

**UNDERINVESTMENT IN EMPLOYER TRAINING:  
IS A MANDATE TO SPEND ON TRAINING THE ANSWER?**

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American employers and their workers underinvest in employer training. Underinvestment occurs because training generates externalities, because the tax system is biased against training investments, and because most workers are unable to finance general training because they lack access to loans to finance consumption during periods of heavy investment in training. School based occupational training ameliorates the underinvestment problem somewhat but it is not a complete answer to the problem. The French approach of requiring firms to spend at least 1.4 percent of their wage bill on continuing training of employees (if they are to avoid paying a tax) holds a good deal of promise but suffers from some critical flaws. These flaws are not basic to the tax offset design, however, so the paper concludes with a description of how a mandate to spend for the United States should be designed.

1. REAL EXTERNALITIES

The primary justification for public subsidy of education and training is the fact that the individual who gets the education and training receives only part of its benefits. When deciding on the type and amount of education and training to undertake and how hard to study while at school, most individuals are taking only private benefits--the higher after-tax income and the prestige and consumption benefits of having an education--into account. These private benefits account for only part of the total benefits to society of education and training, however. People who have received more or better education and training or who achieved more during the experience benefit others in society by paying higher taxes, by making discoveries or artistic contributions that benefit others in the society, by being more likely to give time and money to charity, by being less likely to experience long periods of hospitalization that are paid for by insurance or government, and in many other ways (Haveman and Wolfe 1983). Economists call social benefits such as these "spillovers" or "externalities." Private decisions will lead to an insufficient quantity and quality of education and training and insufficient achievement by students and trainees, unless public agencies intervene and partially subsidize the cost or add to the rewards. The externality case for public subsidies of schooling has been generally accepted and well known for a long time. Little attention has been focused, however, on the real externalities generated by employer training. Training produces three kinds of real externalities:

1.1. Discoveries Attributable to Good Training

High quality training benefits customers and the public as well as the trainer and the trainee. When, for example, the dancers of the New York City Ballet receive excellent training, the company benefits through greater ticket revenue but the audience benefits as well because they derive a larger

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consumer surplus from the performance. The COMSAT employee who figured out how to double the lifetime of communication satellites by judicious use of the rocket fuel remaining on board, benefitted customers and competitors at least as much as he benefitted COMSAT. The Aloha airlines pilot who landed his plane after an explosive decompression and the loss of a major section of the fuselage, certainly raised the lifetime earnings of his passengers. On-the-job training and experience were critical to the COMSAT discovery and the safe landing of the Aloha plane.

### **1.2 Disasters Attributable to Poor Training**

When a worker screws up because of poor training, the customers and the general public often lose just as much as the worker and the company. Examples of disasters caused or contributed to by poor training are legion: Chernoble, Three Mile Island, Exxon Valdez, the shoot down of the Korean Airlines 747 (pilot error caused the plane to be off course), and Greyhound bus crashes in New York State. Tort law internalize some but not all of these costs. A study of egregious physician errors in New York State found that only one-eighth of them resulted in a malpractice claim. Damage awards are typically paid by insurance funds that are imperfectly experience rated. Where the public interest in assuring that training is of top quality is manifest to all, training is often regulated or subsidized by government. The Federal Aviation Administration, the Department of Transportation and the Nuclear Regulatory Commission, for example, engage in such regulation.

However, for every big discovery or disaster that gets media attention and generates a political response, there are millions of little discoveries, unrewarded services, or unanticipated product failures that directly effect consumers that do not generate political responses. Since customers lack low cost access to accurate information on the quality of what they are buying, the prices paid do not fully reflect quality differentials between different providers. As a consequence, training which enhances quality and reliability often generates benefits for customers which are not recognized or rewarded by the market.

### **1.3 Poor Signalling of General Skills to Other Employers**

The training provided by one employer benefits other employers and consumers, not just the trainee and his/her employer (Bishop 1989). The worker is more productive in future jobs, but these employers do not perceive accurately the quality of the general OJT received by the worker and, as a result, do not fully compensate the trained worker for their higher productivity. Bishop's (1991) study of the relative productivity and the profitability of new hires obtained results that are consistent with this hypothesis. New hires who had received formal off-job training sponsored by a previous employer made significantly more suggestions designed to improve productivity, were more productive and profitable and were less likely to be fired. If one accepts these findings as valid, the implication is a market

failure which reduces the payoff to worker investments in OJT. The ultimate cause of this problem is the lack of effective signals of the quantity and quality of training.

