The Eric John Hanson Memorial Lecture Series Volume IV,Fall 1989

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Government and Job Training

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Foreword

The Eric John Hanson Memorial Lecture Series recognizes the many contributions made by Dr. Eric Hanson to the University of Alberta and to the wider community. Eric Hanson taught at the University of Alberta from 1946 to 1975. He was Head of the Department of Political Economy from 1957 to 1964, and was instrumental in building our department. Many of us have benefitted from his dedicated efforts and his wisdom.

The fourth Hanson Lecture, Government and Job Training, was delivered by Dr. Jozef M.M. Ritzen, Professor of Public Economics, Erasmus University, Rotterdam. Having studied applied physics and systems analysis, Dr. Ritzen has some personal appreciation of the place of training and retraining during one's career. With a lengthy list of scholarly publications, he is an acknowledged expert on the economics of education. In conjunction with his active and distinguished academic career, Dr. Ritzen frequently advises governments, international organizations and business. For example, he recently served as a member of The Netherlands' Cabinet Commission on Technology Policy. Today, he is more directly involved in structuring education and training policy. On the evening following the presentation of this lecture, Dr. Ritzen was called back to The Netherlands to assume responsibilities as the newly-appointed Minister of Education and Science. We were fortunate to benefit from his visit and wish him success in his new position.

The Memorial Lecture Series has been financed by matched endowment contributions from Eric Hanson's friends, colleagues and students, and by a most generous gift from the Alberta Municipal Financing Corporation, arranged by its President, Mr. Chip Collins.

Melville L. McMillan
Department of Economics

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   by John W. Crow
   Governor, Bank of Canada

3. The Political Economy of Economic Advice
   by Cliff Walsh
   The Australian National University

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1. Introduction

I am honoured to have the opportunity of giving the fourth annual Eric J. Hanson Memorial Lecture and I am grateful to the Department of Economics of the University of Alberta for inviting me to present this lecture. In this lecture, I argue for a more extensive public role in the training of adult employed workers in Western industrialized countries. I also present proposals for such a role. There will be a surprise for you in these proposals. Rather than calling for more Government money, I'll restrict myself to the role of Government in creating institutions and in organizing training. The thrust of my argument is the failure of markets to provide the training which is socially desirable. My thesis is that, without substantial Government intervention in training, the rate of economic growth will suffer. It would suffer under any socio-economic circumstances. Today, there are, however, two factors in our socio-economic environment which should heighten our interest in the problem of market failure for training. First, there is the present high rate of change in the technologies embodied in the products which are offered on world markets and in production processes. This

enhances the negative effect of the undersupply of training on economic growth. Higher levels of training would provide a more fertile environment for technological change. The second factor is the aging of the population. Almost all industrialized countries have experienced a decrease in their birth rates in the sixties after a baby boom in the late forties and fifties. As a result, the average age of workers is increasing and will continue to do so in the next two decades. There is a good chance that, without increase training efforts, this will cause the rate of productivity increase to slow down, as older workers are likely to be less productive than younger workers.

Three major and different target groups of training can be distinguished. The first group is made up by unemployed youngsters, and more specifically unemployed youngsters from a minority background. The second category is formed by dislocated or displaced workers, who have substantial work experience but whose jobs disappeared as a result of the technological change and the change in the composition of output caused by changes in consumer demand and investment. Also workers who are still in jobs, but whose jobs are expected to disappear within the foreseeable future belong to this group. The third group is the adult worker within a job which may be considered to be reasonably secure.

The need for a public role in training for unemployed youngsters and for dislocated workers is widely recognized. This lecture will not dwell on these two categories. Rather we focus on the Government role with respect to the job training of employed adult workers. In Canada, the United States and Western Europe, the current dominant political view is that markets are, by the large, the proper vehicle for the supply and demand of training of adult employed workers. The public role in the training of this group of workers is limited. Canada has the Critical

Skills Training Programs, the Canadian Manpower Training Program, and the National Training Act of 1982. The percentage of workers which participates in training under these programs is, however, very small.

According to the market view, job training is either the result of a choice by the worker on his or her own, or by the worker and his or her employer. The worker may choose a certain level and amount of training and pay the price of this training by means of a decrease in wages and/or a direct price. Or employees and employers negotiate the terms of gainful training and end up with agreements which are satisfactory to both parties. Job training can be part of those agreements as long as both parties see this as being to their mutual advantage. The financial returns to training for the firm or the worker are, in this view, the incentive for training.

So what is wrong with the market view? Why not leave the job training of adult, employed workers to the private decisions of firms and individual workers? The first part of the answer is that there are empirical indications that the market for training does not work as it should. The little evidence we have shows that rates of return to the training of adult, employed workers far exceed rates of return to other investments. Once would expect more investment in this training if the gains relative to the costs are so large. So we suspect that there are barriers in the supply of training which lead to under-investment. Under-investment is most notable for workers with the following characteristics:

- older;

- a lower level of education;

- working in a small firm.

