Manpower Planning in a Market Economy with Labor Market Signals

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As countries move from centrally planned to market economies, manpower planners must abandon old techniques for forecasting manpower requirements and learn to analyze signals from the labor market.
This paper — a product of the Education and Employment Division, Population and Human Resources Department — is part of a larger effort in the Department to study the operation of labor markets and their impact on human resources development. Copies of this paper are available free from the World Bank, 1818 H Street, NW, Washington, DC 20433. Please contact Selina Khan, room S6-228, extension 33651 (29 pages). January 1992.

The movement from centrally planned to market economies will not eliminate the need for manpower planning. Rather, it will substantially change the roles manpower planners play and the techniques they use.

Manpower planners must become analysts of the labor market. In a market economy, they will be asked for information:

- To guide private decisions about training.
- To improve the management of training systems.
- To identify impediments to competitive labor markets.
- To help rationalize public investments in education and training.

Adams, Middleton, and Ziderman introduce techniques for manpower planning that acknowledge the dynamic nature of market economies. They reject the idea of forecasting manpower requirements, proposing instead to use signals from the labor market picked up by monitoring movements in wages and employment and evaluating training programs.
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In industrialized and developing countries, governments are expected to continue their involvement in the financing and delivery of training where market imperfections and failures impede private delivery and where concerns for equity exist. This involvement produces a need to ensure the efficiency of publicly supported training operations. Costs have to be kept under control and training offered that meets market needs. The improvement of planning techniques is important to achieving these objectives and providing information that enables training systems to be responsive to changing economic contexts and to the demand for different kinds of skills. This improvement 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.

Manpower planning as a guide to both public and private spending on education and training requires the monitoring of labor markets and training incentives. Manpower planners need to become labor market analysts. The information manpower planning produces is essential to improving the efficiency with which resources are used in skills training. The information provided is a guide to public and private training decisions and the management of training systems. This paper introduces techniques for manpower planning that acknowledge the dynamic nature of market economies. It rejects manpower requirements forecasting, which continues to be used as a tool for planning in many planning agencies, and in its place, proposes the use of labor market signals developed by monitoring at the local level movements in wages and employment and the evaluation of training programs.

A. Roles of the Manpower Planner

The manpower planner is most commonly identified with the role of guiding public sector training expenditures. In a market economy, however, the planner is confronted with other roles. There is a need for information: (i) to guide private training decisions; (ii) to improve the management of training

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1/ See World Bank (1991:35) and Middleton, Ziderman, and Adams (forthcoming).
systems; and (iii) to 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 is able to 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 nature of much of this information results in the absence of market incentives for its production. There are also equity issues in leaving the production of this information to private markets, particularly where ability to pay inhibits consumer access. The public sector and manpower planners are important to overcoming what is a market failure. Evidence of this is found in industrialized market economies. None of these economies rely exclusively on private markets for the training information needs of individuals, enterprises, and training institutions.

Guiding Market Training Decisions

Manpower planners have the ability to improve the efficiency with which labor markets perform their allocation function by analyzing and disseminating information on training incentives. This information is essential to well-functioning labor markets. Without it, prospective trainees and managers of training institutions are left with only informal networks for 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 will almost certainly limit equity in the choice of training for individuals and groups with differential 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. The information furnished on the balance of skills demand and supply can be used by managers in curriculum planning and staffing to single out skills where demand is growing and where it may be declining. Manpower planners are also a source of information on market demands for new skills as planners track the introduction of new technologies and industries. By studying training costs as part of evaluating economic returns to alternative skills investments, planners can produce valuable information on cost norms for managers of training programs. The information developed can help program managers better match skills supply and demand and improve the quality of skills training.

Improving Labor Market Efficiency

Manpower planners can identify labor market bottlenecks affecting skills development by tracking measures of demand and supply for specific skills and their determinants. The analysis of these bottlenecks and their determinants by planners provides policy makers with an early warning of market imperfections or failures requiring public interventions to correct. Markets may not always get the training incentives right. Government policy interventions in an economy 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 also impede efficient skills development. Thus, the manpower planner is a potential monitor of labor market performance as well as market signals for skills training.

