What Should Be Our Human Capital Investment Policy?

JAMES HECKMAN*

Abstract

This paper considers the magnitude of the human capital investment required to offset the increase in the inequality in labour earnings in the US economy since 1979. It considers the ineffectiveness of government training policies, the effectiveness of private sector training and the conflict between economic efficiency and the work ethic. It also considers revisions of the tax code. The importance of the distinction between the long view and the short view in analysing human resource policies is emphasised.

JEL classification: J24, I28, H40.

I. INTRODUCTION

The US labour market has undergone some important transformations in the past 15 years. The demand for skilled labour has increased relative to the demand for unskilled labour and the workplace has been transformed by technology and trade. This paper considers what policies might be appropriate to respond to these changes in the US labour market. In it, I make six points.

First, I discuss the magnitude of the human resource problem confronting the US economy and the size of investments required to solve the problem. Second, I comment on the general ineffectiveness of current government training policies. Third, I want to comment on the general effectiveness of private sector training. Fourth, I discuss the conflict between economic efficiency and pursuit of the work ethic. Fifth, I consider a broader array of policy options including extensions of the tax code and revisions of educational subsidies. Finally, I

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distinguish between the long view and the short view in approaching human resource problems.

Presently, the economy has a large group of unskilled workers, many of whom can be trained to be skilled labour only at a prohibitively expensive cost. In an era of tight budgets, it is far from obvious that investments in such workers are justified on any but political grounds. The real cost of such investment is the diversion of investment away from the young and the more trainable for whom a human capital strategy is likely to be more effective and for whom it is likely to produce favourable outcomes in the long run. Missing from most discussions of job training is any discussion of the rather convincing evidence that investment is most profitable when it is made in the young.

Also missing from current discussions is any consideration of priorities or the need to prioritise. In an era of tight government budgets, it is impractical to consider active investment programmes for all persons. The real question is how to use available funds wisely. Government investments have not been shown to be effective in any meaningful cost–benefit sense for severely disadvantaged adults or older workers. For these groups, wage subsidies may be more effective tools for keeping persons employed than skill investment programmes. The available evidence supports the policy prescription: invest in the young; subsidise the old and the severely disadvantaged.

There is also a strong presumption in current discussions that investment in persons should be supplied by the government sector. This leads scholars of human resource problems to ignore a potentially important role for tax incentives in encouraging training by private firms to raise the demand for and wages of labour. The evidence suggests that the returns to firm-supplied investment in human capital are larger than the returns to government training. This alone would justify greater reliance on the private sector. However, the better performance of private firms may be due to the lower skill level of trainees in the government programmes. Evidence of their lower skills does not vindicate continued investment in such persons. No investment may be the best short-run strategy for low-skilled adults, contrary to a central implicit premiss of current job training strategies.

II. THE NEW US LABOUR MARKET

There is much evidence to support the view that wage gaps have widened across the skill levels. In purchasing-power-constant or deflated dollars, male high-school graduates earned 4 per cent less per week in 1989 than in 1979. Male high-school drop-outs earned 13 per cent less per week than in 1979. In contrast, male college graduates earned 11 per cent more per week (Blank, 1994). These comparisons widen further if we consider annual earnings. By any measure, labour incomes for men have become more unequally distributed. For women, the story is somewhat different. The real weekly earnings of female high-school
graduates have risen but the rise has been even greater for female college graduates.

For both men and women, inequality of labour incomes has risen. The returns to schooling and skill have increased. The relative earnings of workers at the bottom of the skill distribution (lower than high-school graduate) have definitely declined for persons of either gender. Youth have been hit hardest in the shifting market for skills.

A corollary phenomenon is the decline in labour market activity, especially among the unskilled. A variety of labour force measures show increasing joblessness and longer unemployment spells for workers at all skill levels. Particularly problematic are less-skilled youth (those with high-school education or less) who appear to flounder in the market for years before they find stable jobs. These youth are a source of major social problems. Teenage pregnancy and idleness are on the increase in most areas. It is very likely that diminished labour market opportunities for youth help to create these problems.

