

## THE IMPORTANCE OF INCLUSION AND THE POWER OF JOB SUBSIDIES TO INCREASE IT

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## INTRODUCTION

Wide access to a career and a livelihood in society's mainstream economy is again a subject of discussion among economists and sociologists. Great value is placed on the opportunity of working-age people to obtain rewarding work in the formal economy and to earn enough in such jobs to be self-sufficient – twin conditions for what is often termed *economic inclusion*.<sup>1</sup> A decline of inclusion generally falls most heavily on the economically disadvantaged, whose pay and employment rates are normally the lowest. Take a shock causing declines in the “demand price” of labour at all wage levels. Even if all resulting wage rates fell equiproportionately, the pay cuts would present the severest challenge to the lowest paid: their cushion of assets relative to their wage rate is thinner, since they are more often unemployed, and their cushion of discretionary spending is thinner too. Further, even if the unemployment rates in all labour groups rose equiproportionately, less qualified workers, in having the highest unemployment rate, would suffer the largest absolute increase in their unemployment rate – the largest layoff relative to their number in the labour force, hence the largest proportionate decrease in employment – and it is the unemployment rate that matters to a group, not its relative unemployment rate.<sup>2</sup>

Inclusion is again an issue because, mostly in the 1980s, a deep decline of inclusion, particularly among less qualified workers, swept over the advanced Western economies. No country in the OECD entirely escaped it and none has entirely recovered.<sup>3</sup> The gap between pay at the low end of the labour market and median pay widened markedly, accompanied by a decline in participation and a rise in unemployment of less educated men. The economy where the widening of the gap was somehow resisted, Italy, and the economies where the gap was actually compressed, France and Germany, apparently paid a stiff price – a far greater rise of unemployment and fall of participation among less-educated men over the 1980s than in the other advanced economies (Figure 1).<sup>4</sup> In the first half of the 1990s France and Germany again compressed low-end pay and again saw the steepest rise in unemployment of low-skilled labour (Figure 2).

Both figures suggest an adverse shift of what may be called the *inclusion frontier* relating the relative wage in the *lowest-paid* ranks to substantially the same workers' absolute unemployment rate.<sup>5</sup> The latter is a measure of the frequency with which workers join or are discharged into the unemployment pool multiplied by the

Figure 1. **A glimpse of the inclusion frontier**  
Late 1970s – mid 1990s

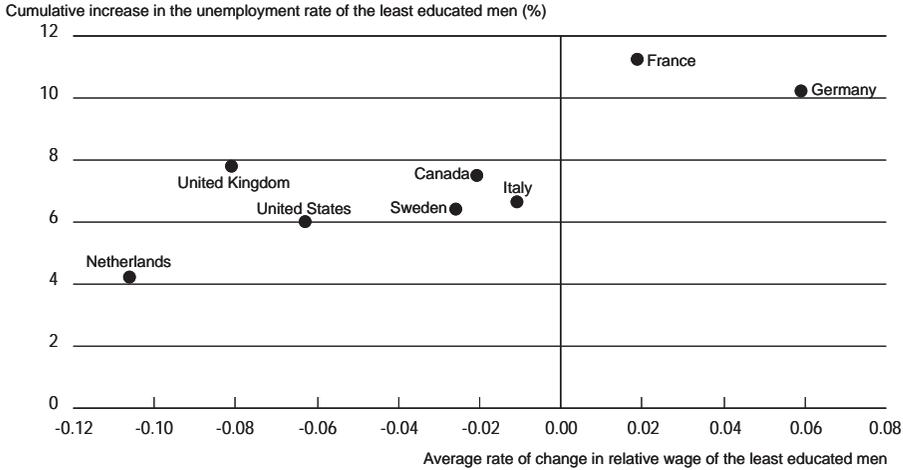
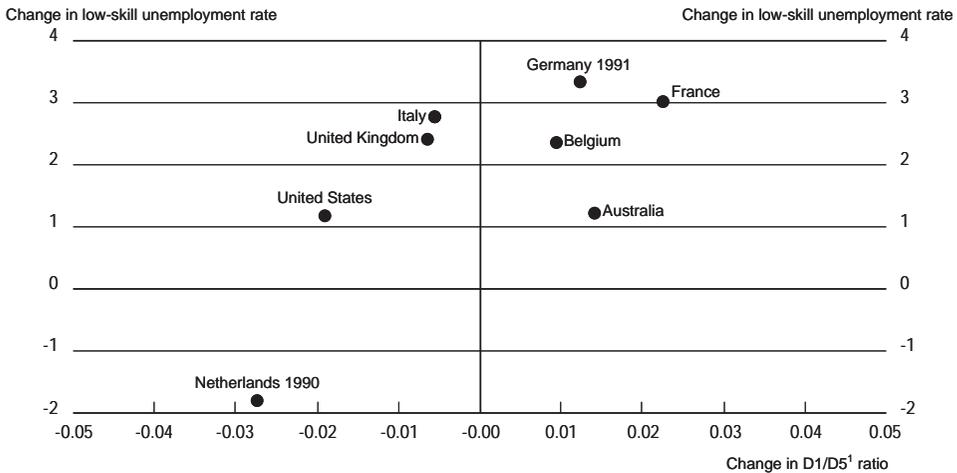


Figure 2. **Change in low-skilled unemployment rate and earnings distribution**  
1989-1995



1. D1 and D5 refer to the upper earnings limits of, respectively, the first and fifth deciles of employees ranked from the lowest to highest.

waiting time that entrants into the low-wage job pool must expect before being called to a job. The two data, the relative wage of the low-paid and the proportion of the time they spend in unemployment, express their degree of inclusion.

This paper aims to do four things. First, it sets out the best existing understanding of the forces and channels behind the deterioration of inclusion in the West. Without some consensus on the mechanisms affecting inclusion little agreement on solutions can be expected. Second, it tries to articulate why inclusion is a distinctive and important goal for social policy to foster. Third, going to particulars, it argues that a low-wage employment subsidy to firms is an effective way to boost both components of inclusion – pay and employment. Finally, it asks whether such employment subsidies are cost-effective in the sense of promising better results than other subsidies or government programmes having the same cost. In a very short space this paper cannot do all of these things very well but at least it can begin the discussion.

## HOW WAS THE DECLINE OF INCLUSION CAUSED?

We had better know the explanation of this deterioration before we prescribe cures. My own model for this purpose, with incentive wages and a capital market, has gained converts.<sup>6</sup> It portrays the equilibrium course of the economy from given present conditions along which employment must at each moment be just low enough in relation to labour supply (*i.e.* unemployment is just high enough) that the upward pressure on wages will be confined to what employers can afford to pay without laying off or stopping their hiring. If something now happens (say a rise in workers' assets and the income therefrom) to add to wage pressure at all unemployment levels (thus changing present conditions), the equilibrium path of employment is shifted down and the wage path pushed up. If a shock (say a rise in the cost of capital) reduces the wage that employers can afford to pay, the equilibrium employment path is shifted down and the wage path down.<sup>7</sup>

Viewed through this model, most or all of the decline of inclusion in the West was apparently driven by macro-structural developments. The extraordinarily low unemployment rates in continental Europe in its "glorious years" from the 1950s to the mid-1970s were the result of special circumstances: First, the austere level of non-wage private incomes relative to productivity that was a legacy of the war kept wage pressure low enough to permit very high employment; and the sprint of productivity, especially on the Continent as it moved to catch up with best technical practice in the US, and the sprint of productivity caused wealth to lag further behind, caused wealth to fall farther behind wages, which lowered wage pressure more. Second, rapid productivity growth came to be built into employers' expectations with the result that the cost of capital (net of expected productivity growth) fell to a very low level, which sparked still more hiring.<sup>8</sup> The US was less blessed in

both regards, so its unemployment rate never matched the lows reached in Europe. Yet the post-war structural boom could not last. After new laws in the 1960s added to the social wealth of welfare entitlements and boosted unemployment pay for job losers, some upward wage pressure resulted in the early 1970s, unemployment rates moved generally higher and profit shares generally lower. As the technical catch-up neared completion in one country after another in the 1970s, expected future productivity growth slowed from its breakneck speed to a normal pace; the resulting rise in the net cost of capital (net of the productivity growth rate) dampened hiring and the resulting slowdown of paycheques relative to wealth generated upward wage pressure. Finally, the sudden elevation of the world real rate of interest early in the 1980s had the same effects. (In the US there was no such catch-up, but there was a substantial though lesser productivity slowdown from 1974 until 1994.) The two-fold rise in the cost of capital, in dampening the “demand price” of labour, reduced wage rates relative to productivity as well.<sup>9</sup>