Planning Public Investments in Training

Finally, even in a market economy, the manpower planner will continue to plan for public investments in education and training. The scope of planning for this purpose, however, can be reduced by the rationalization of the public sector's role in the delivery and financing of skills training. This rationalization calls for public interventions in skills development where labor markets fail to anticipate and
deliver accurate signals involving the demand for skills, where fairness and equity issues are involved in access to education and training, and 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.

B. Abandoning Manpower Requirements Forecasting

A wide range of planning techniques are available to the manpower planner (Psacharopoulos, et al., 1983). However, one technique above all others has become synonymous with manpower planning: manpower requirements forecasting. Over the past two decades, this technique with its precise quantitative estimates of training capacity needs has dominated the field of manpower planning. The linkage of manpower planning with this technique has become so entrenched that the two terms are frequently used interchangeably. As a planning technique, however, manpower requirements forecasting is flawed. The flaws are found in the model's underlying assumptions about economic behavior. The technique also suffers from its requirement of timely, detailed labor market information covering the demand for and supply of skilled labor.

The manpower requirements forecasting model utilizes four steps: (i) overall economic output is estimated for a given time period; (ii) the output is allocated across industry sectors and the labor requirements to produce this output are estimated; (iii) the labor requirements are translated into educational requirements, assuming each job corresponds with a specific occupational level and type of education; and (iv) the forecast of educational requirements is compared with the stock of educated labor adjusted for attrition and new entrants to estimate the need for expansion or contraction of 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. The fixed relationship between labor and the quantity of goods produced is not borne out in practice. Goods and
services can be produced with more or less labor and 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 results in the estimation 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 frequently show the diverse paths by which people arrive in occupations. The number of occupations in which formal education serves as the principal entry point is quite small. People perform the same jobs with various levels and types of education and training. Thus, predicted skill shortages are often met through many alternative ways other than the expansion of formal education programs. 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.

The weaknesses of the model for forecasting skill needs are most evident when it is used for long-term forecasting. This is because given adequate time employers will find ways to adjust to skill shortages and rising wage costs. With time, they are able to 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-effective means to increase the supply of skills. In many cases, this leads to a bypassing of 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.
Box 1: Manpower Forecasting Problems in Tanzania

In the early stages of its independence, Tanzania relied on manpower requirements forecasting to guide its investment in post-primary education and training. The World Bank with these forecasts recommended Tanzania curtail expansion of secondary education. The 1980s began with scarcities of skilled personnel in a large number of fields, while government investment in secondary education was reduced to one of the lowest levels in Africa.

A manpower and employment planning project was launched in 1980 to implement a new approach to manpower planning. Its objectives were to develop a labor market information system; engage in coordinated and centralized planning and programming for training; and conduct studies of organizational structure, pay, and staffing policies. Recommendations were made to improve the timeliness and reliability of labor market statistics.

A tracer study of secondary leavers and a study of newspaper job advertisements was set in motion to analyze labor market "signals." The emphasis on signals was an important component of the shift away from the use of manpower requirements forecasting. The studies revealed that the demand for secondary graduates has been grossly underestimated. The new approach to manpower planning led to a reversal of the decision to cut investments in secondary education.


The technique, nevertheless, remains popular in many developing countries. In a recent review of the Asian experience in manpower planning, seven out of ten market economies used manpower requirements forecasting (Amjad, 1987). The popularity of the technology is even acknowledged by its critics. Having demonstrated that "making long-term projections of manpower supply and demand on the basis of general economy-wide methods is not likely to be a very fruitful exercise for a developing country, Hollister (1983:69) concludes 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." Psacharopoulos (forthcoming) notes that "...this is not the only activity which has maintained itself in society despite the abundance of more intelligent approaches to a situation."

Confronted with evidence of its failure to forecast accurately the need for skills training, the question is why has this technique remained so popular? Among the reasons that can be given for its popularity is the transparency of the methodology and its appeal to common sense. The technique is applied in a straightforward manner with its data requirements and assumptions easily grasped. The concept of economic growth creating a demand for skilled labor which is 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. A second reason is the absence of a system of accountability for failure in most country settings where the technique is applied. The use of the technique in long-term forecasting frequently takes place with the political process giving little attention to yesterday’s decisions and errors.