Institutions for Signalling Occupational Competence--A Comparison: In the U.S. labor market, hiring decision makers have a very difficult time assessing the quality of the general human capital obtained from on-the-job training. This fact increases turnover, lowers wages, and lowers productivity. Since part of the reason for getting general training is to improve the worker's marketability with other employers, not recognizing the benefits of this training reduces the incentive to invest in general on-the-job training.<sup>1</sup> Doing an especially good job of training employees will immediately benefit trained workers when they leave the firm if the firm develops a reputation for being a good trainer.<sup>2</sup> Past experience with the former employees of a firm is probably the primary determinant of a firm's reputation as a trainer. Large firms that turn over a reasonable share of their trainees are likely to develop a reputation (good or bad) for the training that they provide. A positive reputation helps separating employees find better jobs, and this in turn helps the firm recruit the best possible candidates when it is hiring. Even though a good reputation as a trainer forces them to pay higher wages in the post-training period, most firms have a strong interest in establishing such a reputation. The armed forces are aware of this, and consequently spend millions of dollars advertising the quality and civilian usefulness of their training.

Most young workers without a baccalaureate degree, however, do not obtain jobs at the large firms with established training reputations. The smaller less well known firms where they find their first job are typically unknown quantities when it comes to the quality and general usefulness of their training.

The lack of full reward for improvements in general skills if one leaves one's current employer reduces the incentives for the trainer and trainee to devote time and energy to learning general skills that are not easily signalled to the external labor market. High turnover exacerbates this problem so under investment is greatest for temporary and seasonal employees and for young workers generally.

Formal systems for certifying competencies gained through on-the-job training exist in the United States, but they have not achieved the widespread usage they deserve. The apprenticeship systems of Switzerland, Austria, and Germany are probably the best examples in the world of widespread and effective systems of on-the-job training and competency certification. One of the most important features of these apprenticeship systems is the requirement that the apprentice pass written and practical examinations covering the occupation's curriculum. If an employer cannot provide training in all the skills included in the curriculum, it is must arrange for their apprentices to receive instruction at another firm or at a special employer-run school. The examinations are set and scored by a local committee of

masters (skilled workers) and employers so the quality of the training provided by the master and the firm is put to a public test. Passing this apprenticeship exam is of benefit not only to the trainee, it is important to the masters as well, for both their reputation amongst their peers and their ability to recruit high-quality apprentices depends upon it. As a result, 90 percent of German apprentices remain at one employer for the full 3-year apprenticeship period, and 90 percent of these pass their test (on the first or second try). The apprenticeship systems of the English-speaking nations are based on time served rather than competencies achieved and are considerably less successful in standardizing and upgrading the training that occurs.

The standardized curriculums and the proficiency exam at the end of the apprenticeship mean that the quality and nature of the training is well signaled to employers in Germany, Switzerland and Austria. The result is that the worker can count on benefiting from doing a good job in their apprenticeship even if the training employer does not keep them on. Since the future payoff is certain, German apprentices are willing to start out at a wage that is only about one-quarter of the wage they will be able to command at the end of the apprenticeship. If the apprentices were adults, they could not afford to accept so low a wage. They are, however, teenagers who because they live at home are heavily subsidized by their parents. Consequently, the liquidity constraint that is such a barrier to heavy investments in general training in the US is much less of a problem in Germany.

## 2. TAX INDUCED DISTORTIONS OF THE TRAINING MARKET

### 2.1 The Non-Deductibility of Some Training Expenses

The benefits of training are taxed, but not all of the costs are deductible.<sup>3</sup> Some of the time that trainees devote to employer sponsored training comes from reducing leisure time. Employees taking job related college courses typically attend classes on their own time and always do their homework on their own time. Japanese workers frequently take correspondence courses related to their job and, when they are rotated to a new job, the meticulous description of how the job is done written by its previous occupant is studied at home. Japanese supervisors are expected to fill up slack time with training. When Ronald Dore presented his passport at an out of the way port of entry that seldom sees British passports, the supervisor called his younger colleagues over and taught them about its intricacies while Dore looked on. This little training session delayed passengers somewhat and necessitated a sacrifice of on-the-job leisure but output--the number of passengers processed--did not change (Dore and Sako 1989). Incentives to undertake training are distorted if government does not share in the costs of training to the same degree it shares in its rewards. When training time substitutes for leisure time, that is what happens.

### 2.1 The Progressive Income Tax

The second tax induced distortion arises from the fact that investments in OJT are typically made at a time when the individual has no tax liability or a lower-than-normal marginal tax rate and the benefits are received when earnings and marginal tax rates are higher. As a result, the after-tax benefits of an OJT investment are reduced more than the after-tax costs and such investments are discouraged. Firms, on the other hand, train continuously, so the marginal tax rates faced when the costs of training are incurred and deductible are no different from those faced during the payoff period.

### 3. HIGH BORROWING COSTS AND LIQUIDITY CONSTRAINTS

The third reason why society subsidizes education is the failure of the free market (in the absence of publicly funded loan guarantee programs) to offer loans to young persons investing in their education. College students now have access to such loans, workers investing in general on-the-job training do not.

