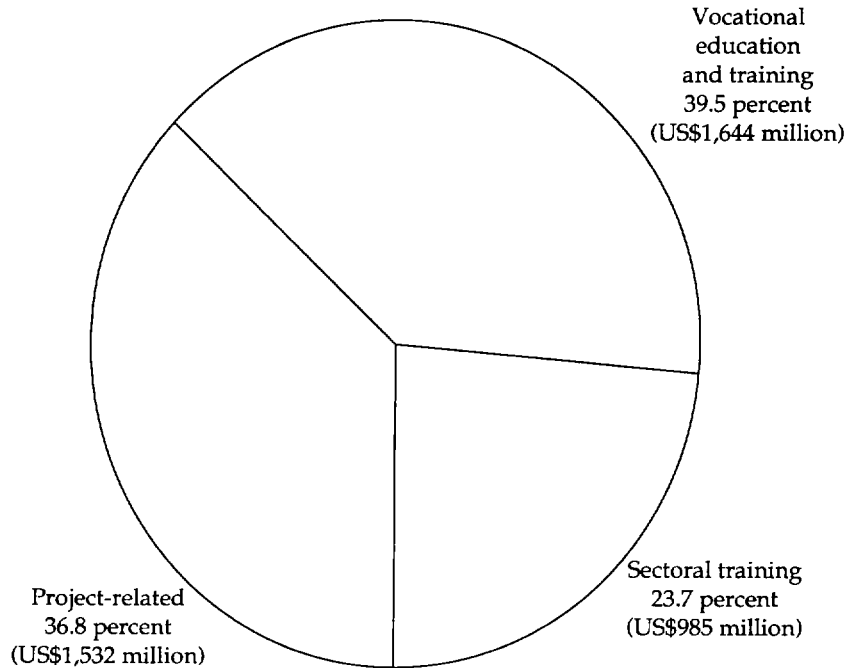
Because the overall level of World Bank support for education and training grew substantially across this period, the absolute amount of total support provided annually for vocational education and training also grew. Between 1987 and 1991, assistance for vocational education and training averaged about US\$480 million annually (World Bank 1990e, 1991d), compared with some US\$380 million annually during 1983-88 (see Table 10-2).

In addition to lending in the education sector, the World Bank provides a significant amount of financing for project-related training and public training operations in various sectors of the economy. In the 1983-88 period these investments were one-and-one-half times larger than assistance for training within the education sector (Figure 10-5). Project-related training supports new public investments in infrastructure, agriculture, and health. Sectoral training investments support "free-standing" training organizations, operated by various sectoral ministries, that provide entry-level and in-service training for public employees. The large amount of World Bank assistance to sectoral training organizations is a phenomenon of the 1980s. It is especially marked in agriculture, where sectoral training agencies have been found to be more effective than preemployment preparation in agricultural schools.

In the past the largest share of World Bank training assistance has supported preparation for employment in industry, but that pattern appears to be changing in recent years. Since 1987 support for agriculture and, especially, for service and commerce occupations has grown relative to training for industry (Figure 10-6). Assistance to specialized agricultural training agencies has accounted for much of the increased support in that sector.

The World Bank's pattern of support for different kinds of vocational preparation has also changed (Figure 10-7). Between 1963 and 1976, Bank lending was roughly equally divided among diversified secondary schools, secondary vocational schools, postsecondary technical education, and vocational training. Beginning in the late 1970s, support for diversified schooling was phased out because evaluations showed that

Figure 10-5. *Distribution of World Bank Lending for Training, by Type of Assistance, 1983–88 Commitments*

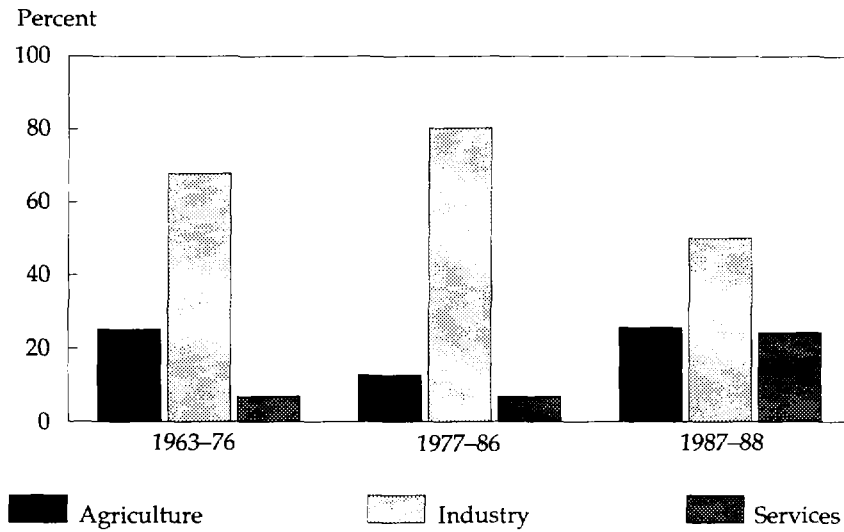


Source: World Bank data.

this approach was not cost-effective (Psacharopoulos and Loxley 1985). Support for secondary vocational schools was also reduced. Lending for vocational training increased substantially, however, in recognition of the greater potential for flexibility and efficiency in center-based training in comparison with secondary vocational schooling. In sum, center-based vocational training before employment, and entry-level and in-service training through project-related training and free-standing sectoral training institutions have become the main modes of skills development that the World Bank supports.

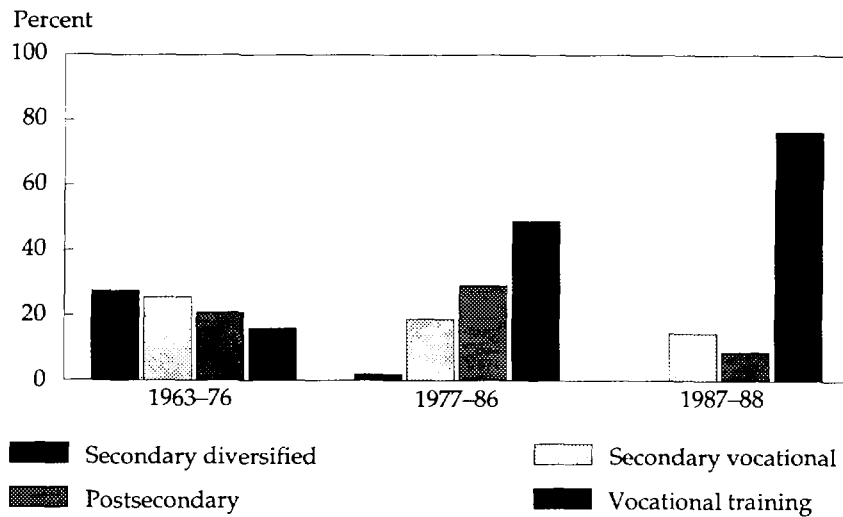
As is the case with concessional assistance, the rehabilitation of existing training capacity has become more important in World Bank-assisted vocational projects. The share of total investment being used for construction declined from 50 percent in 1979–81 to half that level in 1984–86, while support for furniture, equipment, and technical assistance increased.