The second part of the answer is that there are also theoretical reasons which make it highly unlikely that training of adult, employed workers would be provided efficiently by means of markets. Two main reasons are uncertainty and liquidity constraints. The financial returns to training are not certain, but risky at the time the worker has to decide whether or not to invest in training. For risk averse workers, this causes under-investment in training. A second reason why the training market could fail is liquidity constraints. Workers may not possess the means to finance additional training out of current income and could be unable to borrow from financial institutions. Other arguments for the failure of markets to provide training are:

- minimum wage legislation which effectively excludes contracts in which minimum wage workers pay for their training through reduced wages;

- the existence of subsidized training for the unemployed which makes it attractive for workers to defer training until they are unemployed;

- complementarity between general and specific training; substantial turnover of labor reduces the payoff to general as well as specific training;

- the transaction costs involved in signalling to other employers the outcome of general training;

- labor contracts which do not contain incentives for training;

- unemployment insurance and transfers to the unemployed which facilitate the substitution of older by younger workers.

Training can be provided in different

forms. It can be made available as on-the-job training within the firm or as formal training outside the firm. However, formal education is often less efficient than training provided by firms. Workers learn more readily through a combination of prac-experience and theoretical instruction. Firms often have the most recent equipment, have the experience in their use in production and can provide mentors for gaining practical experience. Also workers are often more motivated for job-based learning rather than learning in a school setting. Lastly, job-based training is generally better connected to the knowledge requirements of jobs. The Canadian Skills Training Program and the National Training Act provide such job-based training. Formal education definitely can play a role in providing the theoretical instruction associated with training, and sometimes the training can be so general that the formal education system can better provide it as happens in Canada under the Canada Manpower Training Program.

We elaborate on the following proposals for public policies which aim at improving the efficiency of the training market:

- improved information on training courses;
- training wages;
- inverse insurance in which workers receive subsidies for training costs and pay a certain percentage of the returns;
- guaranteed wage increases for workers who have completed training (as an alternative to inverse insurance).

In the following, I first present the case for an increase in the training effort in Western industrialized countries. This case is made on the basis of technological

change and the aging of the working population. Second, I will define general and specific training and discuss the market view on the supply and demand of these kinds of training. Third, different sources of market failure in training are explored. The effect of risk and of liquidity constraints on an individual worker's choice of training is highlighted. Fourth, I present the main features of participation in training in Western industrialized countries, and these features present circumstantial evidence for the thesis of market failure in the training market. Fifth, I present proposals for a more extensive public role in training which do not require a greater financial commitment from Government. This is the kind of proposal every Government should like to get, particularly when its budget deficit is high.

2. Technology and Demographic Development

Technological development is a driving force behind training. International competition requires firms to keep up with the Joneses in technology. Newer products and products made with new production processes form an increasing share of the product market. In many cases it is technology which allows the introduction of new products or production processes. The result is that the span of the life cycle of products and of production processes will continue to decrease. Workers, if they remain within the same firm, will experience during their life-time many different products and production processes. Once a new product or production process is introduced in a firm, the human capital of the workers depreciates as some becomes obsolete. Only training can ensure that the human capital stock is kept intact. Training is like rowing against the current. Once you stop you're dragged downstream.

The decrease in the average span of the life cycle of products is widely recognized.

When products or production technologies change it should lead firms to engage on more training as well as refreshing their stock of human capital by means of lay-offs of older workers and recruitment of younger workers.

In the next decades, young well-trained workers will become a scarce commodity. It will become more and more difficult to retain the human capital level necessary for a successful technological competition by means of lay-offs of depreciated human capital and recruitment of fresh human capital, unless substantial selective immigration would be applied. The issue of constantly training the adult, working population will have to be faced.

3. General and Specific Training

The economist Gary Becker (1964) first made the distinction between general and specific training. It is based on the answer to the question whether the training can be used only in one firm or whether the training would also increase the productivity of the worker in other places. Specific is the training which the worker cannot use gainfully at other places. All the training which can be used in more than one specific firm or institution is in principle general. That would make specific training, as delineated by Becker, a virtually empty box.

But Becker seems not to have realized that in practice the category of specific training includes also all those types of training for which the benefits of moving to another firm are not sufficient to offset the costs of a move. Let us use the term transaction costs for the costs involved in the move. These costs are borne by the individual worker. They may, for example, be the costs of selling and buying a house, the largely unmeasurable costs of adjusting to a new neighborhood, new schools and new friends. Beyond these are the costs of a

potential job change of a partner.

The benefits of the move are the extra earnings to be gained from the training over the foreseeable future. The benefits depend very much on the time that the training remains useful, in other words on the depreciation and obsolescence rate of the training over time. Hence, we may consider training to be specific if the difference between the value of that training in other firms and the value in the firm of training is less than the transaction costs of moving.