The above shocks damaged inclusion in every social group, since it led to greater unemployment throughout the labour force – in the high-education groups as well as the low-education groups.<sup>10</sup> However, as noted earlier, not only was the absolute increase of the unemployment rate generally greater at lower education categories; with few exceptions in the OECD, even the *proportionate* increase in unemployment rate and the proportionate decrease in *wage rates* were greatest in the lowest education category. I believe that two of the “macro-structural” developments struck the earning power of the less educated with disproportionate force and that these biases explain a large part of the unequal incidence just described.<sup>11</sup> First, the rise in the net cost of capital hit hard the less educated since hiring them posed greater investment costs relative to their wage for potential employers than more qualified workers did, so the wages that employers could pay the former had to fall proportionately more. Second, the income from private wealth has risen proportionately far more in the lower ranks of the labour force than in the upper ranks (the assets of the less educated rose in many cases from near-zero) and, of even greater importance, the benefits from *social* wealth (social insurance and social assistance) rose steeply from the 1960s into the 1990s in most countries. At the same time poor families shared fully in the slowdown of productivity. As a result, particularly in low-productivity areas, especially in Europe, work simply “does not pay” for as many as it did decades ago – in 1929, 1939, 1959 and 1969.<sup>12</sup>

As the inclusion frontier contracted for those working-age groups most challenged by the difficulties of gaining self-supporting work in the mainstream economy, the question arose of how the government could best respond. Until recently the discussion focused on the optimum position to assume on the two horns of the dilemma. One camp advocated moving away from union-set pay scales or statutory minimum wage rates propping up pay at the low end, saying that these “rigidities” destroyed jobs and thus operated to expand dependency or increase

the underground economy. The other camp opposed moving to greater employment through increased "flexibility", saying that a fall of low-end pay rates or of social transfer payments would widen income inequality.<sup>13</sup> The latter view accepts lower employment in return for higher pay at the low end while the former would trade off some pay for more jobs. Some at the low end will lose from the one, others from the other. But there ought to be a better way. And there is.

It is now dawning on policy discussion, in Europe and to some extent in America, that countries can engineer a reduction of unemployment *without* a sacrifice of low-end pay or a rise in low-end pay rates *without* a sacrifice of employment (or some of both). This can be done by means of tax-subsidy measures that produce a favourable *shift* of the inclusion locus. Already several countries have introduced, some many years ago, fiscal programmes aimed to do just that, though generally on a small scale and often targeted at particular sub-groups in the low-wage population. Taking such a step on a large scale – large enough to make a big difference – involves a paradigm shift in political economy that some policy makers are not yet ready to take. I want now to discuss the "philosophy" of this step and then take up the particulars of the fiscal programme of this kind that I have recently proposed.

#### WHY IS THE DECLINE OF INCLUSION A PROBLEM FOR SOCIAL ACTION?

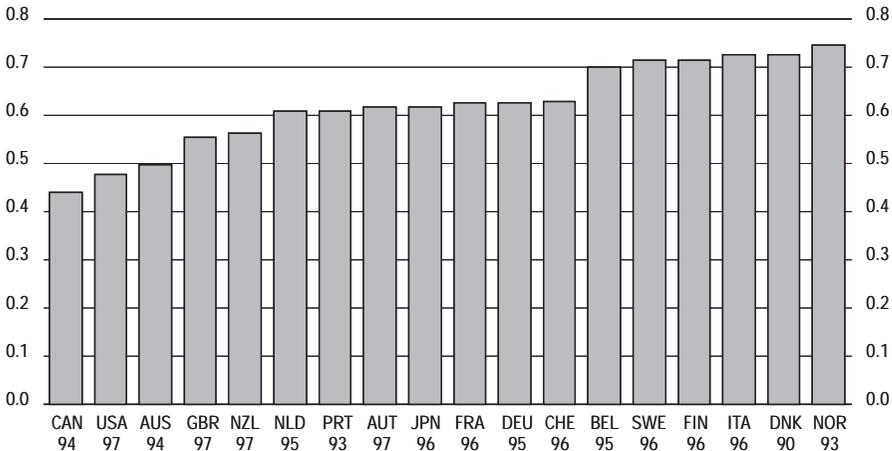
Some observers view low inclusion as not a phenomenon appropriate for *social intervention* – not something to be corrected through collective action by the state. The reply to that position, which dates back to the 18th century Enlightenment, is that a democratic country's formal economy is a project for citizens' mutual gain so the accessibility of this project and the meaningfulness of the terms it offers participants are a legitimate object of social policy. Some of the classical economists, with their notion of consumer surplus, said that a mutual gain results from the economic cooperation of a society's members, an idea revived in the Progressive era. A formulation survives in some textbooks today: Just as the gains from foreign trade *could* be made to benefit everyone, if necessary with the help of redistributive taxes and subsidies, so all workers interlinked in a large society's market economy enjoy wages rates superior to what they would earn if they worked alone or in homogeneous teams – at least, superior wage rates *could* be arranged through fiscal tools. So there is a *social surplus* that society can distribute in any one of a great many different ways to the diverse kinds of workers without leaving any group with no gain over what it could have if it broke away.<sup>14</sup> The surplus could be used to add to the rewards of participants who would earn little under *laissez-faire*. It could also be used to boost the wage of those who need a bigger reward to make it possible to participate.

In present times, more attention is given to the *negative* interactions among people if an entrenched underclass is allowed to develop: *all* suffer a loss of amenities – unsafe streets, drug use among youth, public health hazards, high tax

rates for social assistance, and so forth – if large numbers of working-age people are marginalised from work and self-support.<sup>15</sup> A central part of my book *Rewarding Work* (1997a) argues that the benefits from reducing these *negative externalities* through low-wage employment subsidies that draw the marginalised into regular work and self-support would come close to covering the cost of the subsidies.<sup>16</sup>

To commentators unmindful of the classic lines of thought reviewed above, however, deficient inclusion is nothing more than an instance of income inequality and, for some, not the most serious inequality either (if bad at all). On the seriousness issue, it is true that in several countries pay rates are estimated, upon controlling for a range of factors such as education, to discriminate against both women and blacks. Of course it rankles that there should be a systematic pay difference between two apparently equivalently prepared subgroups and we must all be sensitive to the historical background of extreme racism and sexism. Yet the extant pay differentials of this kind are no longer garish and they appear to be still trending downwards.<sup>17</sup> By contrast the percentage gap between the tenth percentile wage and the median wage is huge in the US and quite wide in a great many other Western economies (Figure 3).<sup>18</sup> Furthermore, even in those OECD countries that have shown a degree of recovery in recent years there is no broad sign of a significant narrowing of this gap.

