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Issues and Options

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The need for justifying public training programs is often underappreciated. International experience strongly indicates that the cost-effectiveness of alternative options should be taken into account in the design of such programs.

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This paper — a product of the Education and Employment Division, Population and Human Resources Department — is part of a larger effort in PRE to examine governments' role in the financing of training programs. Copies are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Cynthia Cristobal, room S6-035, extension 33640 (68 pages).

Many policymakers have assumed that the state should play a dominant role in providing training. Dougherty and Tan set out to appraise the rationale and scope for cost-effective government intervention to mobilize resources for training. They also document international experience with alternative arrangements.

Their review indicates that the case for financial interventions and the analysis of the incidence of interventions are complex. Several factors demonstrate a need to make the analytical input into evaluations of these interventions more rigorous.

First, this analysis can reduce the risk of a misallocation of resources — a particular hazard when interventions involve subsidies that alter the effective price of training services that employers or trainees must pay.

Second, such analysis can reduce the risk of unnecessarily increasing the burden on the public purse. Rigorous inquiry about the need for an intervention, and its likely impact, may disclose that the intervention is not justified or is justified only on a smaller scale. Another outcome might be to demonstrate that intervention is justified but that it could take a nonfinancial form.

Examples of nonfinancial interventions include the exemption of apprentices from minimum wage legislation; campaigns to increase the commitment of firms to training; and pump-priming operations such as providing technical help to establish enterprise-based training programs.

Equity and social concerns provide perhaps the clearest argument for subsidizing training through general public revenue, focusing on training activities with benefits for society beyond those accruing to individual trainees. Institutions where apprenticeship and other initial training are an alternative to continued education, and a strong case exists for subsidizing those in the training stream to the same extent as their peers in general education.

In concluding, the authors note that policymakers often overlook the complementarity between basic education and later skill development. The consequence is that resources may be spent on expensive, low volume training programs when they might be used more cost-effectively and more equitably to upgrade the quality of basic education.

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Executive Summary

The private financing of training

Until comparatively recently, most training in most countries has been enterprise-based and has been financed by the employer, by the trainee, or by both jointly, normally without money changing hands. In most countries, this remains the case. As a first approximation, the cost of firm-specific training is absorbed by the employer, and the cost of transferable training is shifted to the trainee by means of a reduction in his wages, often within the framework of an apprenticeship agreement. The first chapter examines the rationale for this division of the burden and the way that it may be modified in certain circumstances. The most important modification to the analysis is the finding that firms may be prepared to absorb part or all of the cost of transferable training when there are constraints on labour mobility or when there is asymmetric information among firms concerning the value of the training. The chapter also notes the role played by proprietary institutes financed by the fees paid by the trainees.

The case for government intervention

Chapter 2 examines the arguments for the subsidization of training from public funds. The case can be made under four headings: market failure, externalities, equity considerations, and social considerations.

Market failure: The main types of market failure relevant to training provision are the failure of employers to respond to training incentives through inertia or other reasons; failure of individuals to respond to training opportunities; minimum wage legislation and other wage rigidities; capital market imperfections and risk averseness; and rigidities in the provision of in-service training.

All of these arguments are persuasive, and possibly the most important in terms of its negative impact is the first, the failure of some employers to respond to incentives to provide training. This failing is of course just one aspect of a wider problem of poor management, and the appropriate response would be a package which took a balanced approach to redressing managerial shortcomings. In practice it is difficult to evaluate the extent to which any given enterprise is failing to respond to incentives. Small enterprises, in particular, often provide relatively little training, but it is difficult to tell whether this should be attributed to managerial deficiencies or whether it is in fact a rational consequence of their use of simple technology with limited skill requirements. This calls for caution in the design of incentive schemes, especially those targeted at small enterprises.

Individuals may fail to take up training opportunities at the wages offered because they underrate the value of the training or because they are unduly pessimistic about the future employment prospects. In either case subsidization may be justified, but an alternative measure would be improved vocational counselling.

Minimum wage legislation or wage rigidities attributable to union or social influence undoubtedly prevent employers from shifting the cost of transferable training to the trainee in some countries and hence inhibit the provision of such training. The subsidization of initial training may then be justified if direct measures aimed at eliminating the rigidity are impracticable or undesirable because they conflict with other social objectives.

Subsidization may be justified if shifting the cost of transferable training to trainees would require the latter to accept wages below subsistence level, and capital market imperfections make it impossible for them to borrow. Similarly it may be justified if risk-averseness deters individuals from making training investments which in other respects are rational. However, in both of these cases, direct measures should also be considered, for example student loans with income-contingent repayment conditions.

Subsidization may also be justified for the promotion of in-service training of a transferable nature. Firms providing it usually have limited scope for recovering its cost from the trainees during the training period. Hence in the absence of subsidies covering part of its cost, such training may be underprovided.

Externalities: The chief externalities cited as grounds for subsidizing training are: the improved utilization of underutilized manpower by alleviating structural unemployment; the raising of skill standards through the benign effect of well-trained workers on the skill development of those working with them; the breaking of bottlenecks restricting economic growth caused by shortages of critical skills; the ability of a pool of trained labour to attract investment; and reduction in inflation. Of these arguments, the first is perhaps the most compelling, and there may be some substance in the second. However there is little evidence that the other three are of practical importance.

Equity concerns: Where apprenticeship and other initial training is an alternative to continued general education, there is a strong case for subsidizing those in the training stream to the same extent at their peers in the education stream. In addition, it may also be argued that the training of the disadvantaged should be subsidized.

Social concerns: There may be a case for subsidizing training programmes that have social externalities - social benefits which are not captured by individuals or their employers.

Subsidies and other financial incentives

Chapter 3 reviews experience with the various types of subsidy scheme that have been implemented in different parts of the world. Although formally such schemes have been implemented in many different guises, in economic terms they are essentially equivalent: they reduce the net cost of training, which is the cost of training including the wage cost of trainees, less the value of trainee output and subsidies. Where schemes do differ is in the criteria for eligibility for grants and the scale of the grants.

Although training grant programmes have been established by governments in many developing countries, there have been relatively few critical evaluations of their impact. This is in itself a significant finding, suggesting as it does that the support for them is intuitive rather than objective. In those countries where evaluations have been made (notably Brazil, Chile, South Korea, Singapore and Taiwan), the general conclusion is that the impact of the programmes, in terms of average duration of training received per worker in scope per year, has been insubstantial. Further, even the low figures recorded may overestimate the true impact of the programmes, since it is reasonable to suppose that much of the training qualifying for grants would have been undertaken anyway. Typically the main beneficiaries of the programmes have been larger firms; small firms tend to be deterred from participation by the overhead costs of organizing structured training and the administrative costs of participation. Their employees may also tend to have lower training needs.

Not only may training grant schemes have less impact than is often claimed for them, but they may also have adverse side-effects. Eligibility criteria may lead to a bias towards overly-structured and inflexible training arrangements, and to unnecessarily high unit costs. Programmes also impose significant administrative costs on both the public authority responsible for them and on the firms participating in them.

As an alternative to subsidizing enterprise-based training, in many countries public resources are used to fund or subsidize the institutional provision of off-the-job training courses. Such courses are typically for initial training and full-time, though exceptions in both respects are common. Such programmes have had a major impact on skill development in many countries. However, their cost-effectiveness depends critically on their management and other factors and can vary enormously. For a review of the issues, and a comparison with enterprise-based training, see Dougherty (1989).

Sources of finance

Private financing: The bulk of training in most countries is financed privately (Chapter 1). Nevertheless there may be considerable scope for increasing the scale of privately-financed training. In particular, the government may be able to promote apprenticeship training to the advantage of both trainees and their employers, by assigning it a legal status which separates it from regular employment.

Further, there may be significant scope for enhanced cost-recovery in public training institutes through the charging of fees. Often, the absence of cost-recovery is backed by little more than tradition. The introduction of substantive fees might call for the establishment of a trainee loan programme on the lines of those established for higher education in a number of countries. However, this remains largely unexplored territory.

Public revenue: There is a prima facie case for using general public revenue to finance interventions motivated by equity or other social considerations, the equity argument having particular force in the case of pre-employment training. Where young people of lower academic ability are channelled into training programmes, while those of higher ability remain in subsidized education, it would be discriminatory not to give equal financial assistance to those who are in any case less privileged. The use of general revenue has the practical advantage that it does not require additional revenue-collecting machinery, but it also has the disadvantage that it may be a vulnerable source of funding in times of recession.

Payroll taxes: Payroll taxes have been used very widely to fund training programmes, especially in Latin America, the schemes varying in coverage from all employers to individual industries. The rationale for a scheme is typically that the provision of training is inadequate and that the scheme will lead to an increase financed by its beneficiaries. It would seem that practical considerations also contribute to the popularity of the payroll tax: it may provide a source of sheltered resources in times of recession and it may constitute a means of mobilizing financial resources otherwise inaccessible to the public sector.

Whether it is used to provide the resources required by a central training agency, or to fund incentives for firms to increase their training provision, the payroll tax is at first sight an attractive instrument. However when a closer analysis is undertaken, its attractions are somewhat diminished. There is the problem of determining the justifiable scale of such an intervention and there is the tricky problem of identifying the incidence of such a tax. Inevitably there will be employers and individuals who make windfall gains and others who make corresponding losses. Even the practical virtues are open to doubt,

since the sheltering may lead to oversheltering and the increase in the tax base may not be as great as appears at first sight. A review of the U.K. experience with levy/grant schemes is provided in the Appendix.

Two comments on policymaking

It appears that policymaking with regard to training finance has a tendency to be impulsive, with adverse consequences for the design of the intervention. Indeed, the thinking behind some schemes seems to have amounted to little more than an assertion that, since the economy could benefit from the training of more skilled workers, the government or industry should intervene to promote increased training provision. However, the same argument could be applied to most productive goods and services, and even some final goods and services. As with these alternative uses of public funds, if there is a case for subsidy, it must be made more rigorously.

Second, there appears to be a systematic tendency for policymakers to overlook the complementarity between basic education and later skill development. The consequence is that resources may be spent on expensive, low-volume training programmes when they might more cost-effectively and more equitably be used to upgrade the quality of basic education. The fact that specialized training programmes tend to have a higher profile and more influential lobbyists than basic education reinforces the bias in their favour.

Introduction

In most countries the cost of training is shared by individuals, enterprises and government. The purpose of this paper is to appraise the scope for cost-effective government intervention into the mobilization of resources for training, examining measures catalytic in nature as well as direct interventions. There used to be a tendency, especially in developing countries, for it to be assumed that the state should play a dominant role in training provision. In recent years economic recession and shrinking government revenues have forced a reconsideration of this view which has led to a growing acknowledgment and appreciation of the role of the private sector. Although the documentation is incomplete, it is now evident that the government is, and always has been, the junior partner nearly everywhere.

In recognition of this fact, the first tasks of this paper are to discuss the contribution of the private sector and to analyze the rationale for government intervention. Next, in those cases where intervention is thought to be desirable, is the issue of how best to provide financial incentives. What has been the experience with different instruments? Finally, there is the issue of how to mobilize the resources required for financial intervention.

As far as possible it has been attempted to minimize the overlap between this survey and a companion study of training cost-effectiveness (Dougherty, 1989). In particular, in evaluating a government financing intervention, the main concern has been whether the intervention achieved its intended impact on the provision of training, and not whether the objective was well-conceived in the first place. However, it has not been possible to maintain an orderly division of labour. Financial interventions are heavily biased towards the promotion of formal training methods, for the simple reason that eligibility for benefits is usually restricted to structured schemes, and it is desirable to consider the implications.

The term training is used here to cover all forms of instruction with some occupational relevance and it therefore covers a spectrum ranging from task-specific instruction to instruction in general principles. The use of a single term is not meant to imply that the heterogeneity of training is irrelevant for financing issues. On the contrary, it will be seen that the position of any given form of instruction in the spectrum is of critical importance for determining who pays for it. The term is used to avoid the unsound classifications that have given rise to so much unnecessary conflict in the literature on training. There used to be a tendency to refer to instruction towards the general end of the spectrum as vocational or technical education and to that at the more specific end as vocational, technical or occupational training, but attempts to make such a distinction, like the parallel distinction between vocational and technical instruction, are futile: there are no well-defined boundaries between the putative categories. In recognition of this, many recent studies side-step the problem by referring to VET (vocational education and training) or VTET (vocational and technical education and training).

The analysis is primarily addressed to the economic issues surrounding the financing of training, but it is acknowledged that social and political factors are often also of great importance. The focus of the paper is on financing training in developing countries. However it has been thought desirable to draw on the experience of the industrialized countries as well, partly because the issues are often similar in these countries, but mainly because the literature, especially the analytical literature, is dominated by studies relating to them.

1

The Private Financing of Training

The two main private forms of privately-financed training are enterprise-based training and proprietary school training. Data on the volume and the cost of the former are notoriously scarce and unreliable, even in those countries with the most sophisticated statistical services. The cost of trainee and trainer time, the cost of disruption to production and the cost of equipment and facilities are all hard to measure in a context where training is merged with productive activity, and the task is magnified by the dispersion and heterogeneity of such training. But if the conclusions of reverse tracer studies (for example, U.S. Department of Labor, 1964) provide any guide, enterprise-based training is a more important source of skill development than institutional training for most non-professional occupations and it is probably fair to say that it consumes more resources. Proprietary school training is likewise poorly documented in most countries but it can also represent a significant share of training provision.

1.1 The Financing of Enterprise-Based Training

The traditional apprenticeship bargain

Until the present century, apprenticeship in one form or another was the usual means of entering those occupations which demanded extended initial training. In many countries it still is, either because it has retained popular support as a social institution or because alternative forms of training provision remain small in scale. It is not always called apprenticeship. Indeed, that term is typically reserved for training for the craft occupations. In non-manual occupations, no doubt reflecting status differentiation, other terms are used instead. For example, accountants and lawyers may serve articles, and doctors do internships or housemanships. In some occupations, there may be no special term at all, but nevertheless the trainee is effectively an apprentice during the training period.

Regardless of the terminology, pay determination has rested on a simple principle which has long been well understood by both practitioners and theorists (it is explained, for example, by Adam Smith in the *Wealth of Nations*). It can be stated very briefly. An apprentice or any other individual receiving initial training, is in a position to appropriate all the benefits of the training if the skills are transferable. If the employer that has trained him (or her) does not offer the market wage once he has qualified, he can move elsewhere. It follows that, since the training firm cannot reap any part of the benefits of the training, it cannot be expected to bear any part of the costs either, and will shift them to the apprentice by offering a wage lower than that paid to an unskilled worker who is not being trained. This is acceptable to the trainees because on completion of their apprenticeships they can expect to earn more than unqualified workers, the difference being "sufficient to compensate the superior expence of their education" (Smith, 1776, Volume I, p. 125).

As Becker (1964) has shown, in a classic work which formalized and greatly developed the theory, the amount that an apprentice might expect to be paid depends on his productivity and the cost of training. The relationship is illustrated in stylized form in Figure 1.1. The individual has the choice of entering an apprenticeship at time zero or entering the labour force directly as an unskilled worker. If he chooses the

latter, his annual wage is constant at w_0 (the assumption of constancy is made for convenience). If he enters an apprenticeship, his output is given by the curve ABC. This is his net output after taking account of the loss of output of other workers attributable to his training (caused, for example, by slowing down the production line). The net contribution of the apprentice to the firm's revenues is his output less the direct cost of training (instructor salaries, cost of training facilities, training materials, etc). It is represented by the curve DEF and may initially be negative.

In the simplest version of the theory, the firm pays a wage exactly equal to the net contribution, so that at no stage does it incur a net cost. With the growing productivity of the apprentice, output and net contribution tend to rise over time. At the end of the apprenticeship the annual output of the trainee is w_1 . Since training costs cease at this point, this will henceforward be his wage, assuming that the labour market is competitive. The total cost of training during the apprenticeship is equal to the direct training costs and the output the apprentice would have contributed if he had not been trained, less his actual output. Since the difference between his output and direct training costs is his net contribution, and hence the apprentice wage, the total training cost is equal to w_0 minus the apprentice wage, in other words the income forgone by the apprentice. In Figure 1.1, the cost is given by the area DEP less the area FEQ, it being assumed that the apprentice wage actually exceeds w_0 towards the end of the apprenticeship. (Of course it may happen that the net contribution never reaches w_0 during the apprenticeship, and hence the apprentice forgoes income throughout his training.)

output,
net contribution

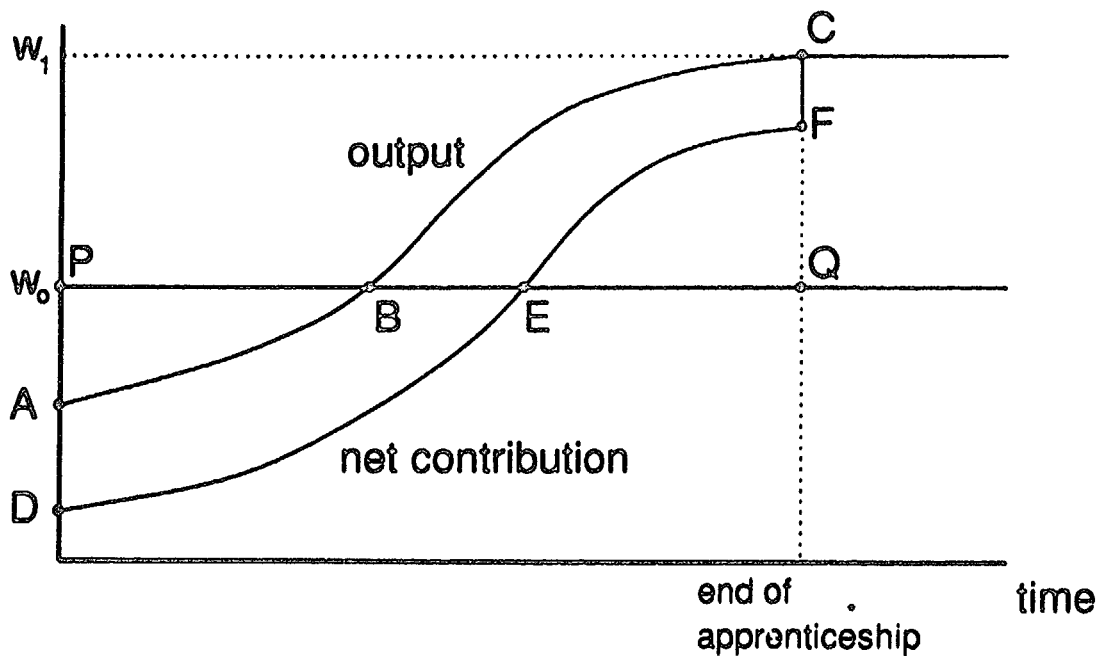


Figure 1.1

The benefit of the training is the increase in earning power attributable to it, $(w_1 - w_0)$, and this is the annual return that the apprentice receives on his investment.