Transaction costs also exist in the asymmetry in information about the training workers have received between the firm which provided the training and a recruiting firm (Katz and Ziderman, 1988). Unlike formal education, on-the-job training is essentially heterogeneous and difficult to measure. It is often tailor-made for individual workers and does not readily lead to certification on completion. It takes time before the recruiting firm has assessed the value of the training in terms of the worker's marginal product. During that assessment period, in the view of the firm, the worker will have to forego the benefits from the training received elsewhere. These foregone benefits can also be considered transaction costs.

By introducing transaction costs in the definition of specific training, we have made the specificity of the training dependent on circumstances other than the nature of the training alone. The training of welders of stainless steel in Edmonton may be more specific than the same training in the Toronto area, simply for the reason that the transaction costs required to use that training elsewhere are higher for workers in Edmonton, with relatively few industries which use stainless steel welding when compared to the Toronto area.

Specific training will be provided by

firms. Employers and employees will share the costs and the benefits of the training (Hashimoto and Yu, 1980). The firm is able to appropriate the returns to specific training since the training only yields returns to a worker if he or she remains in the firm of training. This is not the case with general training; workers can appropriate the returns to training by moving to another firm. It does not make any economic sense for the firm to provide such training. Instead, the worker has an incentive to invest in general training.

There is a large area of training which is general. Virtually all training in vocations and occupations is general rather than specific since it can be used in more than one firm. The formal education system also can supply and does supply many of these courses, particularly for youngsters. It is important to realize that general training and certain parts of the vocational education system are close substitutes.

Within general and specific training, we distinguish between formal and informal training. Much of the training is informal in the sense that it is fully intertwined with the worker's daily work activities. The worker does not take time off for this training. In contrast, formal training activities require full time attention during the training periods and prohibit the use of that time for work activities. They reduce the worker's productivity during the training time substantially and require, in addition, the outlay of costs for the formal training program.

It should be clear at the outset that we consider the quantity and the quality of the supply and demand of on-the-job training as a matter of choice by firms and workers. It is not something which simply happens by some mysterious virtue or another, but it is discretionary.

4. A Failing Market

Let us now consider in somewhat more detail the theoretical reasons why we expect that markets are not going to supply us with the amount of training which is socially optimal. First, we consider the financial risks involved. Then we turn to the role of liquidity constraints in the supply of training. Subsequently, a number of other potential reasons for training market failure are discussed.

Risk

Training is a risky investment. The benefits to individual from general training are rather unclear in advance. A welder who would like to know the benefits from a course in stainless steel welding or a machine operator who wants to know the benefits of a course on the operation of computer controlled machines will only have a vague idea of the benefits. The available information gives the probability distribution of the returns. The returns to the training could be high, but they might also be low.

A risk to training does not imply that no training at all will be chosen, but, for cautious people who do not like to gamble, the amount of training chosen would usually be less than in the case where returns are certain. This holds even if the expected value of the risky return is the same as the certain return (see: Kodde, 1986, Levhari and Weiss, 1974 and Eaton and Rosen, 1980). Cautious people want to include a premium for the risk they bear when engaging in risky training, or they would like to insure themselves against "the vagaries of wage rates." However, insurance companies do not get involved in the insurance of human capital for the following reasons. If persons were insured to receive a certain wage they would have no incentive to work

long, hard hours. This is often called "moral hazard". In addition, it is likely that only those persons with low abilities would be attracted to "training" insurance. This "adverse selection" would make it difficult to provide such insurance.

It is a well-established fact that markets are not efficient if there is risk for which no insurance can be bought, and if people are risk averse (Arrow and Lind, 1970). There is then a possibility that the market's performance can be improved through public intervention.

To be sure, investments by firms in specific training are also risky, but firms have more possibilities to pool risks than individual workers have. One might say that for the firm the risk in the return to specific training of one worker may compensate that of the next worker. Also, firms need not be as cautious as individuals, as they may be owned by stockholders who have stocks in different firms in such a way that their risks are pooled. In other words, the riskiness of investments in specific training does not seem to justify public intervention. In contrast, individual workers have fewer means to pool the risk in the returns to general training, and therefore a public role should be considered there.

Liquidity constraints

There is also the matter of the availability of loans for general training. The costs of training may be too high to be financed by the worker out of savings or out of current income. At the same time there will be few facilities which lend for investments in training, since such a loan does not provide the lender with security or collateral which can be sold in case of a loan default. This argument is less convincing for white collar workers as training is often relatively inexpensive for them.

Liquidity constraints might be relevant, however, for blue collar workers.

Minimum wage legislation

For the group of young, blue collar workers, institutional constraints, like minimum wage legislation could also be an effective barrier to training because employers cannot recover the costs of training through reduced wages for minimum wage workers.

Subsidized training of the unemployed

The existence of subsidized general training for the unemployed could be a disincentive for employed workers to participate in training while employed. It is only rational not to follow and pay for general training while employed, however, if the benefit of the subsidy outweighs the income foregone due to the deferment of the training decision plus the income lost as a result of unemployment.