Until a recent change in practice, the World Bank helped encourage the technique’s survival since most requests for educational loans and project appraisals were justified on the grounds of manpower requirements forecasts (Psacharopoulos and Woodhall, 1985). This gave the technique added credibility. Donors joined the World Bank in using the technique to justify projects. As a result, borrowers became familiar with the methodology and its use spread. Even though international agencies no longer make use of the forecasting technique, the World Bank among them, the technique continues to be popular in the planning ministries of developing countries. A better approach to planning is available, however, that employs labor market analysis and market-based measures of skills demand and supply.

C. Introducing Labor Market Signalling

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

**Focusing on Education and Training Qualifications**

Labor market signalling calls for focusing on education and training qualifications and not on occupational classifications (Godfrey, 1991, Psacharopoulos, forthcoming). The reasons relate to the quality of occupational statistics, the impact of technology on the concept of an occupation, and the practical link between academic specialization and occupational placements. In the first case, 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, e.g., managers, professionals, technical workers, etc. They are poorly suited to the planner’s needs when attempting to capture the balance of skills demand and supply. Technological change is by itself undermining the very concept of an occupation. In Japan, for example, workers’ roles are rapidly changed as needs arise (ILO APSDEP, 1988). Skills become the central issue in this context rather than occupations.

Perhaps the most important reason to focus on education and training qualifications in manpower planning is that the link between skill specialization and occupational placement is weak. A reverse tracer study of higher education and the Philippine labor market found that the proportion of employed graduates of the previous two years working in their field of academic specialization was only 75 percent for applied scientists and 47 percent for liberal arts graduates (Arcelo and Sanyal, 1987). The important issue for the allocation of resources on training is the impact of a training program on productivity rather than occupational placement. The emphasis on occupations is a feature of manpower
requirements forecasting that would be replaced in labor market signaling. The signalling technique emphasizes economic outcomes, measured in terms of wages and employment, and costs for specific education and training programs as a guide to public and private resource commitments to these programs.

Producing Labor Market Signals

The identification and deciphering of labor market signals requires a basic understanding of demand and supply analysis applied to labor markets. This understanding is important as a tool to enable the manpower planner to identify important labor market signals and interpret their meaning. In addition, manpower planners need to be firmly grounded in analytical techniques such as multiple regression analysis, survey research methods, and basic inferential statistics to develop and analyze these signals. Finally, manpower planners will benefit from an infrastructure of labor market information. However, as explained in the section below on labor market information, even in cases where this infrastructure is missing or of poor quality, there are relatively inexpensive techniques available for developing labor market signals. These signals can be used in each of the roles played by manpower planners.

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, as the wage or employment opportunities for one level of schooling or training program rise relative to others, this is a market signal of the demand for the skills associated with the schooling or training. The rise in wages or employment opportunities in relative terms is seen as a signal of excess demand for the skills involved, while a decline in wages or employment opportunities in relative terms is viewed as a signal of 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. While measuring the level of job vacancies, the trend is also important as in the case for labor force activity and the movement of relative wages and employment. The shift in demand and supply for skills is observed through trends in these measures. Thus, when job vacancy rates fall, unemployment rates rise, or employment growth slows or declines for workers with specific levels of schooling or training, this can be interpreted as a market signal of a downturn in the need for the skills associated with the workers' level of schooling or training. This is a signal to prospective students and trainees and to managers of education and training institutions concerning future economic benefits for public and private investments in these skills. Labor market signalling, as such, is focused on the dynamic nature of skills demand and supply, distinguishing it from the technique of manpower requirements forecasting.

Other market-based signals can be developed by planners monitoring the placement of graduates and the demand for particular courses or programs of study. 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 unemployment can link this information with the skills acquired to produce a market-based measure of the economic benefits attached to the skills involved. Thus, surveys of graduates from a general secondary school or a vocational technical institute can generate labor market signals involving graduate placement rates and earnings as a guide 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 applicant to admission ratios are a market signal of demand for specific schools and training centers or for particular programs of study or courses. By comparison, low applicant to admission ratios and half-filled training centers or classes are a signal of low demand to be used by school and training center managers in curriculum and staffing decisions. The regular monitoring by manpower planners of these signals, followed by timely dissemination of the findings to parents and students and to school and training center counsellors 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.