Figure 10-6. Average Annual World Bank Support for Vocational Education and Training by Sector, 1963-88 Total Project Costs



Note: Total of government and World Bank financing.
Source: World Bank data.

Figure 10-7. Average Annual World Bank Lending for Vocational Education and Training by Mode, 1963-88 Total Project Costs



Note: This figure shows total of government and World Bank financing.
Source: World Bank data.

Priorities for International Cooperation

International financial and technical support will continue to be key factors in building public and private training capacity in developing countries. Indeed, effective partnerships between national governments and international assistance agencies will be vital in designing and financing successful reforms. To make these partnerships effective, governments need to develop national policy reform strategies that are based on much improved economic analysis, that recognize the importance of strengthening primary and academic secondary education, that encourage the development of private sector training, and that seek to improve the effectiveness and efficiency of public training. Assistance agencies need to strengthen their analytical support for national strategy development, improve coordination among themselves in providing assistance in a given country, and be prepared to provide the long-term support needed to implement reform programs.

Supporting National Strategy Development

Many governments have yet to address the task of developing a comprehensive training policy strategy, and in many of those countries the capacity to carry out the necessary analysis is weak. Yet without a carefully developed national strategy, continuing international financial support for training is likely to have little impact.

Flexible donor support for country analysis and strategy development is thus needed. For most agencies, including the World Bank, this support will require a higher-than-usual level of commitment of staff and financial resources. The reason is simply stated: developing effective training investments is a much more complicated process than planning for other forms of investment in education. Not only is the required level of analysis complex, but time and resources are needed to involve all the various interest groups in the policy development process. Expanded support for analysis, moreover, should be used to develop local planning capacity, with the participation of local research institutions and consultants.

Large donors, most notably the World Bank, should bring their considerable analytical resources to bear in this process, but they should not close out other participants. By pooling information and resources, donors can greatly improve the efficiency and effectiveness of analytical work. Many bilateral agencies have long supported training in certain countries, and in such cases these agencies should assume leadership.

Donors should also consider joint programs to train professionals and policymakers from developing countries in analyzing training

policy issues. Organizations such as the International Institute of Educational Planning have made important contributions in this respect in other areas of educational development. The International Labour Office currently offers international technical training through the Turin Center in Italy. Adding training policy analysis to this program, for example, could provide a much needed element of support for national efforts.

Many developing countries have already successfully implemented effective training policies, creating a rich source of expertise. Governments and donors alike would benefit by systematically tapping this expertise as they plan and implement their own training policy reforms.

Strengthening Education

Because basic education is the foundation of all further training, donors should give high priority to primary and compensatory basic education programs. Improving basic education will improve the earnings of the poor and women, provide the foundation necessary for access to pre-employment and employer training, and bring significant benefits to society as well as to individuals. This is especially true in low-income countries where access to basic education is now limited, especially for girls, and where learning achievement is low.

Where primary education enrollments and outcomes are satisfactory, attention to improved access and quality in academic and general secondary education is important, especially in middle-income countries immediately facing the challenges of international competition and technological change. Improving instruction in science, mathematics, and communication skills should receive high priority.

These priorities should not suggest that the public vocational and education training system be abandoned. But they do underscore the need to improve the effectiveness and efficiency of existing public training programs before expanding the system.

Improving Aid Coordination

The considerable differences of emphasis among donors in the type of training supported and the kind of assistance provided have led to a variety of piecemeal projects. Often several sponsors each support a different training institution within a given country with little coordination between individual projects or between the projects and those in the country responsible for training planning and policy. In these circumstances, policy issues are rarely addressed.

Well-crafted national strategies are only the first step toward improved coordination. Donors need to find ways to fit their objectives and

program interests together so that national training strategies will receive the coherent and flexible support that they require. Such cooperation may not always be easy, especially if donor agencies themselves have domestic constituencies with a stake in doing business as usual. But progress can be made. Donors to African Education, formed in 1988, has effectively coordinated assistance to education in Sub-Saharan Africa, and its subcommittee on vocational education and training has been instrumental in improving the policy dialogue among donors and recipient governments.

Providing Long-Term Support

The record shows that international aid for training reform is most effective when it is available for a decade or more. Future assistance should therefore adopt a long-term perspective, financing investment and institutional development programs that are needed to maintain government reform efforts.

Where institutional capacity for analysis, planning, and management is strong, donors can provide flexible support for training sector reform programs, such as the one being undertaken in Togo. Specific projects can be appraised by national training agencies using mutually agreed upon criteria. Where planning and management institutions are less developed, initial investments should focus on strengthening their capacity, most notably their ability to monitor labor markets and training and to shift to market-oriented planning.

Priorities for Future Research

Research on vocational education and training has been dominated by evaluations of the external efficiency of different training modes (see, for example, Psacharopoulos and Loxley 1985, Metcalf 1985 for reviews of these evaluations). Various methodologies have been used; the strongest use tracer studies or census data to assess benefits, combined with careful studies of costs. Taken together, these studies provide a partial mosaic of the economic value of different kinds of training. As discussed in Chapter 2, however, the results are mixed. Diversified secondary education has not proved to be cost-effective in developing countries, while both successful and unsuccessful examples of cost-effectiveness can be found for all other modes—public and private technical and vocational schools, postsecondary technical colleges, vocational training institutes, enterprise training, and the traditional apprenticeship.

As the authors of this volume have argued throughout, the cost-effectiveness of training depends on the economic environment and employment opportunities, on the efficiency of market signals and incentives

for investment in training, and on a range of institutional factors that condition the ability of training institutions to respond flexibly and efficiently. Very few evaluation studies have put economic outcomes in this broader context. The direction set by Foster's pioneering work (1965) on the socioeconomic environment of vocational schooling in West Africa was rarely taken up in subsequent studies. Exceptions may be found; Ziderman's (1978) theoretical analysis of the economics of training and recent work by Adams, Goldfarb, and Kelly (1991) are two examples. Writing on a series of tracer studies of elite diversified schools in Kenya, Närman (1988a) acknowledged the central role of stagnant labor markets in depressing returns to training. Paul's (1990) analysis of training outcomes in Togo and Cameroon suggests how differential patterns of growth in the formal and informal sectors of the economy affect training results. And recent World Bank sector studies in Zimbabwe and Indonesia have begun to incorporate analyses of the economic and employment environment into the more traditional assessments of external efficiency and institutional capacity. These broader forms of analysis have begun to replace fixed manpower requirements forecasting as a guide to investment in training.

Narrow cost-benefit evaluations will continue to have an important place on the research agenda, but because their results cannot be generalized and applied to different economic and institutional environments, such evaluations are best used as components of broader studies and as mechanisms for monitoring training in specific contexts. Moreover, as Dougherty (1989) argues, the differences among training modes are becoming less important than the similarities. This convergence of modes further directs the researcher away from the traditional comparison of different types of training institutions toward analysis of the complex set of economic and institutional factors that interact to determine outcomes, regardless of mode.