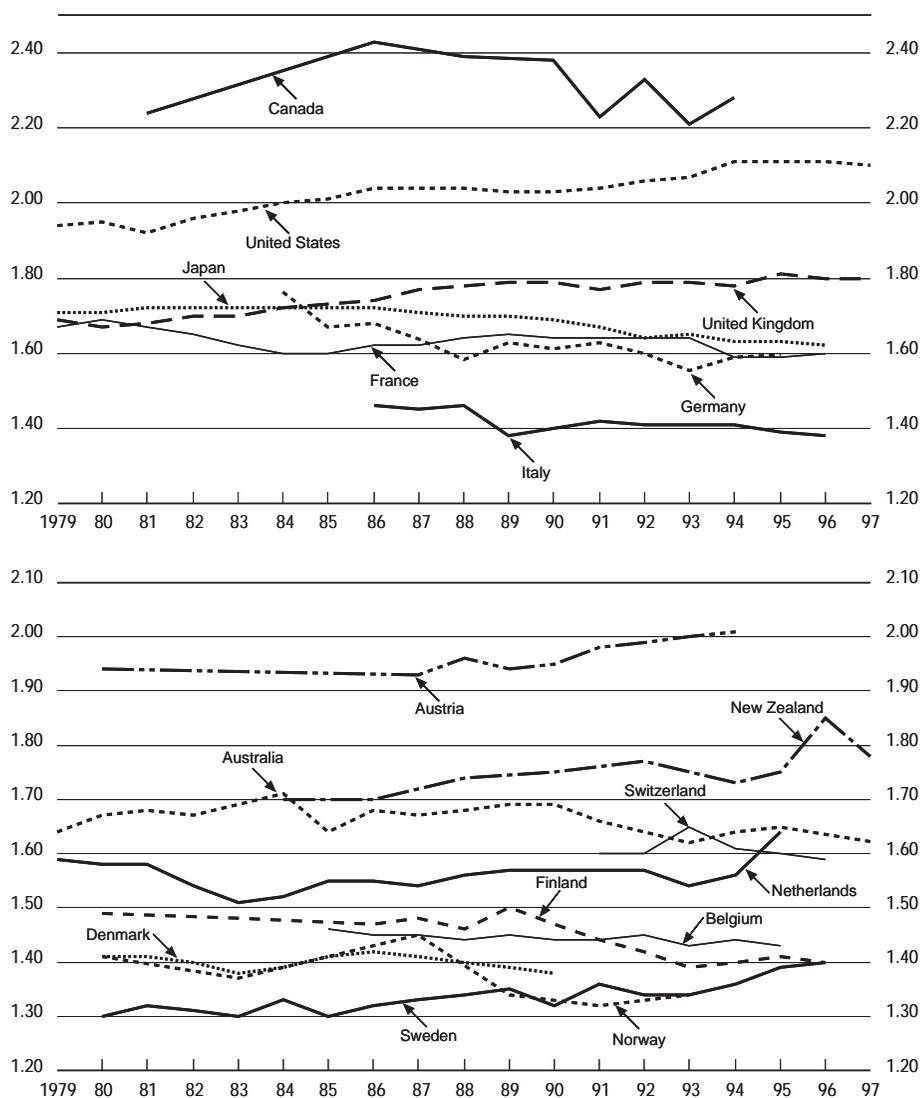
Figure 3a. Trends in wage rate dispersion<sup>1</sup> D1/D5,<sup>2</sup> males and females, 1997



1. For Canada, Austria, Finland, New Zealand and Norway the data have been interpolated for missing years.  
 2. D1 and D5 refer to the upper earnings limits of, respectively, the first and fifth deciles of employees ranked from the lowest to highest.

Source: OECD Secretariat.

Figure 3b. Trends in wage rate dispersion<sup>1</sup> D5/D1,<sup>2</sup> males and females, 1979-97



1. For Canada, Austria, Finland, New Zealand and Norway the data have been interpolated for missing years.
2. D5/D1 refers to the ratio of wage rates at the breakpoint between the fifth and sixth deciles and the breakpoint between the first and second deciles.

Source: OECD Secretariat.

On the basic issue, critics' reduction of disinclusion to an instance of inequality, the point is that a deficiency of inclusion – too few employed in society's central economic institution, the market economy, or too few of the employed able to support themselves by working in it, even full-time – has social effects beyond income inequality, wage inequality and inequality in general.<sup>19</sup> *Rewarding Work* points to several functions of jobholding. For most people, having a job most of the time is crucial in its own right, independently of the resulting income: that is because having work is their main chance to exercise their abilities, to achieve something; and working with others is their main means to personal development. For a great many people, participation in the economic mainstream adds to their sense of belonging to their society; they want to be a part of society's projects and the development of the economy is one of them, perhaps the most intriguing one. Finally, earning one's own way – making enough to support one's self at a decent level by society's standards and to be a part of community life – is hugely important for people's self-respect.<sup>20</sup> One might think that all this is commonplace wisdom. "Yet", as Derek Bok said, "we continue to talk ... as if income statistics captured the phenomenon in some meaningful way".<sup>21</sup>

By its nature, then, the inclusion problem cannot be solved by "throwing money" in the form of *transfer payments* to those not included. Receiving income support from the state does not make one a contributor to society's economy and a member of society who works for what he has. When the OECD governments expanded the system of entitlements offering transfer payments under various contingencies (illness, reaching a certain age, etc.), they were meeting a desire of the electorate for greater security – not for greater inclusion, which had been rising in the post-war decades and which was already pretty broad in several of these countries. Unfortunately, these programmes have lessened inclusion. That must be so if recent studies are right in confirming that what lies behind the inclusion difficulty faced by many working-age people – their low pay rates in relation to their other resources, their low participation rates and their high unemployment rates as a result of their poor morale – is their low marginal productivity after taxes and any subsidies *relative* to the benefits from their private assets and their entitlements. To legislate still more government transfer payments would worsen the inclusion problem by making jobholding less competitive as a means of supporting one's self and thus lowering participation and increasing unemployment, especially among working-age people with relatively low earning power.

By the same logic, the spread of the underground economy does not solve the problem either. The underground economy, like the welfare state, shrinks and damages the formal economy by weakening performance incentives in formal jobs and weakening the incentive to participate in the formal economy. Working underground may be socially preferable to *welfare*, since at least something is

produced, but it is a poor substitute for a job in the legitimate economy. Like the domestic economy of paid housework, the underground economy functions as an escape valve that drives unemployment in the legitimate economy above the level it would have if there were no such escape from unemployment.<sup>22</sup> If that is right, the underground, far from offering a welcome *cushion* of alternative work for people viewed as having irrevocably lost the possibility of employment in the formal sector, ultimately substitutes its inferior jobs – dead-end jobs, jobs with poor conditions that would once have been passed up, jobs that are viable only because of tax evasion and other criminal acts, all work activities that were once rejected – for the good jobs that would otherwise have been created in the formal economy. The personal and social effects of this development may be nearly as stultifying and pernicious, I believe, as the effects of drawing upon the entitlements of the welfare state. However, the toleration of the explosion in welfare entitlements and the expansion of the underground economy are parts of the *problem*, not solutions.

Finally, I would add that the value of careers in the formal economy depends on the stimuli provided by its organisation along capitalist lines. Any country can achieve full employment and high relative wage rates at the low end by sacrificing private enterprise and foregoing decentralised wage setting. The Soviets did it through central wage setting and state-enterprise toleration of employee shirking, absenteeism and alcoholism. Yet that system could not offer the job satisfactions and personal growth obtainable from stimulating jobs and motivating pay. In capitalism, owing to its unplanned and entrepreneurial nature, careers have unforeseeable turns. Most people relish and learn from the novel challenges and changing opportunities presented, and they compare it favourably with the bureaucratic sector. The right objective, therefore, is wide inclusion in *private enterprise*, not more work and better pay anywhere at all. And worthwhile inclusion requires jobs offering real engagement in firms – preferably career-track jobs and in any case full-time jobs, so there is serious involvement with the firm and its workforce rather than just a peripheral and ephemeral presence.

It should be commented that policy measures unshackling private enterprise from *harmful* regulations and harnessing their productivity through *helpful* regulations, to the extent those measures speeded up productivity growth, would usefully boost inclusion as a side effect. An acceleration of productivity in European business would bring a partial recovery of inclusion, reversing the decline due to the deceleration decades ago. Yet it would be unrealistic to suppose that governments could find a way to return to the record-breaking productivity growth rates of the “glorious years”. So such an attempt to restore inclusion to its level in the 1960s would not reach the goal of restoring inclusion to the level of the glorious years. That is why another policy tool must be deployed.