Because of the fear of turnover, employers are reluctant to pay for general training that is visible and useful in other firms. If the employer is not willing to pay for general training, it will be offered only to those workers who pay for it by accepting a lower wage during the training period than could be obtained elsewhere. The more intensive the training, the greater the required reduction in wages. Most workers are unwilling to accept a large reduction in their current standard of living, and, since they are unable to borrow at reasonable interest rates, they forego the investments in general on-the-job training.<sup>4</sup> If they do undertake such investments, they do so only if extremely high rates of return are obtained.

Most young workers are liquidity constrained--that is they are unable to shift as much consumption from the future into the present as they would like because they have neither assets which can be depleted nor access to credit at reasonable terms. Half of households headed by someone under the age of 25 have less than \$746 in financial assets and 19 percent have no financial assets at all. Half of households headed by someone between 25 and 34 have less than \$1514 in financial assets and 13 percent have none (Survey of Consumer Finances 1984). Borrowing against the equity in one's home is a possibility for some but only 34 percent of households with heads under the age of 35 own a home and many of the houses have been owned for only a short while, so the equity that can be borrowed against is small. Even with collateral, the loans available to individuals usually carry higher interest rates than those charged businesses.

Studies of the willingness of consumers to substitute consumption over time have all concluded that the intertemporal elasticity of substitution is no higher than one and most studies conclude it is .5 or below (Friend and Blume 1975; Hall 1988; Hubbard and Judd 1986). A substitution elasticity of

.5 implies that reducing a liquidity constrained worker's wage by one half (in order to pay for general training) roughly quadruples the worker's marginal utility of consumption. Such a worker would be willing to give up four dollars of future income in return for one dollar of current income. The liquidity constrained worker finds employment contracts in which the employer shares the costs of general training a very attractive proposition (Glick and Feuer 1984; Feuer, Glick and Desai 1987).

Firms have better access to capital markets and are thus more willing than workers to trade off future earnings for present earnings. The compensation packages that result from the asymmetric access to capital markets and the progressive tax structure reflect the worker's strong preference for compensation now rather than later. In effect, firms offer new hires a loan that will be canceled if a separation occurs. Firms do not require repayment of the loan when separations occur for the same reasons that banks do not offer large unsecured loans without a government guarantee of payment. The administrative costs of obtaining repayment are extremely high and bankruptcy is a real option for someone with zero assets. Firms, however, undertake to finance some of the costs of general OJT only when their investment yields a return that is sufficient to pay for both the cost of capital and the risk of turnover. This reduces employer investments in general on-the-job training below the level that would have prevailed if workers were able to borrow at the same interest rates as employers.

Summary of Section 1 to 3: Evidence has been presented that on-the-job training produces spillover benefits just as schooling does. When an individual receives extensive, high-quality on-the-job training, they also benefit others in the society by paying higher taxes, by receiving fewer government transfers, by making scientific and technological advances and artistic contributions. In addition, labor market distortions, such as the lack of access to loans and lack of certification of OJT, cause individuals and firms to choose less OJT and lower quality OJT than is desirable from society's point of view. There would appear to be a need for the government to promote increases in on-the-job training. We now turn to a discussion of how government can promote training in general skills.

#### 4. CAN VOCATIONAL TRAINING IN SCHOOLS SUBSTITUTE FOR EMPLOYER TRAINING ?

The primary response of most societies to the tendency of employers and workers to underinvest in skill training is to establish occupational training programs in schools. This ameliorates the problem of under provision of skill training, but school based training cannot replace some kinds of employer training and is generally less effective than employer provided training in the same skills.

Often, training in a skill can only be organized by the employer. This is obviously the case when skills are specific to the firm or partially specific to the firm, but is also sometimes the case for completely general skills as well. General skills are often easier to learn when they are

integrated into a training program that is specific to the context of a particular firm. The need for particular general skills is often generated by the introduction of new technology and new equipment or a reorganization of the business. The firm must select which skill is to be taught and when. Since firms quite reasonably desire to have all employees use the same word processing and financial analysis programs, the selection of such a program must be centralized. IBM first developed the FORTRAN computer language and then taught it to its employees and customers. Colleges and universities eventually offered courses in FORTRAN, but it took many years for schools to take over the bulk of the teaching of this very general skill.

Even when the same skills are to be taught, employer provided training is generally more effective than school based training? Seven reasons appear to account for it. First, most individuals who obtain occupational training from a school do not obtain jobs in the occupation they studied in school, while most of those trained by an employer stay in the occupation. For graduates of high school vocational training programs in the US, only 43 percent of the employed graduates out of school between one and ten years had a training related job (broadly defined) in the 1985 National Longitudinal Survey of Youth (Campbell *et al.*, 1987). The proportion of CETA participants whose occupational field 12 months after completion of classroom training matched their field of training was only 41 percent for clerical training, 39 percent for training in operative occupations and 29 to 32 percent for professional and craft training (Barnow 1985).