The first priority on the research agenda, then, should be the development of a body of studies that evaluate training outcomes in the context of economic and institutional factors. Three broad areas of study stand out. First, in an era of economic adjustment and change, it is important to understand the effect on the demand for labor and skills that results from the interactions between different trade, industrial, and labor policies on the one hand and technological change on the other. Second, policymakers and training managers need to know more about how training institutions acquire and use signals to guide training supply. The recent World Bank review of the way vocational training institutes in Latin America function is a good start in this direction (World Bank 1991b). In particular, the ways in which enterprises make decisions on training, Becker's elegant theory notwithstanding, need further investigation, perhaps along the lines of Ryan (1980). Third, although the theory

of public finance provides a workable guide to the appropriate role of governments under different economic circumstances, more attention should be given to identifying and estimating training externalities and to evaluating various forms of subsidy programs in practice.

Many theoretically interesting and practically useful research questions can be asked in each of these three categories. The research questions discussed below by no means exhaust the list of possibilities.

Understanding the Economics of Skill Demand

Considerable attention has been given to the impact of economic adjustment on labor markets, but little to the effect of adjustment on labor market signals and the demand for education and training. An enterprise that relies on a public training system whose output is unrelated to the market demands for skills and whose operation is not cost-effective is unlikely to be able to compete in world markets. The high labor costs associated with such a system would encourage producers of tradable goods to demand more efficient public training systems and to either take more responsibility themselves for training or adopt more capital-intensive production methods.

As economies move toward export-led development, the response of training systems to the new market signals and incentives should be studied. This response will likely vary from country to country depending on the degree to which training systems are insulated from external market pressures. Country case studies of training systems in economies newly opened to international trade would help identify those barriers that prevent training systems from adjusting to new market signals as well as the interventions needed to remove those barriers.

Policy interventions in labor markets can distort the incentives for skills training, as explained in Chapter 3, and impede the efficient provision of skills training. In this case labor reforms, adopted as part of the adjustment program, are the preferred solution. The political sensitivity of these reforms, however, may lead instead to the adoption of second-best solutions to compensate for the market distortions produced by policy interventions. More attention needs to be given to understanding how individual labor market policies affect skills training and how second-best solutions might be designed to compensate for these policies.

Research on individual labor market policies needs to examine the wage compression produced by minimum wages, progressive income taxes, and administered wages and evaluate its effect on training incentives. How have countries motivated skills training when wage compression has reduced incentives for training, and what effect has this compression had on the capacity of economies to adjust to changing

labor and skill demands? The wage and nonwage costs of interventions should be studied to see what effect they have on employers' choices of technology and how these choices interact with the demand for labor and skills. How, for example, have social insurance costs influenced these choices, and what have the implications been for labor and skills demand?

Assessing the Dynamics of Training Supply

Enough research has been conducted to establish, in broad outline, the characteristics of flexible and efficient training institutions. Training planners and managers, however, need more detailed knowledge from a variety of institutional settings to take the practical steps needed to ensure an efficient supply response as economies change. Detailed case studies offer a promising approach for both public and private pre-employment training institutions. Who makes decisions on curricula and enrollment? What information is used? What political and social factors influence these decisions? How is accountability established?

For private training providers, additional questions arise. What is the scope and nature of private training in a given country? What are the effects of different regulatory regimes on training efficiency and quality? Is it true, as is often alleged, that private training is most often of poor quality, or does such training in fact meet the demands of the labor market, if not the high standards of training professionals? Do the clients of private training have adequate information on the job placement records of the institutions they patronize?

Enterprises in developing countries are often said to invest insufficiently in the skills of their workers. These allegations come most often from training professionals with high pedagogical standards, and they may or may not be correct. Certainly, the available evidence suggests that more enterprise training takes place than is often supposed, but relatively little is known about how much this training contributes to productivity. Although some studies exist, such as Fuller (1976), more studies that assess the cost-effectiveness of enterprise training, particularly those that use direct productivity measures, are needed.

Policies intended to stimulate training by private sector employers need to rest on a broader and firmer base than that provided by training and productivity studies alone. Managers chose different combinations of labor and capital equipment in light of information on relative costs, including indirect costs such as those imposed by inflexible labor regulations, and on likely developments in technology and labor and capital markets, among other variables. Managerial skill and autonomy set the framework for these choices, which in turn determine how much and

what kind of training is provided. Yet this decisionmaking process has been little studied in developing countries. In practice, how do enterprise managers make decisions on training investments? What weight is given to the economics of factor combinations relative to other variables, such as labor regulations? How do firms acquire the expertise needed to train in new skills? How is skill development linked to productivity and compensation? Researchers should remember that the answers to these questions may be different for firms of different sizes and in different sectors of the economy.

Analyzing Training Finance

The general principles that should underline policy regarding training finance are well documented, but practical guidelines for their translation into policy, particularly in specific country contexts, are less clearly established.

In Chapter 4 a case was made for the public subsidy of training in the presence of externalities, market distortions, or weak enterprise training capacity. The relative strength of these arguments, and the particular contexts in which they are relevant, will differ from country to country. Thus, interest groups may use these arguments to push for training subsidies that are not justifiable. This danger can be much reduced by comparative international research, buttressed by case studies. Some illustrative examples may be helpful.

Arguments that externalities, such as the need for more workers with specific bottleneck skills or those claimed to be strategic for development, justify subsidies may be tested in the comparative context of the experience of more advanced economies and sectors. The argument that training subsidies are necessary to compensate for the deleterious effects of market distortions on worker investment in training on the job is well established. But recent theoretical research (Katz and Ziderman 1990) has suggested a more optimistic view of the availability of company finance for training, even when minimum wages distort the ability of firms to pass training costs to workers and limited loan markets restrict the ability of workers to finance their own training. The need now is for more empirical work on these issues, in differing country contexts.

Where weak training capacity in firms goes hand in hand with inefficient management, the case for subsidizing company training may be strong; yet the amount of empirical research addressing the effectiveness of training subsidies in raising the quantity and quality of company training in developing countries is sparse. Focused research on these issues would be very valuable.

Finally, additional comparative research on training funds would be useful. The establishment of earmarked training funds has been recom-

mended as a major instrument for developing and maintaining efficient training systems. Yet how are these funds to be organized to best ensure both public accountability and effective use? There is much international experience in the use of such funds but virtually no comparative research evaluating alternative organizational and administrative arrangements. Where these funds are raised by levying company payrolls, who bears the final incidence—the firm, the workers, or the final consumer? The answer to this question has important implications for the efficacy of payroll levies. Yet available research is meager and focused mainly on industrialized economies; it does not address the effect of the labor market settings typically found in developing countries.

The Role of International Organizations

As this set of questions indicates, research that deals with both demand and supply questions will be of most use to policy and practice. The public training bureaucracy is no longer as isolated from market forces as it once was, and public training planners and managers need better insight into the relationships between the economic environment and demand for skills and into the likely effects of alternative public subsidy or provision policies. The work of economic policymakers will be improved if the implications of various policy strategies for human resource development are better understood. Work force skills play an important role in facilitating economic change and in improving productivity and earnings. Research that further illuminates the complex process that underlies the efficiency of training in society can thus make important contributions to economic change, growth, and the welfare of the citizens of developing countries.

Training should thus have a place on the research agendas of the international community. International agencies are well placed to help research institutions in developing countries address training issues, and indeed this is perhaps the most important contribution that can be made. The record of building human resource development research capacity in developing countries, at least for the World Bank, is not good (Lockheed and Rodd 1991). A firmer commitment to the development of research institutions over the longer term will have to replace casual funding of “studies” in project assistance if the record is going to be improved. This commitment will not require increased aid, but rather a marginal shift in priorities. This will not, and should not, be the highest priority in international assistance to education and training, but it deserves attention in proportion to the international aid directed toward skill development.

