

Chapter 2

Wage Compression and the Unemployment Crisis: Labor Market Institutions, Skills, and Inequality-Unemployment Tradeoffs

DAVID R. HOWELL AND FRIEDRICH HUEBLER¹

It is the orthodox view that the persistence of high unemployment is explained by the rigidities imposed by labor market institutions, such as centralized collective bargaining, legal minimum wages, employment protection laws, and unemployment benefit programs. Job creation is made less attractive for employers while joblessness becomes more attractive for workers. These disincentives for employment growth may take place as direct effects of protective labor market institutions, or indirectly, through their effects on the wage structure - by raising wages at the bottom of the skill distribution, protective regulations and institutions price the less-skilled out of jobs. The policy response must be comprehensive labor market deregulation (OECD 1997; OECD 1999; IMF 1999; IMF 2003). This should be of particular importance in the aftermath of 1970s-80s productivity, energy price, technology and trade shocks that are argued to have dramatically shifted the demand for labor away from the less-skilled. Because of the strong advocacy for this diagnosis and policy prescription by the Organization for Economic Cooperation and Development (OECD) and the International Monetary Fund (IMF), we refer to widely accepted view as the “OECD-IMF orthodoxy.”

This orthodox explanation for persistent high unemployment has two distinct variants. In the first, institutions may increase unemployment by blocking downward wage flexibility (the *wage compression* variant). In the second, institutions can undermine employment opportunities, not through their direct effects on the wage structure, but through non wage labor costs and work incentives, since competitive forces ensure that the skill distribution will determine the wage structure (the *skill dispersion* variant).

While the OECD-IMF orthodoxy points broadly at the problem of labor market rigidities, the wage compression version narrows the focus to wage rigidities, particularly at the bottom of the skill distribution.² As Horst Siebert (1997: 45) explains, “A lower degree of wage differentiation indicates that the wage rates do not completely fulfill their function of bringing about the necessary adjustments to a new equilibrium with more employment; then, as the alternative to adjusting the price of labor, adjustments take place via changes in the quantity of employment. A more differentiated wage structure has become more important in recent years.” This simple textbook model has the great merit of accounting for both rising unemployment in Europe and rising wage inequality in the United States, and has been referred to as the “Unified Theory” (Blank, 1997; Blau and Kahn, 2002) and the “Transatlantic Consensus” (Atkinson, 1999). If this *wage compression* version of the OECD-IMF orthodoxy is right, there should be compelling evidence of tradeoffs between various measures of employment performance and earnings inequality.

But the OECD-IMF orthodoxy does not actually need a wage compression story. If OECD country labor markets are reasonably competitive, the skill distribution can be expected to trump the compressing effects of institutions in setting the earnings distribution.³ In this case, there would be no necessary expectation of unemployment-inequality tradeoffs, since the skill mix and supply-demand forces will determine earnings inequality, and unemployment can then be explained by other institution-related effects, such as non-wage-related labor costs (e.g., taxes and the effects of

employment protection laws) and work disincentives (e.g., unemployment benefits and other transfers). If this *skill-dispersion* variant of the OECD-IMF orthodoxy is right, we should not necessarily expect to find strong evidence of inequality-unemployment tradeoffs, since institutions do not have their employment-unfriendly mainly through the wage structure.

This chapter considers the institutions-unemployment question by focusing on the evidence for these wage compression and skill dispersion versions of the OECD-IMF orthodoxy. The first section explains the derivation of the necessity of inequality-unemployment tradeoffs from the simple demand-supply model. Section 2 turns to the data and describes recent cross-country earnings inequality trends, Freeman (1997), Freeman and Schettkat (2000), Devroye and Freeman (2000), and Lucifora (2000) find that labor market institutions are far more important than skills in the explanation of cross-country differences in the distribution of earnings.

2.1 Demand Shifts and Inequality-Unemployment Tradeoffs

Underlying the conventional Unified Theory explanation for sharply rising unemployment and inequality since the 1970s is the belief that there has been a massive shift in demand away from the less skilled, which has required substantial price (wage) or quantity (employment) adjustments. Among the more plausible explanations for the demand shock is skill-biased technological change.⁴ As a recent IMF survey explains, “If the structure of relative wages is rigid, biased technical progress favoring the demand for skilled workers will lead to an increase in unemployment among the low-skilled workers” (IMF 1999: 102). In short, demand shifts in competitive markets require a choice for every country between lower wages and more unemployment.

A convenient way to demonstrate this tradeoff appears in Figures 1 and 2 (after Snower 1998). There are two categories of workers, those with high skills (the left side) and low skills (the right side, read from right to left). The horizontal axis shows employment shares for these two

groups. With no institutional barriers, there is no (voluntary) unemployment. The shift of the vertical line from “skill mix 1” to “skill mix 2” shows a movement towards greater “skill intensity.”