When, on the other hand, employers are heavily involved in providing occupational training, it is much more likely to be used. Mangum and Ball (1986) found in their analyses of NLS data that employer controlled training institutions have much higher training related placement rates. Using a procedure of matching training fields against jobs, they found that the proportion of male graduates who had at least one job in a related field was 85 percent for company training and 71 percent for apprenticeship but only 52 percent for vocational-technical institutes and 22 percent for proprietary business colleges. The rates for females were 82 percent for company training but only 59 percent for nursing schools, 61 percent for vocational-technical institutes and 55 percent for proprietary business colleges. Six months after passing a German apprenticeship examination, 68 percent of those with civilian jobs were employed in the occupation for which they were trained (much more narrowly defined) (Federal Institute for Vocational Training, 1986).

If the skills and knowledge developed in a training program are not used, they will rapidly deteriorate. In one set of studies, students tested 2 years after taking a course had forgotten 1/2 of the college psychology and zoology, 1/3 of the high school chemistry, and 3/4 of the college botany that had been learned (Pressey and Robinson, 1944).

The second reason why learning skills on a job is to be preferred to learning those skills in a classroom is the fact that trainees are well-motivated because skills developed are almost certain to be used, and because

promotions and pay increases go to those who do well. Third, the training is generally tutorial in nature and this is known to be an effective teaching method. Fourth, since training is generally done by supervisors and coworkers who are aware of the trainee's progress and can give necessary corrective instruction. Fifth, the equipment and materials necessary to the training are generally readily available at the work site and time on the machine for the trainee can generally be arranged without disrupting production. When schools provide the training, equipment must be specially purchased and keeping the equipment up-to-date is often prohibitively expensive. Sixth, the trainer (not just the trainee) is held accountable for success since the training is designed to increase productivity and supervisor/trainers are held accountable for the productivity of the work group. Finally, when employers provide training the trainee's time tends to be used more efficiently. Because they are paying for both the trainer and the trainee's time and receive most of the benefits, employers have much stronger incentives to select cost effective training strategies than schools which neither pay the time costs of the trainee nor receive any of the direct benefits of the skills that are developed.

#### 6. THE FRENCH MANDATE TO SPEND

Legislated mandates to spend on formal training are a central component of the French system of continuing training. Employers and unions established the foundations of this system with the National Intersectoral Agreement of 9 July 1990 (later amended to cover managers and professionals on 30 April 1971. This agreement was enacted into law on the 16th of July 1971. Every employer with 10 or more employees was obligated to spend .8 percent of its wage bill on continuing education and training of its employees or pay a tax equal to the difference between its obligated and actual training expenditure. In addition, every employer regardless of size was required to spend .5 percent of its wage bill on apprenticeship training or pay a tax equal to the difference between its obligated and actual training expenditure.

The mandated training tax for continuing training was raised to 1.0 percent of wage bill in 1974, to 1.1 percent in 1977, and to 1.2 percent in 1987. Beginning January 1993, the mandated spending level is 1.4 percent. Since the initiation of the mandate, the share of the wage bill spent on formal training has risen substantially, from 1.35 percent in 1972 to 3.14 in 1990. Firms are required to develop a training plan and present it to the firm's labor management committee. The auditing of the firm's reports of training expenditure is accomplished by a staff of 120 controllers.

The obligation to invest in continuing education and training can be fulfilled by five different types of expenditure:

- \* the firm's own formal training programs (These must have a curriculum, develop a skill that is useful at other firms and be located away from the trainee's normal work station.),

- \* external training (often cooperative programs organized by groups of employers),
- \* training insurance funds agreed to by management and labor,
- \* government approved training programs for unemployed youth who have no qualifications (Within the overall 1.4 percent mandate, firms are required to spend at least 0.3 percent of their wage bill on these programs or be subject to the tax), and
- \* wages and tuition of employees taking courses at schools and colleges (Firms are required to spend at least 0.15 percent of their wage bill on in-school training of employees or be subject to tax. Firms with fewer than 10 employees are subject to this requirement as well.).

The first panel of Table 1 indicates how firms of different size allocated their eligible training expenditures in 1988. Internal training accounted for 28 percent of the eligible training expenditures reported to French authorities by all firms, 50 percent of the expenditures reported by firms with 2000+ employees, but only 1 percent of expenditures reported by firms with 10-19 employees. External training programs, many of which are provided by organizations formed by industry councils and other groups of employers, accounted for another 35 percent of eligible training expenditures. The firms with 50 to 2000 employees are the heaviest users of this kind of training.