The problem of a deteriorating market for unskilled or semi-skilled workers is not solely a problem of youth. Displaced adults, primarily factory workers, are a major concern. Middle-aged workers displaced from high-wage jobs are at a major disadvantage in the new market for labour that has emerged since many of these workers first took their jobs. Displaced workers constitute 10 to 20 per cent of the unemployed, or roughly 1 to 2 million workers. Recent evidence on the patterns of earnings losses experienced by workers displaced by mass lay-offs suggests that the losses are significant and long-lasting, especially for those previously employed in unionised industries or occupations (Jacobson, LaLonde and Sullivan, 1993).

III. THE LEVEL OF INVESTMENT NEEDED TO REDUCE THE CURRENT LEVELS OF WAGE INEQUALITY

There have been many proposals for investments in human capital designed to increase the wage levels of the less-skilled. An investment generally yields returns over many years after initial costs are incurred. For human capital, a round, and roughly correct, average rate of return is 10 per cent. Thus, for each $10 invested in a person, the expected annual return is $1. Some claim that this number is lower and some claim that it is higher, but most economists would accept a 10 per cent return as a good starting-point for estimating the aggregate investment needed to upgrade the skills of the low-skilled segment of the workforce.

At this rate of return, to add $1,000 in earnings per year to the average person, it is necessary to make a one-time investment of $10,000 in that person. Using a 10 per cent rate, the investment needed to reduce any annual wage gap is 10 times the amount of the gap.
To put the magnitude of recent developments in the labour market in perspective, consider the following two questions:

1. How much would we have to invest in the US work-force in 1989 dollars to restore real earnings of male high-school drop-outs and graduates to their real 1979 levels? This question is meaningful only for men because real weekly earnings for women have risen or remained roughly constant over the period 1979–89.

2. How much would we have to invest in the US work-force in 1989 dollars to restore 1979 earnings ratios between lower education groups and college graduates, without reducing the 1989 earnings of college graduates?

Using a 10 per cent rate of return, it would require an investment of $25,000 in each high-school drop-out, or a staggering $214 billion in 1989 dollars, to restore male high-school drop-outs participating in the work-force to their 1979 real earnings levels. To restore all high-school graduates to their real 1979 levels would take an investment of $10,000 per high-school graduate, or more than $212 billion in 1989 dollars. This gives a total answer to the first question of $426 billion in 1989 dollars.

The answer to the second question is even larger. Table 1 shows the amount needed to restore the 1979 earnings ratio between high-school graduates or high-school drop-outs and college-educated full-time workers over age 25. To restore real earnings for both male and female workers over age 25 who are high-school-educated or less to their 1979 relative positions with respect to college graduates (holding the latter at 1989 real wage levels) would require an investment of more than $1.66 trillion. These cost estimates are optimistic because they do not consider persons below age 25 or persons who do not participate in the work-force at the current wage levels. They are also optimistic for another reason: few — if any — government training programmes have returns anywhere near 10 per cent. Zero per cent is a much closer approximation to the true return.

One might wish to qualify these calculations in many ways. One might want to adjust down the rate of return as more difficult-to-train persons receive training. Or one might wish to account for the fact that, as persons have their skills upgraded, the real wages of the lower-skilled workers are likely to increase as they become more scarce and the real wages of those with higher skills are likely to decrease as their supply increases. Still, under most plausible scenarios, the costs of restoring skill parities to their 1979 levels are huge.

Investment in human capital may still not reduce income inequality. Raising the skills of a few need not reduce overall inequality. By moving some workers from low-skill to high-skill status, some standard measures of earnings inequality might actually increase. Many programmes train only the high end among the low-skilled workers. Such training efforts could polarise the labour market. In addition, it takes skilled labour to produce skilled labour. A large-scale increase
in training activity might therefore increase earnings inequality in the short run since it would further expand the demand for skilled labour to train the unskilled labour. It takes educated labour to produce educated labour.