[Fig. 1 about here]

[Fig. 2 about here]

At the same time, we know that in the U.S. during the 1980s, high-skill workers, defined as those with a college education or more, experienced a real wage increase of about 5 percent, while low-skill workers were faced with a much larger 20 percent wage decline (Gottschalk 1997). Within this supply-demand framework, these wage outcomes require sizable demand shifts: upwards for high-skill workers and downwards for the least skilled. With the high-skill wage on the left axis and the low-skill wage on the right, wage change for each group is depicted as an upward movement from point HS1 to point HS2 for high-skill workers, and a downward movement from LS1 to LS2 for low-skill workers. The growth in wage inequality is shown by comparing the gap between LS1 and HS1 at “skill mix 1” to that between LS2 and HS2 at “skill mix 2.” Figure 1 depicts a substantial shift in the demand for skill, widely believed to reflect the spread of computer-based production technology. The significance of such demand shifts will be greater the more unequal the skill distribution and the greater the share of workers with low cognitive skills.

Figure 2 is similar, but here institutional barriers prevent wages from falling for the least skilled. Without downward wage flexibility, wages stay at LS1 and employers move up their demand curve (on this graph, to the right), reducing the number of jobs available to the least skilled. Thus, with a large skill-biased demand shift in an inflexible labor market, skilled workers remain fully employed but a large share of the least skilled become redundant. This is, according to the *wage dispersion* variant of the OECD-IMF orthodoxy, precisely what explains the rise of European unemployment in the 1980s.

But this predicted tradeoff may not be observed for a variety of reasons. First, the conventional account of massive skill-biased demand shifts may be exaggerated. The growth in earnings inequality in the U.S. may have less to do with such demand shifts than with declining worker bargaining power, stemming from weakened institutions and shifts in social norms (Fortin and Lemieux 1997; Howell 1999, 2002). Similarly, high unemployment in Europe may also have had less to do with demand shifts than tight macroeconomic policy and product market rigidities (Krueger and Pischke 1997; Akerlof 2002), in which case wage compression would not be closely linked to unemployment across countries.

Second, if labor markets are imperfect, some forms of monopsony characterize important parts of the economy and employers consequently have considerable bargaining power, and institutions and social norms matter, the responsiveness of employment to wage changes may be muted or nonexistent even within countries with relatively competitive labor markets, like the U.S. (Akerlof 2002; Bhaskar, Manning and To 2002). And these considerations may matter a great deal for cross-country comparisons. For example, consider the following hypothetical case, suggested by Bjorklund and Freeman's (1997) demonstration of the far greater inequality among otherwise similar Swedes in the U.S. compared to Sweden. We would expect pay inequality to be greater in the U.S. than in Sweden even for identical workers within identical assembly plants with the same total labor costs, simply because egalitarian outcomes are more highly valued in Sweden. In the U.S. plant, managers might earn much more, and shop floor workers much less, than their Swedish counterparts, so although total employment costs are the same in the two plants, inequality is far higher in the U.S. one. Lower wages would not be possible in the Swedish plant, both for morale reasons and because all the firms operate within the same set of social norms. Even among plants that could relocate, the same social constraints that keep management pay low may keep outsourcing (to the U.S.) to a minimum. This hypothetical case only suggests that even for countries with similar

skill distributions, we may not observe the strong inequality-unemployment tradeoffs predicted by the simple textbook model (and by the Unified Theory).

A third issue concerns the direction of causation. For a variety of reasons that may be independent of the presence of labor market institutions, most regions tend to have a labor surplus.⁵ Blanchflower and Oswald (1995) have provided substantial evidence for a “wage curve,” in which wages tend to be lower in labor markets with higher unemployment. In contrast to the conventional view, their work suggests that it is *unemployment that drives wage levels* for a given skill group, not the reverse.⁶ This may be a crucial distinction, for if the causality runs from unemployment to wage levels, and the wages of lower skill (or lower wage) workers are the most sensitive to local unemployment conditions, *higher unemployment for the least skilled should lead to greater inequality*. With more people pushed into the labor market by low wages (family members – typically women and teenage children – due to declining pay of the main earner in the household) and by welfare reform, and with the influx of low skill workers from low-wage countries, the U.S. might be a good example: increasing labor supply contributing to relatively high unemployment among the less skilled. The empirical prediction that follows from this reverse-causation view is that there may be a *positive* correlation between earnings inequality and unemployment.⁷