Complementarity between general and specific training

It is a likely proposition that general and specific training are complementary. For example, to acquire the specific knowledge of the foundry of axle-casks for trucks, one needs a basic understanding of foundry in general. Inherent in complementarity is that general training only pays off if it is combined with specific training, and that specific training cannot be profitable unless it is done jointly with general training. Complementarity then means that employers will not invest in specific training unless workers have sufficient general training. The mirror image is that workers will not invest in general training unless they know that specific training will follow.

Complementarity in a world without turnover would imply a possibility for a contract between workers and employers such that employers pay part of the costs of the general training. This would be rational, because the general training provides a positive spill-over for specific training. But when turnover is high, complementarity might lead to under-investment in general training. Workers observe, on the one hand, that general training only pays off if combined with specific training. On the other hand, firms are reluctant to provide specific training because of high turnover. Employers might want to hedge against the risk of early departures of workers from the firm by means of contracts in which workers only receive specific training if they stay with the firm for a specified period. However, such agreements, even if made, are not enforceable. As a result such contracts provide little support for employers.

Limited information

Employers generally lack information on the productivity gains which are made possible by much of the general training which has been completed in other firms. This information asymmetry renders general into specific training. A social loss is incurred because of the transaction costs which are required to signal the importance of the general training to other employers exceeds the cost of determining the value of that training within the supplying firm.

Contracts

In explicit labor contracts, wages tend to rise with experience within the firm whatever the productivity development of the worker. With the current high rate of technological change, productivity is likely to decrease at a relatively early age if workers rely solely on human capital acquired in their youth in the education system. But

the labor contract does not reward general training of the worker. Contracts do not contain (enough) incentives for general training.

Unemployment transfers

Earlier we noted that firms may have secured an adequate supply of human capital through the substitution of younger well-educated labor for older workers with obsolete human capital. It is the existence of unemployment insurance or, more generally, of transfers for the unemployed which has facilitated this substitution. This process is socially inefficient unless the costs of training of older workers are exceedingly high.

The process will also reduce the supply of and demand for general training. The time period over which individual older workers have to write-off general training becomes shorter than it would be if lay-offs of older workers would not take place. In addition, there is the complementary effect that general training becomes less attractive to older workers when they know that little specific training will be supplied.

These theoretical cases for training market failure help to explain the empirical findings. Let us now turn to that empirical evidence.

5. Circumstantial Evidence on Market Failure

Reliable estimates on the overall annual dollar volume of training of adult employed workers are, to the best of my knowledge, not available in any of the Western industrialized countries. Usually the data are restricted to formal training, and even these estimates tend to suffer from selective non-response in surveys. For the U. S., formal corporate training (including foregone earnings) amounted to between 30 and 35

billion dollars in 1987 (Training Magazine, May 1988 and Bartel, 1988). At a wage bill of approximately 2.5 trillion dollars this makes corporate training a marginal activity in firms. Data for Canada for 1985, West Germany and the Netherlands give the same impression.

The cost of on-the-job training is even more difficult to measure. Estimates of the dollar value of informal on-the-job training crucially depends on the output loss during the time periods of informal training and on the costs of the mentors who train co-workers. Since measures of these two variables are often not available, assumptions have to be made. Estimates for the U. S. have been made with the assumptions of zero productivity of workers during the training period combined with zero costs of mentors (Mincer, 1988b, p. 11 and Carnevale, 1987). These estimates show a remarkably high dollar volume of training; 180 billion in 1987. The total cost of formal and informal training would then come close to that on all formal education.[1] In the following, we shall assume that the U. S. is the rule rather than the exception within Western industrialized countries with respect to the relative size of expenditures on training.

From the existing data it is not possible to distinguish what part of the informal and formal corporate training is general and what part is specific. To be sure, there is ample empirical evidence from the U. S. that in many cases firms do pay fully for general training, even though we earlier stated that this would not be sensible. Bishop (1988) finds from detailed data on the content of training by firms for a small sample of workers in the U. S. that, in fact, most of the training is general.[2] The explanation for the free provision of general training by firms is the transaction costs involved in the general training as was mentioned before.

The dollar value of training may be huge in Western industrialized countries. Yet, we conclude that there is too little investment in training. This conclusion is deduced from the following characteristics of training:

- Training remains, on the average, for the individual worker a much better investment than a savings account. This is at least what one surmises from U. S. studies. According to these studies average interest rates to be earned on investments in training in 1982 were, depending on the assumed depreciation rate, between 18 and 26% (Mincer, 1988a, p. 10). One might object to these findings on the grounds that the data used to compute rates of return are exceedingly weak. However, they are still the best available. The least one can say is that they do not contradict the possible existence of market failure in training.

- Training is highly concentrated in the early years of work. This is a general finding in Western industrialized countries. For example, in the U. S. in 1976, 41% of the training was concentrated on workers in the ages under 25 and 72% in the age group of 35 years or less (Duncan and Stafford, 1980). These age groups constituted 22% and 48% of the labor force respectively. The results of the 1985 survey on Adult Education in Canada are similar for formal training and job related adult education, although in Canada the difference in participation between young and old workers is less striking that in the U. S.