Finally, the most efficient training policy may not be to train the unskilled. As first noted by Mincer (1962), there is strong evidence that those who complete more school invest more in post-school training. It may be economically efficient to invest in higher-skilled workers and to alleviate concerns about income and earnings inequality through income transfers or through wage subsidies.

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>Investment in Human Capital Required to Restore Earnings to 1979 Levels and to Restore 1979 Relative Wage Ratios, Using a 10 Per Cent Rate of Return</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>To Restore Earnings to 1979 Levels</strong></td>
<td><strong>Billions of 1989 dollars</strong></td>
</tr>
<tr>
<td><strong>Males</strong></td>
<td></td>
</tr>
<tr>
<td>Investment needed to restore average male high-school drop-out earnings in 1989 to average real earnings of male high-school drop-outs in 1979</td>
<td>214</td>
</tr>
<tr>
<td>Investment needed to restore average male high-school graduate earnings in 1989 to average real earnings of male high-school graduates in 1979</td>
<td>212</td>
</tr>
<tr>
<td>TOTAL</td>
<td>426</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>To Restore 1979 Earnings Ratios</strong></th>
<th><strong>Billions of 1989 dollars</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td></td>
</tr>
<tr>
<td>Investment needed to restore average male high-school drop-out earnings in 1989 to the level needed to achieve the 1979 high-school drop-out/college earnings ratio (holding 1989 college graduate wages fixed)</td>
<td>382</td>
</tr>
<tr>
<td>Investment needed to restore average male high-school graduate earnings in 1989 to the level needed to achieve the 1979 high-school graduate/college earnings ratio (holding 1989 college graduate wages fixed)</td>
<td>770</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
</tr>
<tr>
<td>Investment needed to restore average female high-school drop-out earnings in 1989 to the level needed to achieve the 1979 high-school drop-out/college earnings ratio (holding 1989 college graduate wages fixed)</td>
<td>136</td>
</tr>
<tr>
<td>Investment needed to restore average female high-school graduate earnings in 1989 to the level needed to achieve the 1979 high-school graduate/college earnings ratio (holding 1989 college graduate wages fixed)</td>
<td>378</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,666</td>
</tr>
</tbody>
</table>

Source: Wages are from Blank (1994). We assume workers work 50 weeks a year. The figures on the educational breakdown for the labour force are from Table 616, *Statistical Abstract of the United States, 1992*. We delete all persons out of the labour force and those less than age 25. On these criteria, our estimated investment costs are downward-biased.
However, to the extent that working fosters socially desirable values among those who work, it may still be desirable to invest inefficiently or to subsidise the employment of low-skilled workers in order to promote those values.

IV. THE INEFFECTIVENESS OF PUBLIC TRAINING PROGRAMMES

In this section, I examine the evidence concerning the rate of return to government training. The evidence suggests that the 10 per cent rate of return assumed in the calculations performed in Section III is wildly optimistic. Few programmes earn anywhere near this return.

1. The Summer Youth Employment and Training Program

It has been proposed that the Summer Youth Employment and Training Program under the Job Training Partnership Act be increased. The stated purpose of this programme is to preserve and upgrade the skills of low-income youth during the summers between school terms. The new twist on this programme is that an ‘investment’ argument has been given to support it. Barbara Heyns and her associates have argued that knowledge acquired in schools deteriorates through disuse during the summer (Heyns, 1987). The recent proposals recognise this possibility and suggest that summer youth programmes should be enhanced by learning-enrichment activities.

What are the prospects for success of this programme? A recent evaluation of a similar effort — the Summer Training and Education Program (STEP) — has been presented by Public/Private Ventures, a Philadelphia-based non-profit corporation that evaluates and manages social policy initiatives aimed at helping disadvantaged youth. STEP offered two summers of employment, remedial academic courses and a life-skills programme to low-achieving youth aged 14 and 15 from poor families. The objective of the programme was to reach youth at the crucial ages at which they are deciding whether or not to drop out of school or to become pregnant. Part-time summer work at the minimum wage was supplemented with remedial reading and maths classes and courses on the long-term consequences of drug use, unprotected sex and dropping out of school.