Appendix I.

Selected Evaluation Studies in Developing Countries

The analysis and conclusions reached in this volume are based on the accumulated weight of evidence provided by a review of more than 950 studies of vocational education and training in countries throughout the world. This literature varies widely in coverage of issues, quality of analysis, and methods of study.

An important subset of this literature evaluates the economic and labor market outcomes of major training programs. This evaluation literature has been widely cited in the review of the vocational education and training record in Chapter 2. To give the reader a sense of the geographical and training-mode coverage of this literature, this appendix lists those evaluation studies that we have found to be particularly useful. For each country, the studies are listed in chronological order.

Bangladesh

World Bank. 1990. *Bangladesh: Vocational and Technical Education Review*.

This sector study provides a comprehensive analysis of formal pre-employment vocational education and training in Bangladesh, including social rates of return under differing assumptions about training costs and employment outcomes.

Benin

Rasera, Jean-Bernard. 1988. *Les enseignement moyens general et technique au Benin : Devenir des diplômés, coûts et rendement internes des études.*

The employment and earnings of graduates of lower secondary general and technical schools are compared using tracer study data.

Botswana

Hinchliffe, Keith. 1990. *The Returns to Vocational Training in Botswana: A Research Note.*

Social rates of return to training provided in the Youth Brigades and in secondary vocational schools are computed using an employment census and surveys of graduates.

Botswana and Kenya

Kukler, Ron. 1987. *A Comparison between the Kenya National Youth Service and the Botswana Brigades.*

The main features of two youth training programs are described, and post-training employment outcomes are analyzed.

Brazil

de Moura Castro, Claudio. 1979. *Vocational Education and the Training of Industrial Labour in Brazil.*

Social rates of return are computed for various combinations of primary or secondary general education with different types of vocational training, based on survey data from industrial firms in Rio de Janeiro and São Paulo.

Arriagada, Ana-Maria, and Adrian Ziderman. 1992. *Vocational Secondary Schooling, Occupational Choice, and Earnings in Brazil.*

Census of population data are used to examine the labor market outcomes for vocational school completers who work in occupations related to course of study, compared with counterparts who attended general secondary schools or those from vocational schools employed in noncourse related occupations.

Cameroon and Togo

Paul, Jean-Jacques. 1990. *Technical Secondary Education in Togo and Cameroon: Research Note.*

The formal and informal sector employment outcomes of secondary vocational education programs in the two countries are compared; private and social rates of return are estimated.

China

Noah, Harold, and John Middleton. 1988. *China's Vocational and Technical Training*.

This case study of three types of secondary vocational and technical education examines the relationships among labor market factors, institutional management, and the employment of graduates.

Dougherty, Christopher. 1990. *Unit Costs and Economies of Scale in Vocational and Technical Education: Evidence from the People's Republic of China*.

A sample of secondary technical, vocational and general schools, and workers' school in Shanghai is used to fit cost functions and to evaluate the importance of economies of scale.

Min, Wei-Fang, and Mun Chiu Tsang. 1990. *Vocational Education and Productivity: A Case Study of the Beijing General Auto Industry Company*.

Job satisfaction and direct productivity of graduates of company-affiliated vocational schools and academic secondary schools are compared.

Colombia

Puryear, Jeffery. 1979. *Vocational Training and Earnings in Colombia: Does a SENA Effect Exist?*

The earnings of graduates of vocational training programs and of general secondary education are compared, and the extent to which vocational training complements or substitutes for general education is assessed.

Jimenez, Emmanuel, Bernard O. Kugler, and Robin Horn. 1986. *An Economic Evaluation of a National Job Training System: Colombia's Servicio Nacional de Aprendizaje (SENA)*.

Using earnings data for workers trained in short and long SENA courses and for a control group of workers without SENA training, the study estimates social rates of return to various combinations of general education and long and short training.

Horn, Robin, and Emmanuel Jimenez. 1987. *Does In-service Training Affect Self-employed Earnings?: The Colombian Case*.

The effects of vocational training on the earnings of self-employed workers are examined using household survey data.

Côte d'Ivoire

Grootaert, Christiaan. 1988. *Côte d'Ivoire's Vocational and Technical Education*.

Household survey data and training cost studies are used to estimate the private and social rates of return to secondary and postsecondary technical education and to informal sector apprenticeship.

Hong Kong

Cheng, K. M. 1987. *Where Are the Trainees?: Trainers' Plans versus Student Aspirations in Hong Kong*.

Low enrollments in vocational training programs are explained in terms of cultural traditions and student aspirations.

Chung, Yue Ping. 1990. *Educated Misemployment: Earning Effects of Employment in Unmatched Fields of Work*.

Census data are used to compare the earnings of vocationally trained workers who are in jobs that use their skills with those who are not; the effects of differential rates of economic growth in the sectors of employment are also examined.

India

Fuller, William P. 1976. *More Evidence Supporting the Demise of Pre-employment Vocational Trade Training: A Case Study of a Factory in India*.

The job performance of workers with formal preemployment training, formal in-service training, or informal on-the-job training is compared.

Indonesia

Clark, David. 1983. *How Secondary School Graduates Perform in the Labor Market: A Study of Indonesia*.

Data from a nationwide tracer study are used to assess the employment outcomes of academic and vocational secondary education in different regions of the country.

Israel

Ziderman, Adrian. 1989. *Training Alternatives for Youth: Results from Longitudinal Data*.

Data from school records and on earnings from social security records are used to compare the effects on earnings of vocational schooling and less expensive, work-related vocational training.

Neuman, Shoshana, and Adrian Zideman. 1991. *Vocational Schooling, Occupational Matching, and Labor Market Earnings in Israel*.

Census of population data are used to examine the labor market outcomes for vocational school completers who work in occupations related to course of study, compared with counterparts who attended general secondary schools or those from vocational schools employed in noncourse-related occupations.

Kenya (see also Botswana and Kenya)

Godfrey, Martin. 1977. *Education, Productivity, and Income: A Kenyan Case Study*.

The trades test results of individuals with and without formal training are compared.

Cumming, Christopher. 1988. *Curriculum Costs: Vocational Subjects*.

The study reports a detailed analysis of the costs of vocational courses in a diversified academic curriculum.

Lauglo, Jon and Anders Närman. 1988. *Diversified Secondary Education in Kenya: The Status of Practical Subjects and Their Uses after School*.

The effects of practical vocational subjects in an otherwise academic curriculum on postschool employment and training are assessed through tracer studies.

Närman, Anders. 1988. *Technical Secondary Schools and the Labour Market: Some Results from a Tracer Study in Kenya*.

Tracer studies are used to assess the effects of technical secondary education and family socioeconomic status on graduate employment.

Lauglo, Jon. 1989. *Technical Secondary Students in Kenya: Origins, Achievements, and Destinations*.

Tracer studies are used to assess the academic achievement and employment histories of graduates of technical secondary schools.

Kenya and Tanzania

de Beyer, Joy. 1990. *The Incidence and Impact on Earnings of Formal Training Provided by Enterprises in Kenya and Tanzania*.