The concentration of training on the young does not make sense if the depreciation time of training is relatively short, as it is most often estimated to be. Lillard and

Tan (1986) estimate the annual depreciation rate of informal training to be 15 and 20%. This could mean that training has to be renewed every 5 to 8 years, until retirement is near. If not, a potential source of profitable investment is left untapped.

We do not know whether the finding of the concentration of training on young workers only holds for specific or only for general training, or for both. The few data we have (Bishop, 1988) suggest that it applied to both general and specific training. We then can search for the reasons that older workers are less likely to participate in training. Concentration of general training on the young is not commensurate with the liquidity constraints or minimum wage legislation explanations of market failure. There is also no reason to assume that subsidized training for the unemployed or complementarity between general and specific training or information asymmetry would lead to a concentration of general training on the young. This leaves the "risk", "contracts" and "unemployment transfers" explanations. With respect to risk, our observation can only be explained if the risk involved in the gains of training increases with age. Contracts and unemployment transfers are a more likely explanation. With respect to contracts; generally older workers have few incentives in labor contracts to engage in training. The existence of transfers for the unemployed helps to force older workers out of firms. The expected duration for which a certain training will have a payoff, declines as a result.

Some would explain the finding that most training is supplied to young workers with reference to the efficiency of learning. In their view, it would be inefficient to train older workers because they are slower learners. Bad news for many in this audience. This explanation is, however, not founded on solid grounds. The learning

ability of adults may decrease with age for abstract knowledge, but research to date suggests that the ability to learn experience-based knowledge does not decrease until relative high ages (60-70).

In general, one notes that training is mostly focused on newly hired workers. It obviously not only serves as an investment, but also helps to screen newly hired workers.

- Training is highly concentrated among the higher educated. In the U. S., for example, those with 8 or fewer years of education received in 1976 about 5% of the training effort (Duncan and Stafford, 1980), while they formed 11% of the labor force. Almost 50% of the training went to workers with some years of college or more education, while this group formed only one-third of the labor force. The concentration of training on higher educated workers is in part the result of the concentration of training in the early years of work experience in the firm. A substantial other part is solely due to the level of education. This is also an indication of over or/and under-investment, particularly since the evidence is that the rates of return to training do not differ between workers with different levels of education (Mincer, 1988b, p. 25). An important implication of this characteristic is that the distribution of wage income is less equal than necessary.

Once again we search in our list of explanations, assuming that this finding applies also to general training if it were measured. Now liquidity constraints, minimum wage legislation, subsidized training of the unemployed, complementarity between general and specific training are all possible candidates. Liquidity constraints are less likely for higher educated workers. Minimum wage legislation could effectively bar general training for minimum wage workers. Subsidized training for the

unemployed is generally directed to less educated labor and will, as a result, only reduce general training for that group. The complementarity explanation is also relevant. Better educated labor has a superior foundation for specific training and may expect increased general training to result in even more specific training; a spiral effect.

Even uncertainty could be an explanation if the risk involved in training is higher for lower educated workers than for higher educated workers. Information asymmetry is less likely. There is no reason to assume that this asymmetry is stronger for lower educated than for higher educated workers.

- Training is more prevalent in large than in small firms (Bartel, 1988, p. 6). As a result, there is more under-investment in worker training in small than in larger firms. This finding is not surprising if one notes that the internal labor market of larger firms makes for more training being specific. Another explanation for this finding is that larger firms have more possibilities to pool the risks of investments in specific training. Complementarity might provide more general training.

An institutional aspect plays a role as well. Small firms often do not have the capacity to set up formal training and are unable to pool resources with other small firms in such a set-up. They are unable to tap the economies of scale involved in a training program.

- There are indications that the volume of informal training has declined in the past decade (Mincer, 1988a). This is not in line with the expectation that technological innovation is firms would give rise to an increase in the need for (re)training.

These empirical characteristics of the training effort lead us to the conclusion

that there is under-investment in training. The different theoretical reasons provide a good explanation for this under-investment.

The failure of one person to lift two hundred pounds does not automatically imply that the next person will lift that weight. The conclusion that the market fails to produce general training efficiently does not imply that therefore the public sector will do better. The merits of public intervention have to be established in their own right.

6. The Public Role

The public role in training should depart from the reasons why the training market fails; the riskiness for individual workers of investments in training, liquidity constraints, minimum wage legislation, subsidized training of the unemployed, complementarity, asymmetric information and contracts.

There are different means of intervention which address different causes of market failure. For example, the information asymmetry could be countered in part by making existing information widely available. Another example is that the effects of minimum wage legislation on training can be countered by training wages for young workers with little education, or by subsidies for the training facilities of such workers. As a third example, one can address the effects of risk, liquidity constraints, complementarity and contracts in a combined scheme. These are the three forms of public intervention to be discussed here. Two alternatives for the combined scheme are discussed, i.e. "inverse insurance" and "guaranteed wage increases with training." Elsewhere (Ritzen, 1989), I have elaborated in mathematical terms the potential for public intervention to avoid part of the under-investment in training by means of these schemes. It can be shown that such

schemes improve the positions of workers who participate in training without making anyone worse off.