## GRADUATED (AND LUMP-SUM) EMPLOYMENT SUBSIDIES

Moving from the general to the particular, we now consider employment subsidies as a tool with which to expand inclusion. How would they work? More precisely, what, in the terminology of fiscal theory, is their incidence on pay rates and unemployment rates, in particular the unemployment and pay found at the low end of the labour market? We may as well stick with incentive-wage models, since incentive problems are pandemic in labour markets while, in some countries, collective bargaining is narrowly confined; in any case, models containing unions do not give inherently different results. Since the OECD economies are all open, it is natural to focus on the open economy, for simplicity, the small open economy – one small enough that it has no perceptible effect on external real interests.

For ease of exposition it is useful to start with a *constant* subsidy – a lump-sum subvention in real terms for every employee regardless of productivity and pay – *not* a proportional one. All tax rates are held constant to begin with; then the effects of alternative financing are brought in. Labour force and employment refer to the formal economy. The former is taken to be fixed, as if there is no domestic economy and no underground. Jobs are supposed to be full-time. The *pay* rate (per day or week) will denote the paycheque, or *net wage*; adding the payroll tax and subtracting the employment subsidy gives the cost of labour, or *gross wage*. Unless otherwise indicated, the analysis will refer to the short run, in which the income from wealth owned by workers is taken to be given; but long run implications will sometimes be addressed.

The employment subsidy adds a component to the firm's proceeds from each worker in its employ, thus an increase in the marginal revenue product of labour inclusive of taxes and subsidies. Hence the subsidy shifts up the *labour demand* curve in the employment-pay plane; the number of employees demanded increases at every pay level. The curve shows the labour demanded to be decreasing in the pay rate – equivalently, the “net demand wage” is decreasing in employment – since the pay rate employers can afford is greater the higher unemployment rate, given the labour force.<sup>23</sup> As noted above, in modern models based on incentive pay to cope with quitting, shirking and other employee motives, the current equilibrium level of unemployment is determined by the intersection of the labour demand curve with the *wage setting* curve; the associated volume of (involuntary) unemployment is given by the distance between the labour force and the wage-setting curve at the equilibrium pay rate. In such models, the afore-mentioned labour demand shift pulls the economy up the wage-setting curve, reducing unemployment and pulling up the pay rate.<sup>24</sup> Models based on union bargains give similar results. Neo-classical supply-demand analysis, which implies full employment under equilibrium conditions, reaches the analogous result that the labour-demand shift pulls up pay and the size of the labour force, hence also employment.

As long as we hold tax rates unchanged and confine attention to the case of the constant subsidy, it has no more effects. The wage setting curve in terms of the pay rate (the net wage) is not shifted by the lump-sum subsidy to employers. Hence the effects brought about by the labour demand shift are the sole effects on employment and pay. It might go without saying that, with workers rankable by respective productivities, the constant subsidy drives up a worker's pay proportionately more the lower the worker's productivity and, on reasonable assumptions, pulls unemployment down by a larger absolute amount the lower the productivity.

Some results may differ once we bring in the change in tax rates made to finance the constant subsidy. If the subsidy is financed by an additional tax on *non-wage incomes and benefits*, the upward shift of the labour demand curve will be *reinforced*, since quitting, shirking, etc. is dampened by a reduction in the cushion provided workers by the after-tax returns, services and benefits from their assets and entitlements; moreover the wage-setting curve shifts down, since the marginal benefit (the reduction of quitting, etc.) to employers of a small increase of the pay rate is diminished now that non-wage income is reduced. These results imply an unambiguous increase in employment at all productivity levels in the labour force. The effect on pay rates is either a general rise or a general fall, but which outcome results cannot be theoretically determined without knowledge of several of the parameters of the model. (Similarly, the welfare state reduces employment unambiguously but its effect on pay rates is ambiguous.)

What if, instead, the subsidies are financed by an increase in the proportional tax rate on *payrolls*? From an aggregate viewpoint, the upward shift in the labour demand curve is erased: the downshift caused by the tax increase exactly offsets the up-shift caused by the subsidy. However, for those wage earners at the low end of the market, the increase in the payroll tax collected relative to their wage is the *same* as for everyone else, since the payroll tax is proportional, while the constant *subsidy* as a ratio to their wage is *larger*, so the demand curve for their labour is unambiguously shifted *up*. At the same time, the low-end workers' wage-setting curve is shifted *down*, since, with the payroll tax higher, a given increase in the pay rate would impose a greater increase than before in the employer's labour cost, wage and non-wage costs included. So employment is unambiguously pulled up at the low end of the market while there are two opposing effects on the pay rate. But if the labour demand curve is flatter than the wage-setting curve, a condition apt to be satisfied in open economies, or if the wage curve shifts down by less than the demand curve shifts up, the empirical result will be an increased pay rate too. Furthermore, bear in mind that whatever the size of the downward shift of the wage setting curve, its pay effect is just one side of the coin; the other side is the positive employment effect that the pay effect induces – an employment effect on top of what the upward shift of the labour demand curve produces. These twin wage-curve effects are a movement *along* what was dubbed earlier the inclusion frontier – and,

economists agree, in the right direction for those countries in Europe whose policies and institutions appear to keep the cost of labour higher, and thus employment lower, than what can possibly be justified by Paretian economic efficiency. In any case, the main point is that the inclusion frontier is *shifted*, and in the right direction, by the lump-sum subsidy through its salutary boost to low-end labour demand.

The above analysis points to a *contraction* of labour demand at wage levels above the mean, where the effect of the payroll tax on labour demand outweighs the demand effect of the subsidy. That shows that when the extra lunch in the lunch pail of the low-end worker comes from a subsidy *financed by payroll tax* it is not a free lunch: no matter how many lives may be saved by the reduction of low-end unemployment, through the ensuing reduction of homicides and drugs, there is an efficiency loss at wage levels above the mean. But Pareto himself would not have objected to a small increase of unemployment among higher-wage people if they and their children were compensated by reductions in the risks of homicide, theft, drug abuse, etc. brought about by the (larger) decrease of unemployment in disadvantaged communities where it was causing social pathologies. Moreover, the implications just discussed are *short-run*. In the models being examined here, the increase in the payroll tax rate, taken alone, is *neutral* for employment rates in the *long run* – provided social policy allows it to be by gearing social benefits to pay rates. The *tax rate* ultimately leads to a decline in private assets and thus in the wage curve sufficient to bring an accommodating decline of pay rates such that unemployment rates are restored to the reduced levels achieved by the subsidy “before” introduction of the tax. In contrast, the employment effect of the *subsidy* is eroded but not fully erased by the accumulation of private wealth it induces.<sup>25</sup>

A *graduated* employment subsidy has the obvious merit that the budget for it is free to be targeted on the workers with the lowest wage rates and thus, typically, the highest unemployment rates. The subsidy at low pay rates is not yoked to the subsidy at high pay rates at a great fiscal cost entailing a large increase in tax rates. On this count, the graduated subsidy does not suffer the poor “cost effectiveness” of the lump-sum subsidy. But a flexible subsidy, graduated in a progressive way, could score badly in other respects unless some care is taken to avoid the hazards.<sup>26</sup>

These hazards arise from the fact that, in the spectrum of earning power from the low end on up, the graduated subsidy creates a range, large or small, within which an employer’s decision to lower an employee’s pay rate would bring in a larger subsidy – or would cause the employee to earn a subsidy who would otherwise have been out of the subsidy range. This points to the risk that if the subsidy decreases rapidly with the pay rate, some workers out of range would see their pay cut not merely because the payroll tax rate has been increased but because in addition they are jumped into the subsidy range. It may be no consolation to them to explain that their unemployment rate will fall correspondingly farther as a side effect. But, fortunately, the subsidy can be graduated to the pay rate slowly enough

that, for *all* employees, the negative effect on an employee's pay on account of the employer's incentive to gain a higher subsidy does not offset the positive effect on pay on account of the subsidy earned.