Establishment survey data are used to identify the type and extent of training of workers in the modern sector, and the relationships between training and earnings.

Korea, Republic of

Lee, Chingboon. 1985. *Financing Technical Education in LCDs: Implications from a Survey of Training Modes in the Republic of Korea*.

Surveys of employed workers and training costs studies are used to compare the social rates of return to three modes of training for the same occupations: preemployment vocational secondary schooling and vocational training, and inplant training.

Morocco

Salmi, Jamil. 1987. *New Hope for Unemployed Youth?: The Vocational Training Reform in Morocco*.

The employment outcomes of vocational training are reported, using unpublished government data.

Niger

Mingat, Alain, Jean-Pierre Jarousse, and Marc Richard. 1989. *L'Enseignement technique court au Niger : Une évaluation pour le marché*.

The employment outcomes of technical secondary education for males and females are examined through tracer studies; the impact of labor market rigidities on employment are also assessed.

Nigeria

Mabawonku, Adewale. 1979. *An Economic Evaluation of Apprenticeship Training in Western Nigerian Small-Scale Industries*.

Establishment surveys and tracer studies are used to examine the impact of traditional apprenticeship and formal preemployment training in trade schools on earnings; private rates of return are estimated.

Birks, Stace, and others. 1992. *Skill Acquisition and Work in Micro-Enterprises: Recent Evidence from West Africa*.

The study reports on a survey of education and training histories of urban informal sector workers in Ibadan, Nigeria.

Peru

Moock, Peter, and Rosemary Bellew. 1988. *Vocational and Technical Education in Peru*.

The effects of general and technical secondary education on the earnings of urban workers, including those who were self-employed, are analyzed using household survey data.

Arriagada, Ana-Maria. 1989. *Occupational Training among Peruvian Men: Does It Make a Difference?*

The study uses household survey data to estimate the effects on male earnings of preemployment secondary vocational education, both public and private, on-the-job training, and work experience on earnings in wage and self-employment.

Arriagada, Ana-Maria. 1989. *The Effect of Job Training on Peruvian Women's Employment and Wages.*

The effects of public and private preemployment vocational education and of in-service training on the probability of employment and on wages for women are examined, using household survey data.

Moock, Peter, Philip Musgrove, and Morton Stelcner. 1989. *Education and Earnings in Peru's Informal Nonfarm Family Enterprises.*

Household survey data are used to determine the effects of primary and secondary education on male and female earnings in rural and urban informal sector enterprises.

Arriagada, Ana-Maria. 1990. *Labor Market Outcomes of Non-formal Training for Male and Female Workers in Peru.*

Household survey data are used to examine the effects of non-formal occupational training on the employment and earnings of both male and female workers, in the wage and nonfarm self-employment sectors.

King, Elizabeth. 1990. *Does Education Pay in the Labor Market?: The Labor Force Participation, Occupation and Earnings of Peruvian Women.*

Household survey data are used to estimate the impact of various kinds of education and training, including on-the-job training, on the probability of employment and earnings for urban and rural women.

Sierra Leone

Wright, Cream. 1988. *Curriculum Diversification Re-examined: A Case Study of Sierra Leone.*

A case study of the implementation of curriculum diversification in secondary schools, along with a survey of student attitudes toward vocational subjects and aspirations for employment.

Somalia

Chapman, David, and Douglas Windham. 1985. *Academic Program Failures and the Vocational School 'Fallacy': Policy Issues in Secondary Education in Somalia*.

Employment demand for vocational school graduates is compared with the supply, and the costs of academic and vocational education compared.

Taiwan (China)

San, Gee. 1990. *Enterprise Training in Taiwan: Results from the Vocational Training Needs Survey*.

Large-scale survey data are employed to analyze the extent of vocational training among firms in Taiwan, and to identify factors relevant to a firm's training effort.

Tanzania (see also Kenya and Tanzania)

Fowler, Alan. 1990. *After Vocational Training, What?: A Tracer Study of Graduates of Legruki VTS, Tanzania*.

The employment outcomes of a rural vocational training center are examined using tracer study data.

Togo (see Cameroon and Togo)

Trinidad and Tobago

Chin-Aleong, Maurice. 1988. *Vocational Secondary Education in Trinidad and Tobago and Related Evaluation Results*.

Cost and tracer studies are analyzed to estimate the cost-effectiveness of general and vocational secondary education.

Appendix II. Statistical Appendix

Table A-1. Vocational Education Enrollment in Selected Countries,
by Region, 1985

Country	GDP annual growth rate (1980-85) ^a	Gross secondary enrollment ratio (1985) ^b	Vocational education enrollment as a percentage of secondary enrollment (1985) ^c	Percentage of population 12-17 years old participating in secondary vocational education (1985) ^d
<i>Africa</i>				
Zimbabwe	2.5	43.0	0.1	0.04
Ethiopia	0.3	12.0	0.7	0.08
Mauritius	3.9	51.0	1.2	0.61
Tanzania	0.8	3.0	1.5	0.05
Kenya	3.1	20.0	1.7	0.34
Madagascar	-0.8	36.0	1.8	0.65
Niger	-3.6	6.0	2.0	0.12
Ghana	-0.7	39.0	2.2	0.86
Malawi	2.0	4.0	2.2	0.09
Nigeria	-3.4	29.0	2.5	0.73
Lesotho	0.5	22.0	3.4	0.75
Central African Republic	0.6	13.0	3.8	0.49
Uganda	4.9	0.0	3.9	0.0
Sudan	-0.7	19.0	4.6	0.87
Chad	0.1	6.0	5.2	0.31
Mauritania	0.2	0.0	5.2	0.00
Togo	-1.8	21.0	5.4	1.13
Guinea	0.9	12.0	5.8	0.70
Benin	3.4	20.0	6.1	1.22
Senegal	3.3	13.0	6.7	0.87

(Table continues on the following page.)

Table A-1. (continued)

Country	GDP annual growth rate (1980-85) ^a	Gross secondary enrollment ratio (1985) ^b	Vocational education enrollment as a percentage of secondary enrollment (1985) ^c	Percentage of population 12-17 years old participating in secondary vocational education (1985) ^d
Côte d'Ivoire	-1.7	20.0	7.1	1.42
Mali	-0.5	7.0	7.6	0.53
Mozambique	-9.6	7.0	7.7	0.54
Botswana	12.1	29.0	7.7	2.23
Burkina Faso	2.4	5.0	8.0	0.40
Zaire	1.0	57.0	10.0	5.70
Congo	7.8	0.0	10.5	0.00
Somalia	4.9	17.0	13.0	2.21
Burundi	1.9	4.0	18.8	0.75
Gabon	0.0	25.0	19.6	4.90
Cameroon	8.6	23.0	24.2	5.56
Rwanda	1.8	2.0	26.4	0.53
<i>Asia</i>				
Bangladesh	3.6	18.0	0.6	0.11
Myanmar	5.5	24.0	1.4	0.34
Malaysia	5.5	53.0	1.6	0.85
Lao Peop. Dem. Rep.	0.0	19.0	6.0	1.14
China	9.8	39.0	6.5	2.54
Indonesia	3.5	39.0	9.2	3.59
Thailand	5.1	30.0	17.3	5.19
Korea, Republic of	7.9	94.0	17.3	16.26
Bhutan	0.0	4.0	37.0	1.48
<i>Europe and the Middle East</i>				
Portugal	0.9	47.0	1.3	0.61
Yemen Arab Republic ^e	4.5	10.0	1.5	0.15
Pakistan	6.0	17.0	1.9	0.32
Morocco	3.0	31.0	2.3	0.71
Algeria	4.9	51.0	3.6	1.84
Oman	4.0	32.0	6.2	1.98
Syria	1.5	61.0	6.4	3.90
Jordan	4.1	79.0	9.2	7.27
Yemen, Peop. Dem. Rep. of ^e	1.6	19.0	12.5	2.78
Greece	10.0	86.0	13.4	11.52
Tunisia	4.1	39.0	18.9	7.37
Turkey	4.5	42.0	21.1	8.86
Egypt	5.2	62.0	22.9	14.20