Union-management training insurance funds account for 37 percent of the eligible training expenditure of firms with 10-19 employees but only 4 percent of the expenditures of the largest firms. Contributions to government approved training programs for unemployed youth account for 25-27 percent of training expenditures by firms with under 50 employees and 13 percent of the training expenditures of firms with 2000+ employees. Wages and tuition for employees attending schools and universities account for 7 percent of training expenditures.

French leaders believe the training mandate has stimulated the growth of formal training and aided French competitiveness. Studies have found that individuals receiving training are significantly more likely to receive internal promotions and 2 to 3 times more likely to transition from unskilled to skilled occupations. This is just as true for training that the worker has initiated as for training taken at the initiative of the employer. For those who were in unskilled jobs in 1980, individuals who initiated their own training in the subsequent 5 years had a 58 percent probability of being in a skilled job in 1985 and those who took training at the behest of their employer had a 55 percent chance of being in a skilled job. Those who received no formal training between 1980 and 1985, by contrast, had only a 20 percent chance of moving up to a skilled job by 1985 (Berton and Podevin 1991).

As in other nations, formal training is more extensive at large firms and for more skilled workers (see Table 1). In 1990, firms with 10-19 employees spent 1.30 percent of their wage bill on formal training, barely more than the 1.2 percent mandate. By contrast, firms with more than 2000

employees spent 4.99 percent on average on formal training, more than three times the mandate. Those receiving training averaged about 46 hours during the year. This varied little by firm size and skill level. The incidence of training, however, varies substantially. Slightly over one-half of supervisors, technicians, managers and professionals receive formal training each year. One in four craft, sales and clerical workers and one in eight unskilled operatives receive formal training each year. The incidence of formal training is considerably higher in France than in the United States.

The French mandate to spend has the following advantages:

- \* Employer needs for skill upgrading determine the allocation of funds so the risk that people will be trained for jobs that don't exist or in skills that do not increase productivity is small.
- \* Training occurs at the work site where it is most effective.
- \* Training funds are available to the employed as well as the unemployed.
- \* Decision making is decentralized.

However, the French system also has some important disadvantages:

- \* Six-million of the 9 million French workers employed by firms subject to the training tax are at firms which regularly exceed the mandated amount. The training mandate clearly has no effect on the incentive to train these 6 million workers.
- \* Another 27 percent of workers are employed at firms which report spending exactly 1.2 percent (the threshold that applied in 1990) of their wage bill on training. While some of these firms have increased their training expenditure to the required minimum because of the mandate, administrators of the program report that many smaller companies simply stop keeping track of their training expenditure once they reach the tax threshold. It is not clear, how much of the response to the mandate is creative accounting and how much is a real behavioral change.
- \* Firms whose expenditures on formal training would have been below 1.4 percent of payroll in the absence of the mandate, save in taxes the full amount of any increase in expenditures on training. Some administrators of the French program fear that this has induced a careless attitude toward costs and reduced the efficiency of training.
- \* Expenditures on formal training reduce the firm's tax liability; but the costs of informal training do not. This generates a strong incentive to substitute formal training for informal training despite the fact that there is no evidence (either of an empirical or theoretical variety) that formal training is to be preferred over informal training (Bishop 1991).
- \* Formal training is subject to substantial economies of scale, so small firms are put at a disadvantage. The kind of training which small companies excel at--close supervision and informal training by the owner--is not eligible for subsidy. Small firms must join together in cooperative efforts to achieve the scale necessary to make formal training feasible.

Most of these problems can be avoided, however, by modifying its design.

## 6. An American Training Mandate

The source of most of the problems with the French training mandate is the 100 percent offset of training expenditure for tax obligation. It is this feature that results in a few firms (those spending below the mandated level) having little incentive to train efficiently and most other firms facing no incentive to increase training above the level they would have chosen in the absence of the program. An American training mandate can avoid these problems by offering only a 20 or 25 cent reduction in tax for every dollar of training expenditure. This generates strong incentives to use cost effective training techniques. It also means that the tax rate can be low and yet an incentive to expand training is generated even for companies that normally spend 4 percent of their wage bill on training.

All employers--profit making, nonprofit, and governmental--should be subject to the training tax. As an administrative convenience, the mandate should not apply to very small organizations. Furthermore, it should set proportionately higher training targets for larger firms. This can be accomplished by making the training tax progressive. For example, there might be no tax on the first \$40,000 of the firm's wage bill, a 0.5 percent tax on the next \$5,000,000 of the wage bill, a 0.75 percent tax on the next \$5,000,000 of wage bill and 1.0 percent on all wages paid above that. With a 20 cents on the dollar tax offset, a 1 percent tax rate implies that the very largest firms would not be released from paying tax until they were spending over 5 percent of their wage bill on formal training programs. Once accountants are given the task of identifying the full costs of their existing formal training programs (including the time of trainees), this will not be a difficult target for most companies to meet. French firms with more than 2000 employees currently spend this proportion of their payroll on formal training.