It can well happen that the net contribution of the apprentice to the firm's revenues is initially not high enough to justify a subsistence wage. Indeed it may well be negative. Under these conditions rigid adherence to the principle of equating the wage to the net contribution would deter potential trainees from taking up training places, or prevent them altogether if their families are unable to support them or forgo their earning power. This problem has been overcome in several ways:

Training contracts: One solution is to make apprenticeship a contractual arrangement with the trainee required to stay with the employer for a fixed number of years. This allows the employer to redistribute the income of the apprentice, overpaying him in the first part of the training and underpaying him in the latter part. The wage line during training would therefore start higher than D and end lower than F.

Slow training: A second and related solution to the problem is to extend the term of apprenticeship artificially, reducing the rate of training input made by the employer and giving him more time to recover his costs.

Bonding: A third solution is to bond the apprentice to continue to work for the employer for a number of years after qualification, at presumably a below-market wage, allowing the employer to incur net costs during training and recoup them later. Bonding is very widespread in the case of public sector employment, but it is not hard to find instances of its use in the private sector. Korean trainees, for example, must remain with their employers for twice the length of training, although the bond may be reduced if trainees share in the cost of their training (ILO, 1985). A similar arrangement exists in Czechoslovakia: enterprises that finance a worker's university education have the right to five years' service from that worker after he graduates (Tesar, 1981). In some countries, the bonding arrangement is quite flexible in that trainees have the option to repay their employers a lump sum in return for early release from the initially agreed length of service.

Where bonding is discouraged or prevented by legislation or social norms, it may nevertheless be implemented de facto, the enterprise lending the trainee the cost of his training and cancelling the loan if he remains in service for an agreed number of years. British Airways, which has recently re-established a training programme for pilots after a lapse of ten years, has adopted the latter variant. The training takes a year and a half and costs £100,000. Graduates are loaned the cost and the loan is cancelled after five years of employment with the airline.

Fees: A fourth solution is to charge fees, typically paid as an initial lump sum by the apprentice's family. Although this recourse is no longer found in the industrialized countries, its demise is quite recent: the charging of fees was standard practice in accountancy practice in the U.K. until the early fifties and was still extant in Ireland in the sixties (Robinson, 1964). It is still common in small enterprises in West Africa (Dougherty, 1989).

General training and specific training

A key contribution by Becker (1964) to the theory of training finance is the distinction between general training for transferable skills and specific training for non-transferable ones. With regard to general training, the analysis follows the traditional theory outlined above. In the case of specific training which raises productivity only in the firm that provides it, Becker's analysis shows that the costs and benefits of such investment would be shared between the worker and his employer. Because the worker receives part of the benefits, the risk to the employer that he or she will quit after training is reduced; by the same token, because the employer receives part of the benefits, the risk of layoff is also reduced. Since the benefits are shared, it follows that the costs of training would also be shared to achieve balance in the demand for training and its supply.

The share of each party in the costs and benefits of the investment depends on various market conditions, including "the relations between quit rates and wages, layoff rates and profits, and on ... [such] factors as the cost of funds, attitudes toward risk, and desires for liquidity" (Becker, 1964, p. 22). Hashimoto's (1981) formal model of the sharing arrangement indicates that long-run conditions of competitive equilibrium require that costs be shared in the same ratio as benefits.

net contribution,
wages

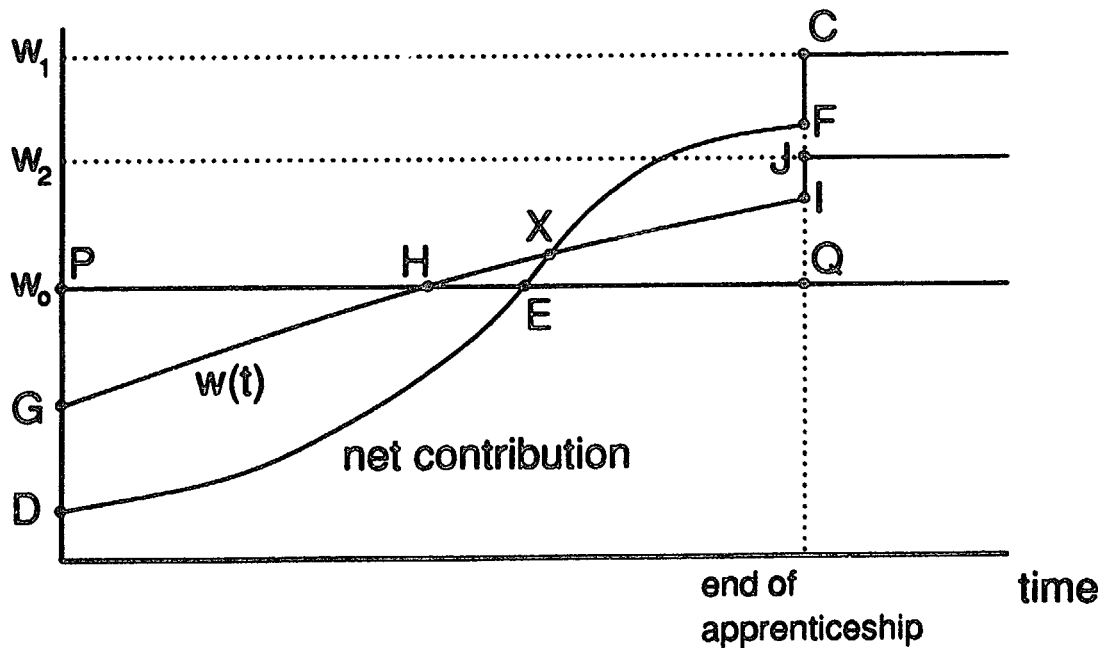


Figure 1.2

In reality, most training investments are neither completely general nor completely specific. Productivity would rise in other firms as well, although not by as much as in the firm providing the training. As a result, the wage that could be received elsewhere would also increase. Becker notes that such investments could be thought of as having two components, one completely general, the other completely firm-specific. For such training, the fraction of costs paid by the firm would be "inversely related to the importance of the general component, or positively related to the specific component" (Becker, 1964, p. 23), the reason being that firms do not pay any of the completely general costs, and only part of the completely specific costs.

The sharing of training costs between a worker and his employer can be expressed graphically, as in Figure 1.2. The growth of a trainee's net contribution during training is again depicted by the curve DEF. If training is completely general, the trainee's wage profile will follow this curve exactly, as in Figure 1.1.

For other training investments where costs and benefits are shared, the trainee's wage profile is indicated by $w(t)$. The firm invests by paying the trainee a wage higher than the value of his net contribution during training, and receives a return in post-investment periods by paying the trainee a wage w_2 which is smaller than the value of his marginal product, w_1 . The firm's costs are indicated by the area DXG, minus the area FXI (during the first part of the apprenticeship the firm is paying the trainee more than his net contribution; for the latter part it is already recouping some of its investment by paying less. Of course in practice there may be no cross-over point during the apprenticeship). The annual return to the firm's investment is given by $(w_1 - w_2)$ for the time that the qualified trainee remains in its employment.

As in the case of transferable training, the apprentice for his part invests by accepting a wage lower than his alternative wage during training, in return for benefits later on in the form of wages that are higher than his alternative wage, but both of these are lower than in the case of general training: the income forgone is represented by the area PHG less the area HIO, and the annual return on his investment is reduced to $(w_2 - w_0)$.

Hashimoto (1979) has applied this analysis to explain the lifetime employment arrangement in large Japanese firms that make substantial investments in training. His empirical analysis shows that a sizeable component of workers' wages in such firms consists of bonus payments (which fluctuate as market conditions change), and that the ratio of bonus to earnings increases as more is invested in a worker's training. Bonus payments may in fact be interpreted as a device to vary wages according to the post-investment productivity of workers. It is this device, in addition to the possible influence of cultural factors, that enables Japanese firms and workers to maintain long term employment relationships that protect both parties' investment in training.

Apprenticeship: the empirical evidence

At least at first sight, the practices governing the determination of wages in regulated apprenticeship systems provide empirical support for the traditional theory. Even more striking evidence is provided by unregulated apprenticeship systems where market forces are wholly unfettered.

Regulated apprenticeship: Most government-regulated apprenticeship systems are intended to provide broad-based, transferable training. According to the theory, in the absence of government intervention, the cost of the training should mostly be borne by the trainee and one should anticipate that apprentice wages should

rise steeply from a low level, following a curve of like DEFC in Figure 1.1. Certainly this is consistent with the facts. Usually apprentice wages are set at a fixed proportion of the wages of qualified workers, the proportion increasing according to the year of apprenticeship. Examples are given in Table 1.1.

On the surface at least, the data support the traditional theory in two ways. First, in all countries apprentice wages start at a fraction of qualified workers' wages and increase with the development of expertise. Second, the wages tend to be lowest in those apprenticeship systems which have a reputation for providing the most intensive training.

In part the variations in the wages reflect differences of coverage. For example, the figures for New Zealand are those prescribed for engineering apprentices, those for Denmark give the average range for plumbers, painters, typesetters and electricians, and those for the United Kingdom also refer to a narrow range of occupations, whereas those for the Federal Republic of Germany, Ireland and Italy are closer to general averages.

Table 1.1

Apprentice Wages as % of Qualified Worker Wages,
Selected Countries, Europe and Asia and Pacific

	Year of Apprenticeship			
	1	2	3	4
Europe				
Denmark	(2.5) ^a	.....	90	
Germany (FRG)	30	35	40	
Ireland	30	45	65	
Italy	55	.....	90	
U.K.	40-50	54-70	60-90	
Asia, Pacific				
Australia	42	55	75	88
Nepal ^b	50	.....	.....
New Zealand	42-48	54-60	66-72	78-84
Pakistan	40	.....	80	
Singapore	40	.....	80	

a Allowance during full-time off-the-job instruction during first year.

b Partly or wholly subsidized.

Sources: K&Ditz (1981), APSDEP (1981).

In part they could be attributed to variations in the sacrifice expected of the apprentice in line with the resources devoted to his training. Köditz (1981) concludes that in "Member States [of the European Community] where apprenticeship training contributes highly towards the qualification of workers (Denmark, Federal Republic of Germany, Luxembourg) ... the apprentice's status as a trainee is emphasized; the proportion of his productive labour is relatively low, as are his wages", whereas in "Member States where apprentice training contributes only minimumly towards the qualification of workers ... more emphasis is placed on the status of the apprentice as an employ e and at least towards the end of the apprenticeship his material situation tends to be close or equal to that of unskilled young workers." His accompanying remarks indicate that K ditz considers Italy and the United Kingdom to be examples of the second category.

And in part the variations in apprentice wages could be attributed to labour market rigidities. As K ditz observes, apprentices in the United Kingdom, far from making a sacrifice, may well earn more than those of the same age who have directly entered unskilled occupations, their generous compensation being the result of social and union pressure (Prais and Steedman, 1986). This is widely held to be a major factor responsible for the relatively poor supply of apprenticeship places in the United Kingdom compared with, say, France and Germany (Jones and Hollenstein, 1983; Prais and Steedman, 1986). In Germany, by contrast, the institutional pressures appear to work in the opposite direction: the obligation of most school-leavers to secure a training place rather than regular employment has helped to create and sustain a large-scale, low-wage apprenticeship system which extends even to occupations where apprenticeship is hard to justify (Dougherty, 1987). At the other extreme there is the example of Panama, where the labour code requires apprentices to be paid nearly as much as skilled workers and not surprisingly apprenticeship is practically moribund (Cuervo, 1985).

It is a matter of some dispute as to whether the apprentice wage scales illustrated in Table 1.1 cause the apprentice to bear the net cost of his training. It is commonly said in Germany that in many trades the enterprise makes a loss on the apprentice in the first year, breaks even in the second, and makes a profit in the third. However, as has been found repeatedly in many countries, it is impossible to measure net costs sufficiently reliably to test such propositions. Indeed Eckaus (1963) observes that measurement is impossible even in principle when training and production are a joint process. In any case, firms seldom make any serious attempt to estimate them (Oatey, 1970).

Such formal studies as have been undertaken typically indicate that the overall net cost to enterprises is positive (for example, in Germany: Noll et al., 1983; and the United Kingdom: Atkinson, 1982). In some cases, especially those involving extensive vestibule training instead of direct on-the-job training, the firm does undoubtedly make a loss and the Beckerian explanation of enterprise-based training provision must be extended (see below). But in others the apparent net cost may be attributed to biased accounting.

Noll et al. (1983), summarizing the findings of one of the most comprehensive training costs studies ever undertaken (2,141 enterprises, 45 occupations), conclude that training costs tend to be systematically overestimated and the net output of the trainee systematically underestimated. In particular, the cost of trainer time tends to be greatly exaggerated. Typically the cost of a trainer hour is estimated using his wage rate, when in fact the real cost, in terms of the lost contribution of the trainer to output, may be much smaller. Indeed, if the trainer is able to fit training into periods when he would otherwise have been idle, the true shadow cost of training is negligible or zero. This flexibility appears to be particularly important for small firms in trades and crafts, and helps to explain their willingness to provide training for apprentices

who are likely to move on to other sectors of the economy: it is far more reasonable to suppose that such firms profit on balance from their trainees than that they incur the losses estimated in such studies (Noll et al. 1983; Dougherty, 1987). The tendency to overestimate the cost of trainer time and to underestimate the contribution of the trainees may be partly attributable to genuine measurement problems, but it is undoubtedly reinforced by an understandable preference on the part of enterprises to be regarded as making an altruistic contribution to the development of young people rather than benefiting commercially from the apprenticeship system.

The alterations that have gradually been made to the terms of apprenticeship are entirely consistent with the traditional theory of apprenticeship. For example, the dropping of fees by the Institute of Chartered Accountants in England and Wales in the 1960s was a ratification of a change that had already occurred as a consequence of obvious market forces: as the profession has established itself in its own right, it has managed to attract better-educated recruits, and because they are better educated, they are productive almost immediately. As a consequence, not only have the fees been dropped, but accountancy firms are able to pay attractive initial wages. Similarly, and more generally, the improvement in the education of apprentices, partly attributable to extra years in school, has accelerated their attainment of net productivity and has made it possible for employers to agree to shorter training periods.

Unregulated apprenticeship: Perhaps unsurprisingly, the traditional theory is corroborated most transparently by the unregulated apprenticeship systems that have spontaneously grown all over the world and are particularly widespread and well-documented in West Africa (for case studies and further references, see Sethuraman, 1981; Hallak and Cailods, 1981; Fluitman, 1987; Harper, 1987). Typically apprentices in these systems receive only nominal pay and may have to pay fees, the size of the fee in such cases bearing a clear relationship to the net cost and the value of the training. For example, a Nigerian survey found that the fees paid by apprentice motor mechanics tended to be much greater than those paid by apprentice tailors, reflecting the greater net cost of training mechanics, the higher incomes earned in that occupation and the greater chances for upward social mobility (Allen, 1982).

An alternative to charging a fee is to extend the duration of the training artificially to allow the master to make a profit, as is described in a study of skill development in small and intermediate enterprises in carpentry and footwear production in Tunisia:

"The small workshops are likely to provide on-the-job training that is conventional and complete, in the sense that apprentices not only learn the techniques of the trade but also acquire practical knowledge (concerning procurement and marketing) which will fit them to become craftsmen in their turn. The system is very selective, and the low wage paid to the apprentice is the price he must pay in order to learn the trade;

"In contrast, the workshops of intermediate size rapidly specialize their apprentices in highly fragmented tasks. This enables them to use a cheap source of labor productively and to pay the workers higher wages, but at the price of abandoning apprenticeship in the trade.

"The first type of on-the-job training which in a way represents a persistence of the traditional and conventional form of apprenticeship,

consists in seeking to maximize the apprentice's productivity in the long term; however, an employer who refrains from maximizing short-term productivity in a situation of unrestrained competition must necessarily minimize his labor cost. Since the pursuit of productivity in the medium or long term calls for a certain stability of the labor force, the craftsman's entire strategy will consist in getting the apprentice to understand that the low wage he receives is the price he has to pay to learn his trade. And the complete training will be imparted only very slowly -- which is, moreover, a measure of good assimilation -- since it is very likely that the apprentice will leave his employer as soon as he completes his training.

"In these cases there is a very large initial turnover of apprentices who seek better pay and who settle down, for the time being, only when they find employers who take the second type of on-the-job training. This second type consists in maximizing short-term productivity through very rapid and highly specialized training, which allows the employer to pay higher wages" (World Bank, 1985).

Curiously, in view of their economic importance, informal apprenticeship has largely been neglected in official policymaking. One factor, undoubtedly, has been a failure to recognize its contribution to skill development. Despite the fact that it may be the dominant means of skill development for most crafts, many planners in developing countries appear to be barely aware of its existence. It is no accident that most studies of informal apprenticeship have been undertaken by non-government bodies or individuals, often foreigners. Even when the documentation is in place, planners typically take it for granted that institutionalized training must be more cost-effective, or at least more effective, whereas it may be neither. Without doubt high priority in the training field in many developing countries should be given to a comprehensive assessment of this underworld, comprising a quantitative survey of its scope and an evaluation of the degree to which it substitutes or complements other forms of skill development.

Extensions of the model of apprentice wages

Although experience with apprentice pay generally supports the traditional theory of apprenticeship and its refinements, there is evidence that the explanation provided by the model can be a serious oversimplification. In particular, it is apparently contradicted by the not uncommon finding that the wages paid to apprentices may not be inversely related to the cost of their training. For example, a disaggregation of apprentice allowances in Germany by trade reveals that apprentices in occupations with high training costs actually tend to be paid more than those in occupations with low ones (Dougherty, 1987).

The key to the resolution of this paradox is a consideration of the mobility of the trainee. Becker's formulation of the model assumes a competitive labour market and unrestricted mobility. As he himself points out (Becker, 1964, p. 29), to the extent that an enterprise exerts monopsony power, general skill development becomes effectively specific skill development and accordingly will be financed by it.

This line of reasoning can be developed in several ways. First, as Oatey (1970) points out, the cause of the immobility is immaterial. Whatever its origin, "if the firm were certain the trainee would never leave,

the question of the generality of skills becomes irrelevant, and the firm could behave as if the investment was specific", as in the lifetime employment system in larger firms in Japan.