Using randomised trials, 4,800 youth in five cities were enrolled into or randomised out of the programme. Both treatments and controls were followed for eight years. A high-quality evaluation was conducted using state-of-the-art demonstration methods for three cohorts of participants. The findings from this evaluation are disappointing. STEP participants experienced measured short-run gains including increases of half a grade level in their maths and reading competency test scores. These gains held up even after 15 months, though gains in the second summer were less than those in the first. Especially large was short-run growth in knowledge of contraceptive methods.
This short-term promise did not translate into longer-term gains. Three-and-a-half years after their STEP experience, at the ages of 17 and 18, work rates and school completion rates were identical and low for treatments and controls. Some 22 per cent of young women had children and 64 per cent of these were receiving public assistance in some form (Walker and Viella-Velez, 1992).

Since STEP is, if anything, more intensive than the proposed summer youth programmes, this evidence suggests that summer youth programmes are not efficient investments. There is no evidence that they have lasting effects on participants. They may protect the peace, prevent riots and lower the summer crime rate, but there is no firm evidence of such effects.


How effective are current programmes in moving people from welfare to work and in increasing their employment and earnings? LaLonde (1995) addressed this question and his evidence is summarised below along with my own evidence on the Job Training Partnership Act (JTPA).

(a) Adult Women

Employment and training programmes increase the earnings of adult female recipients of Aid to Families with Dependent Children (AFDC). Earnings gains (i) are modest, (ii) persist over several years, (iii) arise from several different treatments and (iv) are sometimes quite cost-effective. Table 2 displays evaluation results for a variety of programmes. For example, participation in an Arkansas job search programme was required for AFDC recipients with children over age three. Participants attended a group job search club for two weeks and then were asked to search as individuals for an additional two months. A programme in San Diego required all AFDC participants to take job search assistance and mandated work experience. The gains were high for participants in both programmes. The National Supported Work Program provided intensive training and job search assistance at a cost of about $16,550 per recipient. The estimated rate of return to this programme was at most 5 per cent — high by the standards in this literature.

The results from the recent experiment evaluating the Job Training Partnership Act (shown in Table 3) corroborate these findings. The largest impacts are for adult women, many of whom were collecting AFDC during their participation in the JTPA. The impacts are not sufficiently large to move more than a tiny fraction of women out of poverty. As a general rule, conventional employment and training programmes are often cost-effective for adult women (especially if the opportunity cost of trainee time is ignored or is sufficiently low) but do not produce dramatic changes in participant earnings.
### Experimental Estimates of the Impact of Employment and Training Programmes on the Earnings of Female Welfare Applicants and Recipients

<table>
<thead>
<tr>
<th>Services tested / Demonstration</th>
<th>Net cost per participant</th>
<th>1990 dollars</th>
<th>Annual earnings gain after:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>One year</td>
</tr>
<tr>
<td><strong>Job Search Assistance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arkansas</td>
<td>140</td>
<td>220**</td>
<td>410**</td>
</tr>
<tr>
<td>Louisville (WIN-1)</td>
<td>170</td>
<td>350**</td>
<td>530**</td>
</tr>
<tr>
<td>Cook County, Illinois</td>
<td>190</td>
<td>10</td>
<td>NA</td>
</tr>
<tr>
<td>Louisville (WIN-2)</td>
<td>280</td>
<td>560**</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Job Search Assistance and Training Services</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Virginia</td>
<td>320</td>
<td>20</td>
<td>NA</td>
</tr>
<tr>
<td>Virginia Employment Services</td>
<td>520</td>
<td>90</td>
<td>330*</td>
</tr>
<tr>
<td>San Diego I (EPP/EWEP)</td>
<td>770</td>
<td>600**</td>
<td>NA</td>
</tr>
<tr>
<td>San Diego II (SWIM)</td>
<td>1,120</td>
<td>430**</td>
<td>NA</td>
</tr>
<tr>
<td>Baltimore</td>
<td>1,160</td>
<td>190</td>
<td>630**</td>
</tr>
<tr>
<td>New Jersey</td>
<td>960</td>
<td>720*</td>
<td>NA</td>
</tr>
<tr>
<td>Maine</td>
<td>2,450</td>
<td>140</td>
<td>1,140</td>
</tr>
<tr>
<td><strong>Work Experience and Retraining</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AFDC Homemaker-Health Care</td>
<td>11,550</td>
<td>460**</td>
<td>NA</td>
</tr>
<tr>
<td>National Supported Work</td>
<td>16,550</td>
<td>460**</td>
<td>810**</td>
</tr>
</tbody>
</table>