Labor market signals such as described above can be used by the public sector, enterprises, and individuals to single out skill qualifications for commitment of additional training resources and also qualifications where these commitments need to be reduced. However, in setting priorities on spending, costs needs to be considered alongside the economic benefits of schooling and training. This is done by expressing the labor market outcomes of additional schooling or training in monetary terms and comparing the monetary benefits 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, including enterprises, provide the signals needed to set priorities on public and private spending on education and training. Mingat and Tan (1988) offer a primer on cost-benefit analysis for this purpose. In cases where labor market outcomes are not 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, central planning of the intake, enrollment, and output of courses for skills that require only a few weeks or months to acquire is unnecessary. These decisions can be made more effectively by the managers of training programs with the information developed above 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 the changing situation of local labor markets by shifting the locus of decision-making and financial responsibility to the managers of these institutions and involving local employers in the design, management, and financing of the programs offered by these institutions. The manpower planner in this context need not worry about precise estimates of training needs. The false precision of manpower requirements forecasting in this context is unnecessary. The more flexible approach of labor market signalling can be used by managers of training institutions to plan curriculum and staffing needs.
Box 2: Labor Market Signals for Education in Indonesia

The Indonesian economy experienced sharp growth in the 1980s. Manufactured exports underpinned this growth, primarily in low-skill, labor-intensive textiles, garments, footwear, lumber and wood products, and processed foods and agricultural products. The opening of the economy to trade expanded employment opportunities for unskilled and semi-skilled workers, particularly women. The monitoring of labor market signals shows a changing balance of demand for skills by level of education, a change that is not fully captured by manpower requirements forecasts. The labor market signals used include social rates of return, unemployment for 26 to 35 year olds, and median job search time, each monitored by level of schooling primary through university.

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<tbody>
<tr>
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<td>Real Rate of Return</td>
<td>Unemp. Age 26-35</td>
</tr>
<tr>
<td>Primary and under</td>
<td>13%</td>
<td>.7%</td>
</tr>
<tr>
<td>Jr. Secondary</td>
<td>13</td>
<td>2.6</td>
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<tr>
<td>Sr. Secondary Gen.</td>
<td>13</td>
<td>3.7</td>
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<tr>
<td>Sr. Secondary Voc.</td>
<td>10</td>
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<tr>
<td>Academy</td>
<td>12</td>
<td>6.5</td>
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<td>University</td>
<td>6</td>
<td>7.8</td>
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The observation of trends in the real rates of return from 1982 to 1988, not pictured 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 during the decade to the decline of oil revenues reduced employment opportunities for many university graduates.

The forecast of manpower requirements for the 5-year planning period of Repelita V 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 signalling, 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. Both approaches provide support for a reduction of spending on higher education.

Source: W.W. McMahon, Boediono, and Abas Gozali, "Market Signals and Labor Market Analysis: A New View of Manpower Supplies and Demands in Indonesia, Table 10, (mimeo).
Manpower planners can assist managers of training programs and trainees in choosing cost-effective training strategies. In most occupations for which training programs are designed there are many alternative paths to skills acquisition. These paths include combinations of general and technical schooling, in-plant and outside-plant vocational training in full-time and part-time training modes, and on-the-job learning (Godfrey, 1991:59). 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 prior schooling, employment, and training. The information is used to construct an occupational map illustrating the diverse paths of entry into an occupation and the sources of training. Where multiple entry paths are found, which is the case in most occupations, planners can then pursue the measurement of labor market outcomes and costs associated with the alternative paths.

The information produced by reverse tracer studies provides signals for guiding choices of cost-effective training strategies. Where there are many cost-effective training alternatives available in a market economy to meet skill needs of particular occupations, this is a signal that markets are working well and public interventions are unnecessary. In making this judgement, the measurement of training costs is important. Manpower planners need to spend considerable time in developing cost studies of alternative training programs and strategies. These cost estimates are important to managers of training programs and trainees in developing implicit or explicit labor market signals such as rate of return estimates and cost-effectiveness measures. Planners can improve the functioning of labor markets and skills development by producing cost estimates of alternative training programs and disseminating this information as a public good.