As a quality control measure, firms would be required to give certificates describing the skills taught and competencies achieved to trainees at the completion of training. These certificates would make the individual more marketable at other firms and strengthen worker incentives to engage in training. As a further quality control measure, companies above a certain size would be required to develop a training plan and present it to a training advisory committee that contains worker representation. Public companies would be expected to describe their investments in formal training in their annual report. In order to avoid a conflict of interest in the allocation of training investments, tax offsets would not be available for training received by the owner and top managers.

Initially, the categories of training expenditures that could offset the tax would be similar to those in France: apprenticeship training programs, industry training funds, labor-management training funds, tuition reimbursements for job-related training, contributions of materials or staff time to vocational-technical institutions, the employer's share of JTPA OJT

training expenses and the firm's formal training programs for new and continuing employees.<sup>5</sup> The costs of certain types of informal training (as specified in Department of Labor regulations) would also be used to offset the training tax. Apprenticeship programs for 16 to 21 year olds for high skill jobs generate particularly large externalities, so it would be desirable to structure the mandate to give special encouragement to this kind of training. This could be done by offering a larger tax reduction (eg. 40 cents per training dollar rather than the 20 cents per training dollar) for expenditures on apprentice training programs that meet quality standards promulgated by industry associations and approved by the Department of Labor. Other types of training (for example, training which awards industry recognized credentials or academic credit) might be similarly encouraged by offering a better tax offset ratio.<sup>6</sup>

The major drawback of the system described so far is its tendency to promote formal training programs at the expense of job rotation and other more informal methods of learning and training on the job. Japanese workers are better trained than American workers not because they are more likely to take company sponsored courses (expenditure on such courses is in fact lower in Japan than in the US and France, Dore and Sako 1989), but because they receive continuous upgrading training through job rotation and the Kaizen process. It is very important for an American training mandate to promote informal learning on the job through job rotation, obtaining assistance from coworkers, self study and learning by doing. The Department of Labor should be tasked with the job of writing regulations which would accomplish this.

One strategy that needs to be investigated would be to award training tax offsets for learning outcomes rather than for training expenditure. The MacCalister Commission is considering whether the Department of Labor should promote the development of a nationwide skill certification system for industry and occupation specific skills. If the Department of Labor decides to go ahead with such a program, employer use of the certification system could be insured by awarding training tax offsets to firms which train their workers to industry standards and arrange for them to be tested and certified. Incentives to engage in self study could be enhanced by giving those who demonstrate their competence a small monetary award along with their skill certificate. Without such a system of incentives to attract workers and firms into the skill certification process, I doubt that a skill certification system will gain the scale necessary for sustainability.

When designing a training mandate there will be a temptation to become highly prescriptive about the type of training that is to be allowed to offset the tax. The failure of prescriptive regulation of schooling inputs to produce quality outcomes is a lesson that the designers of a training mandate need to take to heart. We know that training is generally a good investment, but we do not know which types of training are more effective, when and for whom? The profit motive is probably what has insured its cost effectiveness in the past. Too many regulations could get in the way of the profitability

calculation and reduce it's effectiveness.

The training mandate outlined above will increase the incidence and intensity of employer training without changing its basic character or its distribution. Employers clearly believe that formal training of skilled workers generally yields larger productivity benefits than training unskilled workers. The result is that managers and skilled workers get more formal training than unskilled workers. Some analysts view this as a problem that requires government intervention.

A training mandate could be structured with a bias toward training those with less skill. Training received by low wage workers or young workers might generate higher tax offsets. Alternatively, separate training taxes could be imposed on exempt and non-exempt employees and the mandate could apply separately to each group of workers.

Should profit and productivity calculations be the sole determinants of who gets trained? Or should a training mandate favor the training of the firm's least skilled workers? The answer is not clear. While the absence of loan financing of general training applies most of all to young and disadvantaged workers, the externalities that training is thought to generate--discoveries, artistic contributions, reduced risks of catastrophic errors--appear to arise primarily in high level occupations.

How should distributional issues be evaluated? Should the goal be "equal opportunity to compete for jobs which offer training" or "equalizing training outcomes?" By an intergenerational standard, employer training comes off better than schooling. Family background is more determinative of schooling outcomes than employer training outcomes. How far should the goal of equalizing outcomes as opposed to opportunities be carried? The longer a student stays in school the more educational subsidies she accumulates. Does this make public subsidy of higher education undesirable? While evidence about externalities can inform policy choices, the judgement is ultimately a political and moral one.