Finally, weak evidence for inequality-unemployment tradeoffs may also reflect the possibility that labor market institutions not only compress the wage distribution but increase workplace efficiency (and employment) by encouraging trust and cooperation between workers and management and by promoting the development of firm-specific skills by less-skilled workers. Countries with institutions that reduce wage inequality and promote literacy among the least advantaged are likely to also have related institutions that promote cooperation and on-the-job training. Estevez-Abe, Iversen, and Soskice (2000) contend that higher levels of social protection – particularly employment protection, unemployment protection, and wage protection – provide

workers with the insurance they need to invest in firm and industry specific skills. This “production regime” perspective on earnings and skill distributions represents a radical departure from the simple supply and demand stories of the Unified Theory. As Estevez-Abe et al. (2000: 7-8) put it, “Contrary to conventional neo-classical theory, which sees efforts to increase protection against job loss as an interference with the efficient operation of labor markets, measures to reduce future uncertainty over employment status – hence uncertainty over future wage premiums – can significantly improve firms’ cost effectiveness” (see also Schettkat 1993).

In this alternative view, labor market institutions that are conventionally assumed to be the source of rigidities, and consequently unemployment, can be efficiency-enhancing by reducing insecurity and raising skill levels.⁸ Estevez-Abe et al. argue that, with more to gain from access to good jobs or training slots, students in specific-skill production regimes have a greater incentive to perform well in school, raising general skill levels of the least skilled, and compressing the overall skill distribution. We would add that countries with more solidaristic traditions are also likely to invest more, and to do so more effectively, in education (and in health and housing) for those in lower income communities. For both these reasons, we would expect relatively high literacy levels for those at the bottom of the skill distribution and a more compressed overall skill distribution in welfare states with more developed social protection programs. If countries with strong labor market institutions are likely to have a higher and more compressed skill mix, and many of these same institutions tend to directly compress the earnings distribution, we should expect to see a correlation between the inequality of the earnings and skill distributions independently of the supply/demand mechanism of the textbook model. Institutions help determine both distributions.

In sum, if, independently of labor market institutions, labor markets are quite imperfect – employers have some flexibility (bargaining power) in wage-setting – we might expect a positive relationship between unemployment and earnings inequality, not a tradeoff. Further, if labor market

institutions compress the wage distribution while raising skill levels and increasing workplace and labor market efficiency (matching of workers with jobs), these institutions need not generate unemployment and, again, inequality-unemployment tradeoffs will not be inevitable.

2.2 Earnings Inequality in the OECD Countries

This section introduces the basic facts of earnings inequality, measured by the standard D9/D1 ratio (average earnings of the 90th percentile workers relative to those in the 10th percentile). Figure 3 shows male earnings inequality trends for the three countries with notable increases: an average annual rise of .043 percentage points for the U.K., .063 points for the U.S., and .064 points for New Zealand, much of it in the last two years (1995-97). Figure 4 reports the trends for nine countries with little or no growth in inequality. These two figures indicate that the D9/D1 ratio for male workers in most developed countries has ranged from 2 to 3, far below the United States (4-4.5), followed by Canada (3.5-4), and France (3-3.5). It is worth noting that both Canada and France, despite these relatively high levels of earnings inequality, have been plagued by persistent high unemployment (see Figure 1 of Chapter 1, this volume).

[Figures 3 – 6 about here]

Figures 5 and 6 show that female earnings inequality tended to be somewhat more compressed than the male earnings inequality, ranging from ratios of 2 to 3, with three major exceptions: the U.S. (Figure 5) and Austria and Canada (Figure 6), which ranged from 3.5 to over 4. As in the case for males, the U.S. and the U.K. show the most conspicuous increases in female earnings inequality (Figure 5). As Figure 6 indicates, ten of the thirteen nations for which we had time series for female workers show stable or – in the case of Germany (1984-95) and Italy (1979-96) – declining earnings inequality. On balance, outside the U.S., U.K., and New Zealand, trends in both male and female earnings inequality appear fairly stable.

These data indicate that if wage compression is a key source of the unemployment problem, it is not because earnings have become more compressed since the late 1970s. In fact, the usual (Unified Theory) argument is just the reverse. Due in large part to the increasing use of information technologies, skill-biased technological change is held to have reduced the relative demand for less-skilled workers. If this is so, we should observe a broad tendency towards *rising* earnings inequality, even in countries with strong labor market institutions designed to protect the less-skilled from the worst effects of intense wage competition: as demand shifts towards those with the greatest cognitive skills, their earnings would be expected to rise relative to those with much lower levels of these skills, even if institutions helped set the wages of the latter above market-clearing levels. This suggests that countries with rapidly increasing diffusion of new technologies should show rising earnings inequality.

Figures 3 to 6 do not support this prediction. As a review by OECD staff (OECD 1996: 63) concludes, “the United Kingdom and the United States stand out as the only countries where there has been a continuation of a pronounced rise in earnings inequality.” A leading expert on inequality, Anthony B. Atkinson (1998: 4), takes the same position: “It is misleading therefore to talk of a general ‘trend’ towards increased dispersion, and even in countries where dispersion has increased the historical record is better described as consisting of ‘episodes’ of widening income differences rather than as following an inexorable trend.”