The determination of education and training program costs is important as a benchmark for efforts by managers to improve the cost-effectiveness of these programs. By comparing the cost of education and training programs with similar objectives, managers can identify programs where attention needs to be given to cost management. Cost estimates as signals of need for managers to improve the internal efficiency of education and training programs require the measurement of direct and indirect
costs. Direct costs are the sum of out-of-pocket costs for resources used in the education or training program. Indirect costs, on the other hand, represent the market value of resources that require no direct outlay of funds, for example, the value of a trainee's time spent in skills development or that of a facility owned by an education or training institution. The inclusion of indirect with direct costs provides a means for comparing programs that use different proportions of these resources.

Labor market signals that help managers to improve the match between education and training and the skill needs of enterprises, like those introduced above, provide information on the balance of skills demand. By regularly updating these signals, manpower planners can offer managers of education and training programs timely information for determining which programs should be expanded and which contracted. Other signals for this purpose can be obtained through the use of employer surveys, tracking help wanted ads in newspapers and professional journals, and monitoring the introduction of new industries and production technologies. Employer surveys in local markets surrounding education and training institutions can be used by planners and managers of training programs to collect information on employer assessments of the quality of skills training, the introduction of new production technologies, and projected skill needs. Trends in help wanted ads for specific skills are another source for guiding curriculum and staffing decisions along with careful monitoring of sector employment trends.

**Labor Market Efficiency.** The monitoring of wages and employment as labor market signals for schooling and training can also be used as a guide to how well labor markets are performing their allocation function. Labor market analysis of these measures and others can identify bottlenecks that inhibit wage flexibility and labor mobility and 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 in time of wages and value added per worker in an industry sector, for example, provides a signal regarding the flexibility of wages. Mazumdar (1990) cites real wage growth outpacing productivity growth as a factor raising unit labor costs and reducing international competitiveness in manufacturing during the early 1980s in
**Box 3: Togo’s Training and Employment Observatory**

In 1990, Togo established a Training and Employment Observatory (OEF) as part of a World Bank-supported technical and vocational training project. The OEF was located in the Ministry of Technical Education and Vocational Training. Its purpose was to gather information on labor and training markets to inform public and private decisions involving training and employment. To avoid the expensive process of gathering information already available from other sources, the OEF was expected to focus first on existing sources of data in Togo before generating new data. The information gathered was supposed to cover the public sector, parastatals, modern private sector, and informal urban and rural sectors. Training information was to be collected from training centers, apprenticeship programs, and other sources.

Changes in public sector employment by occupation, pay grade, and salary were to be studied every six months using administrative data on the civil service from the Directorate of Finance. Special ad hoc surveys were to be used to study the changing match between training and employment. Social security information on employment would be the main source of time series information for parastatals and modern private sector enterprises. This would form the basis for a sample of firms for regular surveys of pre-employment and in-service training needs. Regular analyses of the informal urban and rural sectors were to be carried out using periodic censuses, profession-specific studies (10 per year), and in-depth studies of some 30 firms in the 10 professions studied each year.

One of the main sources of information for the OEF was to be the regular use of tracer studies of graduates from training centers and programs. 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 would be used to study patterns of education, training, employment, and income. New training needs would be identified by studying information on investment project dossiers submitted to the Ministry of Planning and applications from firms to participate in the Free Trade Zone. The OEF was expected to produce three kinds of products:

- charts summarizing the training and employment situation in Togo to provide a firm foundation for resource allocation decisions by a training fund,
- the collection and analysis of data and studies on training and employment for publication, and
- the distribution of the publications to as wide an audience as possible, including schools, training centers, and employers.

Malaysia. The rapid adjustment of real wages back in line with productivity growth, restoring export competitiveness, was important, he argues, to the economy’s quick recovery from its mid-decade recession.
Evidence of non-competitive wage behavior, once identified, can be studied by manpower planners in terms of the possible determinants. Rigid real wages are an issue of concern where wages fail to send appropriate market signals to prospective trainees and managers of training institutions regarding the balance of skills demand. Rising educated unemployment among graduates that is not combined with declining relative earnings for these graduates is a signal of possibly non-competitive labor markets. Rigid real wages that fail to adjust downward in response to excess skills supply are a potential source of educated unemployment. Understanding the source of the wage rigidity is important to taking steps to improve the competitive behavior of labor markets and the signals they send to individuals, enterprises, and training institutions.