There is another graduation effect arising from the fact that over a range a small pay increase contemplated for incentive reasons would have a smaller total benefit to the firm than before, since it would diminish the subsidy brought in by the employee. Taken alone, this effect of the graduation makes the wage curve of workers within this range shift down. The effect does not operate at the bottom of the subsidy schedule, where a cut of the wage would not yield an increase in the subsidy; so workers at the low end of the labour market will not see that effect. In any case, we have here a second channel through which the subsidy, here the graduated subsidy, boosts employment at the price of reduced pay – though *not* at the bottom of the wage scale. This effect is to be added to the effects that boost employment *and* boosts pay rates. It is possible that in some medium-low range of pay rates the subsidy's graduation effect lowers pay rates more than the subsidy's labour demand effect raises them; it is also possible the net result is the opposite. Again it is necessary to stress that the affected workers here get something in return for the negative graduation effect on their pay rates: they get an extra boost to their employment. Some subset of them may view that outcome as a net loss to them even if it is an efficiency gain for the economy. Obviously this effect can be moderated by adopting a slower rate of graduation of the subsidy. Of course, a less graduated subsidy either costs a larger budget or offers a smaller subsidy at the low end.

## EMPLOYMENT SUBSIDIES VERSUS OTHER SUBSIDIES

Recently some governments have begun low-wage employment subsidies as a device to boost the structural-equilibrium volume of employment among low-wage workers and, it is believed, pay rates as well.<sup>27</sup> Yet legislating employment subsidies has faced an uphill struggle against several extant programmes that are seen as fostering inclusion equally well or better.

A premise of traditional thinking has been that there is little or nothing that governments can do to engineer a *market outcome* offering better pay and employment at the low end of the market. In this view what can be done is to *interfere* with the market through statutory minimum wage legislation in order to raise pay rates among low-paid workers able to obtain employment. In standard economic theory, though, this intervention poses a cost: leaving aside pockets of monopsony power here and there in the economy, the rise in pay must come at the cost of reducing the number of workers that can be profitably employed; increased employment by the state is apt to crowd out private-sector employment, enough so that little or none of the decrease of employment is averted. If the jobs of some are being

traded off for a raise in pay to those fortunate enough to keep their jobs, the minimum wage is objectionable on moral grounds. And if, further, the proponents of the minimum wage are wrong that there is no other way to pull up pay, the result can be objected to on efficiency grounds as well.<sup>28</sup>

Orthodox opinion has long endorsed social assistance and social insurance benefits in order to lessen the pain of joblessness and relatively low pay and, implicitly, to lessen resulting social unrest and social pathologies, which are costly for others. There is now some statistical evidence and some persuasive social analysis suggesting that this welfarist response – even if some of its actions are quite justified to a point – operates perversely to worsen the phenomenon it is responding to. Time-series studies of Italy, the UK and the US all find social-welfare spending to be a statistically significant and not unimportant force driving up unemployment rates within low-education groups at least, where social benefits loom larger relative to pay rates than is the case farther up the education ladder.<sup>29</sup> Several commentators have also argued that the ethos of the welfare state, with its focus on security and comfort instead of self-reliance and achievement, operated (to varying degree in various countries) to weaken the sense of initiative and energy found in poor communities.<sup>30</sup> Even if these ill effects are exaggerated, welfarist thinking has been an obstacle to consideration of possible *remedies* for the low pay and employment of the less advantaged.

An approach to the inclusion problem receiving strong support in some quarters is tax relief for *low-income* recipients. Proposed tax relief for workers earning low wage income often takes the form of *income-tax* reduction in the lower tax brackets. Such tax relief is seriously cost-ineffective next to graduated employment subsidies owing to the way that personal income tax liability is formulated. The budgetary cost of graduated employment subsidies is only the disbursement of the subsidies to the firms employing low-wage earners, since high-pay employees are ineligible for such subsidies from the first euro earned, while an equivalent disbursement of income-tax relief in the low brackets – for example, the first \$16 000 of annual income – will cost the government the loss of tax revenue on *all higher* earners' first \$16 000. The increase in tax rates on higher incomes required to restore the budget balance is thus vastly greater under the latter approach. (If there was just one low-wage worker the loss of fiscal efficiency per worker would be huge.) Such cost inefficiency is very general drawback of reducing marginal tax rates on low earnings.

Eliminating or cutting the *marginal tax rate* in the *low part of the payroll-tax base* – the marginal rate applying to the first several thousand euros, say, of the annual payroll-tax base – is also seen as attractive as a way to pull up pay and employment at the low end.<sup>31</sup> But such a design is as cost-inefficient as the constant employment subsidy – even more inefficient. First, the many wage earners whose earnings *exceed* the low part of the tax base will receive in full the benefit from the tax-rate

elimination or reduction on the first several thousand euros, so the budgetary outlay will be high, and if marginal tax rates are increased on high wage incomes or on corporate income to finance it, the disincentive effects may be very burdensome. Second, unless a novel provision is added, wage earners who are *well-paid* but are working only part-time or only a small part of the year will receive the same benefit in reduced payroll taxes that the working poor receive who earn the same low wages in the fiscal year. The graduated employment subsidy analysed above does not wastefully spend the same subsidy on high earners. And if, as I proposed (1997a), the subsidy is reserved for employees certified by their employer as full-time, it does not subsidise the employment of those whose annual earnings are low only because they work little. It seems best to target employment stimuli at those who need to work full time to achieve self-support and who will serve themselves and society by entering fully into the world of work. Finally, if such payroll tax reduction or elimination extends beyond the level of the statutory minimum wage or the lowest level set by union scales, workers whose annual earnings exceed the minimum will derive a larger benefit from the tax reduction than the minimum-wage workers.

Subsidies to investment, either a tax credit to enterprises for their expenditure on plant or equipment investment or a loosening of the criteria for public-sector investment, are popularly seen as another way to pull up employment and pay rates of low-wage workers. It is undeniable that if tax rates on domestic capital are too high for fiscal efficiency, cutting those rates through offsetting tax credits on domestic capital or current capital investment is a way of obtaining an efficiency gain that would tend to pull up employment and pay rates throughout the spectrum of workers. But it is not clear why it should be presumed that tax rates on domestic capital are so high to begin with that there is a Pareto improvement to be obtained by their reduction.<sup>32</sup> And one cannot presume that such Pareto improvements, if attainable, will increase employment among low earners.<sup>33</sup>

In any case, there are two shortcomings to investment subsidies as a tool to meet the inclusion problem. First, they have no disproportional impact on the low-wage and high-unemployment parts of the working-age population. So there is no cost-effectiveness in so blunt a tool. Second, the investment subsidy may actually have a *negative* effect on employment in the long run. In some modern models of wage setting, the increased capital-labour ratio induced by the capital subsidies raises the wage-setting curve as employers, finding shirking more costly than before, respond by raising incentive pay, thus driving up the cost of labour.<sup>34</sup>

Programmes that pay households a supplementary tax credit geared to their earned income have been in place in several countries for some time.<sup>35</sup> These earned income credits offer legislators the opportunity to tailor the size of the credit to the status of the recipient as disclosed on his or her income tax return. In principle this flexibility is a valuable advantage but in practice it has resulted in tax credits that go to parents, most often the single parents, of dependent children

virtually to the exclusion of young men and women who have no children, often because, being unemployed, they cannot afford marriage and children. Moreover, as the “needs” of the recipient increase with the number of children, the tax credit increases accordingly up to a ceiling level. From the perspective of giving help to children who would otherwise be poverty-stricken the curious thing is that it is effectively limited to families whose single parent is working. Presumably the design is best understood as an attempt to give extra compensation for employment to adults who will face child-care costs and related concerns if they choose to have the same careers as those not hampered from doing so by children to support. From this latter point of view it is a step in the direction of making wage subsidies more cost-effective, somewhat like discriminatory prices and pay. The trouble, though, is that, empirically, young single men benefit little or not at all from this programme.