*Statistically significant at the 10 per cent level.

**Statistically significant at the 5 per cent level.

**Sources:** Gueron and Pauly, 1991, pp. 15–20; Bell and Reesman, 1987, Tables 3 and 4; Couch, 1992, Table 1.

(b) Adult Men

The evidence for this group is consistent across programmes. Returns are low but usually positive. Job search assistance is an effective strategy but produces only modest increases in mean earnings levels. This programme is worth keeping but I do not think that it will make much of a difference in closing the emerging wage gap.

(c) Youth

Evidence from the JTPA experiment indicates that this programme produces only low or negative impacts on earnings. For male youth, the estimated negative effect is unbelievably large. If taken seriously, participation in JTPA has a more negative impact on the earnings of male youth than participation in the Army,
loss of work experience or the cost of incarceration as measured by many studies. Only the Job Corps Program has a demonstrated positive impact on earnings. It is an expensive programme, costing around $20,000 per participant, with an estimated return of roughly 8–9 per cent. There is some basis for supporting its expansion, but even for this programme the evidence is weak. The evaluation of the Job Corps Program is not experimental. Part of the high return comes from the very large value imputed to human life and the slightly smaller rate of committing murders found among persons who participate in the Job Corps. With lower values placed on lives saved, the gains from Job Corps tend to weaken greatly (see Donohue and Siegelman (1998)).

### TABLE 3
Impacts on Total 18-Month Earnings and Employment: JTPA Assignees and Enrollees, by Target Group

#### Per Assignee

<table>
<thead>
<tr>
<th>Impact on:</th>
<th>Female adults</th>
<th>Male adults</th>
<th>Female out-of-school youths</th>
<th>Male out-of-school youths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earnings ($)</td>
<td>$539***</td>
<td>$550</td>
<td>–$182</td>
<td>–$854**</td>
</tr>
<tr>
<td>Earnings (as a percentage)</td>
<td>7.2%</td>
<td>4.5%</td>
<td>–2.9%</td>
<td>–7.9%</td>
</tr>
<tr>
<td>Percentage employed</td>
<td>2.1%**</td>
<td>2.8%**</td>
<td>2.8%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Sample size</td>
<td>6,474</td>
<td>4,419</td>
<td>2,300</td>
<td>1,748</td>
</tr>
</tbody>
</table>

#### Per Enrollee

<table>
<thead>
<tr>
<th>Impact on:</th>
<th>Female adults</th>
<th>Male adults</th>
<th>Female out-of-school youths</th>
<th>Male out-of-school youths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earnings ($)</td>
<td>$873b</td>
<td>$935b</td>
<td>–$295b</td>
<td>–$1,355b</td>
</tr>
<tr>
<td>Earnings (as a percentage)</td>
<td>12.2%</td>
<td>6.8%</td>
<td>–4.6%</td>
<td>–11.6%</td>
</tr>
<tr>
<td>Percentage employed</td>
<td>3.5%b</td>
<td>4.8%b</td>
<td>4.5%b</td>
<td>2.4%b</td>
</tr>
</tbody>
</table>

*At any time during the follow-up period.