Table A-1. (continued)

Country	GDP annual growth rate (1980-85) ^a	Gross secondary enrollment ratio (1985) ^b	Vocational education enrollment as a percentage of secondary enrollment (1985) ^c	Percentage of population 12-17 years old participating in secondary vocational education (1985) ^d
Yugoslavia	0.8	82.0	25.0	20.50
Hungary	1.8	72.0	73.7	53.60
Poland	0.5	78.0	77.0	60.06
<i>Latin America and the Caribbean</i>				
Trinidad & Tobago	-4.1	76.0	0.8	0.61
Haiti	-0.8	18.0	2.4	0.43
Jamaica	0.5	58.0	3.7	2.15
Venezuela	-1.6	45.0	5.3	2.39
Dominican Republic	2.2	50.0	5.8	2.90
Paraguay	1.4	31.0	6.2	1.92
Mexico	0.8	55.0	11.7	6.44
Uruguay	-3.9	70.0	12.0	8.40
Chile	-1.1	69.0	19.3	13.32
Colombia	1.9	50.0	20.9	10.45
Guatemala	-1.4	17.0	22.2	3.77
Honduras	0.6	36.0	22.5	8.10
Costa Rica	0.5	41.0	22.7	9.30
Panama	2.4	59.0	26.6	15.69
Nicaragua	0.2	39.0	27.6	10.76
Ecuador	1.5	55.0	32.1	17.66
Brazil	1.3	35.0	49.1	17.19
Argentina	-1.4	70.0	60.2	42.14
El Salvador	-1.8	24.0	67.0	16.08

a. GDP growth rates cited from Table 2 of World Bank (1987a).

b. Gross secondary enrollment ratio cited from Table 30 of World Bank (1988c). It is the ratio of secondary school enrollments (number of children of all ages enrolled in secondary school) to the population of secondary school age children (most commonly 12-17 years).

c. Vocational education enrollment as a percentage of secondary enrollment was calculated using data from Table 3.7 of the *Statistical Yearbook 1987*, Nancy, France: Unesco (1987); and from Unesco statistics found in the World Bank Economic and Social Databases.

d. The percentage of the population 12-17 years old participating in secondary vocational education was calculated by multiplying the gross secondary enrollment ratio by vocational education as a percent of secondary enrollment.

e. The two Yemens have since become a single country.

Table A-2. New Entrants to the Work Force in Selected Countries, by Region, 1988

Country	Labor market entrants (thousands) ^a	Number of paid workers (thousands) ^b	Ratio of entrants to workers	Annual growth in paid labor market 1980-85 (percent) ^c	Average number of new jobs created (lost) annually ^d
<i>Africa</i>					
Central African					
Republic	13.40	15.43	87.0	-2.0	(309)
Niger	11.80	21.52	54.8	-7.5	(1,614)
Burundi	6.72	38.15	17.6	-0.3	(114)
Togo	22.55	55.90	40.3	3.5	1,957
Benin	24.12	74.74	32.3	2.9	2,167
Botswana	14.46	112.80	12.8	11.2	12,634
Mauritius	14.51	159.03	9.1	2.6	4,135
Malawi	6.96	219.99	4.5	5.3	11,659
Zambia	30.92	326.40	9.5	-0.1	(326)
Côte d'Ivoire	64.03	357.70	17.9	-2.8	(10,016)
Tanzania	20.77	525.77	3.9	2.1	11,041
Zimbabwe	98.09	780.00	12.6	1.0	7,800
Kenya	154.86	933.50	16.6	3.4	31,739
<i>Asia</i>					
Sri Lanka	321.81	423.40	76.0	-3.4	(14,396)
Malaysia	388.50	3,935.90	9.9	3.9	153,500
Myanmar	394.88	5,020.00	7.9	2.3	115,460
Thailand	539.95	8,846.30	6.1	3.4	300,774
Korea, Rep. of	1,111.90	11,237.00	9.9	4.0	449,480
India	8,243.60	23,273.00	35.4	1.5	349,095
Indonesia	2,084.86	31,297.00	6.6	4.5	1,408,365
China	15,787.20	128,080.00	12.3	3.0	3,842,400
<i>Europe and the Middle East</i>					
Jordan	83.95	153.24	54.8	5.4	8,275
Tunisia	100.68	1,284.80	7.8	1.9	24,411
Syria	271.37	1,674.60	16.2	3.0	50,238
Greece	197.59	1,728.20	11.4	0.7	12,097
Algeria	481.12	2,885.00	16.7	4.6	132,710
Portugal	142.01	3,261.00	4.3	2.3	75,003
Hungary	109.80	3,813.30	2.9	-0.4	(15,253)
Egypt	832.44	5,127.80	16.2	4.5	230,751
Turkey	936.86	6,042.10	15.5	5.8	350,442

Table A-2. (continued)

Country	Labor market entrants (thousands) ^a	Number of paid workers (thousands) ^b	Ratio of entrants to workers	Annual growth in paid labor market 1980-85 (percent) ^c	Average number of new jobs created (lost) annually ^d
Yugoslavia	517.66	6,052.00	8.5	1.7	102,884
Poland	407.59	10,690.00	3.8	-0.5	(53,450)
<i>Latin America and the Caribbean</i>					
El Salvador	33.18	244.56	13.6	0.5	1,223
Nicaragua	52.95	257.38	20.6	9.1	23,422
Trinidad and Tobago	20.24	350.00	5.8	0.0	0
Guatemala	68.11	398.10	17.1	1.7	6,768
Honduras	69.96	404.40	17.3	-1.0	(4,044)
Jamaica	56.00	501.80	11.2	1.8	9,032
Paraguay	37.68	583.90	6.5	3.8	22,188
Costa Rica	31.51	600.90	5.2	2.7	16,224
Haiti	19.25	649.60	3.0	-0.6	(3,898)
Bolivia	71.98	886.20	8.1	0.0	0
Uruguay	53.99	984.30	5.5	2.8	27,560
Chile	227.05	2,969.40	7.6	1.4	41,572
Colombia	502.85	3,057.90	16.4	-0.5	(15,290)
Peru	360.90	3,390.20	10.6	1.8	61,024
Venezuela	321.76	4,279.90	7.5	1.1	47,079
Mexico	1,833.75	6,175.00	29.7	2.6	160,550
Brazil	1,298.71	38,047.00	3.4	3.5	1,331,645

a. The number of labor market entrants was derived from Tables 3.7 and 3.8 of the *Statistical Yearbook 1987*, Nancy, France: Unesco, in the following way: it was assumed that changes in the distribution across grades represented students who dropped out or who graduated and were therefore eligible to enter the paid labor market. The proportion of these students was estimated by summing the changes in grade attendance for 1985. This proportion was then applied to total secondary school enrollment.

b. Number of paid workers is cited from Table 4 of the *1988 Yearbook of Labour Statistics*, Geneva: International Labour Office.

c. Annual rate of growth in the paid labor market was calculated from Table 4 of the *ILO 1988 Yearbook of Labor Statistics* cited above.

d. Average number of new jobs created annually was calculated by multiplying the number of paid workers (column 2) by the annual growth in the paid labor market (column 4).