Information

The information function would entail that the information on the content and value of training is more easily accessible and digestible than it is at present. It should ensure that employers can evaluate the general training (even courses from the regular education system) which workers may have completed before entering the firm. One means to organize the information on training and education is to have some kind of accreditation. Training courses with similar objectives and similar content can be accredited if they satisfy certain conditions.

Information on the content and value of general training for employers also reduces the uncertainty on the part of employees. They have now more reason to assume that potential new employers have an understanding of the training they have received. This improved understanding by firms and workers will lead to a better negotiated, and likely higher, wages.

Training wages

Battles have been fought in different western industrialized countries over training wages. Trade unions have often objected to such wages because they view training wages as a reduction of salary. The assumption is that employers reduce wages for minimum wage workers without providing general training. The solution for this quandary is very simple as the experience in Germany and the Netherlands shows. In these countries, training wages are only allowed if the training which is provided in the firm is approved by representatives of the trade union (as is the case in Germany) or by

Government (the Dutch system). Government might also subsidize the training, if it considers the training wage too low for a living, or subsidize training costs, as is the case in the Netherlands. Such a subsidy has a similar effect as a wage subsidy; it reduces the costs the workers have to pay out of their current income and, as a result, increases their net income.

Inverse insurance

Liquidity constraints could be countered by means of a public policy which ensures the availability of loans. A more effective scheme is inverse insurance which looks very much like a student loan scheme in which the pay-back of the loan depends on future earnings (for a recent proposal, see Reischauer, 1989). This is effective because it does not only address liquidity constraints but also risk. The mechanism of inverse insurance is depicted in Diagram 1. According to this scheme, every participant in training of a certain kind receives the same subsidy. Everybody who has completed that training also pays the same tax rate. But, since the gains from training may differ between persons, the amount of the tax paid differs among individuals. One can show theoretically that such a scheme can engender a Pareto improvement because the risk of the uncertain return is partially neutralized.

Note that the Government does not have to finance this scheme. It can work, like a revolving training fund. The subsidies for training are balanced against the taxes received. Note also that the subsidy does not have to be the full amount of the investments in the training.

In principle, the scheme could be implemented by the Federal or a Provincial or a local Government, but it could also be introduced by trade unions and organizations of employers within negotiated contracts, for

example, on the scale of a sector of industry within a province or for the whole nation. Instead of a tax we should then talk about a premium. In a contract, the scheme could become less individualized. For example, workers might be given paid educational leave for certain training courses and receive extra wages for training completed, the extra wages being the gross average gains from training minus the costs.

There are several "buts". First, the scheme only works if it applies to all. In other words, if it is compulsory. This condition is fulfilled in case the scheme is part of a negotiated contact between trade unions and employers, as described above. If it were not compulsory the problem of adverse selection might arise; i.e. only those workers with low expected future returns to training might sign up for the inverse insurance knowing that they would gain from the difference between the subsidy and the tax. To balance the fund, the tax rate would have to be increased. Workers with high expected returns would no longer sign up for the scheme as they would be sure to lose. The scheme only works if for all workers the subsidy from the scheme is equal to the expected tax to be paid.

This implies that separate funds should exist for different types of job training and for different workers. The workers involved in any one scheme should be as homogeneous as possible. Complete homogeneity, however, is an illusion. There will always be some deviation from this ideal if there is to be more than one person involved. If the heterogeneity within groups which receive the same subsidy and pay the same tax rate remains within bounds, the scheme could still be beneficial.

Income contingent student loan schemes for participation in college education have often been rejected because of adverse

selection (Reischauer, 1989). For college education, compulsion to take out loans and to pay taxes on the extra income derived from the completion of a college education is socially not easily accepted. But this could be different for general training, as so little of such training is in existence at the moment.

A second "but" concerns what is often termed moral hazard. Once workers have engaged in subsidized training they may decide not to work as hard or as many hours as they otherwise would have done because of the tax. On the other hand, other workers may decide to work harder for the same reason. As long as the dis-incentive effects of the tax on hours of work and work effort is not too large, the scheme will still be welfare improving.

Associated with moral hazard is the difficulty of distinguishing between extra wages which are due to the training and those which are due to other sources. All these problems become less prominent if the scheme is "depersonalized" and introduced in negotiated contracts as paid educational leave.

The scheme is also susceptible to fraudulent behavior. Workers could convince employers to exchange wages for fringe benefits and escape the tax in this manner.

Finally, one has to recognize that the scheme only provides insurance for socially diversifiable risks, and not for risks associated with major structural changes in the economy, like sudden changes in oil prices (Arrow and Lind, 1970 and Hirschleifer and Riley 1979). Such shocks call for separate public funds for dislocated workers.

Guaranteed wage

As an alternative to the inverse

insurance scheme, the guaranteed extra wage scheme is depicted in Diagram 2. There is no subsidy involved in the costs of the training, but the training is certain to generate at least a predetermined wage raise. This scheme addresses risk as a source of market failure in training.