Second, an enterprise may be willing to bear the cost of general skill development even if some trainees are attracted to other firms by higher wage offers and depart immediately. It is sufficient that it should be able to recoup its investment by paying those who stay behind wages below the market rate. Several studies have shown that the costs of training can be recouped even if a trained worker stayed on for only a short while after training (for example, Ziderman, 1969). Ryan (1980) estimates on the basis of conservative assumptions about the marginal product of trained welders relative to their wages that a return of 15 percent would accrue to the firm even if a trained welder quit as early as the fourth year of employment. In the German study cited above, it was concluded that employers with high training costs hope to recoup their investment in the subsequent employment of the worker and they are prepared to pay well to recruit able individuals, the premium wage being a very small proportion of the total investment. Is it realistic to expect workers with transferable skills to stay with the training firm despite being offered a wage below the market rate? Yes, within limits, if there are costs in moving. Such costs may be monetary (loss or impairment of pension rights; cost of moving house, if necessary) or non-monetary (psychic cost of overcoming inertia; loss of companionship at work; loss of seniority and impairment of job security). Potentially an important factor is a temporary loss of earnings due to asymmetric information among firms. Katz and Ziderman (1987) argue that a worker with transferable skills who changes employer can expect to suffer a cut in wages for a transition period while his ability is being evaluated and recognized. He has no incentive to move if the present value of the loss of wages during this probationary period is greater than the present value of the loss incurred by staying with the training firm at a below-market wage. In this respect certification has a negative impact on training, for by facilitating inter-firm mobility it reduces the incentive for a firm to provide training. It is perhaps significant that in West Germany, one of the few countries where the acquisition of higher credentials via in-service training is well-established (Maurice, Sellier and Silvestre, 1986), there are powerful socio-institutional constraints on the competition among firms for trained workers.

Finally, as Oatey (1970) observes, it is rational for enterprises to provide general training if its cost is exceeded by that associated with the recruitment of the skill in the open market.

This last consideration, together with the recognition of the role played by mobility in training decisions, leads naturally to the development of the internal labour market model of Doeringer and Piore (1974). According to this model, training is a major instrument in the management of the internal market of the firm and the fact that its cost may be more than justified in terms of reduced hiring and firing costs provides an explanation of the willingness of firms to provide in-service training of a partly or wholly general nature, despite the fact that such trainees are not expected to accept lower wages for its duration.

The adoption of such a framework also makes it possible to replace the simple, short-term wage concept of compensation with a long-term notion of career development in which an explicit or implicit promise of training at appropriate times, accompanied by promotion and pay increments, is as much a part of the package as the immediate earnings. Needless to say, the problems involved in the empirical investigation of a compensation model on these lines are immense and it appears that no such studies have been undertaken.

1.2 Privately-Financed Institutional Training

Although enterprise-based training is the dominant source of skill development in most countries, privately-financed institutional training is also significant in scale in some. The rationale for purchasing such training is a straightforward extension of the rationale for purchasing privately-financed education: the trainee (or his or her family) incurs costs in the form of fees paid to the institution and income forgone during training, and in exchange receives benefits in the form of higher earnings on completing the training. The decision to purchase the training is rational if the rate of return on the investment exceeds the available return on alternative investments.

Proprietary school training

The simplest type of privately-financed institutional training is the training provided by proprietary schools, training institutions which are privately-owned. The increasing concern with husbanding public financial resources in developing countries suggests that policymakers should look positively on the potential contribution of proprietary schools to skill development. Nevertheless, proprietary training is very poorly documented in most countries. Even in the United States, where proprietary schools enrol nearly 4 million students each year and generate \$4 billion revenues, and correspondence courses enrol 1.5 million students and generate \$1 billion revenues (Wagner, 1983), it is only over the past 20 years that such training has been systematically surveyed. The reasons for this neglect are similar to those responsible for the lack of documentation of informal apprenticeship.

First, policymakers and planners, and even researchers, are frequently unaware of the scale of this type of training. Quite typical in this respect is the study undertaken by Lukomski (1978). The objective of the study was to evaluate the relative importance of SENAI apprenticeship and short courses for training lathe-operators, it being supposed that apprenticeship would be the more important mode. In fact it turned out that apprenticeship was the minority route and that the majority of those who had acquired their skills through short courses were not trained by SENAI at all, but in proprietary schools:

"Although it was known before the study that the proprietary schools existed, it was not realized that they were responsible for 1.7 times as many courses as SENAI ... The existence of a "system" of proprietary industrial training - relatively large and with a long history - was one of the most important findings of the study" (Lukomski, 1978).

A second reason for the neglect of proprietary training by policymakers and planners is a prejudice against it caused by the profit motive. They are concerned that the schools are prone to overmarket their courses and to generate unrealistic expectations with respect to the jobs that will follow from the training. They suspect that the schools provide inferior quality training, economizing on inputs. In addition to these substantive criticisms, there is often a general feeling that the profit motive leads to the subordination of broader educational objectives, and that it is wrong for human development to be commercialized. However, when these complaints are well-founded, the authorities should consider remedial action rather than discouragement or prohibition. Remedial action could include requirements that proprietary schools publish records of the success of their graduates in obtaining employment, or perhaps, as a last resort because it can and does lead to corruption, regulation. It is worth noting in this context that the expectations aroused by

public training programmes are not necessarily any more reliable. It is unusual for public training establishments to undertake placement studies and to publicize the results.

In addition to reducing the pressure on public sector training provision, proprietary schools can be more cost-effective than their public counterparts. Public administrators sometimes note with dismay the lack of standardization of the course structures in proprietary schools, both in terms of curriculum and duration. However public administrators have a vested interest in standardization since it reduces the complexity of the world around them and simplifies their work. Hence, for example, if a public training establishment offers courses in electric installations, machining and auto mechanics, their duration will by amazing coincidence be identical, and by further coincidence it will be an exact number of years or half-years. Moreover, irrespective of any changes in technology and the curriculum, the course lengths will remain invariant over time. By contrast, the programmes offered by proprietary schools, which are often smaller and more specialized, typically exhibit a bewildering range of duration, sometimes even within a single trade. This state of affairs could be construed as evidence of the superior organizational genius of the managers of the public institutions, but a more realistic interpretation in most cases is that the lengths of the proprietary school courses are more closely tailored to the actual requirements of each occupation and are adapted to the level of skill demanded by the particular market served by it. Indeed one of the explanations advanced for the co-existence of proprietary schools with competing, free, community colleges in the United States is that they economize on the trainee's time, and are therefore cheaper from the private as well as the social viewpoint (Wilms, 1975, 1987). By reaching the job market sooner, the private trainee has an opportunity to earn part or all of the fee while the public trainee finishes his course.

In some countries it is evident that proprietary schools have the additional merit of being more responsive than their public sector counterparts to changes in the demand for skills. In Malaysia, for example, proprietary schools fill major gaps at the junior technician level left by the public programmes. They are typically much more assiduous than public establishments in maintaining close links with local employers, not just for the short-run objective of placing current trainees, but also for adapting curricula so that placement rates may be maintained. And when the demand disappears, the courses are dropped and the school may even close (Wilms, 1987). By contrast, public training establishments tend to suffer from inertia. In many countries, this is attributable to the heavy centralization of authority. But even where public training establishments enjoy substantial autonomy, their management may lack incentives to respond promptly to local feedback (Castro, 1987). And as for closing those that have outlasted their usefulness, the problem of redeploying permanent staff often makes it an impossibility.

Cost-recovery in public training institutions

In many countries public sector training institutions have been established in response to a perceived need for the skills provided and a failure of the private sector to meet this need, the failure being caused by a lack of know-how or entrepreneurial capacity, a lack of capital, or risk aversion. In developing countries such institutions are frequently established with the aid of international donor agencies which provide technical expertise and funding.

The fact that such institutions are publicly owned does not automatically mean that they should be publicly financed. In principle they could finance themselves like proprietary schools by charging user fees which cover their costs. In practice this is exceptional, especially in developing countries. In fact the general ethos remains against full cost recovery. In the 1970s those visiting public training centres could usually

expect to be told, with pride, that no fees, or only nominal fees, were charged. Since then harder times have brought cost-recovery to the agenda, and institutions are more ready to assert that they do charge fees - but these often turn out to be minimal, as before.

Partial or even nil cost-recovery can only be justified if there is a case for subsidizing the training on one or more of the grounds discussed in Chapter 2. Otherwise a failure to charge full-cost fees will lead to a misallocation of resources and to an unnecessary burden on the public purse. The misallocation of resources results from the price of training not reflecting its cost, with the consequence that social demand is artificially stimulated. A typical outcome would be unemployment or the graduates or their employment in jobs not related to their training. The unnecessary burden on the public budget is partly caused by this excess demand, and partly by the crowding out of private provision of the training.

If training were determined solely by market forces, as in the foregoing analysis, would training investments fall short of the social optimum? Is there a role for government intervention? From an economic viewpoint, the government's role can be assessed in terms of the usual criteria of efficiency and equity in the allocation of resources. Under efficiency, two separate reasons may justify government intervention: imperfect market conditions and externalities. Under the equity criterion, subsidies are often intended to improve the access to jobs and income, particularly among disadvantaged groups in society. In addition to the economic considerations, government intervention may be justified on social grounds. For example, it may help to prevent social disruption by inculcating desirable values or attitudes or by facilitating attachment to the labour force.

2.1 Market Failure and Related Problems

The term market failure will be used here to cover the consequences of non-profit maximizing behaviour on the part of firms and distortions attributable to minimum wages and wage rigidity, imperfect capital markets, risks and uncertainty, and rigidities associated with in-service training. In principle the best solution to the problem of market failure is a direct attack on its causes, but this may not always be feasible. First, the distortion may be a side-effect of policy which has been adopted for other reasons; second, the distortion may not be susceptible to direct measures. In either case, a second-best solution requiring government intervention may be desirable.

Non-profit-maximization by firms

Firms may undertrain because they are not managed in an economically-rational manner. They may fail to provide specific training which is in their interest, and they may fail to respond to market incentives to provide general training.

In practice it is often difficult to tell whether a failure to provide training is economically irrational or rational. Small firms in particular may have good reasons for not providing training: the technology and administrative procedures used by them may be so simple that structured training is unnecessary.

Even if an underprovision of training can positively be identified, training incentives alone may not be the answer. If the problem is attributable to weak management, it is likely to be accompanied by the use of outmoded technology, inadequate quality control, poor book-keeping, poor marketing and other shortcomings, in which case the promotion of training should be part of a broader package.

With regard to the training problem, the most satisfactory measure would be some form of business education which would stimulate the firms to act in their own interests. However, such measures may be ineffective or their impact may be too slow. In this case several direct measures may be justified: the provision of training in public institutes, the encouragement of firms to establish group or industry training schemes, and the provision of technical assistance to promote both on-the-job and off-site skill development. The first approach has been adopted to some extent world-wide, and in Latin America no doubt accounts for the rise of the national training authorities throughout the region.

Lack of training intermediaries

A closely related case for intervention can be made when the market fails to lead to the establishment of training intermediaries. It may well be, for example, that a neglect of training is merely a reflection of the opportunity cost of the manager's time: the cost to him of establishing an in-house training scheme may outweigh the likely benefits. Further, most training other than on-the-job training appears to be subject to economies of scale. These facts, rather than a lack of rationality on the part of small employers, probably account for the world-wide finding that large firms provide structured training while small ones do not. For exactly the same reasons, small firms tend not to undertake marketing, R&D, and business with government.

In principle, in this situation, it ought to be possible for training intermediaries to establish themselves, and this may occur. SENAI, the Brazilian training authority (the first to be founded in Latin America and in many ways a model for the rest), was established by industry. But if industry initiative is lacking then government intervention may be justified. However, in this case there should be a presumption that it should be self-financing, unless the intervention is partly justified on other grounds as well.

If the undertraining is caused by the overhead cost of organizing training, technical assistance designed to reduce its cost may be justified. For example, firms too small to organize in-house training may be deterred from using off-site training by the opportunity cost of the time taken by the manager to locate suitable off-site facilities. In this case the government may establish an information clearing house linking training providers and employers. The fact that a private clearing house of this type recently established in France is said to be immensely profitable indicates the potential value of such an intervention - and that the operation might pay for itself.

Individual myopia

The counterpart of non-profit-maximization by firms is the failure of individuals to take up training places because they fail to perceive the value of the training. Because they underestimate the value of the training, or because they overestimate their own initial productivity, they are not willing to take up an entry-level job at a low enough wage to compensate the employer for the cost of the training. Instead they take up jobs which provide higher wages but little or no training opportunities, or they remain unemployed. Alternatively, while they have an accurate perception of the value of the training, they may be unduly pessimistic about employment prospects on its termination. For example, Hollister and Freedman (1988) report that the low take-up on training schemes for young people in some OECD countries is attributable to such pessimism, despite the fact that the labour market for young people is on the point of being transformed. In either case subsidization of training from public funds might be a justifiable response, but an alternative measure would be more effective vocational counselling.

Minimum wages and wage distortions

Whether training is general or specific, it must be financed, at least partly, by the worker or apprentice, in the form of a reduced initial wage. Where current productivity warrants paying the minimum wage, the provision of training would entail paying initially a subminimum. Since this condition cannot be satisfied in the presence of minimum wage legislation, firms are discouraged from providing the training, the impact being weaker in the case of specific training since firms are prepared to bear at least part of its cost. In the current discussion of new minimum wage legislation in the U.S., this consideration is probably

responsible for the inclusion of a clause allowing employers to pay subminimum wages during a period of initial employment.

Leighton and Mincer (1979) note that minimum wages also lead to differential training outcomes across population groups. "Those who are intellectually and financially able to prolong their schooling will do so, even if their interests are primarily vocational, and they would have preferred job training to staying in school" (p. 159). They speculate that this response is partly reflected in the growth of junior colleges and private vocational schools, the growing importance of vocational programmes in college curricula, and the tendency to combine study and work. The result is thus to shift the venue of job training partly into the formal school system. Low wage workers face greater difficulties: loss of jobs for those with wages initially below the minimum, and loss of training opportunities even for those whose initial productivity is worth as much as or somewhat more than the minimum wage. Empirical evidence from their study confirms that minimum wages discourage job training, the effect being most pronounced among people with lower levels of education.

Restrictions on wage flexibility may also distort the incentives to invest in training. Such restrictions, often the result of collective bargaining activities, tend to compress before-and-after-training wage differentials, thus affecting how the costs and benefits of investment in training are shared between workers and employers. Trade unions seek to limit wage differentiation for at least two reasons: ostensibly to improve equity in pay among workers, equity being variously defined; but more importantly, to reinforce the union's bargaining power (Ryan, 1984a). By jacking up trainees' wages relative to that of experienced workers, unions create incentives for employers to hire fewer trainees. The strategy thus neutralizes the potential threat that a younger and cheaper labour force might pose to incumbent workers.

The impact of wage compression on training outcomes is illustrated in a study by Prais and Steedman (1986) on vocational training in construction trades in France and Britain. The authors found that the number of youths attaining comparable professional qualification in France was about 1.7 times the number in Britain, despite the fact that the industry was of comparable size in both countries. An important factor in their view was the relatively high level of trainee wages in Britain. In the 1970s, second-year trainees in Britain earned, on average, about 70 percent an adult craftsman's wage, while those in France received only about 25 percent of an adult's wage. Apprentice wages in Britain have been revised recently, but even so, they were at the time of the study still more than double the French percentage.

What could be the role of government when distortions in the wage structure diminishes the incentives to invest in training? The most obvious solution is the removal of the institutional obstacles that restrict wage flexibility. In particular, apprentices may be assigned a legal status separate from that of the regular labour force and exempted from minimum wage legislation. For other workers, a direct solution may be difficult to implement. Minimum wages are often desired for various social and political reasons, and their possible adverse effect on training may not outweigh the importance of these other goals. Under these circumstances, an appropriate alternative role for government intervention is more complex to define. Providing subsidies to cover part of trainees' wages is a possible (and common) intervention, although no claim can be made on theoretical considerations that it is the optimal intervention under conditions of wage distortion.

Capital market imperfections, risk and uncertainty

Becker's model predicts that the cost of completely general training should fall on the trainees, but the cost of firm-specific training should be shared with the employer. Imperfect capital markets may, however, prevent workers from making the investment, even if it were highly profitable. Human capital is seldom acceptable as collateral for borrowing funds in commercial markets, so only those who can finance the cost of direct outlays and of forgone earnings would be able to take advantage of the profitable investment opportunities. As a result there is likely to be underinvestment in training.

Risk and uncertainty may also be responsible for underinvestment. Like all other investments, training costs are incurred in anticipation of later benefits that may or may not materialize. The longer the training, the less certain are the potential benefits, and the greater the risks of investing. In this context, market forces are likely to yield a less than socially optimal amount of investment in training because private risks tend to exceed the social risks, the private risks being higher because individuals lack ways to diversify their portfolio of investment in training.

Both of these considerations can be used as arguments in favour of public support for training, even specialized and expensive types, on a profit-sharing basis: the state shares in the investment by providing a subsidy and in return, under generally-agreed conditions, receives part of the additional earnings attributable by the training. The arrangement comes in two versions, one in which the state takes an equity stake in the human capital generated, and the other in which it effectively purchases a bond. Both versions apply to general education as well as to training and have been extensively discussed in the literature on financing education (for example, see World Bank, 1986).

Equity approach: In countries with taxes on personal income, the provision of subsidized education and non-firm-specific training at all levels can in principle be justified by the fact that those who benefit from the training earn higher incomes and pay more tax. The increment in the tax is the return on the equity stake represented by the subsidization. The bargain is attractive in principle, not least by virtue of its simplicity, but it is inevitably a crude one with obvious shortcomings.

First, it is not applicable in those countries without well-developed income tax systems or where the system is prone to manipulation - in other words, most developing countries and not a few higher-income ones as well. Second, there is no evidence that tax rates or their degree of progressiveness have in any country been determined with a view to recovering educational investment on the part of the state. Third, those who earn higher incomes by virtue of native ability, industry, private education or good fortune invariably have to pay the same rates of tax as those who earn them by virtue of extended subsidized education. Fourth, the justification of the arrangement loses its force when individuals treat training as consumption and/or when they take-up low productivity occupations. Fifth, by increasing the gap between pre-tax and post-tax earnings, the funding of education from direct personal taxation aggravates the inefficiencies associated with the latter.

Bond approach: A system of student loans is an alternative investment-sharing/profit-sharing arrangement which is less susceptible to some of these criticisms, especially in the strict form where the trainee undertakes to make definite payments of interest and repayments of capital according to a predetermined and fixed schedule: it does not penalize those who have not received subsidized training; it discourages the use of training as consumption (which can be a serious problem, for professional training as well as for education: in several major developing countries, social custom causes even professionally-trained women to retire from

the labour force on marriage); it discourages inefficient choices of occupation; and it does not add to the welfare losses associated with direct taxation. The main weakness with the system (apart from the problems of administering it and losses due to default) is that it responds to only one of the reasons for intervention - imperfections in the capital market. It does not address the problem of risk-aversion, since the risk remains the responsibility of the individual.