Table A-3. Multilateral Assistance to General Education and Vocational Education and Training, by Region, 1983-88
(US\$ million)

Region	1983					1984					1985					1986					
	Total education and training ^a		General education			Vocational education and training ^a		Total education and training ^a		General education			Vocational education and training ^a		Total education and training ^a		General education			Vocational education and training ^a	
	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	
<i>Africa</i>																					
African Dev. Bank ^b	46.7	17.9	38.3	28.8	61.7	25.3	2.8	11.2	22.5	88.8	73.1	38.0	52.1	35.0	47.9	7.9	7.9	100.0	0.0	0.0	
Islamic Dev. Bank ^c	9.8	9.8	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	5.0	62.5	3.0	37.5	
UNDP ^d	23.6	13.2	55.9	10.4	44.1	23.7	11.2	47.3	12.5	52.7	21.2	11.1	52.4	10.1	47.6	25.5	14.5	56.9	11.0	43.1	
UNICEF	9.2	5.4	58.7	3.8	41.3	8.5	5.4	63.5	3.1	36.5	7.6	4.7	61.8	2.9	38.2	7.0	4.2	60.0	2.8	40.0	
World Bank ^e	137.3	114.5	83.4	22.8	16.6	24.9	6.7	26.8	18.2	73.2	128.0	125.4	98.0	2.6	2.0	125.0	90.6	72.4	34.4	27.6	
Total	226.6	160.8	71.0	65.8	29.0	82.4	26.1	31.7	56.3	68.3	229.9	179.2	78.0	50.6	22.0	173.4	122.2	70.4	51.2	29.6	
<i>Asia</i>																					
Asian Dev. Bank ^f	126.0	68.0	54.0	58.0	46.0	123.6	39.5	32.0	84.1	68.0	38.8	38.1	98.2	0.7	1.8	116.2	86.8	74.7	29.4	25.3	
Islamic Dev. Bank	8.3	0.0	0.0	8.3	100.0	8.3	8.3	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
UNDP	20.5	8.8	42.9	11.7	57.1	19.7	7.2	36.5	12.5	63.5	22.3	7.8	35.0	14.5	65.0	25.4	10.7	42.1	14.7	57.9	
UNICEF	15.8	13.4	84.8	2.4	15.2	12.3	9.7	78.9	2.6	21.1	18.6	15.1	81.2	3.5	18.8	18.6	13.3	71.5	5.3	28.5	
World Bank	257.0	68.6	26.7	188.4	73.3	466.3	279.9	60.0	186.4	40.0	403.0	397.6	98.7	5.4	1.3	491.4	345.0	70.2	146.4	29.8	
Total	427.6	158.8	37.1	268.8	62.9	630.2	344.6	54.7	285.6	45.3	482.7	458.6	95.0	24.1	5.0	651.6	455.8	70.0	195.8	30.0	

<i>Middle East/North Africa</i>																				
African Dev. Bank	0.0	0.0	0.0	0.0	0.0	28.9	0.0	0.0	28.9	100.0	39.0	0.0	0.0	39.0	100.0	0.7	0.7	100.0	0.0	0.0
Asian Dev. Bank	0.0	0.0	0.0	0.0	0.0	0.2	0.2	100.0	0.0	0.0	28.0	28.0	100.0	0.0	0.0	0.2	0.0	0.0	0.2	100.0
Islamic Dev. Bank	8.0	0.0	0.0	8.0	100.0	1.3	1.3	100.0	0.0	0.0	16.0	8.8	55.0	7.2	45.0	0.0	0.0	0.0	0.0	0.0
UNDP	10.5	5.8	55.2	4.7	44.8	9.2	4.0	43.5	5.2	56.5	6.5	3.0	46.2	3.5	53.8	4.4	2.1	47.7	2.3	52.3
UNICEF	13.6	13.2	97.1	0.4	2.9	7.2	6.6	91.7	0.6	8.3	2.9	2.2	75.9	0.7	24.1	2.2	1.3	59.1	0.9	40.9
World Bank	93.8	30.3	32.3	53.5	67.7	142.7	71.6	50.2	71.1	49.8	209.0	105.0	50.2	104.0	49.8	213.1	130.7	61.3	82.4	38.7
Total	125.9	49.3	39.2	76.6	60.8	189.5	83.7	44.2	105.8	55.8	301.4	147.0	48.8	154.4	51.2	220.6	134.8	61.1	85.8	38.9
<i>Latin America</i>																				
Caribbean Dev. Bank ^g	3.0	3.0	100.0	0.0	0.0	1.7	1.7	100.0	0.0	0.0	1.1	1.1	100.0	0.0	0.0	3.8	3.8	100.0	0.0	0.0
Inter-American Dev. Bank ^h	189.5	111.0	58.6	78.4	41.4	59.0	59.0	100.0	0.0	0.0	92.0	70.6	76.8	21.4	23.3	179.0	128.6	71.8	50.4	28.2
UNDP	6.1	3.0	49.2	3.1	50.8	6.4	2.8	43.7	3.6	56.3	4.7	2.2	46.8	2.5	53.2	4.4	2.9	65.9	1.5	34.1
UNICEF	1.6	1.6	100.0	0.0	0.0	2.2	1.2	54.5	1.0	45.5	3.1	1.6	51.6	1.5	48.4	2.5	1.0	40.0	1.5	60.0
World Bank	59.8	59.8	100.0	0.0	0.0	68.0	43.0	63.2	25.0	36.8	195.8	108.3	55.3	87.6	44.7	10.0	3.6	36.4	6.4	63.6
Total	260.0	178.4	68.6	81.5	31.3	137.3	107.6	78.4	29.6	21.6	296.6	183.7	61.9	113.0	38.1	199.7	139.9	70.1	59.8	29.9
Total for all regions	1,040.1	547.3	52.6	492.7	47.4	1,039.3	562.0	54.1	477.3	45.9	1,310.6	968.5	73.9	342.1	26.1	1,245.3	852.7	68.5	392.6	31.5

(Table continues on the following page.)