While looking at possible wage rigidities as a source of rising unemployment among graduates of schools and training programs, the planner may also want to look on the cost side at public subsidies for individuals involved in schooling or training. Direct subsidies in the form of study grants or indirect subsidies produced by the lack of cost recovery will create a "wedge" between private and social rates of return that can produce an excess supply of graduates by increasing the private economic incentive for schooling or training. When combined with wages that are inflexible downward, the incentive is expected to accentuate the graduate unemployment problem. In an environment of flexible wages, the graduate unemployment problem may be mitigated by the downward adjustment of wages 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.

The manpower planner needs to look for signals of labor market segmentation and 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, and 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 impact of productivity measures on earnings for labor market segments are a signal of possible segmentation.

Non-productivity-related wage differentials are the most authoritative indicator of labor market segmentation. However, a careful examination of country labor market policies can highlight policies that are regularly associated with labor market segmentation. Any labor market policy whose effect is to reduce wage flexibility or impede 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, frequently become detached from productivity and are used as an instrument for incomes redistribution and equity. When these systems create a high-wage sector, they are associated with queuing for public sector employment, high levels of open unemployment, and wage depression in the informal sector of the economy. For evidence of this, follow-up attention should be focused on wage differentials between workers in the public and private sectors with similar skill qualifications.

Other indirect policy signals of segmentation can be identified. 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, and in firing workers, to engage in length adjudicatory procedures. In some instances, wage differentials may actually be codified inhibiting their use as market signals of skills demand. The enforcement of these policies and others determines their impact on labor markets. In many cases, government enforcement capacity is limited. Evidence involving this capacity can be used as 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 can be found, it is usually limited to large enterprises which are more cost-effective to regulate. Again, for evidence of this follow-up attention should be focused on wage differentials between workers in large and small enterprises.
Manpower planners by examining labor market policies can identify threats to wage flexibility and labor mobility and study their impact on segments of the work force. Labor mobility across urban and rural markets, firms and industries, and occupational groups can provide signals 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 in improving the efficiency of labor markets is to identify these signals and bring them and their economic cost to the attention of policy makers. Where labor market policy reforms are resisted for diverse social and economic reasons, the planner can assist managers of training institutions in the design of compensating policies for the resulting 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 in Latin America have also pursued market solutions. In Africa, more than two dozen countries are engaged in adjustment programs reducing government reliance on central planning. In market economies, the role of the public sector in the finance and delivery of schooling and training can be rationalized. As explained above, much of the training required by enterprises for job-specific skills can be acquired in relatively short periods of time. Central planning of this training is unnecessary. Planning for this training can be left to the managers of training institutions and enterprises relying on the labor market signals provided by manpower planners. Public sector interventions and the planning of public investments in training can be reduced to situations where markets fail to perform their allocation task.

Market imperfections, for example, created by government policy interventions that distort competitive market prices, including wages, if left uncorrected will lead to a misallocation of resources for education and training. Labor market signals will be distorted. 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. Markets failures may also arise. Market failures occur where the net private benefits of skills development fail to equal the net social benefits with the result that individuals 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 private underinvestments in skills training.

Inadequate private training capacity can also justify public sector interventions in training. This applies primarily to low-income countries and countries moving from centrally-planned to market economies where private training capacity is limited. Public sector interventions can be used as a transitional mechanism to ensure adequate capacity for skills training while encouraging the development of the private sector. And finally, the public sector will continue to intervene in the interest of fairness and equity in access to schooling and training as affected by family income, residence, or ethnicity. Labor market signals developed above for guiding market training decisions and improving labor market efficiency can be used to identify the conditions where public sector interventions in training are justified. For example, the estimation of social and private cost-benefit ratios as a guide to market training decisions can also be used to determine when market failures will arise with private training incentives failing to encourage socially optimal levels of skills training.