Consequently, in some versions the arrangement is altered so that the risk is shared with the state, or even wholly borne by it: payment of interest and repayment of capital is contingent on the level of the future income of the trainee. But this weak version allows some of the other problems to reappear: freed from a necessity to raise his income to repay the loan, the individual can afford to treat training as consumption, and to select an inefficient occupation. Further, the income-contingent provision artificially raises the effective marginal rate of taxation in much the same way as some income-support schemes at low levels of income.

Notwithstanding these problems, the bond approach, especially in its weak version, is being increasingly entertained as a means of increasing access to training, especially professional training, while husbanding financial resources.

There are other theoretical solutions to the problems of capital market imperfections and risk aversion. For example, Friedman (1962) has proposed a privately-financed version of the equity approach: an investor would advance the funds needed to finance the training on condition that the trainee agrees to pay in return a specific fraction of his future earnings. "In this way, a lender would get back more than his initial investment from relatively successful individuals, which would compensate for the failure to recoup his original investment from the unsuccessful" (p. 103). Alternatively, Gunderson (1974) has suggested that a risk averter could reduce his risks by entering a collective agreement with others to share the cost and benefits of training under the assumption that failure in some investments will be offset by success in others. However, the formidable difficulties involved in such schemes render them of doubtful practicability. Not least would be the problem of identifying the changes in earnings attributable to a given training intervention. In econometric studies, the personal characteristics of an individual, including education and training, typically account for less than half of the variance in earnings. It would therefore be dangerous to credit a training intervention with the whole of a subsequent increase in income.

Firms also invest in training, but they are less affected by capital market failure and riskiness. The possibilities for diversifying the investment portfolio are greater, and training expenditure is generally a very small proportion of the total labour cost.

The provision of in-service training

The term in-service training can be used to cover both training provided by enterprises aimed at improving directly the productivity of their employees, and training initiated by the employee and usually undertaken independently of the enterprise. Here the term will be restricted to the first category; the second type of in-service training, which is usually described as recurrent education, will be considered in the next subsection.

Much in-service training is provided by firms voluntarily for firm-specific purposes. Being firm-specific, it does not raise the value of the employee to competitors and so the firm does not need to increase his pay, or can afford to offer an increase which is lower than the gain in productivity. In this way it recoups

its investment. In the case of transferable training, the basic theory holds that if labour is mobile the firm should shift the cost of the training to the employee by reducing his wages during the training period. While this may be feasible in the case of apprentices, it is usually impracticable in the case of experienced employees. If the firm offers transferable training, and then fails to raise pay in line with productivity, it risks losing not only the new investment in general training but also all its previous investment in firm-specific training. Some general training may be provided by firms involuntarily because it is inseparable from production (Eckaus, 1963), but, otherwise training in transferable skills will tend to be underprovided.

In a coordinated market economy the problem may be mitigated by tacit agreements among enterprises, sustained by the influence of such institutions as chambers of commerce, not to poach each other's workers. In the U.K. no such moderating mechanism exists and labour markets are competitive. Competitive labour markets may confer short-run benefits in that they lead to an efficient allocation of existing skills, but experience seems to show that such benefits are outweighed in the longer term by the additional skill development encouraged by German-style imperfections. In Germany firms can treat in-service training as one of their core activities, whereas in the U.K. it remains a peripheral one, and as a consequence German firms are much better placed for product or process innovation. In this respect, the German employment and training framework has much in common with that obtaining in the larger firms in Japan. This problem calls for government intervention in the case of countries with competitive labour markets - for example, grants to cover the cost of the transferable part of in-service training.

Access to recurrent education

Recurrent education (broadly defined as "a global system containing a variety of programmes which distribute education and training ... over the life-span of the individual in a recurring way that is alternated with work or other activities", Stoikov, 1975, pp. 5-6) - also tends to be underprovided.

Where individuals can obtain general training in their own time, for example, in an evening programme, there is in principle no problem: they can be expected to take rational self-investment decisions, as in the case of pre-employment proprietary education. If circumstances are favourable (in particular, if mobility is low and the absence of the worker does not disrupt output), firms may be willing to absorb or subsidize the direct costs and grant leave. However if circumstances are not favourable, an existing worker has fewer options than an apprentice undergoing initial training. In particular, it is extremely unusual for an existing worker to be able to compensate an enterprise for reduced productivity or disruption during the training period by temporarily accepting a low wage.

This rigidity may be regarded as a special case of market failure which may justify government intervention, financial or legislative. In practice, no country has yet achieved a full-scale system of recurrent education, although elements of it do exist in some countries. The extent of public funding tends to vary between countries, and employers are often legally obliged to share part of the cost of recurrent education. In Sweden, study grants are available from central government, but few people take up the option of study leave because funds are limited. In France, employers are required by law to provide paid educational leave, mostly for vocational training, but participation is biased towards male skilled workers in large firms. In Germany, workers and employers are obliged by law to contribute 2 percent of fixed monthly earnings

towards the financing of vocational training, but here also skilled workers benefit disproportionately (Blaug and Mace, 1977).

Examples of large-scale provision of recurrent education are rare in developing countries, but Thailand's Sukhothai Thammathirat Open University appears to have a significant impact, judging by the size of its clientele. Opened in 1978, its emphasis has from the start been on life-long education. It had 115,700 students in 1989, about 18 percent of all higher education students, most of whom were shown by a survey (STOU, 1989) to be working adults wishing to upgrade their skills. Many are government employees enrolled under joint programmes set up by the University and individual public agencies. About two thirds of the operating costs are recovered from fees paid by students, mostly from their current earnings.

Levin and Schütze (1983b) point out that in principle one could make a case for subsidizing recurrent education if it had a cooling out effect on the demand for higher education. At present, they argue, the fact that initial education is such an important determinant of the future life chances of the individual leads to social pressure for provision on a scale which exceeds the social optimum, with the consequence that the rate of return to much initial education is low. The establishment of a system of recurrent education could take some of the heat out of the initial competition and reduce the welfare loss attributable to over-provision. However, as Levin and Schütze themselves point out, the cooling out effect might not be significant: at present, the scope for upgrading through recurrent education is strongly influenced by the initial job and this would still be primarily determined by initial education. This negative conclusion is reinforced by the fact that, as many studies have found, recurrent education and initial education tend to be complements, not substitutes.

Perhaps the strongest argument in favour of subsidizing recurrent education is the simplest: it should receive the same support as any other form of general skill development and not be subject to (negative) discrimination.

2.2 Externalities

Externalities exist when the benefits of training to society exceed those that accrue to private firms and individuals. Since they are unable to capture all the benefits, they will underinvest in training. Economic theory indicates that in order to reach the socially optimal volume of training investment, the government should provide subsidies for training.

The case for public subsidization of training requires closer examination of the externalities that training schemes are thought to generate. The five main types which feature in the literature and project documents are the breaking of bottlenecks in production, the development of a pool of skilled workers to encourage industrialization, the raising of skill development standards, improvement in the use of underemployed manpower, and the reduction of inflation. In the discussion that follows, it is not disputed that each of these objectives is desirable, other things being equal. The question is whether it is justifiable to devote more resources to these objectives than would be allocated by private decision-making acting on its own. And if there is a discrepancy, whether it is attributable to the inability of an individual or an enterprise to capture fully the benefits of the skill development, that is, to a genuine externality.

In addition to the five main types, it is commonly asserted that there is a sixth, negative externality: underinvestment in transferable training caused by non-training firms poaching qualified workers from the

firms that trained them. This supposed externality may be described as the poaching illusion and is in fact based on nothing more than a failure to understand the incidence of training costs, as will be discussed below.

Bottleneck-breaking

The commonest type of externality argument is the assertion that a shortage of workers with key skills is responsible, or, more usually, is about to be responsible, for a reduction in the rate of growth of the economy and hence an increase in their numbers would confer benefits out of all proportion to their earnings. It appears far more often in the project documents of donor agencies than in the professional literature and it usually is unsubstantiated: judging by the lack of compelling evidence, authentic examples of genuine externalities of this type are hard to find (Castro, 1988). Where shortages are identified, they are much more likely to have their origin in market failure (see below).

The reason for this is that most types of skill development can be effected at relatively short notice as a regular part of the investment process. In particular, skill requirements associated with the introduction of new technology can generally be made good as an integral component of the transfer of technology, whether it involves the importation of a single machine or the construction of a fertilizer plant (Dougherty, 1989, Chapter 8). Provided that there exists a supply of trainable labour, the actual training process is normally a straightforward and uncontentious matter.

The development of a pool of skilled labour

A second type of demand-related externality argument asserts that it may be desirable to create a pool of skilled workers in excess of anticipated requirements. There are two versions of this argument, which might be termed active and passive. The passive version, put forward by Gunderson (1974), is an extension to training of Weisbrod's (1964) argument that society may be willing to pay for the option to use a service in the future because it may be extremely valuable if needed. In essence, it amounts to taking out an insurance policy against potential bottlenecks and is similar to the externality just discussed. The active version argues that it is desirable to subsidize training to improve the infrastructure for investment, either by local enterprises, or, frequently in the case of developing countries, multinationals, the subsidization being justified because it can lead to an increase of effective demand, and hence utilization of domestic resources, which would otherwise not have taken place.

The passive version clearly has merit for military contingencies. But for most civilian purposes the same objection can be made to both the passive and active versions as in the case of the bottleneck externality: skill requirements can generally be made good in real-time (that is, during the investment process) if there exists a trainable labour force. In this case the objection is reinforced by the fact that most skills atrophy if not used immediately and hence most training-in-advance on the lines advocated would be wasted. An intervention which is much more likely to be effective is the creation of a mediating agency possessing the expertise (knowledge of local labour supply, training establishments, and legislation) to organize appropriate training as required. A much stronger argument can be made for subsidizing such a catalyst and several U.S. states have created "start-up agencies" on these lines (Dougherty, 1989, Chapter 8). The success of this approach is likely to depend, not on a stock of pre-trained labour, since this is

unnecessary, but on a stock of trainable labour; in other words, skill development should be directed towards general and broad technical educational, rather to occupational training.

The raising of skill development standards

It is often asserted that the quality of training provided by market forces leaves much to be desired and that the government should intervene to improve it. The argument is never expressed in terms of externalities and often amounts to little more than a desire that every good and service should be the best of its kind, regardless of economic cost. But an argument can be pieced together on the following lines.

The starting point is Eckaus's (1963) observation that most enterprises involuntarily provide training in the course of their normal operations, even if there is no explicit intention to do so: production and training are a joint process. Enterprises can capture part of the value of the training by getting the trainees to accept lower wages, but they cannot capture all of it. They can make the trainee pay for the value of the training which will lead to higher future earnings for him, but they cannot make him pay for the spillover effect he will eventually have on the quality of the training received by those he involuntarily trains in turn. Hence, so this argument might go, there is a discrepancy between the social and private value of training which justifies subsidization.

In principle, however, the discrepancy will be eliminated if the training function of the skilled worker is recognized and his earnings are increased accordingly. This allows the trainee to internalize the full value of his training and hence in turn allows the firm to make him pay for it, by accepting a further corresponding reduction in his wages during training. This seems to be the situation in parts of the German apprenticeship system, where the *meister* has a higher status and pay than an ordinary skilled worker. If the training function of the skilled worker is not fully recognized, as is often the case elsewhere, the discrepancy will not be eliminated. In such cases it might be more correct to attribute the problem to market failure than to a true externality, but this technicality does not detract from the case for government intervention.

Improved utilization of underemployed manpower

The case for subsidized training is sometimes also based on the belief that training programmes contribute to a more efficient use of manpower resources by increasing the employability of job-seekers who would otherwise be unemployed or underemployed, or by enhancing the mobility of workers whose narrow or excessive specialization has locked them into low-productivity jobs or localities.

In the industrialized countries the employability argument is usually addressed to disadvantaged groups or displaced workers. In developing countries where the labour force is growing faster than jobs are being generated, it is commonly used to justify the wholesale vocationalization of education. The benefits of the intervention are psychic benefits to the individual who finds work, improved social cohesion, and increased output, which may result in a compensating reduction in welfare expenditure.

Subsidization can be justified only if skill development does lead to a net increase in employment and should supplement rather than displace the training that would be undertaken privately as a result of market forces. The literature on spill-over (replacement and displacement) employment effects is reviewed in Ziderman (1975b, 1978). A simple version of the argument, based on Johnson and Layard (1986), can be presented as follows: suppose that workers who have received a particular type of training earn a wage w_1 and are in short supply, while those who have not been trained earn a wage w_0 and a proportion u of

them are unemployed. If there is a sufficient turnover of jobs, any given worker in the second category will earn on average a wage $(1-u)w_0$, and accordingly the gain on being trained is $[w_1 - (1-u)w_0]$. This is lower than the social benefit of the training. Switching an individual from the untrained category will not reduce the total output of the type of labour, while it will still lead to an increase of output equal to w_1 . Hence the social benefit is simply w_1 . Consequently the social rate of return to the training may be much greater than the private rate of return (see Ziderman, 1975a, for an example), and this may justify a subsidy.

The case can in fact still be made even if it assumed that there is little turnover of workers in the untrained category, if the losers in the competition for jobs are in some way disadvantaged. In principle, the unemployed workers should seek training and the private benefit would be equal to the social benefit (and there would be no case for a subsidy). But in practice, this outcome may be thwarted by the fact that the unemployed are untrainable. If this is true, there is a case for subsidizing the training of an employed untrained worker, so that he will leave behind him a job which can be filled by one of the disadvantaged unemployed. The private benefit of the training is $(w_1 - w_0)$, whereas the total social benefit is w_1 , and the fact that the social rate of return exceeds the private rate again justifies a subsidy.

If there is no shortage of workers in the trained category, the externality argument loses its force. Indeed it can work in reverse, for there is no social benefit when the number of unemployed untrained workers is reduced at the expense of increasing the number of unemployed trained workers (the displacement effect). Under these circumstances, the training is, in the terms of Thurow (1980), a zero-sum activity: the trained worker obtains his job at the expense of somebody else. Thurow's analysis refers to job-training programmes in the U.S., but it applies equally well to the vocationalization movement in developing countries (Dougherty, 1989). Clearly, much depends on whether the unemployment, or lack of it, in either category is expected to be temporary or long-lasting. For this reason, programmes directed towards improving the future trainability of workers and hence the future flexibility in their deployment, like the BEST programme in Singapore, are more likely to be effective than those developing specific skills. And the most cost-effective intervention of all may be the upgrading of general education.

The mobility argument obviously has its merits but it too can lead to an overstatement of the case for subsidized training: as Mehmet (1970) points out, it fails to recognize that increased labour mobility also imposes a cost on society, such as the opportunity cost of time lost in the move between jobs and localities, and the cost of recruitment and termination of employment.

Reduction in inflation

According to one argument cited by Mehmet (1970), training schemes can help to reduce the overall rate of inflation in the economy without raising the level of unemployment. It is assumed that the market mechanism does not bring about a smooth and speedy adjustment of the labour force to changes in the composition of demand. As a result, a mismatch arises between the supply of and demand for labour, so that displaced job-seekers coexist with unfilled vacancies. Left on their own, market forces would restore equilibrium only in the long-run. A faster readjustment would require short-run stabilization policies, but these would lower unemployment at the cost of inflation. A strict trade-off can, however, be avoided by providing subsidies to encourage more training investments: training schemes can be designed to enhance the adaptability of labour, so improving the reconciliation between price stability and unemployment.

A variant of the inflation argument has been advanced by Doeringer and Piore (1985) in the context of internal labour markets. Firms can adjust to imbalances in labour market conditions through at least eleven instruments, including changes in wage and nonwage compensation, job structures, recruitment and screening procedures, and training investments. Some adjustment instruments "appear capable of generating continual cost increases [that] would account for observed relationships between the level of unemployment and the rate of inflation" (p. 197). Since training programmes tend to have less effect on inflation, they argue that these programmes should be subsidized.

The foregoing argument is theoretically attractive, but whether it justifies extensive subsidization of training programmes is open to question. Mehmet (1970) notes, for example, that other forms of government intervention -- such as direct job creation, and promotion of capital inflow -- may also affect the inflation-unemployment trade-off. Thus, subsidies for training would be justified only if they are more effective in bringing about a better trade-off. In recessionary periods, they are unlikely to be more effective, since the basic problem is a lack of jobs rather than a lack of people with adequate training. In some cases, even if subsidies for training were available, the incentive to train would remain weak if job prospects are bleak. The low uptake on subsidized youth training opportunities in Britain, for example, has been partly linked to the perception that jobs are scarce (Ryan, 1984b). The related argument of Doeringer and Piore for subsidized training is also open to question: the subsidies would distort the incentives facing the firm in deciding among alternative adjustments to changes in the external market, and it is unclear whether losses in allocative efficiency would be offset by the social benefit of reduced inflation.

The poaching illusion

There is a widespread belief that when a worker possessing transferable skills leaves the firm that trained him or her and takes up employment with another, the training firm incurs a loss and the "poaching" firm receives a windfall benefit. This has often been cited as a ground for government intervention. The traditional theory of apprentice wages shows, however, that, if the relevant labour markets are competitive, the belief is groundless. The training firm incurs no loss because it has shifted the cost of the training to the trainee. The new employer makes no windfall benefit because it has to pay the full market wage.

These conclusions remain unchanged when the analysis is broadened to consider the development of nontransferable and well as transferable skills, the contribution of Becker. They may however need to be modified when market imperfections and other departures from the competitive model are considered. For example, as noted above, minimum wage legislation may make it impossible for the training firm to shift the cost of training to the trainee. In this case, the obvious remedy is to exempt trainees from the legislation. If this is not feasible, it may be desirable for the government to pay part of the trainee's wages, either directly or through a device which has an equivalent effect. But even in this example it would be wrong to brand non-training firms as "poachers". They do not benefit from the market imperfection, for they still have to pay the trained worker his or her full market wage. The only party that benefits is the trainee, who receives the training at less sacrifice of income during the training period than would have been the case without the minimum wage legislation.

2.3 Equity Concerns

Apart from externalities and possible market failure in the provision of training, concern for equity is another reason that may justify government intervention. In many countries both secondary and higher education are heavily subsidized from public funds, the government paying part or all of the direct cost and sometimes providing a student stipend in addition. Whatever their merits on other grounds, such subsidies constitute a major source of inequity among individuals, for they benefit precisely those who have the best prospects for employment, income and status on entering the labour force. Furthermore, they help to transmit inequality from one generation to the next, for the students who survive longest in the educational system tend to come from those families which are most able to provide supplementary resources for education and to forgo their potential earnings while in school.

One of the more obvious ways of mitigating the problem is to extend the system of subsidies to forms of skill development other than general education, and this is common in developing countries. It is fair to say, however, that the motivation has usually been the promotion of employment or economic growth rather than a concern to redress inequity. Hence, for example, vocational education is provided in the belief that it can serve to mitigate the problem of youth unemployment, and occupational training is provided in response to a supposed impending shortage of "critical skills".