## BIBLIOGRAPHY

- Barnow, Burt S. Government Training as a Means of Reducing Unemployment. ICF Incorporated, August, 1985.
- Becker, Gary. "Investment in Human Capital: A Theoretical Analysis." Journal of Political Economy, Vol. 70,
- Berton, Fabienne & Podevin, Gerard. (1991) "Vingt Ans de Formation Professionnelle Continue: De la Promotion Sociale a la Gestion de l'Emploi," Formation Emploi, No. 34, Avril-Juin 1991, 14-30
- Bishop, John. "On-the-Job Training of New Hires," Market Failure in Training, edited by David Stern and Josef Ritzgen, New York, Springer Verlag, 1991.
- Bishop, John. "The Impact of Training in School and On-the-Job on Productivity, Wages and Turnover of New Hires." forthcoming in The Private Market for Training, edited by Lisa Lynch, University of Chicago Press.
- Bishop, John and Kang, Suk. "On-the-Job Training/ Sorting: Theory and Evidence" National Center for Research in Vocational Education, Ohio State University, 1984.
- Bishop, John and Kang, Suk. "A Signaling/Bonding Model of Employer Finance of General Training." Center for Advanced Human Resource Studies, Cornell University, Ithaca, New York, 1988.
- Campbell, Paul B.; Elliot, Jack; Hotchkiss, Larry; Laughlin, Suzanne and Seusy, Ellen. "Antecedents of Training-Related Placement." Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1987.
- Centre d'Etudes et de Recherches sur les Qualifications, Statistique de la Formation Professionnelle Continue Financée par les Entreprises: Années 1989-1990. Paris: La Documentation Francaise, 1992
- Dore, Ronald and Sako, Mari. How Japanese Learn to Work. New York: Routledge, 1989. 1-150.
- Federal Institute for Vocational Training. "The Transition of Young People into Employment after Completion of Apprenticeship in the 'Dual System'." West Germany: The Federal Institute for Vocational Training, 1986.
- Feuer, M., Glick, H., and Desai, A. "Is Firm-Sponsored Education Viable?" Journal of Economic Behavior and Organization, March 1987, Vol. 8, #1.
- Friend, Irwin and Blume, Marshal. "The Demand for Risky Assets." American Economic Review, Vol 65, December 1975, pp. 900-922.
- Glick, Henry A. and Feuer, Michael J. "Employer-Sponsored Training and the Governance of Specific Human Capital Investments." Quarterly Review of Economics and Business, Vol. 24, No. 2, Summer 1984.
- Hall, Robert. "Intertemporal Substitution in Consumption." Journal of Political Economy, Vol. 96, NO. 2, April 1988, pp. 339-357.
- Hubbard, R. Glenn and Judd, Kenneth L. "Liquidity Constraints, Fiscal Policy and Consumption" Brookings Papers on Economic Activity, 1986, #1, 1-60.

- Mangum, Steve, and Ball, David. "Military Service, Occupational Training and Labor Market Outcomes: An Update." Columbus: Center for Human Resource Research, The Ohio State University, March, 1986.
- Pressey, Sidney, and Robinson, Francis. Psychology and New Education. (New York, Harper and Brothers Publication, 1944), p. 544.
- "Survey of Consumer Finances, 1983." Federal Reserve Bulletin. Vol 70, September 1984, p. 686 and December 1984, p. 863.

Table 1  
 Formal Training in French Companies  
 by Size of Firm

	Number of Employees					Total
	10-19	20-49	50-499	500-1999	2000+	
<u>Share of 1988 Training Expenditure for</u>						
Internal Training	1%	2%	6%	17%	50%	28%
Joint External Training	26%	31%	42%	46%	29%	35%
Union-Management Funds	37%	33%	22%	11%	4%	11%
Training of Youth	27%	25%	23%	19%	13%	19%
Time off to Attend School	<u>9%</u>	<u>9%</u>	<u>7%</u>	<u>7%</u>	<u>4%</u>	<u>7%</u>
	100	100	100	100	100	100
<u>Training's Share of the Wage Bill</u>						
in 1974	.66%	.86%	1.14%	1.45%	2.59%	1.63%
in 1990	1.30%	1.45%	2.17%	3.20%	4.99%	3.14%
Hours of Training per Trainee-1990	41	43	41	44	53	46
<u>Share Receiving Training in 1990</u>						
All Employees	8%	11%	23%	39%	53%	32%
Unskilled Operatives	2%	4%	9%	15%	22%	13%
Skilled Operatives	6%	7%	16%	29%	48%	25%
Other Non-Supervisory	8%	11%	24%	37%	46%	29%
Supervisors & Tech.	15%	19%	38%	55%	70%	53%
Managers & Professional	13%	21%	41%	62%	71%	50%
Share of Covered Employment	5%	15%	32%	19%	30%	100%

Source: Centre d'Etudes et de Recherches sur les Qualifications, Statistique de la Formation Professionnelle Continue Financée par les Entreprises: Années 1989-1990. Tables 13 and Fabienne Derton & Gerard Podevin, "Vingt Ans de Formation Professionnelle Continue: De la Promotion Sociale a la Gestion de l'Emploi," Formation Emploi, No. 34, Avril-Juin 1991, 14-30, Table 2 & 3.