There is now a subsidy for those workers who end up, after the training is completed, with less than the minimum wage raise. They receive from a fund a supplement on their wage such that the minimum wage raise is achieved.

The sources for the fund are the taxes paid by workers who earn more after the completion of the training than the original wage plus the predetermined wage raise. These workers pay into a fund a tax out of the difference between their earnings and the minimum. It is, as with the "inverse insurance" scheme, a revolving fund in which the taxes finance the subsidies. The public intervention is mostly of an organizational nature.

Adverse selection and moral hazard are also problems for this scheme. Adverse selection problems are avoided if the scheme is made compulsory, and every worker who has completed a certain general training pays a tax on the income above the minimum.

The difficulty of measuring the gains from training are similar to those for the inverse insurance scheme. Similar fraudulent behavior is also possible and, in addition, employers could be enticed to substitute for part of the wage increase (that they normally would pay for workers who have completed training), the subsidy from the fund by awarding a wage under the minimum.

A variation of this scheme, which solves many of the problems, is a labor contract in which training is rewarded with an ex-ante

determined wage increase.

As mentioned, inverse insurance and guaranteed wage increases are alternative schemes, not to be introduced jointly. The choice for one above the other must be made on practical grounds; which one is less costly to administer. In any case, inverse insurance is to be favoured slightly, because it also deals with liquidity constraints.

With these four proposals I have addressed several of the potential sources of market failure; risk, liquidity constraints, asymmetric information and labor contracts. The proposals are meant more to stimulate reflection on the training of adult employed workers, rather than as the final plan. I speak in a well-respected academic tradition if I add that more research is needed.

Two popular proposals are not on my list. These two are vouchers for trainees or other direct or tax subsidies for trainees and tax deductions for firms which provide training. Such proposals should be rooted in the reasons for market failure and, in view of the distortions of taxes, should require no more Government money than necessary. I find it hard to support the spending of Government money for training from the preceding analysis of market failure. From that point of view a more appropriate title of this lecture would have been: same money; more training.

7. Conclusion

Western industrialized countries are passing through a state of transition. The rate of technological change is high. The labor force will soon start to age substantially. These factors force us to utilize the training of adult, employed workers. Markets are not going to provide us with the required amounts of training. Too many reasons can be put forward which indicate

that markets fail to provide the training that is needed. The empirical evidence we have underscores this.

Public intervention can and should be of different types. Several suggestions have been forwarded to stimulate your thinking of this issue. Public intervention need not always be the collective action of the federal, provincial or local Government. It could also be action by trade unions and organizations of employers.

Footnotes

1. Jacob Mincer presents estimates of the volume of informal training based on two different surveys, i.e. the 1976 University of Michigan's Panel Survey on Income Dynamics (PSID) and the 1982 Current Population Survey (CPS). The PSID contains information for the years 1976 on 1,200 male heads of households concerning the length of time of training required during the current job, as well as its learning contents. A supplementary survey collected information on the hours per week of training (Duncan and Stafford, 1980). The information on the length of training required is the answer of the individual worker surveyed to the question: "On a job like yours, how long would it take the average person to become fully qualified?". The Current Population Survey contains the incidence of training in its March 1983 survey. Here training is measured from the answers of individual workers to the question: "What training was needed to get the current or last job and what training is needed to improve skills on the current job?". The estimates of Mincer are very rough, but agree well with a guesstimate of Anthony P. Carnevale of the American Society for Training and Development. This guesstimate is based on data of the Bureau of Labor Statistics concerning how workers get their training. These data tell us the ratio between formal and informal training. This ratio together with an estimate based on the Current Population Survey of 1983 on formal training (unpublished) yields the volume of informal training.

2. Bishop has data on a subset of almost 1500 employers who provided information on the training of the last person hired after July 1980 and before August 1981.

59% responded that almost all of the skills for which newcomers were trained were useful outside the company, 13% responded "most" and only 7.5% answered "almost none".

3. One of the most far reaching forms of accreditation is to admit only those courses for which final exams or other final tests are being held state wide or even nation wide. Less far reaching forms of the information function involve the registration of courses and the collection of these registrations in regular publications. This could again be done on a nation wide basis, but also on a state wide scale. It is not always necessary to have a financial involvement in this information function from Government. It might be sufficient for Government to provide a stimulus. The information function could be also performed by private parties if they see means to appropriate the returns to the collection of information. For the Netherlands such a guide book for job training exists (Guidebook Adult Education, in Dutch; published by VUGA publishing company since 1981).