The main issue, however, is not the motivating factor, since this is immaterial, but whether the extension of subsidies to training truly reduces inequity or whether it in practice creates another small privileged section of society. The proportion of young people benefiting from training programmes is invariably small, in developed and developing countries alike, because the proportion of jobs requiring extended training is much lower than seems to be generally assumed. A U.S. study using data from the National Longitudinal Survey of the High School Class of 1972 found that only 5% of the labour force entered occupations requiring six months or more of training (Sherman, 1983). The figure might be higher elsewhere, but it is inconceivable that it could be more than a very small proportion. The crucial factor, therefore, is the social origin of the trainees. For simplicity, the following discussion is confined to craft training.

Higher-income countries

In the developed countries and some of the developing ones the scholastic ratio for secondary education is so high that the craft trainees tend to be drawn from the least advantaged in terms of ability and family resources. In such countries the equity argument for subsidizing training is strong and the main issue is whether it is possible to move away from institution-based funding, which tends to be inequitable because people who manage to enter high cost programmes get more subsidies than others who are either ineligible or unable to enter such programmes, towards an individual-based system of financing.

Levin (1977) has proposed a scheme in which public support for training would be channelled to students in the form of a promissory note or entitlement. Entitlements could comprise grants and loans, the mix depending on a person's financial and background, and type of training. Entitlements would be useable over a person's lifetime, the unused portion being refundable at a person's retirement. Any training institutions that meet the government's eligibility criteria could accept students with entitlements, and redeem

them for cash from the treasury. An important ingredient of this system is government sponsorship of an information and regulatory agency to provide data on training alternatives, their costs, programme descriptions, graduate performances, and job prospects. This individual-based system achieves a more equitable distribution of public funding for training because the subsidies appropriated by each person is determined according to his personal economic circumstances, not by the type of programme he succeeds to enter.

Such a system of financing has not been fully implemented in any country. One problem is the possibly onerous task of evaluating each person's entitlement. In the United States and United Kingdom, the concept of individually-based entitlements has been extensively discussed (under the titles of Individual Training Account and Individual Training Credit respectively), and a government-commissioned report in the United Kingdom has suggested that an entitlement scheme would be feasible in practice (Coopers and Lybrand, 1985). And McMahon (1987) has argued -- illustrating his analysis by showing how an individual-based scheme of post-secondary scholarships would operate in Indonesia -- that the practical difficulties of determining awards on an individual basis are surmountable, even in developing countries. Nevertheless the straightforward subsidization of institutions remains the rule.

The arguments for subsidizing initial training in such countries apply equally to subsidizing recurrent training for the least skilled and least-educated workers. However the strength of the argument is blunted by the fact that the cost-effectiveness of such training is often low. Those who are illiterate or barely literate tend to have a low absorptive capacity - which of course accounts for the finding in many countries that they tend to be passed over by employers for on-the-job training (Nollen, 1976) - and they tend to have lower motivation, even for the adult literacy programmes which might have greatest long-term impact: adults from underprivileged homes are often the least willing to take up education since they are the very ones who dropped out earliest from the formal system (Blaug and Mace, 1977).

Lower-income countries

By contrast, in the lower-income countries where the scholarity ratio for secondary education is low, the subsidization of training can actually have an adverse effect on equity. Budgetary constraints tend to cause the limited resources available for subsidizing training to be concentrated in a few public programmes. While some of these programmes may be addressed to basic literacy and numeracy, most funds tend to be channelled to more sophisticated training for which completion of at least lower secondary schooling is a prerequisite. The effect, therefore, is to improve the prospects of those who, if not among the most privileged, nevertheless are relatively advantaged, and the inequity is exacerbated if the provision of this training, normally expensive, is at the cost of not enhancing the coverage and quality of primary education.

2.4 Social Concerns

It may be argued under certain circumstances that training may benefit society at large as well as the individual. The benefit to society may be regarded as a social externality akin to the economic externalities discussed in Section 2.2, and accordingly may be used to justify government subsidy or other intervention.

Training programmes designed to mitigate unemployment are commonly held to benefit society by reducing the threat caused by unemployment to the social fabric. In higher income countries some programmes addressed to the long-term unemployed and minority groups appear to be at least partly motivated by this consideration (for examples, see Hollister and Freedman, 1988). Intervention is generally justified on equity grounds, but the presumed social benefits (for example, reduction in the incidence of drug-abuse and criminality) may also be a spur. In some developing countries the threat of mass youth unemployment and consequent political unrest has clearly been at least partly responsible for the uncritical political support for the vocationalization of secondary education (Dougherty, 1989).

A second objective which may be held to justify intervention is the modification of the values or beliefs of the trainees in a socially-approved direction. For example, it is sometimes said that the continued support given by German employers to the dual system is attributable to its part in creating an amenable labour force:

"As part of the social framework, employers are keen to exercise their influence over the young generation at the critical stage when young people move from school to work. They resist fiercely when they might be dislodged from the driving seat and they will do so even at great expense to themselves. In 1976, for instance, employers blocked proposals to amend the 1969 Act in order to spread the cost of training more equally through a levy/grant system. Employers feared that such a measure would reduce their influence over the wider purposes of apprentice training. This is because VET has in their eyes many purposes in addition to that of conveying occupational competence. It encourages good work habits, a lasting concern for the quality of work done, a flexible approach to change, co-operation at work, willingness to accept responsibility and to display self-reliance. Beyond that its purpose is to give people, and especially young people, a status and therefore a stake in society" (Hayes, Anderson and Fonda, 1984, p. 12).

For obvious reasons, official policy statements on these lines are hard to find. But an explicit example is provided by the handbook published by the Malaysian Ministry of Youth and Sports, which states that its training programme is addressed to potentially-disaffected drop-outs (and for this reason contains a month of paramilitary training).

2.5 Conclusions

The foregoing sections present some of the more important arguments for government intervention aimed at promoting training. Clearly, the relevance of each argument will vary from country to country according to the socio-economic context and, most particularly, the functioning of labour markets. Paradoxically, it may well be that where labour markets are most competitive, intervention is most justified, since the in-service provision of transferable skills is likely to flourish only if labour mobility is restricted.

On the whole, the arguments point to the use of the carrot rather than resort to the stick. Certainly there is a presumption that interventions justified by equity or other social concerns, and perhaps also those justified by externalities, should be financed from public resources. In the case of market failure, if there is a common thread to the analysis, it is that where an individual who has received transferable skills leaves

his training firm, it is he who benefits at the expense of the training firm. The recruiting firm precipitates the loss to the training firm, and so incurs its odium, but it has to pay the market wage and so does not in fact make a windfall gain. For this reason there is a presumption that the appropriate intervention should be the establishment of institutional constraints on the mobility of the newly-trained, for example, by allowing firms to bond trainees. Where this is not feasible, there may be a case for providing grants to training firms.

Finally, it should be observed that government initiatives to promote training are frequently launched without reference to any of the arguments summarized in the previous sections. In some cases, no doubt, the initiative has been preceded by an unpublished technical discussion which invisibly underpins the policy documents, but in others there must be grounds for suspecting that the justification, such as it is, is expected to be taken at face value. Often, it would appear, the justification is simply an opinion that "not enough" training is provided by the private sector and that more would be desirable. The perception may be expressed in absolute terms, for example when it is based on finding that relatively few firms provide structured training, or in relative terms (in comparisons with the level of training activity in similar countries, or in intersectoral comparisons, or in comparisons of training activity in large and small firms). The truth of the assertion that the level of training is too low is frequently taken to be self-evident rather than justified by reference to objective criteria.

The looseness, or indeed absence, of supporting arguments is paralleled in other critiques of private sector performance: the failure of the private sector to devote adequate attention to research and development, or to make satisfactory use of existing technology; its failure to devote adequate attention to sourcing, quality control and marketing; and perhaps also, its failure to invest in physical capital. As such, the complaint about training may be regarded as part of a wider conflict over the allocation of resources to consumption and investment: policymakers often seem implicitly to be taking the view that market forces result in an inadequate commitment to investment (whether human, intellectual, organizational or physical) and to economic growth. Moreover, they appear to be doing so without explaining why their view of the optimal point on the trade-off between consumption now and consumption in the future should prevail over the collective view of private decision-makers as reflected in the market.

Of course it may well be the case that the perception that the level of training activity is inadequate could be justified on technical grounds. But even then it is important that the technical case be put, since the efficacy of the intervention and the equity of resourcing decisions may depend upon an accurate diagnosis.

3

Subsidies and Other Financial Incentives

Arguments in favour of the public subsidization of training do not automatically support the public provision of training. Indeed many training interventions have taken the form of incentive schemes designed to expand the scale and improve the quality of enterprise-based training. However in many countries training interventions have also taken the form of subsidized public provision of training. This section discusses each type of intervention in turn.

3.1 Introduction

The separation of sources and uses of finance

Any government intervention which involves the subsidization of training inevitably also involves the mobilization of the necessary resources to fund it. Often the funding and spending are bound together in the same intervention, as in levy/grant schemes and tax deduction schemes. While such bundling may have administrative or political advantages, there is no connection in principle from an analytical point of view.

Grants from general public revenue should be expected to have much the same effect on promoting training as grants financed by pay-roll taxes or implicit grants financed by tax deductions; variations in the overall impact of such initiatives should be attributable solely to the method of financing.

To the extent that this is the case, it is appropriate to consider sources and uses separately. For example, in the case of levy/grant schemes, it is appropriate in principle to consider the effects of the levy as part of a general analysis of the effects of levies, and the effects of the grant arrangements as part of a general analysis of grant schemes, and hence evaluate the overall impact of the intervention by combining the two subanalyses. In practice, however, it is harder to separate the effects of the sources and uses of funds, since they tend to affect each other interactively as policy-making evolves. The classic example is the emasculation of levy/grant schemes as levy-exemption takes hold. For this reason this section, while primarily directed towards sources of funds, does include some discussion of the repercussions of grants made with them. Section 4 looks in more detail at experience with different types of grant scheme.

The fungibility and incidence of subsidies

The net cost of training to an employer is the cost of employing the trainee and the direct cost of training him, less the value of his output. Since the net cost is the only economic variable relevant to a training decision, an intervention which subsidizes trainee wages should have exactly the same impact as an intervention which subsidizes direct training costs, if their impact on net costs is equivalent.

For the same reason, in the case of the subsidization of trainee wages, it makes no difference in substance whether the payment is nominally received by the trainee or by the employer. This is illustrated by Figures 3.1a and 3.1b, where the solid lines represent the demand curve for trainees by employers and the supply curve for trainees as a function of their wage. In the absence of any subsidy, market equilibrium is represented by the point A, the intersection of the curves, with employment e_0 and market-clearing wage

w_0 .

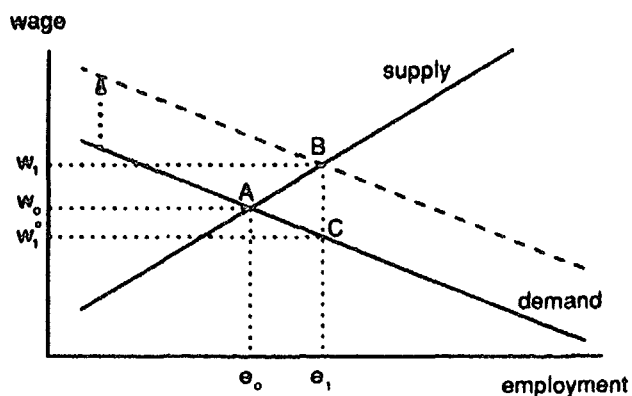


Figure 3.1a

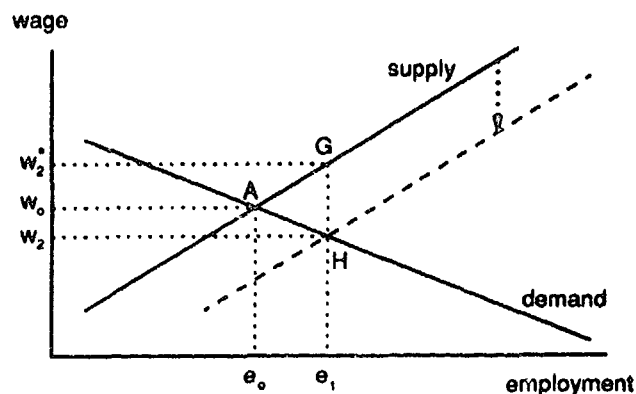


Figure 3.1b

If a subsidy S per trainee is given to the employer, the demand curve will shift upwards by this amount, as in Figure 3.1a. Different aspects of the new equilibrium are represented by the points B and C. B represents the outcome from the point of view of the trainees: the market clearing wage has increased to w_1 with the consequence that the supply has increased to e_1 . C represents the outcome from the point of view of the employers. They are willing to expand employment to e_1 because the net cost to them of a trainee has fallen to w_1^* , which is equal to $(w_1 - S)$.

If, instead, a wage-supplement S is paid directly to the trainee, the supply curve will shift downwards by that amount, as in Figure 3.1b. Different aspects of the new equilibrium are represented by the points G and H. H represents the outcome from the point of view of the employers. Because trainees know that they will receive a wage supplement, they are willing to accept a lower market wage from the employer, and in turn the employer is willing to take on more trainees. The new market wage is w_2 and the new employment level is e_1 . G represents the outcome from the point of view of the trainees. They have accepted a lower wage from the employer, but their total pay, taking account of the wage supplement is w_2^* , which is equal to $(w_2 + S)$. Because their total pay has improved, their supply has increased.

The crucial fact to notice in this analysis is that the vertical distances BC and GH are both equal to S , the subsidy. Since there can be only one point in which the vertical distance between the line is equal to a given amount, it follows that the points B and G are identical, that the points C and H are identical, that e_1 and e_2 are the same, that w_2° is equal to w_1 , and that w_1° is equal to w_3 . Hence in either case the net cost of a trainee to the employer is w_1° and the total income of the trainee is w_1 . The only difference is that the nominal wage is higher in the first case than the second.

In the first case, the employer has to share part of the subsidy with the trainees, raising the nominal wage to induce the increase in supply. In the second case, the trainees have to share part of the subsidy with the employer, accepting a lower nominal wage to induce him to increase recruitment. In substance the outcome is the same. The total income of each trainee rises by an amount $(w_1 - w_0)$ as a consequence of the introduction of the subsidy, and the net cost of a trainee to the employer falls by an amount $(w_0 - w_1^{\circ})$. The actual incidence of the subsidy is not determined by who nominally receives it, but by the elasticities of the demand and supply curves. For example, if the supply curve is relatively elastic (relatively flat), $(w_1 - w_0)$ will be small and the subsidy will mostly be appropriated by the employers, regardless of whether it is formally paid to them or to their trainees.

3.2 Types of Training Subsidy

Subsidization of training expenses

Schemes which provide firms with grants for training expenses incurred by them are now common in both developing and industrialized countries. The criteria for computing the size of the grant, and the method of payment, vary widely.

Tax deductibility of training expenditure: Simple tax deductibility of training expenditure is so much taken for granted that it is seldom the subject of public comment, despite being in terms of resources the most important concession made to firms in many countries. In the United States, for example, Wagner (1983) estimates that the U.S. Treasury contributed \$2.7 billion in 1980 to organized off-the-job training provided by industry, twice as much as was spent on public manpower programmes in that year. This figure excludes the cost of employees' wages during training, likewise a tax-deductible cost, and worth perhaps as much again. Almost certainly the Treasury's contribution to the cost of unstructured on-the-job training was much higher still (estimates of the total cost for 1980 range from \$2 billion to \$100 billion (Smith, 1983), and the tax contribution would again be about one third).

The fact that training expenditure is regarded as part of the ordinary operating expenditure of a firm of course accounts for its deductibility being taken for granted, in the same way as expenditure on physical assets is deductible, by instalments through depreciation allowances. Nevertheless, investment in human capital is typically treated more favourably than investment in physical capital. In the first place, the entire investment is deductible immediately, whereas that in physical capital is spread over a period of years. Second, transferable training in general skills, the value of which is (as a first approximation, at least) appropriated by the trainee, is rarely subject to personal taxation. This gives firms and their employers an incentive to transmute part of employee compensation from cash to training benefits. Of course the employee's perception of the value of the training may differ from its cost, but in principle the deviation

could be positive as well as negative: firms may be able to provide valued training less expensively than external sources; indeed, external sources might not exist at all.

Enhanced incentive schemes: In some countries the grant may be received in the form of a partial exemption from profits tax, over and above the usual deduction of such expenditure in the computation of taxable profits. In Brazil, for example, double the expenditure on approved training programmes may be deducted, with a maximum remission of 10% of the liability to profits tax. In Chile, expenditure on training may be deducted from the profits tax liability up to a maximum limit of 1% of the payroll (Martinez, 1984). In the Philippines, firms may deduct 150% of the cost of training in the computation of taxable profits, provided that the extra 50% does not exceed one tenth of the wage-bill (de la Llana, 1982).

As a slight variation, in some countries enterprises may receive tax credits, equal to expenditure on training, which can be used to discharge liabilities for any national taxes. In Argentina, tax credits equal to training expenditure are issued up to a maximum of 0.8% of the payroll (Martinez, 1984).

Perhaps the most common arrangement is a special case of the latter, an exemption equal to part of all of training expenditure from a pay-roll levy, earmarked for training purposes (Fiji, Ireland, Taiwan, UK).

Finally, what is effectively an inverse levy/grant system has been introduced in South Korea: firms in six industries above a minimum size are required by law to train a certain proportion of their workers each year; those that do not are fined an amount equivalent to the estimated cost of the training that should have taken place. This arrangement is of course equivalent to one in which firms are first charged the corresponding levy, and then reimbursed if they provide the training. The only difference from a conventional levy/grant scheme in practice is that the amount reimbursed per worker is the training cost norm, not the actual cost of training.

In principle, the impact of the grant scheme should be much the same, dollar for dollar, irrespective of the actual grant mechanism and of whether it is an outright grant or an exemption from a tax that would otherwise have to be paid.

Types of training covered: In most training incentive schemes it appears that the regulations concerning scheme approval allow firms considerable latitude in determining the type of training offered. As a consequence it has frequently been found that professional and managerial workers have benefited disproportionately, both in terms of numbers receiving training and the cost of their training. To counteract this tendency some schemes have been designed to favour the training of skilled and semi-skilled workers. In South Korea, only basic training programmes have been eligible for grants. In Chile, the scheme has been amended to reduce (but not eliminate) the incentives for higher-level training: firms must bear 30% of the cost of training those who earn more than 12 times the minimum wage; they must bear 40% of the cost of overseas training; and a ceiling has been placed on the allowable cost per trainee per hour (Gili, 1985).