Table A-3. (continued)

Region	1987					1988					1983-88				
	Total education and training ^a			Vocational education and training		Total education and training ^a			Vocational education and training		Total education and lending ^a			Vocational education and training	
	\$	\$	%	\$	%	\$	\$	%	\$	%	\$	\$	%	\$	%
<i>Africa</i>															
African Dev. Bank ^b	42.4	39.5	93.2	2.9	6.8	50.5	31.6	62.5	19.0	37.5	245.8	137.7	56.0	108.1	44.0
Islamic Dev. Bank ^c	6.8	6.8	100.0	0.0	0.0	6.6	3.7	56.1	2.9	43.9	31.2	25.3	81.1	5.9	18.9
UNDP ^d	22.8	12.8	56.1	10.0	43.9	24.0	13.8	57.5	10.2	42.5	140.8	76.6	54.4	64.2	45.6
UNICEF	7.7	5.7	74.0	2.0	26.0	8.9	6.9	77.5	2.0	22.5	48.9	32.3	66.1	16.6	33.9
World Bank ^e	104.9	104.9	100.0	0.0	0.0	178.2	152.5	85.6	25.7	14.4	698.3	594.5	85.1	103.8	14.9
Total	184.6	169.7	91.9	14.9	8.1	268.2	208.4	77.7	59.8	22.3	1,165.0	866.4	74.4	298.6	25.6
<i>Asia</i>															
Asian Dev. Bank ^f	71.9	2.9	4.0	69.0	96.0	211.2	160.1	75.8	51.1	24.2	687.7	395.4	57.5	292.3	42.5
Islamic Dev. Bank	1.7	1.7	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.3	10.0	54.6	8.3	45.4
UNDP	22.8	10.9	47.8	11.9	52.2	22.3	11.0	49.3	11.3	50.7	133.0	56.4	42.4	76.6	57.6
UNICEF	21.4	18.8	87.9	2.6	12.1	20.6	17.4	84.5	3.2	15.5	107.3	87.7	81.7	19.6	18.3
World Bank	0.0	0.0	0.0	0.0	0.0	355.7	186.3	52.4	169.4	47.6	1,973.4	1,277.4	64.7	696.0	35.3
Total	117.8	34.3	29.1	83.5	70.9	609.8	374.8	61.5	235.0	38.5	2,919.7	1,826.9	62.6	1,092.8	37.4
<i>Middle East/North Africa</i>															
African Dev. Bank	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.6	0.7	1.0	67.9	99.0
Asian Dev. Bank	0.2	0.2	100.0	0.0	0.0	0.5	0.0	0.0	0.5	100.0	29.1	28.4	97.6	0.7	2.4
Islamic Dev. Bank	2.2	0.0	0.0	2.2	100.0	0.0	0.0	0.0	0.0	0.0	27.5	10.1	36.7	17.4	63.3
UNDP	16.2	12.8	79.0	3.4	21.0	18.4	13.8	75.0	4.6	25.0	65.2	41.5	63.7	23.7	36.3
UNICEF	1.4	0.9	64.3	0.5	35.7	1.4	1.0	71.4	0.4	28.6	28.7	25.2	87.8	3.5	12.2
World Bank	250.0	169.1	67.7	80.9	32.3	242.2	73.2	30.2	169.0	69.8	1,150.8	579.9	50.4	570.9	49.6
Total	270.0	183.0	67.8	87.0	32.2	262.5	88.0	33.5	174.5	66.5	1,369.9	685.8	50.1	684.1	49.9

<i>Latin America</i>															
Caribbean Dev. Bank ^g Inter-American Development Bank ^h	9.4	0.6	6.4	8.9	93.6	3.0	3.0	100.0	0.0	0.0	21.9	13.1	59.8	8.8	40.2
UNDP	3.4	2.4	70.6	1.0	29.4	5.2	3.2	61.5	2.0	38.5	30.2	16.5	54.6	13.7	45.4
UNICEF	4.5	3.4	75.6	1.1	24.4	5.1	3.9	76.5 ^f	1.2	23.5	19.0	12.7	66.8	6.3	33.2
World Bank	84.9	10.3	12.1	74.6	87.9	88.3	8.3	9.4	80.0	90.6	506.8	233.3	46.0	273.5	54.0
Total	177.2	79.9	45.1	97.6	55.1	123.7	40.5	32.7	83.2	67.3	1,194.5	730.1	61.1	464.6	38.9
Total for all regions	749.6	467.0	62.3	283.0	37.7	1,264.2	711.7	56.3	552.5	43.7	6,649.1	4,109.2	61.8	2,540.1	38.2

Note: Unesco data not available.

a. New education loans, credits, or grants approved excluding cancellations of previous loans and credits.

b. Includes African Development Fund and Nigerian Trust Fund.

c. Islamic Development Bank: includes loans approved between 1983-88.

d. UNDP: Data provided by UNDP Office, New York.

e. World Bank includes both International Development Association and International Bank for Reconstruction and Development investments in education.

f. Includes loans approved from ordinary capital resources, special funds, and technical assistance grants.

g. Includes distribution of loans approved (net).

h. Includes ordinary capital, interregional capital, and fund for special operations.

Table A-4. World Bank Lending for Vocational Education and Training, 1963–88
(US\$ million)

<i>Category</i>	<i>1963–76</i>	<i>1977–86</i>	<i>1987–88</i>
<i>Mode</i>			
Secondary diversified	268.1	94.4	0.0
Secondary vocational	247.7	609.2	171.8
Postsecondary vocational	202.4	939.9	102.0
Informal	251.2	1,579.4	901.7
Total	969.4	3,222.9	1,175.5
<i>Sector</i>			
Agriculture	243.3	409.3	301.7
Industry	658.2	2,591.2	588.3
Services	67.9	222.4	285.5
Total	969.4	3,222.9	1,175.5
<i>Income level</i>			
Low	101.6	474.5	122.3
Lower-middle	422.7	1,392.0	492.5
Upper-middle	445.1	1,356.4	560.7
Total	969.4	3,222.9	1,175.5
<i>Region</i>			
Africa	193.9	335.2	136.4
Asia	311.2	1,160.2	350.3
Europe, Middle East, and North Africa	360.6	1,108.7	438.5
Latin America and Caribbean	103.7	618.8	250.3
Total	969.4	3,222.9	1,175.5

Source: These tables are based on cost and financing data extracted from the Staff Appraisal Reports (SARs) of all World Bank-financed education and training projects through fiscal 1988. Because the reports reflect projects at loan approval stage, the data are indicative of Bank and country plans and underlying strategies, rather than of actual implementation.

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The World Bank

When and why should a government finance or provide skills training for its work force?

Improving job skills has been a cornerstone of economic development theory and practice and has received more international assistance than any other form or level of education. Returns on many investments in skills training during the past four decades have been disappointing, however, and governments and donors are uncertain about how to develop national training capacities. To mobilize the private training capacity of employers and to improve the effectiveness of public training, governments must take a fresh look at their strategies.

The first comprehensive review of vocational education and training in developing countries, *Skills for Productivity* identifies the elements of the new strategy. It draws on a comprehensive review of the literature and the experience of the World Bank, on specially commissioned studies, and on original research conducted by the Bank. It has also benefited from consultations with policymakers from more than fifty developing countries, donor agency representatives, and experts in the field, and is the basis for the World Bank Policy Paper *Vocational and Technical Education and Training*.

The authors advocate modifying the design of public training policies so that policymakers can create strategies that are economically sound and practically feasible in a given national context and that can be adapted as economies evolve. The findings also have implications for international support of government policies and programs.

This book will be welcomed by the policymakers and practitioners of vocational education and training, who must deal with changing economic circumstances in the developing world, as well as by academics and students of education and training systems worldwide.

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