However, the earned-income credit device has inherent design flaws. First, the EITC pays more in tax credits the larger the earned income of the recipient up to the point where the ceiling payment is reached. Hence the tax credits help least those whose earning power is the lowest. It is as if the government wanted to put the money where only a little more was required for self-support through work. But that leaves the most severe cases of non-inclusion utterly unattended. Second, under the earned-income credit design, benefits are clawed back through a phase in which the credits decrease with earned income. In this latter phase the tax credit withdrawal effectively adds to workers’ marginal tax rate. As a result it may operate to shorten the work week of some who would otherwise work full time and thus have a more intensive relationship to the business economy and have a greater sense of self-support. Third and last, the family credit programme is designed to help low-income families rather than to promote working and self-support as valuable in themselves, so it pools the income of family members; as a result, it gives the secondary earner (husband or wife) in a married couple the incentive to reduce earnings in order to preserve the family tax credit for the primary earner; one study finds that secondary earners have responded by decreasing their employment and family pre-tax income has actually decreased on balance.<sup>36</sup> These shortcomings present an easy target for the ideological opposition that opposes subsidies in general and subsidies to boost inclusion in particular. Consequently, the earned-income tax credit tool does not seem destined to be funded sufficiently to wipe out more than a small proportion of the unemployment and the dependency among the working poor. And where this tool is already in use, the shortcomings may give a bad reputation to the general approach of using subsidies to achieve adequate inclusion.

If these criticisms of the EITC are close to the mark, why the adoption of such “top-up” programmes in the US and the UK while, in contrast, France and the Netherlands are subsidising low-wage employment? An answer, I believe, starts

with the observation that any *non-discriminatory* subsidising of low-wage employment is expensive in relation to the gain per beneficiary, since there would be so many eligible. *Rewarding Work* estimates that to pull up the bottom pay rate by three-eighths (with attendant increases in employment) would cost about 1.5 per cent of national income – although the resulting cost savings to the government and to households would repay a very large part of that. The outlay for the EITC in the US is only one-quarter as much – about US\$30 billion – thanks to its restriction of eligibility mostly to parents, typically single parents, of dependent children. But a programme with such a drastic narrowing of eligibility cannot be said to address at all seriously the problem of inclusion among the low-employment and low-wage part of the working-age population. And, as one discussant remarked, it is almost as if the US Congress decided which low-wage people it would enable to hold a job and earn a living and which it would not. In contrast, it may be that in France and the Netherlands the proportion of the population with very low wage rates and high unemployment rates (by national standards) is perceived to be small enough that the objective of inclusion without restrictions is felt to be more easily affordable.

## CONCLUDING REMARKS

Let me conclude with thoughts on a few of the interesting comments on this paper made at the Workshop. A design-feature of my low-wage subsidy plan that puzzled some participants was that it is targeted at full-time jobs to the exclusion of those working only part-time no matter how regularly. To me the appeal of this restriction is that it directs the subsidies to jobholders whose self-support and participation in the business world is at stake, at least in many cases. Those who in spite of the low pay rate choose only to work part-time are revealing that they have other resources, such as an independent income or their partner's earnings, or that they have other interests and obligations that prevent them from intensive participation in the economic mainstream, at least for the moment. If it is accepted that society's objective is to increase the number able to contribute and earn a living working in the business economy it is hard to see how one could go on to deduce the desirability of subsidising the involvement of people for whom it would be a peripheral activity and who to support themselves did not apparently need full-time employment.

The question was asked whether the high minimum wage rates prevalent in most of Europe, whether implemented through a statutory minimum or union wage negotiations, did not have some implications for the choice of the inclusion strategy. Indeed they do. In some European countries there has been a marked wage compression in the past decade or more, so it is reasonable to infer that some workers must have been priced out of the labour market in the formal economy. In

such circumstances the Anglo-American response of topping-up the earned income of low-wage employees does not go to the problem of those workers unable to find employment at the enforced minimum wage. The device of the employment subsidy, however, makes profitable the hiring of low-productivity workers whose employment firms would otherwise be unable to afford.

In some ways the subsidy plan, though already instituted in France and the Netherlands in some form, does represent a significant break with orthodox political economy. Subsidising low-wage jobs will lessen somewhat the progress of the population in preparing itself for the more productive jobs, since it will shrink wage differentials at the low end. But it is a mistake, I believe, to say that some people must accept the prospect (at least the risk) of failing to gain participation and self-support in the economic system in the name of the optimum path of human capital formation. Even if that were not so, a country can over-invest in education. (Certainly there is now a heavy subsidy to education in most countries.) The fact that in many countries the market value of productivity at the low end of the labour market has dropped off so much while the *social* productivity of low-end work has not done so to the same degree, since work has its own rewards, strongly suggests that the market incentives spurring young people to clamber up the education ladder have been *excessive*.

The philosopher-economists of the Enlightenment understood that the pursuit of happiness, in Jefferson's phrase, lay in self-reliance and personal development through access to careers in the business world. Today we understand that where this opportunity is not made broadly available the entire society falls ill from the negative externalities that result. Happily, governments in the advanced economies have it within their capabilities to design a major broadening of this precious opportunity.

## NOTES

1. Rewarding work here refers mainly to the job satisfaction provided by a job's challenges and the personal growth from the resulting interactions with others. Self-sufficiency here means that workers earn enough for a decent living by society's standards and possibly some involvement in community life – not just a wage sufficient for subsistence. Broad inclusion does not have to mean high employment even among workers with productivity (at market prices) far below the normal range, but it could do so. The formal economy consists of the business and public sectors, not paid and unpaid activity in the domestic economy and the underground economy. The classic inclusion failures in the first half of this century were the result of discrimination – barriers against women and minorities in the economy, the community and in social affairs.
2. It is the absolute increase that matters for any group since it is the number of them becoming unemployed expressed as a ratio to their number in the labour force. Their unemployment rate might triple but if it were tiny that would disemploy only a minuscule fraction of the group's labour force.
3. The US is not a clear exception in either of the two dimensions of inclusion. Regarding self-sufficiency it would be hard to argue that the bottom decile of wage earners in 1999 can better afford good clothing, housing and participation in community events than could the corresponding group in the 1950s and 1960s, since the relative wage as measured by the 10/50 ratio has declined quite a lot over the past three decades. Regarding joblessness, both high-school dropouts and (by a smaller margin) those workers with only a high-school diploma had a higher reported unemployment in 1998 than in 1970 or 1965, notwithstanding the strong structural recovery especially since 1995.
4. It may be significant that these same three economies have conspicuously failed to see a big turnaround in unemployment in the 1990s.
5. The two sets of workers are not identical since in some countries the young may be important among the low paid but less so among the unemployed and in some other countries the reverse. The question of whether youth unemployment and low pay among youth represents a deficiency of inclusion or instead the rough efficiency and "tough love" of the free market goes beyond this paper.
6. See the expositions in Phelps (1994) or Phelps and Zoega (1998). Convergence toward this structuralist theory is seen in Blanchard (1997), Blanchard and Katz (1999) and Nickell (1998*a, b*). Econometric assessments of the main alternative, hysteresis, in Papell *et al.* (1999) and in Phelps and Zoega (1998) are quite negative. (It is true the unemployment rate is lumbering in some countries.)
7. In more technical terms, aggregate employment and the average wage (in terms of product) are determined by the intersection of an upward-sloping wage curve and a generally downward-sloping labour demand curve. The gap between employment and

labour force is involuntary unemployment and, for simplicity, the supply of labour force participants is taken as absolutely fixed. The wage curve indicates how high a wage firms will settle on (and unions will agree to in industries wherever they are in the picture) when their expectations about the general wage and price levels are correct. An equilibrium path here means a path over the future along which expectations are borne out, barring unforeseen shocks – that is, a correct expectations scenario.