Subsidization of trainee wages

The subsidization of trainee wages is quite common in developing countries. For example, the National Apprenticeship Board in Sri Lanka assumes responsibility for 100% of apprentice allowances; in India, the authorities pay 50%, up to a certain limit, of the stipends of apprentices in enterprises employing fewer than 500 workers; in Nepal, the authorities pay 40% to 60% of apprentice wages in the private sector and 100% in the public sector; in Singapore, those completing military service and undertaking

apprenticeship are given an allowance which restores their earnings to their previous level; in Australia, Fiji and New Zealand the wages of apprentices during their off-the-job instruction are wholly or partly paid from public funds (APSDEP, 1981).

Other financial incentives

Financial sticks as well as carrots are used to stimulate training. The classic example is the imposition of a US\$100 per month levy on the pay of every expatriate in the Indonesian logging industry (APSDEP, 1981). The proceeds are used for training purposes in the logging industry but the main purpose of the levy is to encourage the enterprises affected to develop local expertise.

3.3 Evaluating the Impact of Training Incentive Schemes

Studies of grant schemes generally find a handsome increase in the volume of training immediately after their introduction and that this new higher level is maintained in subsequent years. However these data typically cover only training expenditure approved for tax exemption and it is never clear how much of the apparent increase is attributable to a genuine increase in the volume of training and how much is attributable to a repackaging effect: the adaptation and documentation of existing training provision to comply with eligibility requirements for grants. And even when there is a genuine increase in training provision, it is not always clear whether it is attributable to the scheme or whether it would have occurred anyway.

The repackaging effect

Even when a training scheme has been implemented, much, probably usually the greater part, of enterprise-sponsored training remains outside its ambit. There are two reasons for this. First, the administrative cost of establishing the eligibility of training expenditure for a grant may exceed the value of the grant. The initial hurdle is the investment in time required for learning how to submit an application for a grant. Then an annual training plan almost certainly has to be drawn up, sometimes requiring the firm to anticipate training requirements long before it is in a position to identify its real needs with any accuracy, and involving it in paperwork which otherwise would be unnecessary. Then detailed accounts of training expenditure must be kept, together with records of other activities needed to demonstrate compliance with the regulations, and finally more paperwork must be undertaken to obtain payment.

Second, the cost of adapting a training programme to make it eligible for a grant under the training scheme may exceed the benefit in terms of the value of the grant and the net additional value of the training. In Korea, for example, training programmes had to be of at least six months duration to qualify for a grant. Some enterprises with shorter programmes promptly extended them to six months when the grant scheme was introduced, but others preferred to maintain existing arrangements and forgo eligibility.

No study of the impact of the introduction of a grant scheme has come anywhere near to discriminating in a convincing manner between its real impact and improvement in the documentation, or repackaging, of existing training provision. The greater the grants made by a scheme, the greater in principle should be the net real increase in training, but also the greater is the incentive to make the effort to secure eligibility for existing training. To be convincing, such a study would have to document

comprehensively and in detail the training provided by a sample of firms before the introduction of the scheme and afterwards - in other words, what is needed is an in-depth micro approach, rather than the aggregate approach adopted in the literature to date.

The coincidence of increased training need and incentive schemes

The introduction of a training incentive scheme is usually a response to a perceived increase in the demand for skilled labour. To the extent that the increased demand is for enterprise-specific skills, the enterprises can be expected to undertake the appropriate training effort without the need for intervention. Under such circumstances any additional training provision stimulated by the incentive scheme amounts only to a distortion in the allocation of resources (for example, away from capital formation) unwarranted by any economic consideration of externalities. Only to the extent that the increased training provision takes the form of the development of general skills is it both attributable to the incentive scheme and warranted in principle.

Furthermore, as Lees and Chiplin (1970) point out, training incentive schemes tend to favour firms with high turnover because they have a higher proportion of new staff. If the training is general, the skills embodied in a worker who quits would be of use to his or her new employer. But if the training is specific, the investment would be partly dissipated, and the system would in effect be providing subsidies to firms with poor labour relations and high turnover.

3.4 International Experience with Training Incentives

Latin America

Until relatively recently financial incentives to encourage enterprise-based training were uncommon in Latin America. As was noted in Chapter 4, payroll levies have been imposed in a number of countries since 1942 and are now widespread, but they have been used to finance institutionalized training, and not as part of the stick-and-carrot arrangement of a levy/grant scheme.

Brazil: The Brazilian incentive scheme mentioned above, implemented in 1976, was therefore a major innovation, a "clean departure from the Latin American model" (Ducci, 1983). According to Martinez (1984), it led to an 80% increase in training expenditure and a tripling of manhours of training by 1980, the last year for which he provides data. Nevertheless it is by no means clear that the impact of the scheme was significant in scale. Although the apparent growth rate of approved training may be impressive, it still amounted to less than three hours per worker per year for the Brazilian labour force in 1980, and total expenditure on approved training schemes was less than one fiftieth of national expenditure on education. (According to Martinez, 112 million manhours of training were conducted by approved programmes in 1980 and expenditure on them was Cr.\$7.4 billion. The Brazilian labour force was 44 million in 1980 (ILO, 1986, Table 3), and public expenditure on education was Cr.\$432 billion (UNESCO, 1987).)

One possibility is that the approved training was disproportionately channelled to a minority of occupations in the modern sector, in which case the low average figure would offer no guidance to the duration of the training received by those workers who did benefit. This possibility is reinforced by the fact that only 0.35% of eligible firms secured grants, participation being disproportionately weighted towards large firms.

A less optimistic interpretation would argue that the average figure may actually overstate the impact of the scheme, in that part of the approved training would have been undertaken anyway and was simply repackaged to attract a grant. According to this view the low participation rate of small firms would reflect, not a lack of training need, but the fact that such firms did not find it worthwhile to make the effort to secure grants for the training which they did undertake.

Chile: In the case of the Chilean scheme, implemented at the end of 1976, data on manhours of training before its introduction appear not to be available, but the number of firms participating almost tripled between 1976 and 1982 and there was a corresponding increase in approved expenditure. However, as in Brazil, the scale of such training may have been too small for it to have had a significant impact. Martinez (1984) reports that in 1981 5.7 million manhours of training qualified for the scheme. However, since the labour force in 1981 was 3.3 million (ILO, 1986), this implies an average of 2 manhours of training per worker per year. Similarly, the 750 million peso expenditure under the scheme in 1982 reported by Martinez is insignificant by comparison with the 65 billion peso public expenditure on public education (UNESCO, 1987). Only 1.4% of eligible firms benefited from the scheme. Updated figures for 1983 provided by Gili (1985) reveal little change. As in the Brazilian case, more information is required before the true impact can be assessed.

Argentina: The training grant scheme in Argentina had been implemented too recently (1981) for Martinez to attempt an evaluation of its impact.

East Asia

South Korea: In South Korea the Basic Law for Vocational Training, which was introduced in 1976 and has been amended three times since, requires enterprises in the mining, manufacturing, construction, utilities, transportation, communications, and services sectors, employing more than 300 workers to train a certain percentage of their workforce each year, the percentage being determined on a year-to-year basis according to a formula intended to reflect current needs. Firms not complying with the training requirement have to pay a levy for each individual not trained calculated at three-quarters of the average cost of a training course.

Even the ostensible impact of the scheme is hard to determine. The number of officially-trained persons had already started to rise from its average level of about 13,000 in the early seventies under the influence of its predecessor: in 1974 there were 13,000 trainees, in 1975, 43,000, and in 1976, the year the Basic Law was implemented, it rose to 97,000; the next year it dropped back to 59,000; it then rose again to 91,000 in 1980, and then over the next four years slid back to the 20,000 - 30,000 range where it has stabilized. One factor behind these variations is the adjustment of the training ratio which was not constant as in most schemes of this nature. For example, in 1979 6.7% of workers were supposed to be trained under the Law, since when it has fallen to less than 2%. In principle the training ratio is intended to be based on an objective measure of training needs, but in practice it is determined by bargaining between government and employers (Kim, 1986, pp. 94-95), and it is an open question as to what extent the training effort was responding to the Basic Law and to what extent the reverse was the case.

While the Korean scheme in principle provides the same incentives for training as a conventional levy grant scheme, there is one important difference which appears to have undermined its effect. In a conventional scheme, enterprises may have a strong preference for being exempted from both levy and grant, and if captured, they may try to exert collective pressure to keep the levy as low as possible. But given this,

they have no aversion to having the principle incentive, the grant, made as generous as possible. In the reverse levy case it is in the interest of the enterprises to emasculate the active ingredient as well: in Korea firms have bargained with the government to keep the nominal cost of training well below the actual cost, to minimize the fine payable for non-compliance (Kim, p. 95). Not surprisingly, the current impact of the scheme appears to be minimal. The 24,000 workers trained under the scheme in 1985 represented barely two thousandths of the non-farm labour force (estimated by Kim, p. 13, at 11.1 million in that year).

In addition to the aggregate data, Kim provides case-study material for a small number of enterprises in the sectors covered by the Basic Law. The overall impression is that enterprises complied with the law when they could do so with minimum inconvenience or adaptation and otherwise were not substantially affected by it. Some firms, including the three automobile producers, reported that they would have established their vestibule facilities for basic training even if the Law had not been enacted. The duration of training schemes seemed to be largely unaffected by the law. Some firms, among them a shipbuilder and a heavy mechanical firm, provided courses of greater duration than the minimum stipulated by the Law, while others, particularly those in the textiles industry, continued to provide basic training courses of shorter duration and to pay the levy as well as the cost of the training. Many firms preferred to pay the levy rather than adapt its content to the basic level specified by the law. Most firms provided short upgrading training courses which did not qualify under the law. Perhaps exceptional, but illuminating nonetheless, is the case of a company producing integrated circuits: it paid a levy of 8 million won in 1984, rather than provide the basic training for 16 workers prescribed by the law, but nevertheless spent 250 million won on higher-level in-service training.

Singapore: In Singapore training grants have been made from the Skills Development Fund since its establishment in 1979. Pang and Salome (1986) state that 75,000 workers were trained with grants from the fund in 1984, an impressive figure bearing in mind that the total labour force in Singapore is just over a million, but the average duration of the course is not reported.

The main criticisms of the scheme are its overfunding, its current relatively slow rate of growth, the restriction of grants to classroom training, and the fact that large firms benefit disproportionately. The overfunding problem has been discussed in Section 4 and does not bear on the effectiveness of the scheme as an incentive to training. The relatively slow rate of growth is probably not a ground for criticism but for congratulation, a 7% training rate probably approaching saturation unless very short training interventions are being counted. Pang and Salome do not discuss the rationale or effects of the classroom restriction, but it is possible that it is intended to bias the training aided by the fund away from the firm-specific in-service training which would in any case be undertaken by the firms in their own interest. The statistics do confirm that large firms have benefited disproportionately: 29% of workers in firms employing 200 or more have been trained with grants, compared with 11% of those in firms employing 10-199 and only 1.5% of those employing fewer than 10, but the disproportion is much less marked than in such schemes in most other countries.

Taiwan: The Vocational Training Fund Statute 1972, which raised a 1.5% payroll levy on enterprises in the manufacturing, mining, construction, utilities and transport and communications sectors employing 40 or more workers, allowed contributing firms to reclaim up to 80% of the levy to meet approved training expenses. Taiwan is unusual among developing countries in conducting a continuous training survey, implemented as part of the monthly labour force survey. Hence, subject to the limitation that a training course is defined only as any type of vocational training undertaken for at least four consecutive weeks in

the preceding year, one may obtain a picture of changes in training activity relatively free from the documentation effect.

The impact of the scheme at first sight was impressive: it was implemented in March 1973 and the number of trainees in the sectors in question rose from 52,000 in 1972 to 174,000 in 1974, about 8% of the corresponding labour force. Nevertheless in 1974, in the face of the world-wide recession, the scheme was first suspended and then abandoned altogether. With demand for exports threatened, the minimization of costs was assigned a higher priority than the promotion of training.

Although the annual number of trainees then fell, it remained at a higher level than in 1972: in 1975 it was 103,000, in 1980 102,000, in 1983 122,000 (data from San and Chen, 1986, Table 3.1). San and Chen suggest that "perhaps one of the side-effects of the statute was that increasing numbers of both employees and employers came to realize the positive impact of vocational training on individual careers and enterprises on the one hand, and on the entire economy on the other." However in considering this interpretation, it must be borne in mind that the gradual shift towards the use of more sophisticated technology must also have been responsible for an increased commitment to training, as in Korea.

Since 1974 government policy has largely been directed towards increasing the provision of institutional training, but this is still dwarfed by enterprise-based training, at least in terms of numbers of trainees. In principle a modified levy/grant system has been re-established by the Vocational Training Act of 1983, with the rate of contribution of each enterprise being determined by the industry it belonged to and by its size, but the enforcement rules have yet to be determined and the Act remains inoperative.

Other countries in the region: The tax incentive scheme in the Philippines appears to have had a negligible impact, only 91 firms taking advantage of it in the first three years, 1977-1980. This was, however, a pilot implementation phase and its coverage may be widened (de la Llana, 1982). The Fiji tax-deduction scheme is intended to promote training in firms large enough to mount approved training programmes with registered training officers (smaller firms may take advantage of a wage-subsidization scheme described below). In neither country does any evaluation of the scheme appear to have been undertaken.

Industrialized countries

While formal statistical analysis of the impact of training incentive schemes remains uncommon, some recent well-documented interventions in Australia, Canada and the United Kingdom have provided the basis for econometric studies.

Australia: Richardson (1982) and Merrilees (1984) have investigated the impact of three schemes for subsidizing apprentice training, the National Apprentice Assistance Scheme (1973-77), the Commonwealth Rebate for Apprentice Full-Time Training (1977 onwards), and the Employer Cash Rebate Scheme (1979-81), Richardson's study being descriptive and confined to the metal trades, Merrilees' being econometric and covering the metal, electrical, printing, building and automotive mechanic trades. The subsidies provided by the first scheme were both modest and taxable, and not surprisingly no significant impact is detected by either study. The second scheme subsidized the wages of the apprentices during their off-the-job training. The third, which was supplementary to the second, was explicitly aimed at promoting apprenticeship at the margin, providing an A\$1,000 subsidy per year for each additional apprentice. Together, the second and third schemes provided a subsidy of about 8% of the average wage cost of an apprentice.

At first sight the data on apprentice recruitment seem to indicate that the second and third schemes had a strong impact, the number of new indentures increasing even in the years 1978-79 when the demand for skilled craftsmen was relatively depressed. But as Richardson points out, this finding must be qualified in two important respects. First, the schemes did not lead to a new recruitment to the sector, but to a substitution of apprentices for tradesman's assistants. Second, while the subsidies contributed to this substitution, rather more important was the gradual rise in the relative wages of tradesman's assistants: the ratio of the wages of a tradesman's assistant to those of a first-year apprentice rose from 185% in 1972-73 to 213% in 1978-79. The substitution may also have been encouraged by an improvement in the quality of those taking up apprentices.

Merrilees also found the recruitment of apprentices in the metal trades to be sensitive to the labour cost, the estimated elasticity being approximately unity and highly significant. But in none of the other four trades is the elasticity significant at the 5% level, and in two of them the elasticity had the wrong sign. In all five trades the elasticity of recruitment with respect to output is significant, and in four the elasticity of recruitment with respect to unemployment is significant.

The results of this study are therefore mixed. On the one hand, according to Merrilees it is the first to find significant wage elasticities with Australian data, and in this respect provides support for the effectiveness of wage subsidies. But this finding is restricted to only one of the five trades, and so the support is weak, to put it mildly. There are probably two reasons for this.

First, although much trouble appears to have been taken to obtain appropriate data, aggregative studies of this type are inevitably blunt instruments. A progression from a general specification to a more specific one by testing restrictions is ruled out by the fact that the fit is not good enough to allow restrictions to be rejected. This means that there is no way of guarding against the risk that variables included in the model are proxying for those excluded from it.

Second, there is the identification problem of separating the supply and demand functions for apprentice recruitment. While it is reasonable to suppose the demand for apprentices to be a negative function of their wage cost, it is equally reasonable to suppose that the supply of would-be apprentices is a positive function. Hence there is no obvious way of predicting whether actual recruitment, the result of the interaction of supply and demand, is positively or negatively correlated with the wage, and a single equation method is in general inappropriate. This might by itself account for the insignificance of the estimate of the wage elasticity for four of the trades. The problem is of course exacerbated if it is hypothesized that the effect of wages on supply and demand is subject to a distributed lag. Merrilees mentions the identification problem and implies that he has resolved it by appropriate choice of time periods, but details of the selection process are not forthcoming (reference is made to a working paper).

In conclusion, the studies provide some indirect support for the effectiveness of wage subsidies by confirming, weakly, the common-sense notion that the demand for apprentices is inversely related to their relative wage. Richardson's study, although not econometric, is more compelling because it is based on a more detailed examination of the trade in question; indeed, she is credited - by Merrilees - as being the first to note that the relevant comparison wage is not that of the experienced craftsman, but that of the tradesman's assistant, a much closer substitute for an apprentice.

For completeness's sake, note should be made of Krbavac's (1984) evaluation of the effect of the cash rebate scheme, the third scheme described above. He notes that many of the new apprenticeships attracting the rebate would have been contracted even if the scheme had not been established and he

estimates the net increment. However his calculations are based on Merrilees' econometric results and his analysis is therefore not independent.

The econometric studies thus generally suggest that the subsidization of trainee wages has less effect than might be expected. However there are two reasons for treating this conclusion with some caution. First, it is clear that modelling the responsiveness of training provision to subsidies is not an easy task, and it is entirely possible that the lack of positive findings may largely reflect a lack of success in this respect. Second, the studies have focused on the short-term response to subsidization schemes, if only because the schemes themselves have generally been short-lived. It is quite plausible to argue that the adjustment of employers' staffing practices may take many years, in which case an insignificant short-term effect would not rule out a significant long-term one.

Britain: The impact of apprentice wages and apprentice wage subsidies in Britain have been evaluated by Atkinson (1982) and Merrilees (1983). Merrilees' study, confined to the engineering trades, is developed from an earlier study by Lindley (1975) and is similar in nature to his Australian study. He finds expected output growth (proxied by investment) to be the dominant variable, but the relative wage cost, measured in this case by the ratio of apprentice wages to those of craftsmen, not semi-skilled workers, is also significant with an elasticity greater than unity. He also finds that the backlog of engineering orders has a negative elasticity and argues that this reflects the fact that when demand increases it is rational to reassign craftsmen from apprentice training to direct production, at least in the short run. He also finds that apprentice recruitment is a positive function of the proportion of apprenticeships subsidized by training grants in years when these were made available by the Engineering Industry Training Board, but there must be some suspicion of at least partial tautology in this relationship. The same technical reservations applying to his Australian study are relevant here also. Atkinson (1982) is a report on an interview survey of 58 employers in the engineering, construction and road transport sectors, undertaken after several years of recession had had a severe adverse effect on apprentice recruitment. The main conclusions are that recruitment is sensitively affected by the current and future employment prospects of completing apprentices, with the cost of training being a secondary factor, "operated pragmatically to reduce unacceptable recruitment levels rather than to assess systematically the costs and benefits of apprentice training." The findings therefore corroborate those of Merrilees, the two studies apparently having been undertaken independently.