## ENDNOTES

1. Lack of information about the quality of general OJT received can increase investment in general OJT only under the very unlikely circumstances of very high retention rates and large differentials between the rates at which employers and employees trade off present before-tax income for future before-tax income. Under these circumstances the employer's desire to invest in general training may be stronger than the worker's desire. Because the wage will have to be increased by an equivalent amount, employers cannot benefit from (and therefore do not pay for) general training that is visible to other employers. Consequently, as such training becomes more visible to other employers, the calculus that determines the amount of training shifts to give greater weight to the very high discount rates faced by the worker, possibly reducing investment in general training. The condition that would have to be satisfied is that the retention rate would have to be equal to or greater than the ratio of the firm and worker discount factors. Even if the worker were to face yearly interest rates that were double the firm's rate (e.g., 30 percent rather than 15 percent), the yearly retention rate would have to be above 85 percent. Retention rates for the first year at a job are seldom above 50 percent and average yearly retention rates for all employees new and old seldom exceed 85 percent. Yearly retention rates of employees who have been at the firm for many years may exceed 85 percent, but these more mature workers will typically have better access to capital markets than younger workers and face a tax regime that is neutral to OJT. This discussion has been based on the theoretical analysis of the training decision presented in Bishop and Kang (1984, 1988).
2. Well-trained employees who leave the firm that provided the training may benefit if their new employer eventually learns of their greater-than-anticipated productivity and makes later adjustments to the wage or bases a promotion on it. In the model presented in Bishop and Kang (1984, 1988), high renegotiation costs prevent such adjustments from occurring at the first employer. If a third period was added to the model and retention in the second job modeled, the same assumption of high renegotiation costs would prevent the worker from benefiting from better-than-expected training in the second job. If one were to relax the assumption that post-training wage rates are prespecified and analyze a multi-period model, the size of the distortion to training investment decisions would be reduced, but it would not disappear. Productivity is measured with error so one could never expect the new employer to perceive the full value of the worker's greater-than-anticipated training. Furthermore, other employers remain ignorant of greater-than-anticipated productivity. To all intents and purposes this greater productivity is specific to the firm, so the worker will only receive a small share of this greater productivity in higher wage rates.
3. If training an employee causes a reduction in output or necessitates an increase in hours paid, profits and thus taxes are reduced. If workers pay for training by accepting lower wage jobs, individual income tax payments are reduced. In both of these cases, training costs are effectively deductible in the year they are incurred. If all individuals pay taxes every year at the same marginal tax rate, the tax system would not distort decisions to invest in OJT. In fact, however, some training costs are not deductible and tax rates are generally higher when benefits are being received than when costs are being incurred, so the tax system discourages training investments.
4. Becker clearly recognized the existence of liquidity constraints in his 1962 paper. "Since employer specific skills are part of the intangible assets or good will of firms and can be offered as collateral along with tangible assets, capital would be more readily available for specific than for general investments (p.42)." He did not, however, explicitly analyze how such constraints might influence the tenure profile of wages and thus induce employers to share the costs of general training. Parsons (1972) points out that "The worker's ...discount rate will affect the firm's choice of wage policies....It can be shown that firms will decrease the worker's share of specific investment as the workers discount the future more heavily (p.1129)."

5. To ensure that only training gets subsidized and not vacations or motivational sales meetings, subsidizable expenditures might be defined to exclude: (1) travel to a remote site other than the company's national or the appropriate regional headquarters; (2) housing and food expenses of more than \$100 a day; (3) costs of training non-employees, part-time employees working less than 50 hours a month, or employees for whom more than 50 percent of compensation comes from commissions; and (4) payments to speakers or presenters of a training session of more than \$100 or \$200 per contact hour, whichever is higher. The costs of developing a training package or system for use in training one's own staff would be an allowable expense.
  
6. The French promote particular kinds of training by having sub mandates requiring all firms to spend at least X percent of wage bill on a particular category of formal training. Unless a case can be made that it is undesirable for some firms to specialize in one kind of training (say apprenticeships) while others specialize in other forms of training, sub mandates will be a less efficient way of stimulating particular types of training than varying the tax offset ratio. If it is felt that all workers regardless of where they are employed should have access to certain types of external training, the best way to promote it is to locate it in schools and subsidize its costs there.