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Training Magazine, May 1988

Lecture Outline

Sources of Market Failure in Training

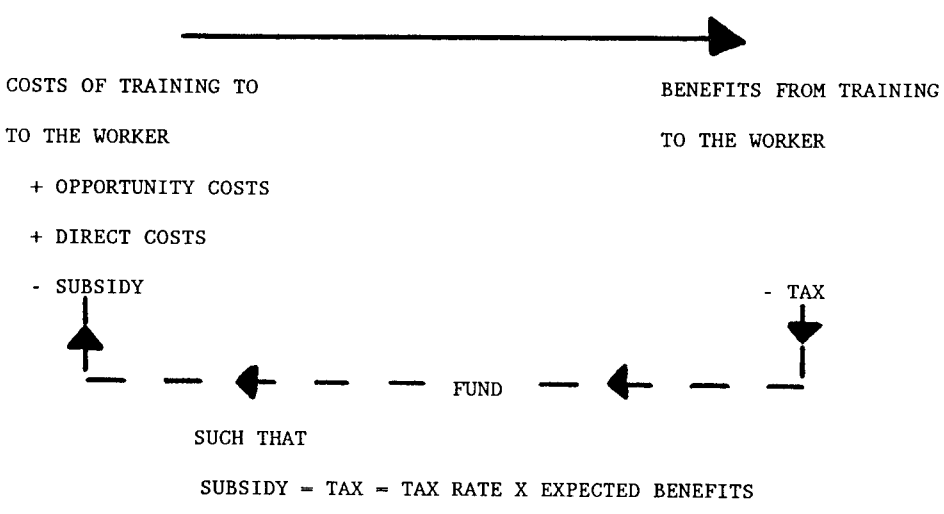
- Uncertainty on the returns to training;
- Liquidity constraints;
- Minimum wage legislation which effectively excludes contracts in which minimum wage workers pay for their training through reduced wages;
- The existence of subsidized training for the unemployed which makes it attractive for workers to defer training until they are unemployed;
- Complementarity between general and specific training; substantial turnover of labor reduces the payoff to general as well as specific training;
- The transaction costs involved in signalling to other employers the outcome of general training;
- Labor contracts which do not contain incentives for training;
- Unemployment insurance and transfers to the unemployed which facilitates the substitution of older by younger workers.

Proposals to Redress Market Failure in Training

- Improved information on training courses;
- Training wages;
- Inverse insurance in which workers receive subsidies for training costs and pay a certain percentage of the returns;
- Guaranteed wage increases for workers who have completed training (as an alternative to inverse insurance).

DIAGRAM I

INVERSE INSURANCE

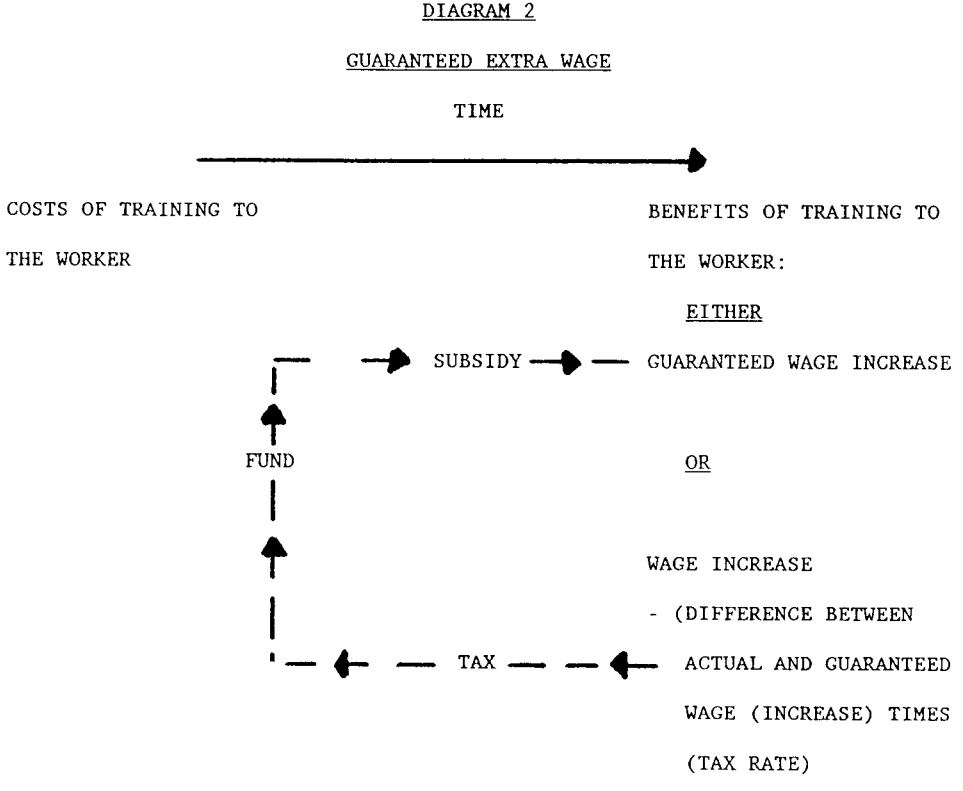


SUCH THAT

SUBSIDY = TAX = TAX RATE X EXPECTED BENEFITS

DIAGRAM 2

GUARANTEED EXTRA WAGE



SUBSIDY = TAX = TAX RATE TIMES DIFFERENCE BETWEEN ACTUAL AND GUARANTEED WAGE