Canada: A federal training program was established in Canada in 1967 under the Adult Occupational Training Act. Some of the funds for industrial training was partly used to reimburse trainees' wages: 40 percent for most eligible workers, but increasing to 85 percent for workers with special needs (such as laid-off workers with difficulties in finding alternative employment). Employers were not reimbursed if a trainee dropped out of training. The incentive was therefore to hire and train reasonably skilled workers (Gunderson, 1977). An evaluation of industrial training in Ontario concluded that "the program was of most benefit to persons in least need of training ... to compete in the labor market" (Dymond, 1973, cited in Gunderson, 1977).

Simpson (1984) evaluates the impact of government subsidies for training under the Canada Manpower Industrial Training Programme with an econometric analysis of data from a sample of 600 establishments. The programme reimbursed employers for direct training costs, as well as a portion of trainees' wages in approved training programs. The intention was to support short training programmes to encourage the development of lower-level skills. Unfortunately Simpson's findings are invalidated by simultaneous equations bias which he notes but does not attempt to correct. The dependent variable in the

statistical analysis was the duration of a training programme, and the impact of government subsidies was modelled using a simple zero-one dummy variable indicating the presence or absence of government training assistance in each firm for each occupation. As Simpson points out, the dummy variable could be non-zero only if training were being undertaken. Although this matter is not discussed in the paper, it is reasonable to suspect that the simultaneity was reinforced by the conditions under which training was eligible for support, for example, by the use of formal methods and minimum course lengths.

3.5 The Side-Effects of Incentive Schemes

The main side-effects of incentive schemes are their tendency to result in arbitrary windfalls for some enterprises and trainees, their tendency to reduce the cost-effectiveness of training, and their imposition of non-negligible administrative overheads.

Windfalls

The theory outlined in Chapter 1 indicates that, in the absence of externalities or market failure, enterprises can be expected to provide training on an appropriate scale and to share its cost with their trainees. It follows that financial training incentives may result in windfall payments to those fortunate to qualify for them, the ultimate division of the spoils between the firms and their trainees depending not so much on the formal designation of the beneficiary as on the elasticities of supply and demand for trainees.

Where the scheme is funded from an industry-specific levy, salt is rubbed into the wound, for then the non-beneficiaries may find themselves involuntarily subsidizing their competitors.

Distortions in training provision

Bias towards structured training: The impact of grant schemes on the quality of training is more difficult to evaluate. The summary of international experience shows that they tend to bias training provision towards unnecessarily structured arrangements and that they penalize firms which resist this pressure. In most schemes, a firm's eligibility for grants and levy exemptions depends on meeting certain training standards, defined usually by such input measures as type and length of course, the number of trainers and perhaps the possession of certain types of training equipment. As Grabe (1981) observes in the context of levy/grant schemes, they "tend to emphasize accountable costs and draw attention away from the less formal methods of training; thus, for instance, from training given in the work situation. In other words, they reinforce the trend towards further institutionalisation of training and tend to counteract efforts to restore training on the job."

Bias towards high unit costs: The fact that training grants are usually related to training expenditure rather than any measure of the effectiveness of the training means that almost inevitably incentive schemes encourage unnecessarily high unit costs (Oatey, 1970). In this respect, the extension of levy/grant schemes to small firms may be doubly unfortunate. As has been seen, their response rate tends to be very low, and hence the levy amounts to just another tax. But when they do participate, they are much less likely than large firms to secure economies of scale, and hence their training programmes are correspondingly less likely to be cost-effective.

Administrative costs

Administrative costs tend to be significant in schemes aimed at subsidizing direct training costs. Firms have to prepare documentation to support applications for grants, or, equivalently, levy-exemption. The economies of scale in both acquiring the necessary bureaucratic expertise and in preparing applications is no doubt responsible for the low participation of smaller firms in grant schemes. In Singapore this problem has been addressed by setting up a system of Approved-in-Principle courses to minimize paperwork, but nevertheless only 2% of enterprises employing fewer than 10 workers had made successful applications for grants by March 1985, as opposed to 23% of those employing 10 to 50 workers and 80% of those employing more than 50 (Singapore Skills Development Fund, 1985).

Further administrative costs are incurred by the training authorities in appraising applications. The Irish Industrial Training Authority, for example, retains about 10 percent (1.9 million pounds in 1982) of levy proceeds to cover its operational costs (AnCO, 1983). It reports difficulties in determining training costs because of differences in accounting procedures across firms. Difficulties are also encountered in apportioning costs among employers with wide-ranging training needs.

3.6 Subsidized Institutional Training

In most countries, even those with apparently-successful incentive schemes for enterprise-based training, the most important government intervention remains the subsidization of institutional training. Typically the institution is publicly-owned, belonging either to the formal educational system ("formal training"), to a national training authority, or to line ministries or specialized agencies ("nonformal training"). One can find examples of the public subsidization of institutions owned by non-government organizations or even the private sector, but they tend to be unimportant, especially in developing countries. It is not the intention here to attempt an general evaluation of the success of interventions of this type - a recent survey will be found in Dougherty (1989) - but to focus on the financing aspects.

The main difference between the public and private provision of training is the weaker accountability of both administrators and trainees in the former. In well-funded systems (typically those financed by payroll levies), resources may be dissipated in ineffective programmes with high unit costs caused by a failure to realize economies of scale; excessive administrative overheads may be tolerated; and funds may be wasted on ill-advised research projects or unproductive conferences. Whereas levies for grant schemes often remain largely undisbursed, the proceeds of levies for public training systems are usually disposed of with little difficulty. In poorly-funded systems (those dependent on grants from central government, especially at a time of recession), the difficulty or impossibility of scaling back the payroll in line with other expenditure often results in wholly inadequate budgets for training materials and maintenance, undermining the effectiveness of the training and shortening the life of the facilities.

But far worse than the misallocation of resources is the failure of many public training systems to detect and respond to the need for change. The weaker is the financial control, the greater is the likelihood that training policy, while paying lip-service to the labour market, will in practice be determined by other social or bureaucratic objectives. These often fail to provide incentives for training establishments to adapt their programmes to the evolution of the labour force. Indeed, the incentives for management may lie in exactly the opposite direction, maintenance of the status quo being irrefragable and there being much

potential danger, with no reward, in attempting innovation. Hence it is common to find that training establishments have little idea of the destination of past trainees and lack the links with employers necessary to anticipate the demand for future ones, sustaining courses that have long outlasted their usefulness and failing to introduce new ones to meet emerging skill requirements. School-based training programmes are notoriously susceptible to inertia of this type.

These remarks should be qualified in three ways. First, they describe general tendencies. It is possible to cite examples of public training establishments with exemplary cost-effectiveness and responsiveness to the local labour market. Second, conversely, enterprise-based training is by no means immune from the deficiencies described above. And third, the fact that institutional training is under less pressure than enterprise-based training to meet immediate skill requirements allows it to be more broadly based and to include a stronger theoretical component. For this reason, even in those countries with a strong tradition of enterprise-based training, much initial training is provided by full-time institutional programmes. Common examples are the first, basic, year of apprenticeship training and the first year or two of technician training.

Chapter 2 examined the arguments for government intervention intended to promote training, but it did not discuss in any detail the sources of any financing that might be required. This chapter considers the case for relying on the more orthodox alternatives: general public revenues, levies and trainee loans. The Appendix to this report reviews the experience of the U.K. levy/grant system.

4.1 Enhancing the Private Contribution to Training Finance

Since the competition for public resources is intense in most countries, the scope for enhancing the private contribution to training finance should not be neglected.

Fees and training loans: In many countries, public training programmes are traditionally free or heavily subsidized out of public revenue, simply because the institutes are publicly owned. As has been noted in Chapter 2, there may in fact be good reasons for such subsidies, but in default of such grounds cost-recovery via the charging of fees should be the norm. Where a lack of collateral prevents individuals from obtaining loans to finance profitable investments in human capital, the obvious remedy is to provide financing via trainee loans analogous to those available for financing higher education in some countries. This appears at present to be unexplored territory, but the fact that many education loan programmes have been successful (Woodhall, 1983), and that many of the loans taken out under such schemes are in fact used for (university-based) professional training, suggests that training loan schemes may be feasible. That individuals are prepared to view self-investment as a commercial proposition, as evidenced by flourishing proprietary training institutes, is also a favourable factor.

Pay sacrifice: Chapter 2 noted several instances where market failure may make it impossible for firms to shift the cost of general training to trainees through reduced wages. In some of these instances recourse to public financing may be avoided if the cause of the market failure is remedied. Apprentice training is a case in point. If apprentices are treated as part of the regular labour force, there is a risk that their wages may settle at a level which does not take into account the cost and value of the training being received by them. In an extreme case, where they benefit from minimum wage legislation, it may be impossible to transfer any significant portion of the cost of training to them. Unless there are over-riding political or social constraints, one solution might be to assign apprentices a separate legal status, as is the case in Germany, so that they are exempt from minimum wage legislation, and possibly also from social security payments. The separate status may also have the effect of lowering immediate wage expectations, especially if the eligibility of the trainee for unemployment benefit, where this is available, is thereby removed or reduced. For example, the willingness of young people to take up places on the low-paid Youth Training Scheme in the U.K. has been said to have been much enhanced by making them ineligible for unemployment benefit.

It was noted in Chapter 1 that some forms of initial training are so expensive that it is not feasible to shift the cost to the trainees via pay sacrifice during the training period. In such cases the cost could still be borne by the trainees if they were able to enter into a contract with the training firm to work for it at a below-market wage for a number of years after completing the training. The government may be able to

play a catalytical role by endorsing such arrangements in policy statements, thereby giving them social legitimacy, and by enacting legislation which would provide a framework for such contracts and their enforcement.

4.2 General Public Revenue

In view of the discussion in Chapter 2, it can be concluded that there is a prima facie case for using general public revenue to finance interventions motivated by equity or other social considerations, the equity argument having particular force in the case of pre-employment training. In many countries there is a tendency for higher ability students to remain in school after completing basic education and for those of lower ability to proceed to some form of initial training. If the education of those remaining in school is subsidized, it is discriminatory to give less favourable treatment to what is in any case the less privileged track. There are of course limits to the justifiable scale of the subsidy per individual, since the benefits of the training are not equally distributed. Subsidization of the off-the-job day-release instruction of apprentices is one thing; subsidization of expensive full-time institutional training, especially of the more costly types, is another. At some point it is desirable to draw a line beyond which other forms of financing should prevail. The question of whether subsidies should be channelled to training institutions or to individuals by way of entitlements is complex. For a review of the issues and a series of proposals, see several of the contributions to Levin and Schütze (1983).

Besides the theoretical arguments for using general revenues, there are practical considerations. The most important one favouring the use of general revenue is that it does not require the establishment of additional tax-collecting machinery. On the negative side, in some countries, particularly the poorer developing nations, public revenue is so vulnerable in times of recession that it is not a reliable source of funding.

4.3 Payroll Taxes

The most common type of sector-specific tax is a payroll tax levied on all establishments exceeding a certain size. It is particularly widespread in Latin America as a result of the dissemination of the SENAI model of public training provision, of which it is a notable, but not essential, feature: in addition to Brazil, it is found in Argentina, Colombia, Ecuador, Guatemala, Honduras, Paraguay, Peru and Venezuela (Corvalan, 1977; Castro, 1979). In most countries the levy is restricted to the industrial sector of the economy, variously defined, reflecting the limitations of the scope of the programmes offered by the public training establishments, but in some it also covers commerce and in a few it is all-embracing (for example, Honduras). Small firms are normally exempt, the threshold for inclusion usually being defined in terms of the number of workers and ranging from 5 workers in Guatemala, Honduras and Venezuela to 15 in Peru.

The tax is often set at 1% of payroll, but sometimes the rate is higher, as in the case of the Cote d'Ivoire and Peru with 1.5%, Colombia with 2% and Venezuela with 2.5% (including the employee's contribution). In some countries, particularly those where responsibility for administering a training promotion scheme has been devolved to industry representatives, the rate of the levy may vary among

different industries, or be levied in some but not in others (as in New Zealand, where it is in force only in the clothing, textiles and engineering industries [APSDEP, 1981], and in the U.K. [Appendix]).

Despite the popularity of levies, the case for using them to finance training is seldom made convincingly. Indeed, as a first approximation, there would appear to be no case at all. If firms fail to shift the cost of transferable training to a trainee, it is the trainee who benefits, not the firm who recruits him. So why should the recruiting firm be expected to pay a levy?

Perhaps the best argument in favour of the payroll levy is that of Whalley and Ziderman (1989). They begin by pointing out that the fact that the firm nominally has to pay a levy does not mean that in reality the tax comes from its profits: the firm may be able to shift all or part of the incidence of the tax to the purchasers of its products, via price increases, or to its workers, via lower wages. The literature on the incidence of payroll taxes, which is complex and largely confined to developed countries, suggests that in fact the tax is shifted to the workers. Whalley and Ziderman argue that this may be expected to be the case in developing countries as well. Hence according to them a payroll tax used to finance training may be regarded as a reverse social insurance scheme, in which the benefits are received on entering the labour force, in the form of training, and the contributions are made afterwards for the rest of the working life. An attractive feature of the levy from the equity view-point, according to this analysis, is that those workers who receive most training, and consequently earn the highest incomes, will later be making the greatest contributions.

The force of the argument depends however on the extent to which workers bearing the cost of the levy do in fact receive training benefits. In practice it is unlikely that as many as 15% of subprofessionals receive the kind of pre-employment training that is commonly funded by such levies. Structured in-service training tends to be more broadly distributed, but it tends to be quantitatively much less important in terms of volume than pre-employment training in developing countries. Hence there is a strong probability that a relatively small number of individuals will be arbitrarily subsidized by the remainder. One way out of this problem is to target the levy to particular occupational groups, as is done in Malawi (Whalley and Ziderman, pp. 19, 20). Employers pay tax according to the number of skilled workers employed by them, and the rate of the tax varies among occupations and is related to the cost of the training. Assuming that the cost of the tax is shifted to the workers, the arrangement constitutes a focused and relatively equitable reverse social security scheme. It may also be regarded as a virtual trainee loan scheme, with the government paying the cost of the training and then recouping its cost by attaching their wages. Administratively, it may be simpler to manage than an orthodox loan scheme, but it has the disadvantage of repayments being less closely related to benefits than in an orthodox scheme. In particular, workers trained entirely on-the-job, normally the great majority in most developing countries even in skilled occupations, would be contributing as much as those who had in fact been trained with public funds.

Practical considerations relating to levies

It is of course possible that the theoretical arguments are in any case irrelevant and that practical considerations account for the popularity of the levy. The tax provides a sheltered source of resources in times of recession and it may constitute a means of mobilizing financial resources otherwise inaccessible to the public sector. A selective payroll tax may also be used as an instrument for restructuring the economy.

The payroll tax as a sheltered source of resources: The payroll tax undoubtedly serves to shelter resources for training from changes in the economic environment. There are however three misgivings one may have on this score.

First, no case has ever been made for giving greater shelter to public expenditure on training than to, say, general education or health expenditure, and it is unusual for these to be funded by earmarked taxes in developing countries.

Second, a payroll tax may constitute an over-sheltered source of revenue: it is often set at a level which generates more revenue than the administration can efficiently spend. The outcome may be the encouragement of a growth of top-heavy administrations and a tolerance of ineffective training programmes with excessively high unit costs. The operations of several levy-based Latin American national training authorities have been criticized on this score, for example INTECAP in Guatemala (Inter-American Development Bank, 1983). Of course in principle control mechanisms could be put in place, but it is not easy to impose discipline on public agencies; in some developing countries controls and the auditing of internal and external efficiency might be expected to be effective, but in others there is less ground for optimism. Sometimes the proceeds of levies accumulate unspent or are diverted to non-training related objectives. In Korea, levies have accumulated in the Vocational Training Promotion Fund, but only a small percentage of the revenue has been used to finance vocational training. Employers feel that the levy scheme "has come to nothing but a new tax burden" (Kim, 1986, 145). Similarly, in Singapore, the Skills Development Fund had a surplus of S\$432 million (about US\$200 million) in 1984 (Pang and Salome, 1986). Grants have been disbursed for other purposes besides training; in fact training grants accounted for less than half the total disbursements in 1984.

Third, as in the case of any earmarked tax, the proceeds of a payroll tax may be subject to diversion. For example SENAI in Brazil currently receives significantly less than the amount collected in its name.

The payroll levy and the corporate tax base: The payroll tax for training may constitute a means of mobilizing net additional resources for the public sector which would otherwise be inaccessible. However this is likely to be the case only if its imposition for other purposes would be politically infeasible and if there is no other taxation of company income. If the latter condition is not satisfied, it may in fact constitute an erosion of the company sector tax base.

The payroll tax as an instrument for restructuring the labour force: In Singapore the payroll tax was introduced not just to promote training but as part of a more general effort to restructure the economy. Under the Skill Development Levy Act of 1979, a levy of 4%, for the first year at half rate, was imposed on the payroll of workers earning S\$750 or less per month, the intention being to induce a restructuring of the economy in the direction of skill-intensive and highly-mechanized activities. The proceeds were intended to be used to upgrade or retrain the affected low-paid workers. In practice much of the revenue has been unspent, and as a consequence the levy was reduced to 2% in 1985 and to 1% in 1986. Furthermore, most of the training has been directed to the more skilled part of the labour force, contrary to the objective of the intervention.

In addition to not always having the advantages claimed for them, payroll taxes are responsible for potentially serious economic distortions and undesirable redistributive effects. They increase the cost of labour relative to capital, and this may have an adverse effect on unemployment. It tends to be regressive

because it taxes labour earnings, which constitute the bulk of income for the working poor and the middle classes, but leaves untouched unearned income, such as rents, dividends, profits and interest, the very sources of income that characterize the rich (Levin, 1977).

4.4 Other Sources of Finance

Although the payroll is the usual object of a training-related levy, exports, imports and sales have also served as bases. Examples are the 0.03% levy on the value of exports of the clothing industry and the 0.25% levy on the value of construction contracts worth more than HK250,000 in Hong Kong, both established to finance basic training in those industries (AFSDEP, 1981), and the 0.2% levy on the value of imported industrial machinery in Ecuador (Castro, 1979).