8. The former kept workers generally more oriented toward gaining economic security by steadily earning wages, so wages were not pushed high in relation to productivity, which would have forced cutbacks in labour demanded. (That workers' non-wage incomes matter for wage setting is one of two main themes in my *Structural Slumps*, 1994.) The latter, in lowering the cost of capital net of expected productivity growth, boosted various assets' real prices, which raised labour demand. (The role of the cost of capital and asset prices in determining unemployment is the second theme. The role of productivity growth as a subtractor in the cost of capital is due to Pissarides, 1990.)
9. Country studies confirm that income from private wealth was a force pushing up unemployment in Italy (Bell and Phelps, 1997c) and in the UK (Phelps and Zoega, 1998). Social wealth was shown to increase unemployment in those countries and in the US (Phelps and Zoega, 1997). The cost of capital was first found significant in an OECD panel in Phelps (1994) and again in Elmeskov, Martin and Scarpetta (1998). The effect of productivity growth has been found in several studies, for example, Phelps and Zoega (1997). A fuller account would bring in tax rates, energy prices, real exchange rates and "structural-structural" forces (*e.g.* Greenwood, 1997; Olson, 1995).
10. In most OECD countries the high education group suffered little absolute rise in unemployment rate and no fall at all in relative wage.
11. The bias of new technologies against those with cognitive/education disadvantages and the bias of entitlements in favour of the low-paid (and non-working) are examples of what the OECD has dubbed "structural-structural" forces.
12. This argument is elaborated and supported with some data in Phelps (1997a).
13. Whichever the policy chosen, there tends to be a perversion of work and a decline in civility and respect for law when some victims of job shortage or low pay turn to criminal activity. Incidentally, the first policy does not entirely avoid poor employee morale and thus increased unemployment.
14. In Phelps (1997b) the economic doctrine of the Scottish Enlightenment is seen as a liberation movement prising people's release from domestic work within the family or hamlet into the relative freedom and stimulus of the market economy. On the social surplus Paul Samuelson's textbook (4th edition, 1958, p. 445) cites Adam Smith's water-diamonds paradox and the view of Progressive-era theorist L.T. Hobhouse (1922), pp. 162-163. From the first pages of Rawls (1971) the surplus is viewed as the rock on which any theory of economic justice must build. Yet some theoretical calculations done by Gilles Saint-Paul and myself (not as yet written up) led to a rough estimate of the surplus that was about 1 per cent of the gross domestic product. (Phelps, 1997a, p. 141, also cites this result.) In judging the significance of that result three points must be borne in mind. First, the neo-classical model we used is just one model of the many that could be built for studying the question. For example, the heterogeneity of the labour force may lead to learning-type externalities and a wider variety of goods. Second, it is not really practicable for coalitions within a nation's labour force to form new jurisdictions to escape the government's taxes. So they will be willing to shell out more than the 1 per cent of national income to combat the negative interactions discussed in the next

paragraph. Finally, 1 per cent of the GDP in the US is close to \$100 billion, which far exceeds the net budgetary cost of even the more-or-less adequate plan proposed in Phelps (1997a).

15. Although the occasional investigation fails to find an effect of unemployment rates on one or more social indicators, there is plenty of success in this regard. For example, Ernesto Felli and Giovanni Tria (1999) find that the regional unemployment rate series in Italy have considerable power to predict the regional murder rate.
16. See Chapters 4 and 9 in Phelps (1997a).
17. A paper by Sandra Black and Elizabeth Brainerd (1999) finds evidence that the increased competition resulting from globalisation has forced American companies to reduce costly discrimination against women.
18. The American economist Finis Welch, in his Ely Lecture at the American Economic Association meetings in January 1999, held that most Americans would prefer today's vast inequality to the more homogeneous income distribution of the late 1940s when racism and sexism blocked occupational choice and pay. Perhaps so, but the issue here is whether marginalisation now is less serious than racism and sexism now, not then. Take the US. The wage difference now between childless men and childless women ages 27 to 33 is put at less than 2 per cent by the Independent Women's Forum of Washington, DC (*Wall Street Journal*, April 13, 1999, p. 1). The wage ratio between the 10th and 50th percentiles of full-time jobs is put at 44 per cent in 1986 by Gottschalk and Joyce (1992). Readers will recall the evidence of Figure 1 that in the countries that compressed the wage distribution in the 1980s a relatively large increase in low-end unemployment was observed.
19. Empirically, inclusion difficulties add to income inequality. Theoretically, though, they might not do so. In a "lifecycle" model of the economy in which successive cohorts of homogeneous workers are born in the unemployment pool and emerge with lifetime jobs, there may be lifetime equality as all the young suffer equally from the inclusion difficulty. (For such a model see Phelps, 1998.)
20. Another unfortunate effect of viewing deficient inclusion as an instance of income inequality is that it burdens the discussion of inclusion with the baggage of controversy and confusion about inequality. First of all, an increase in income inequality cannot be judged out of context to be either good or bad. Yes, it may be that some non-inclusion is theoretically needed (in the form of positive unemployment) to avoid serious inefficiency in employee conduct so there is a theoretical ambiguity there too; but there is a strong presumption that inclusion at present is far from reaching a level at which it threatens productivity. Second, many economists appear to think that existing taxation of high incomes is about right, believing that continuing moderation in marginal tax rates at the top is serving to pull up after-tax wage rates across the board – hence those of the least advantaged – by energising effort and innovation. (Some other economists muster no interest in income equality whatsoever.) It is possible to stand in that camp, however, and still believe that a great deal more inclusion, suitably achieved, would yield a pretty general gain.
21. Domestic Strategy Group (1998), p. 18.
22. When payroll tax rates and income tax rates were increased in the 1970s and 1980s, the initial response was a fall of employment in the form of both higher unemployment and lower labour-force participation. In the theoretical perspective of incentive-wage theory, wages were cut insufficiently to accommodate the cost shock since employers knew that

further wage cuts, which would be needed to restore employment, would reduce pay relative to wealth to such low levels as to have disincentive effects that would actually leave production costs increased on balance. (The collective bargaining perspective tells a parallel story.) Yet, if there existed no underground economy, the long-term response would have been a fully accommodating decline of wealth and pay in equal proportion, triggered by the reduction of saving in response to the decrease of employment and earnings; this would have proceeded to the point where employers could afford to offer the same number of jobs as before. In offering escape into subterranean jobs the underground blocks the completion of that adjustment of wealth and wages, thus blocking full recovery of employment in the formal economy.

23. An increase of employment, hence a decrease of the unemployment rate, stimulates increased quitting, shirking, and absenteeism, thus raising employers' unit cost and causing the pay that employers can afford to decrease as needed to get unit cost back to the sustainable level.
24. The tacit assumption above is that the gross wage employers can afford at any given level of (un)employment is not affected by introduction of the subsidy. But, in models making labour demand a function of non-wage income and social benefits, the original upward shift of the demand curve (by exactly the amount of the subsidy) has a "multiplier effect". The impact on the pay rate serves to reduce workers' assets and entitlements as a ratio to their pay rates. That in turn causes a drop in their quitting, shirking, etc. at any given unemployment rate. So the demand curve rises some more, which in raising the pay rate again provides yet another boost to employee effectiveness, and so forth. Thus the cumulative shift of the labour demand curve is greater than just the first impact. (Both effects, the multiplier effect and the impact effect, have counterparts in a neo-classical setting of market clearing.) But note that, since higher pay causes workers to save more, wealth will tend at a given unemployment rate to approach again its normal ratio to the pay rate. So in the long run the multiplier vanishes.
25. The equations behind the two curves imply that in the long run, *i.e.* when wealth is at its normal ratio to earnings, the two curves must shift (down) by equal amounts in terms of pay rate, since the tax rate impacts equally on the respective pay rates solving the two long-run equations. In the short run, though, the tax impacts are unequal and wealth must fall to pull down the wage curve as much as the demand curve falls. The matching long-run shifts imply that long-run unemployment rates at all productivity levels are unaffected by the tax rate, taken alone. (The long-run pay rate is inversely proportional to the new level of  $1 + \text{tax rate}$ , which puts the cost of labour back to its level before the increase of the tax rate and after the subsidy was instituted.) See Hoon and Phelps (1996). The subsidy impacts unequally on the long-run equations, having none at all on the long-run wage curve.
26. The material here draws heavily on Hoon and Phelps (1999).
27. France and the Netherlands have sizeable programmes in place. Argentina has started a programme in which, in its present form, what is subsidised is employers' hiring of low-wage employees rather than their stock of low-wage employees.
28. This standard theoretical view has been challenged by evidence from an event study in which an increase of a local minimum wage rate was not found to decrease low-wage employment. (Card and Krueger, 1994.) Although the authors suggest a way to rationalise their findings by the monitoring considerations of efficiency wage theory, the sweeping conclusion they draw is problematic in the perspective of such theory. The theory says that, in the standard case, a pay rise within a small area has only a second-order effect