In like fashion, measures of labor market segmentation and distortion of the relationship between wages and productivity will be useful indicators of imperfectly competitive labor markets and distorted signals for education and training. When identified, the preferred economic solution would be to remove the sources of market imperfection and bring private incentives in line with social benefits and costs. However, where diverse policy objectives make this impractical, the observance of labor market signals signifying the presence of imperfections and failures in schooling and training markets would be an occasion for developing compensating policies to offset the resulting market price distortions. This may include public interventions in the financing of schooling and training. Labor market segmentation may also have fairness and equity implications as a further rationale for public sector interventions. Other
signals involving fairness and equity call for looking at family income and demographic characteristics of those participating in schooling and training, and of course, the labor market outcomes related to participation.

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 develop this information as part of their effort to produce labor market signals for guiding training decisions. This information can be gathered while conducting cost studies of schools and training institutions or while conducting tracer studies. The more difficult task is that of addressing the potential problem of labor markets anticipating structural changes in the economy and attendant effects on labor market signals and skills development. The ability of labor markets to look ahead in time and anticipate through relative wage movements 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.

The monitoring of sectoral employment shifts, production technologies and innovations within sectors, new investor activity, and trade and investment policies are a means for manpower planners to anticipate changes with skills demand and supply implications. Armed with this information, manpower planners can monitor labor market signals for these skills 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 adjust these signals and advise policy makers on appropriate public investments in schooling and training. The scope of this task will be narrower than that undertaken by central planners using manpower requirements forecasting. The focus will be on skills that require long lead times to acquire and skills that are considered strategic to economic development. Other skills, particularly those requiring shorter periods of training, perhaps two years or less, can rely on labor market signals and the planning of managers of schools and training institutions.
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 using labor market signals will rely on a more comprehensive array of measures to guide public investments than provided by manpower requirements forecasting. Single forecasts will be replaced by reliance on a composite of labor market signals. Access to this composite will allow the planner to form judgements on the basis of the weight of market evidence rather than point estimates provided by manpower requirements forecasting. Reliance on a composite of labor market signals will likely reduce the risk of forecasting errors.

The dynamic nature of labor markets and the frequent monitoring of their signals also permits 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 by the shifting of labor market signals. Incremental planning and budgeting can increase the flexibility of training systems. As economies are opened to trade and subjected to the forces of global change, the ability 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 will become critical to the ability of these economies to compete in world markets. Manpower planners that produce timely information involving these skill needs by the monitoring of labor market signals will permit a more flexible response to public spending on schooling and training.

Possible Objections

The advantages of labor market signalling for manpower planning are many. The central focus is on signals related to skill qualifications, not occupations. These qualifications apply to 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 providing information to individuals, enterprises, and managers of these programs. Their efforts, if needed, can be focused on skill qualifications that are of strategic importance to economic development and which demand long lead times for skills acquisition. In contrast to rigid manpower forecasting, this approach to manpower planning is more modest and realistic.

However, it is possible to anticipate objections, particularly to the use of signals involving cost-benefit analysis and rates of return. The principal objection to this technique is its underlying assumption that wages are a good measure of productivity, and that the economic benefits of education and training can be assessed through the monitoring of 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, including distortions created by government policy interventions. 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.

Wage may provide a good measure of the private benefits of education and training, but may not adequately reflect the social benefits which are needed to guide public training expenditures. These indirect effects of education and training must be considered in public expenditures on skills acquisition (Ziderman, 1969). For example, the displacement effect represents the case where a program graduate 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 the social effect, 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 will need to use their informed judgement in adjusting estimates of social returns to education and training. Moreover, these judgements need to be made clear unless the criticisms of precise manpower projections be extended to precise rates of return to education and training. In making these judgements, 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 observers. They also need to be knowledgeable about trends in technology and international product markets which affect the future structure of the economy. Judgements should not be based solely on rates of return, but 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 the regular updating of signals.

D. Sources of Labor Market Information

Manpower planning will monitor labor market conditions and evaluate training programs to produce information guiding the training decisions of individuals, enterprises, and managers of public and private training institutions. In monitoring the operation of labor markets and training incentives, the planner will analyze market imperfections and failures for the purpose of influencing market reforms and helping design appropriate interventions to compensate for the distortion of training incentives. These tasks can best be accomplished where countries have invested in labor market information systems. These systems should include national household and establishment surveys. Examples of these surveys are found throughout industrialized and developing countries. They 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 are also used by planners to analyze the operation of labor markets and their performance.