Tests of statistical significance were not performed for impacts per enrollee.

Statistically significant under a two-tailed test:

** at the 5 per cent level;

*** at the 1 per cent level.

(d) Workfare and Learnfare

How effective are the recent learnfare and workfare programmes? An evaluation of two programmes conducted in Wisconsin is of interest (see Pawasarat and Quinn (1993)). One programme — the Community Work Experience Program (CWEP) — required mandatory participation in unpaid community service jobs for non-exempt AFDC participants. A second programme — Work Experience and Job Training — provided AFDC clients with assessment, job search activities, subsidised employment, job training and community work experience. Participants who failed to find employment after completing their education and training were also required to participate in CWEP jobs.

Using randomised trials for one county and non-experimental methods for the rest, researchers found no effect of these programmes compared with existing programme alternatives. The reduction in AFDC participation that is widely cited as a consequence of these programmes is essentially due to the improvement in the Wisconsin economy during the time the programmes were in place. These results are disappointing but consistent with previous studies of the efficacy of such programmes by the Manpower Demonstration Research Corporation (Gueron and Pauly, 1991). Mandatory work experience programmes produce little long-term gain. No cheap training solution has yet been found that can end the welfare problem. Lifting a woman on welfare out of poverty by increasing her earnings by $5,000 per year ($100 per week) will cost at least $50,000. This is the scale of required investment. No ‘quick-fix’, low-cost solution is in sight.

3. Training Programmes for Displaced Workers

As noted above, displacement of older workers with substantial experience in the labour market has become an increasingly important phenomenon in recent years. In response to this trend, Congress passed Title III of the Job Training Partnership Act in 1982 and the Economic Dislocation and Worker Adjustment Assistance Act in 1988.

Although studies evaluating these programmes directly are not available as yet, evaluations of state-funded programmes providing a similar mix of services have been conducted. Leigh (1990) summarises the evidence on a variety of these programmes. Results from some of these evaluations suggest small to moderate wages gains lasting only about a year. A more recent evaluation by Mathematica (see Corson et al. (1993)) of training provided under the Trade Adjustment Assistance Act to workers displaced as a result of foreign trade finds no evidence of any effect of this long-term training programme on the earnings and employment of recipients. Consistent with the other studies of government employment and training programmes already discussed, the overall pattern for programmes aimed at displaced workers is one of weak impacts for most groups.
V. PRIVATE SECTOR TRAINING

Due to a lack of data and a bias in favour of funding studies of government training, the returns to private sector training are less well understood. Studies by Lynch (1992), Lillard and Tan (1986), Bishop (1994) and Bartel (1992) find sizeable effects of private sector training. In comparison with studies of public sector training, most of these studies do not attempt to control for the likely case that more-able persons are more likely to take training, so the estimated rates of return would overstate the true returns to training by combining them with the return to ability. Thus part of the measured return may be due to more-motivated and more-able persons taking training. Estimated initial returns range from 10 to 20 per cent (Mincer, 1993), but they tend to decline after a few years as technical progress renders the training essentially obsolete. To the extent that rapid technical progress in many fields causes the knowledge obtained through training to lose its value after only a few years, fears about the detrimental effects of turnover in the labour market on the volume of human capital investment may be exaggerated.

An important feature of private sector training is that the more-skilled do more investing even after they attain high skill levels. Different types of training and learning have strong complementarities with respect to each other.

Even though the evidence is weak, the direction of the evidence is clear. To the extent that effective training can be produced on the job, it is produced in the private sector and not in the public sector. The best hope of getting reasonable returns from job training is to encourage private sector investment.

It is important to note, however, that private sector training typically excludes low-skilled persons. Firms can be exclusive in a way that government training programmes for disadvantaged workers are designed not to be. The lack of interest of private firms in training disadvantaged workers indicates the difficulty of the task and the likely low return to this activity. Training programmes are an inefficient transfer mechanism and an inefficient investment policy for low-skilled adult workers.