Most of the discussion of payroll taxes also applies to these types of levy. The main difference lies in their distortionary effects: since they are not directly related to the payroll, they do not discriminate against the utilization of labour, but against imports, exports, large contracts etc instead. Since they are levied at low rates the distortionary impact is likely to be small, but by the same token so is the scale of the training financed by them.

5.1 General Conclusions

The need for justifying intervention

One conclusion of this review of training finance is that the case for financial intervention, and the analysis of the incidence of interventions, are complex and that this complexity is often not fully appreciated. Indeed sometimes national policymaking appears to have taken place in an analytical vacuum: the thinking behind some intervention schemes seems to have amounted to little more than an assertion that, since the economy could benefit from the training of more skilled workers, the government or industry should intervene to promote increased training provision. The same argument could of course be applied to most factors of production, social services and consumption goods, and is known as maximization without constraint.

There are compelling reasons for making the analytical input to policymaking more rigorous. First, it can reduce the risk of a misallocation of resources. This is a particular hazard when the intervention involves subsidies which alter the effective price of training services faced by either the employer of the trainee. Second, they can reduce the risk of unnecessarily increasing the burden on the public purse: a rigorous analysis of the need for an intervention and of its likely impact may reveal that the intervention may be justified on a smaller scale than first envisaged, or that it may not be justifiable at all; alternatively, the analysis may show that the intervention is justified, but that it could be non-financial in form. In some contexts non-financial interventions may be more effective, as well as more cost-effective. In others, a mixture of financial and non-financial interventions may be more effective than either kind separately. Examples of the non-financial interventions are the exemption of apprentices from minimum wage legislation; campaigns to increase the commitment of firms to training, such as the successful development of apprenticeship training, without the provision of financial incentives, in Jordan by the Jordanian Vocational Training Corporation; and pump-priming operations such as the provision of technical assistance for the establishment of enterprise-based training programmes. Examples of mixed financial and non-financial interventions are provided by the small-business assistance programmes that have become increasingly common in developing countries, where training is but one element of a broader package.

The institutional vehicle

A second general point in evaluating training interventions is that it is necessary to attempt to distinguish between the effectiveness of the scheme and the performance of the institution implementing it. Some institutions created as executing agencies have gone on to take a leadership role in training design, to introduce training standards and certification, and to provide training advisory services to individual firms. For example, the U.K. Industrial Training Boards which survived the 1982 scrutiny can claim credit on these lines and this is probably the reason for their continued existence (see the Appendix). On the other hand, a less proactive institution can add to the dead-weight of an ill-considered intervention. Not surprisingly, there seems to be some evidence that the more mature the institution, the more likely it is to have developed proactive capability, but it is not hard to find examples of passive stagnation.

5.2 Specific Conclusions

The case for initial training support

Apprenticeship: Apprenticeship support, especially for the cost of off-the-job training, is both the most readily justified financial training intervention and one of the cheapest in terms of administrative overheads. A case may be made on equity grounds, one argument being that young people receiving technical or vocational training should be subsidized to the same extent as their peers continuing with general education; on externality grounds, if well-trained workers have a benign effect on the on-the-job skill development of those working with them; on the grounds of market failure (social or legal norms keeping apprentice wages above their economic level and causing firms to make losses on general training, imperfect capital markets preventing trainees from borrowing for subsistence); and on the grounds that incentives may be needed to offset the effect of risk-aversion.

In some countries there may also be an efficiency argument: it is not uncommon to find heavily-subsidized full-time public institutional training competing with apprenticeship training, and the institutional training may well be significantly less cost-effective, being more expensive and having lower rates of training-related job placement. In such circumstances interventions designed to increase the proportion of young people taking the apprenticeship route, by enhancing its attractiveness, could lead to a net saving of public resources as well as to more effective skill development.

It should however be acknowledged that when the supply of training places is relatively inelastic, as it is in many countries, apprenticeship support can at best be expected to be a long-term measure. In the short run the effect of such a scheme may be overwhelmed by cyclical factors. It should also be recognized that such a scheme cannot be expected to counteract the effects of a long-term trend. And this may be just as well. The decline of the manufacturing sector in the U.K. may be attributable to many factors - an exchange rate kept artificially high by placing oil revenues to current account, failures of management, industrial research and development, etc. - but it has certainly not been caused by a shortage of skilled labour. Skilled craftsmen have been just as vulnerable as unskilled labour in the decline, and the reduction in apprenticeship training has served to mitigate, not aggravate, the problem of their unemployment.

Institutional pre-employment training: Subsidization of full-time institutional pre-employment training may be justified on the same equity and externality grounds cited in the case of apprenticeship. However two factors are likely to limit the scale of justifiable subsidization. One is efficiency: there can be no justification for training workers in excess of likely labour market absorption. This remark applies particularly in the context of secondary vocational education, which is typically more expensive than general education and fully subsidized. In some countries the official policy is that such training will eventually be provided on a large scale, despite the fact that only a small fraction of the graduates are likely to be absorbed in training-related jobs. The other constraint on subsidization is the cost of certain types of training. The equity argument cannot be used to justify the subsidization of expensive training which leads to high subsequent earnings. Here the appropriate intervention, if any should be needed, is more likely to be a loans scheme, possibly with some subsidy element.

In the case of the disadvantaged, the arguments for subsidising institutional training may be reinforced by special equity considerations and social considerations of the kind outlined in Section 2.4.

The case for in-service training support

The limited ability of enterprises to recover the cost of transferable in-service training may inhibit its provision and hence constitute a ground for training grants. Regrettably, however, whether grant systems have a significant impact in practice is open to doubt. In-service training appears to be well-established only in those countries where internal labour markets are important or where there are other socio-institutional restraints on inter-firm labour mobility. Experience with interventions providing grants to firms for general training expenses indicates that the impact of such schemes is often minimal in terms of the average number of manhours of training per worker per year. It is of course possible that some have been successfully targeted to key types of worker and have provided significant training for them, but there seems to be no positive evidence on this score. Further, there must be some risk that much of the training credited to such schemes would have taken place anyway. There is also evidence that such schemes can cause undesirable distortions in the type of training provided, employers choosing inefficient modes of training in order to qualify for grants or levy-exemption, and that they can be expensive in terms of administrative costs.

Financing training with a levy

The case for financing training grants by means of a payroll levy (or indeed any other levy) has been examined in Chapter 4 and found to be much more fragile than is commonly supposed. The usual rationale is that non-training firms benefit at the expense of those providing training when they recruit trained workers. However it is more reasonable to suppose that it is the trainee, not the recruiting firm, that makes the windfall gain at the expense of the training firm, and hence the argument for penalizing recruiting firms loses its force. The rationale due to Whalley and Ziderman (1989) is more persuasive, but even according to their analysis a uniform levy of the kind existing in most countries is likely to cause severe inequities among individuals. To remove the inequities it is necessary to vary the rate of the tax according to the type of worker employed, as is done in Malawi.

The negative aspects of levy schemes is that they give rise to avoidable administrative costs, incurred both by the national authority and firms in scope to it, and to a misallocation of resources that almost inevitably results from the imposition of an earmarked tax. Further, the establishment of a levy/grant authority can have a sclerotic effect on training provision, reducing its capacity to respond to changes in training needs. As Grabe (1981) observes, "an effect often overlooked is the bureaucratisation of the training system which has taken place in most countries in which a levy system has been introduced. Some of the national training bodies created with its help have grown into comprehensive organisations, some of them with more administrators than teachers or instructors. While training in the past generally was underadministered and still is in many countries, a levy-guarantee scheme seems to invite moving to the opposite extreme. This bureaucratisation applies not only to the central body and its regional wings but often also to the industrial and other undertakings concerned." Possibly one of the stronger arguments in favour of a levy is that it may in certain countries offer a means of broadening the tax base, but even this must be in doubt if corporate taxation has been effectively established.

5.3 Basic Education: the Most Effective Intervention of All?

Arguably, however, the most effective intervention is an indirect one. All the evidence shows that firms are disproportionately willing to invest in the training of their more skilled or educated workers, whether or not the government provides training incentives. One reason for this may be that large firms both tend to employ a greater proportion of such workers and are more likely to mount systematic training programmes. But another, and probably much more important reason, is that the value-added of training is greater for such workers. Or, to put it another way, that training and education are complementary.

The conclusions of Pang and Salome (1986, p. 121) concerning the diversion of the proceeds of the payroll tax in Singapore from upgrading low-skilled workers are typical: "Analysis of survey findings revealed that across the board, unskilled workers were the least trained, of all the workers in the workforce. Training was often restricted to on-the-job training or short in-house programmes (as in some hotels) which was really to impart the basic skills necessary for the jobs. There were hardly any attempts made (by companies) to upgrade the skills of the unskilled workers. However, this was not entirely due to companies' lack of interest in training the unskilled workers. More correctly, it was due to the lack of basic education among the unskilled workers that makes it almost impossible to send them on skills upgrading courses."

In other words, the most effective financial intervention for training may be to upgrade the basic skills of the work force, in terms of literacy, numeracy, cognitive ability, communication and interpersonal skills, etc. This may take the form of a remedial programme. For example, in Singapore there is the BEST (Basic Education for Skills Training) programme. Pang and Salome consider that "the implementation of the BEST programme by the Government to help the unskilled workers to obtain the basic literacy and numeracy skills, necessary for further training, was vital for their upgrading." But there are problems with remedial programmes. Adult workers, particularly older ones, tend to lack the motivation to participate, and participation is often made difficult by disruption caused by shiftworking.

The alternative, which has the additional merits of cheapness, high coverage and equity, is to improve the quality of basic education. From a political point of view, this alternative may be unpalatable because basic education does not have a lobby and, unlike direct training initiatives, such an intervention is almost invisible. But it is the standard against which all other initiatives should be measured.

Appendix

The U.K. Experience with Levy/Grant

The British experience with levy/grant has probably received more attention in the published literature than that of any other country and illustrates most of the issues relating to such schemes described in Chapter 4. For this reason a brief review is offered in this appendix, despite the limitations on its relevance to a less-developed country context.

Prior to the Industrial Training Act of 1964 there was no legislation governing training in the U.K. The Statute of Artificers of 1563 had been repealed in 1814 (Perry, 1976). The 1964 Act was predicated on the assertion that "a serious weakness in our present arrangements is that the amount and quality of industrial training are left to the unco-ordinated decisions of a large number of individual firms" (Government White Paper *Industrial Training: Government Proposals*, December 1962, quoted by Woodhall, 1974). While there is general agreement that the quality of training left much to be desired, the belief that the volume of training was inadequate was unfounded. As Merrilees (1983) points out, "during the 1950-64 period, the typical excess demand for craftsmen, that is, vacancies minus unemployment, was about 1 or 2% of the stock of craftsmen. For one or two years and in some industries, the fraction was slightly higher. The fact remains that the quantitative shortfall of craftsmen was not a social crisis and per se did not create an overwhelming justification for the 1964 Act."

Be that as it may, the Act was passed with great expectations concerning its impact. Its most important provision was the establishment of sector-specific Training Boards for this purpose with equal numbers of employer and employee representatives and a smaller number of educationalists. Crucially, each Board was given the statutory power to raise payroll levies and make grants to the enterprises deemed to be in scope to it. Within a few years of the passage of the Act an Agricultural Training Board and 27 Industrial Training Boards had been established.

The reign of the Boards as supreme bodies in the training field was brief. In 1974 a national training authority, the Manpower Services Commission (MSC), was created alongside them. In 1982 all but seven Boards were abolished, one being merged with another but the rest being disbanded entirely. The levy/grant system, which was initially implemented with enthusiasm by the Boards, was in retreat even before the MSC was set up. A Government consultative document published in 1972, *Training for the Future* (U.K. Department of Employment, 1972), went so far as to say that it needed "to be phased out at a reasonably early date". Why were the policies which led to the 1964 Act altered so radically and so quickly?

There are several partial explanations. One is that the decentralized system of Industrial Training Boards encountered greater administrative problems than had been anticipated. Another was a desire on the part of the government of the day to move away from a statutory approach to a voluntary one. But the most important reason undoubtedly was the fact that the levy/grant system was established in response to an impulse of the kind described in Section 2.5, rather than any well-considered rationale. The history of the levy/grant system in the U.K. in the late 1960s and early 1970s is a classic example of a society adopting a non-analytical approach to the rectification of a mistake. With the traditional theory of apprenticeship being ignored and the Beckerian formalization being developed too late to offer analytical guidance, learning

by experience has been the only means of ameliorating an unsatisfactory situation, and it has been painful, slow, imperfect and incomplete.

Although the contradictions in the poaching illusion were undetected by those responsible for the 1964 Act, they became obvious to the Training Boards and their members as soon as the time came to implement a levy/grant scheme, and by 1974 Woodhall (1974) could write that "most boards now accept that the view, prevalent in 1964, that training costs should be redistributed in order to prevent "poaching" of trained workers by small firms who provide no training, is oversimplified."

The first setback to the new order was the withdrawal of the Agricultural Training Board from the levy/grant system in 1969, barely three years after its establishment, its resources subsequently coming first from a fund for subsidizing agriculture and later from general government revenue. The inequity of the system was evidently much clearer to the farmers than to the framers of the Act. Not only did they have to pay a training levy, but when their workers received the training it could have adverse effects. An illustrative example is that of a farmer who, when taken to court for refusing to pay, said the scheme was making it impossible for employers to keep their workers on a realistic level of pay. One of his workers was sent off to a college course financed by the levy. When he returned with various qualifications he promptly left to become a laboratory technician where he could earn more money (Perry, 1976).

Most Boards managed to retain the levy/grant power but found ways of mitigating the arbitrary reallocation of resources from non-training to training firms. First, universally if usually reluctantly, small firms were given exemption. A second response was to introduce a system of differentiated levies under which firms were treated differently according to their product mix, their size, or the occupational profile of their labour force. These differentiated systems were evidently designed to bring the levy for each class of firm into line with the grants that were likely to be earned - in other words, to neutralize the redistributive effect of the levy/grant system. A third response in many of the Industrial Boards was a movement towards levy-exemption. They became increasingly prepared to refund a large proportion of the levy due from a firm if the training offered by it met a number of criteria. As time went by a growing proportion of firms managed to qualify and the levy became mainly a means of providing the resources for the training advisory services provided by the Boards and their administrative overheads.

Ironically, the drift towards levy-exemption was taken by the Secretary of State for Employment in 1972 as evidence that the levy/grant schemes had been so successful in promoting training that they had made themselves redundant and that it was time to do away with the "costly, time-consuming and irritant machinery" necessary for implementing them (*Training for the Future*, U.K. Department of Employment, 1972). This view, which was contested by the trades unions (U.K. Trades Union Congress, 1972) and, naturally, the Boards themselves (for example, the Engineering Industrial Training Board: BACIE, 1972, p. 21), does not appear to have been based on empirical evidence. Indeed the consultative document conceded (p. 51) that, with a diminishing number of young people seeking employment for the first time, the number of apprentices had actually fallen since the passage of the Act, from 135,000 in 1965 to 112,000 in 1971. Accordingly it must be suspected that the proposal to phase out the levy/grant schemes was at least partly motivated by a desire to subordinate the Training Boards to the about-to-be-established national training authority by making them financially dependent on it.

The national authority, the Manpower Services Commission, was established in response to the perceived administrative weaknesses of the Boards: their inability to cover the whole workforce while retaining their ability to cater to the specialist needs of particular industries; their inability to facilitate the

intersectoral or geographical reallocation of labour; the difficulty in coordinating training provision for occupations common to more than one sector; and their difficulty in catering to the problems of small firms (*Training for the Future*, pp. 15, 16). Until its recent demise, it drew its funds from central government revenue and the greater part of them were spent on pre-employment training of young people, the Youth Training Service alone accounting for 75% of the budget in 1986/87 (U.K. Manpower Services Commission, 1987).

The Boards coexisted with the MSC for ten years until 1982 when all but seven were abolished after an official review (U.K. Manpower Services Commission, 1981). The official reason for the survival of those that remained was that they were deemed to be of general importance for the economy and could not be replaced by voluntary arrangements. In fact it is probably more accurate to say that they owe their survival to their contribution to an improvement in the quality of training: the introduction of a modular system by the Engineering Industry Training Board, the spread of day-release which became for many boards a condition of grant (Woodhall, 1974), and a rapid increase in the numbers of instructors and training officers employed by enterprises. The remaining boards still operate levy/grant schemes but the net transfer of resources is negligible by comparison with that effected by the MSC. For example, the Engineering Industrial Training Board, one of the largest, had a nominal income of £177 million in 1986/87, but £150 million was rebated to firms in scope and only £12 million was paid in grant. By comparison, the MSC spent £891 million on the Youth Training Scheme in that year.

Curiously, it is an open question as to whether either the rise or the fall of the levy/grant system were influenced significantly by an economic analysis of the incidence of training costs. The Beckerian theory was presented in a relatively informal and accessible format by Lees and Chiplin (1970), and developed formally by Oatey (1970). These contributions sparked further commentary in the professional journals (Johnson, 1971; Pettman, 1972; Hughes, 1973; Woodhall, 1974). But there is little evidence that this literature had any sustained impact on official thinking, at least at the time. For example, *A Framework for the Future* (U.K. Manpower Services Commission, 1981) uncritically restates the view that "the liability to pay a statutory levy may seem a useful way of ensuring that 'poaching' firms make some contribution towards the industry's training costs".

Several studies have examined the issues from the viewpoint of the traditional theory of apprenticeship, coming to the conclusion that apprentice wages were too high for firms to recoup their training costs (Atkinson, 1982; Jones and Hollenstein, 1983; Prais and Steedman, 1986). Perhaps these studies are having an impact, for the traditional theory of apprenticeship has surfaced in two recent White Papers.

Training for Jobs (U.K. Department of Employment, 1984) argues that trainees should recognize that their pay should reflect the value of their training: "That means keeping training costs down, including the acceptance by trainees of levels of income which reflect the value to them of the training given ... Trainees themselves need to accept that the total costs of training must be taken into account in determining the level of their pay or allowances".

In similar vein, *Education and Training for Young People* (U.K. Department of Education and Science, 1985) notes that "in virtually all our competitor countries young people are treated as learners at least until the age of 18. This is reflected in their status (instead of a contract of employment there is often a contract of training), in the nature of their remuneration and in the level of that remuneration".

However, there appears to have been a relapse, since there was no reference to this source of finance in the recent consultative document on funding training in the U.K. (U.K. Manpower Services Commission, 1987). Perhaps this is a consequence of the fact that training has been provided as a measure for improving the transition from school to work, and mitigating the problem of youth unemployment, rather than for developing occupational skills. It will be interesting to see what happens in the coming years as the supply of new entrants to the labour force falls and youth unemployment ceases to be a macro-scale problem.

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