Earnings data from respondents in household surveys are frequently regressed on respondents' educational qualifications to estimate rates of return to different levels of schooling and fields of study. Rates of return to training can also be estimated where data are collected periodically in these surveys by type of training and source. These estimates based on respondents' earnings are subject to adjustment for reasons explained above. National household and establishment surveys provide a uniform framework for the estimation and comparison of rates of return to alternative levels and types of education and training. Most developing countries already conduct these surveys with varying frequency and detail. Adapting these surveys to the needs of manpower planning may require additional investments in improving the quality of the data collected, the concepts and detail provided, and the timeliness of their collection and presentation. These surveys of labor force activity and employment are also used in evaluating and developing macroeconomic policies.

National household and establishment surveys are essential to a comprehensive labor market information system. Other components of this system will include the capacity for conducting special surveys in local labor markets or on topics of special interest for education and training. Tracer and cost studies, usually conducted as part of the monitoring and evaluation of training programs, are also important sources of information for training decisions. Table 1 summarizes the data sources that might be used in manpower planning and the type of data to be collected from each source and its purpose. On a more practical level for managers of training programs, the flow of information on skills demand and the success of training in meeting the skill standards of employers can be developed by simply building good linkages between training institutions and 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 signalling approach through the use of relatively inexpensive surveys of establishments.
and evaluations of education and training programs. Labor market information in smaller, low income countries may be limited to a decennial census. In other cases, an infrastructure of periodic household and establishment surveys may be in place to collect this information, but poorly funded, affecting the quality and timeliness of the information gathered. Labor market signals can be produced, however, even without a well-developed infrastructure of labor market information. Regular tracer studies of the employment and wages of graduates of education and training programs can provide effective signals of the balance of skills demand in local markets. Periodic surveys of employers in these markets can yield valuable information on expected changes in skill needs, assessments of pre-employment training, and barriers to the productive utilization of skilled labor. Laos provides an example of this rudimentary approach to the use of labor market signalling in Box 4.

E. Conclusions

Manpower planning is important to improving training efficiency. By monitoring the operation of labor markets and training incentives and providing information for guiding training decisions and managing training systems, this planning can improve the efficiency of training and also help improve the performance of labor markets. Achieving these objectives will require the use of planning techniques that balance the social benefits and costs of training and are responsive to changing economic conditions. Except in planning the supply of strategic skills with long lead times for skills acquisition, much of manpower planning can be focused on providing information about the demand for skills, which can be used by individuals, enterprises, and managers of training institutions in training decisions.
# Table 1: Key Data Sources for Manpower Planning

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<tr>
<th>Data Source</th>
<th>Type of Data</th>
<th>Purpose</th>
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<tr>
<td>Social Insurance Administrative Data</td>
<td>Employment, Unemployment, Earnings, Industry</td>
<td>Wage and Employment Trends</td>
</tr>
<tr>
<td>Tracer Studies</td>
<td>Employment, Unemployment, Earnings, Occupation</td>
<td>Rate of Return Studies (benefits)</td>
</tr>
<tr>
<td>Cost Studies</td>
<td>Capital Costs, Recurrent Costs, Enrollments, Training Capacity</td>
<td>Rate of Return Studies (costs)</td>
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Box 4: Moving to a Market Economy: The People's Democratic Republic of Laos

Laos began economic reforms in 1986 in an effort to move from a centrally-planned to a market economy. The steps taken included privatization of public enterprises and preparation for civil service reform. Both steps were expected to lead to the announcement of labor redundancies. In preparation for this, attention was focused on the retraining of workers for new jobs. This required an understanding of the skills workers already possessed, the skill needs of the emerging market economy, and the capacity of training institutions to meet these needs. Very limited information was available to address these issues. A decennial census was 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 this had been done, however, it 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 information. In the small country of Laos, other less costly strategies could be adopted initially. The major restructuring of employment would be in urban areas, principally Vientiane. The United National Development Program (UNDP), as a consequence, 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 along with a survey of 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 would guide public spending on training for the restructured economy. The Government, meanwhile, sought further technical assistance to improve its manpower planning capacity.
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