on the amount of labour demanded if there is no rise in the cost of low-end labour in the rest of the labour market – a smaller effect the smaller is the area. The increase in production cost from the first few pennies of increase in the pay rate will be exactly counterbalanced by cost-saving improvement in employee performance resulting from the rise in employees' relative pay rate that the rise in pay achieves; if it did not, the employer could not have been setting the prior pay rate at the cost-minimising level. In the authors' case, a hike in the local statutory minimum wage may have a positive employment effect. In either case, however, a rise in the national minimum wage might still contract employment, there being no offsetting relative-pay effect.

29. See Phelps and Zoega (1997, 1998). This is all the more remarkable since, when a regression contains two or more explanatory variables that show little variation around their time trends, one has to be prepared for considerable instability in the estimates of their coefficients.
30. For example, Lindbeck, Nyberg and Weibull (1999) and Magnet (1994). See also Phelps (1997a).
31. As may be clear from the analysis in the previous section, an equal reduction in marginal payroll tax rates over the entire range of wage rates would, taken alone, be neutral in the long run for employment rates at all productivity levels and low pay rates in equal proportion; the non-neutralities would depend entirely on what tax rates were increased to make up the loss of tax revenue.
32. In modern models, ones lacking the neo-classical postulates of perfectly informed markets, corporate profits may contain an element of monopoly rent arising from frictions and that may justify a positive tax rate on corporate profits.
33. A recent paper based on wage bargaining shows that investment subsidies raise "welfare" but have no determinate effect on employment. See Fuerst and Huber (1998).
34. See Petrucci and Phelps (1999).
35. The oldest of these programmes are the Earned Income Tax Credit in the US, known as EITC, and, in the UK, the Working Family Credit, which replaces an earlier version.
36. However there is a positive effect on married women's employment in the phase-in region of income. See the study of US Current Population Survey data from 1984 in Eissa and Hoynes (1999).

## APPENDIX

The following illustrative model of the current natural rate and corresponding pay rate can be interpreted as an aggregative model in which the tax rate on labour is held constant through borrowing *or* as a model of wage and employment determination for a particular “grade” of labour in a setting where no worker crosses over to a job requiring a lower grade of labour and no one is able to mimic the performance of workers in a higher grade.

Consider first the daily labour cost per employee,  $v^f$ , including wage and non-wage cost. (In the notation of public-finance economics this is the wage rate “to the firm” although it will be called here labour cost per employee; the wage “to the household (worker)”,  $v^h$ , will generally be called the pay rate.) We first obtain the labour cost per employee consistent with zero profit – also known as the “demand wage” – corresponding to the data: the current technology level,  $\Lambda$ , the given cost of capital,  $r^f$ , on which labour’s marginal productivity depends, the income (including non-pecuniary benefits) that workers receive from assets (broadly conceived),  $y^w$ , and other parameters of the model. To obtain this labour cost per employee one starts with the employees’ marginal product of labour, which can be written  $\Lambda m$ , which gives the opportunity cost of each trainer-day required to impart the training, and one subtracts an allowance for interest and “depreciation” on the needed training investment per hire,  $\beta \Lambda m$ . The depreciation here is the mortality rate,  $\theta$ , plus the quit rate  $\zeta$ . Note that the *rate* of technical progress, denoted  $\lambda$ , which is the *growth rate* of  $\Lambda$ , is subtracted from the interest rate,  $r^*$ , to obtain the *net* interest cost, an effect introduced by Pissarides: just as the presence of a positive interest rate is a reason to defer hiring, with its investment cost involving today’s marginal product of labour, so the prospect of growth in that productivity of workers is a reason for the firm to advance its hiring. The quit rate is a decreasing function of the unemployment rate,  $u$ , and it is a decreasing function of the daily pay rate,  $v^h$ , relative to the expected pay elsewhere in the economy,  $v^e$ , and relative to their income from wealth,  $y^w$ . So we have:

$$v^f = \Lambda \phi(r^f) - \beta \Lambda \phi(r^f) [\zeta (v^e(1 - u)/v^h, y^w/v^h) + \theta + r^* - \lambda].$$

This zero-profit condition implicitly makes the proportion of the labour force,  $1 - u$ , that employers are currently willing to “invest in” a function of capital cost, labour cost, pay relative to expected pay elsewhere in the economy and pay relative to workers’ income from wealth. The relation of the capital-employment ratio to the cost of capital makes labour’s marginal productivity a (decreasing) function of the cost of capital,  $\phi(r^f)$ , and proportional to the technology indicator provided by the current cumulative labour augmentation,  $\Lambda$ .

The companion component of the model is the so-called wage curve. For labour-market equilibrium, unemployment must generally be positive and high enough to contain quitting to a level such that firms are content not to try to out-pay one another as a means of combating quitting. In the present model, the firm raises its pay to the point where the extra cost of raising daily labour cost per employee by another lira would cease to be outweighed by the additional savings per employee in reduced turnover-training costs. Per employee,

the cost of adding one to  $v^f$  is one (per diem). So if the payroll tax rate is a “flat rate” of  $\tau^L$  and we abstract from taxes on earned (and passive) income, the cost of adding one to the pay rate,  $v^f$ , is  $1 + \tau^L$ . The benefit, or cost saving, is the opportunity cost of replacing the quits per employee that would thus be averted. Equating these two yields the “wage curve” for a given value of  $v^e$  and given  $y^W$ :

$$1 + \tau^L = \beta \Lambda \phi(r^f) [(1 - u)(v^e/(v^f)^2)\zeta_1 + (y^W/(v^f)^2)\zeta_2]$$

where  $\zeta_1$  and  $\zeta_2$  denote the partial derivatives of the quit function with respect to the first and second arguments.

Finally, let us invoke labour-market equilibrium, meaning that expectations in that market are correct, not that the wage clears the market, which it does not. Hence we specify:

$$v^f = v^f e.$$

The expectational equilibrium system is then just two equations. We use the last equation to substitute for  $v^f e$ . And we express  $v^f$  in terms of  $v^f$  by the accounting relation  $v^f = (1 + \tau^L) v^f - s^L$ , where the last parameter is the quantity subsidy on labour. (It can be set equal to zero here or made proportional to productivity.) That yields the demand equation,

$$(1 + \tau^L) v^f = s^L + \Lambda \phi(r^f) [1 - \beta(\zeta_1(1 - u, y^W/v^f) + \theta + r^* - \lambda)],$$

which makes labour demand a decreasing function of the equilibrium wage and of the income from wealth. One may rewrite the wage-curve equation:

$$(1 + \tau^L) v^f = \beta \Lambda \phi(r^f) [(1 - u)\zeta_1(1 - u, y^W/v^f) + (y^W/v^f)\zeta_2(1 - u, y^W/v^f)].$$

The alternate procedure would be to retain the left-hand side of the demand-wage equation in terms of  $v^f$  and use the accounting relation to substitute for the left-hand side of the wage-setting equation the expression  $v^f + s^L$ .

The above system of two equations (and the alternate system just mentioned) determines the current pay rate and unemployment rate, *given*  $y^W$ . The last element needed to completely close the dynamic system, of course, is the accumulation of wealth, the income from which is  $y^W$ . But, with regard to the *short* run, meaning that initial wealth is still at its given, predetermined level, it does not do too much violence to reality to suppose that  $y^W$  is also given.

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