VI. THE CONFLICT BETWEEN ECONOMIC EFFICIENCY AND THE WORK ETHIC

To the extent that there are strong complementarities between different types of skill investments, there is a conflict between policies that seek to alleviate poverty by investing in low-skilled workers and policies that raise the wealth of society at large. Taking the available evidence at face value, the most economically justified strategy for improving the incomes of the poor is to invest more in the highly-skilled, tax them and then redistribute the tax revenues to the poor. However, many people view the work ethic as a basic value and would
argue that cultivating a large class of transfer recipients would breed a culture of poverty and helplessness.

If value is placed on work as an act of individual dignity, because of general benefits to families, communities and society as a whole, then all individuals in society may be prepared to subsidise inefficient jobs. Job subsidies are not, however, the same as investment subsidies. The evidence points strongly to the inefficiency of subsidising investment in low-skilled, disadvantaged workers. Investment may have some additional non-pecuniary returns. In this case, a purely economic evaluation of investment policies may be inappropriate. If, however, economically inefficient investments are to be made, the cost of reducing the skill gap grows beyond the already enormous sums presented in Table 1.

VII. THE QUALITY OF THE EVIDENCE ON CREDIT CONSTRAINTS AND PARTICIPATION IN SCHOOLING AND TRAINING PROGRAMMES

The evidence cited by advocates of training programmes that persons from low-income families have high rates of return to schooling leads them to conclude that credit market restrictions are important factors in generating schooling and training outcomes. Another interpretation is possible, however. Family income as measured in those studies is a proxy for a whole range of background factors, not just short-term liquidity constraints that might be eased by more generous fellowship policies. Persons from poor family backgrounds may attain fewer years of schooling because of diminished family motivation for child learning and because family background may affect the child’s learning ability. Given diminishing returns to schooling, it is not surprising that marginal rates of return are higher for persons who have fewer years of school. At issue is what family income really represents. It is significant in this regard that Murray and Herrnstein (1994) find that, after they control for the effects of a score on a combined achievement and ability test, measured family income plays only a small role in explaining schooling attainment. It appears that longer-term factors such as family background that produce the test score are more important. See the evidence in Cameron and Heckman (1998a and 1998b).

VIII. ALTERNATIVE POLICY RECOMMENDATIONS: CHOICE IN SCHOOLS, TAX POLICY WAGE SUBSIDIES AND ANTITRUST POLICY

In the long run, significant improvements in the skill levels of US workers, especially workers not attending college, are unlikely without substantial change and improvement in primary and secondary education. Mincer’s (1962) evidence
that investment begets investment demonstrates the value of early training in making subsequent training effective. Much of the recent discussion about improving post-secondary education is misplaced when the value of early schooling is put in context.

Methods for improving primary and secondary education receive much attention in current policy discussions but are treated as completely separate issues in discussions of traditional training programmes. Increasing the extent of consumer choice in the educational system would help to realign incentives in the right way to produce more effective schools. Choice among secondary training vendors is an important aspect of the German apprenticeship system (see Heckman, Roselius and Smith (1994)). Advocates of strong government activity in the training area do not consider the failure of governments to provide adequate skills to students.

Current tax rules tend to promote human capital formation (see Quigley and Smolensky (1990)). However, there is much evidence that they discriminate against low-skilled and disadvantaged workers. Firms can immediately write off all of their training expenditures; they do not have to be amortised like investments in physical capital. This favours investment in human capital over investment in physical capital. In addition, training expenditures can include tuition paid by employers for each employee up to $5,250 per year, though tuition support is restricted to undergraduate-level education (US House of Representatives, Joint Committee on Taxation, 1992). Since many community colleges qualify as undergraduate institutions, there is an incentive for firms to sponsor vocational training. The bias in the tax code favours vocational training over academic education.

Because tuition paid by employers is exempt from federal personal income tax, individuals have an incentive to seek training on the job. Additionally, portable vocational or employer-based training can be sold to employees by firms and paid for by lower wages. The forgone higher earnings are de facto written off on personal income taxes. To the extent that direct costs of books and educational materials are paid for by lower wages, current tax laws favour on-the-job training activities over off-the-job training activities. Thus they act to shift human capital investment activity away from formal schools and toward workplace environments.

Conversely, individuals cannot write off direct tuition costs for formal schooling if it is not expressly job-related. Write-offs are not given for training in skills useful in other jobs. Thus workers training to switch occupations cannot write off their educational expenses for this activity. Moreover, there is a floor level of training and education expenditures that must be met before persons can write off such self-investment activity. To be eligible for this tax break, it is necessary to itemise deductions and to incur training costs that exceed 2 per cent of adjusted gross income. This tax policy is likely to bias human capital
accumulation toward vocational over academic training, because vocational training is typically more narrowly defined and justifiable.

Since 1986, persons have been unable to deduct interest on educational loans from their taxable income. This removes an important incentive that promotes investment in human capital of all forms (Heckman, 1976). However, since mortgage interest is still deductible, it is possible for persons with home equity to take out mortgages to finance their education or that of their children or to rearrange their portfolios toward mortgage debt in order to finance educational loans.

The tax code for individuals favours human capital accumulation for higher-income persons (and their children) who itemise their taxes and have equity in their homes. Low-income persons who pay no taxes receive little encouragement to invest in human capital from the current personal tax code. However, firms that employ them may write off training expenditures devoted to them. The personal tax code thus encourages low-skilled workers to make training investments on the job. It does not encourage investment in general skills or academic education except for company tuition programmes. Unfortunately, these programmes (defined under section 127 of the 1988 Tax Code) have not received consistent treatment by the tax authorities. In recent years, companies have operated under uncertainty whether or not section 127 would apply to them in a given tax year. Tax policy is an attractive option that should receive more attention in future policy discussion about stimulating skill formation. The recent evidence by Heckman, Lochner and Taber (1998a and 1998b) suggests that movement to a consumption tax will raise earnings but primarily through its effect on capital and hence the demand for labour, and not through its effect on human capital accumulation.

The evidence on government training programmes previously summarised suggests that they can make at best only a modest contribution to aggregate human capital formation. Given the strong evidence of complementarity between schooling and training, it may be more efficient to focus training on high-skilled workers, and then use the tax system to transfer resources to the less-skilled through wage subsidies or inefficient investment. If the goal is to raise their incomes, the extra surplus generated through more efficient investment can more than compensate low-skilled workers for the training they forgo.

Support of co-operative activity among employers could allow firms within an industry to overcome free-rider problems in the provision of general training by contracting to provide similar levels of industry-specific training or general training to their employees. This suggests a role for antitrust policy that is rarely mentioned in discussions of training strategy.
IX. A LIFE-CYCLE PERSPECTIVE

Economic theory demonstrates that the returns to human capital investments are greatest for the young. This is so for two reasons: (i) younger persons have a longer horizon over which to recoup the fruits of their investments and (ii) skill begets skill. Early learning facilitates later learning. At the same level of ability, it pays to invest in the young.

Surprisingly little empirical evidence is available on the returns to early childhood investments. Early childhood interventions of high quality appear to have lasting effects. Despite very small samples, disadvantaged subnormal children randomly assigned to the Perry Preschool Program have higher earnings and lower levels of pathological behaviour in their late 20s than do comparable children randomised out of the programme (see Schweinhart, Barnes and Weikart (1993)). Reported cost–benefit ratios are substantial. Evidence on Head Start is less clear but the programme is quite heterogeneous. These programmes do not boost IQ but they do appear to foster valuable social skills that enhance performance in society at large and in the workplace.

At the same time, remedial skills programmes for young adults with severe educational disadvantages seem to have negligible effects, as do training programmes for more mature displaced workers. The available evidence clearly suggests that adults past a certain age or below a certain skill level make poor investments. Transfers or wage subsidies to employers make more sense than investments for such persons. See Heckman (1998) for amplification and development of these themes.

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