Still, it may be the case that, in the face of the presumed inexorable technology-driven demand shifts against the least skilled, countries with compressed and stable earnings distributions adjusted on the quantity side, through lower employment growth and higher unemployment. More specifically, it may be that stable D9/D1 ratios in the 2 to 3 range are simply too low to ensure that employer demand matches worker supply. Does the evidence show that higher levels of earnings

inequality tend to be associated with lower unemployment and higher employment rates of the less skilled? We consider the evidence for this hypothesis in the next section.

2.3 Earnings Inequality and Low-Skill Employment Opportunities

2.3.1 Unemployment Rates and Earnings Inequality

If the main source of the European unemployment problem is wage compression, we should observe a strong negative relationship between the growth in unemployment and both the level of earnings inequality and its change over time across countries. The standard is the D5/D1, the ratio of the median earnings (D5) to average earnings in the 10th percentile (D1) of the earnings distribution. Taking the average standardized unemployment rate and the D5/D1 inequality measure for four 5-year periods (1980-84, 1985-89, 1990-94, and 1995-99) for 15 OECD countries for which data were available (55 country-time periods), we find a simple correlation coefficient of +.028, which has the wrong sign (a tradeoff would produce a negative sign) and is statistically insignificant by any conventional standard.

Figure 7 shows the 55 country-time points for unemployment and earnings inequality (D5/D1) levels that produced this positive coefficient. A tradeoff should appear as a downward sloping set of points, from the upper left to the bottom right. Clearly, the cross-country data for these 15 OECD countries show no pattern of this sort. On the other hand, the within-country evidence is mixed. The U.S. shows the clearest evidence of a tradeoff, with inequality increasing as unemployment fell between the early 1980's and the late 1990s. There also appears to be some evidence of a tradeoff for Finland, Germany and France, and perhaps Japan and the Netherlands (in both cases the tradeoff appears over just two of the four periods). But other countries show a positive relationship between inequality and unemployment (Sweden and Belgium) or no clear pattern (Canada, the U.K., and Denmark). While it is not surprising that the U.S. and Canada have

the highest levels of D5/D1 inequality, it is notable that Canada has managed both higher earnings inequality and higher unemployment levels than the United States.

[Fig. 7 about here]

An alternative way to plot the data appears in Figure 8, which shows the change in unemployment and earnings inequality between 1980 and 1995 for 16 OECD countries, with the inequality measure now defined as the D9/D1 (the average earnings at the 90th decile relative to those at the 10th decile). Again, there is no obvious tradeoff between unemployment and earnings inequality trends across this set of OECD nations over the 1980-95 period.⁹ Some countries show substantial percentage increases in unemployment and declining inequality (France, Norway, Italy, and Finland) but others show substantial increases in both unemployment and inequality (the U.K., the Netherlands, New Zealand, Austria, and Sweden). Neither is consistent with the tradeoff prediction. It is also worth noting that among countries with growing unemployment, there were countries with highly compressed skill distributions among those with rising inequality (Sweden and the Netherlands) and declining inequality (Norway and Finland).

[Fig. 8 about here]

Although we have only a limited number of country observations, evidence of unemployment-inequality tradeoffs can also be found by regressing unemployment on inequality. To the extent that countries have constrained earnings inequality and its growth, we should expect to observe high and rising unemployment, particularly in a period of major skill-biased demand shocks. The first row of Table 1 (column 1) shows no statistical association between unemployment and earnings inequality (D9/D1) in the mid-1990s across the 18 OECD nations for which we have data. On the other hand, moving across row 1 to column 3 shows the expected negative relationship between the level of earnings inequality and the change in unemployment – higher earnings inequality is associated with a smaller increase in unemployment. But this relationship is only barely

significant by conventional standards, and as column 4 shows, disappears entirely without the United States. In sum, this top row indicates little or no negative relationship (tradeoff) between earnings inequality levels and the level or change in unemployment in the post-1980 period.

[Table 1 about here]

The results shown in the first cell of Row 2 (Table 1) suggests that unemployment levels in the mid-1990s were negatively related to the change in earnings inequality since 1980 (statistically significant at the 5% level). Without the U.S., the negative relationship remains, but the significance falls to just the 10% level. But the right side of row 1 shows that there was no relationship between changes in earnings inequality and the change in unemployment over the 1980-95 period, particularly when the U.S. is excluded. Taken together, the results in row 2 suggest that countries with more flexible wage structures, as measured by the relative change in inequality, may have tended to have lower *levels* of unemployment, but there is no evidence that they tended to experience a lower *growth* in unemployment since 1980.

These are simple univariate tests. Controlling for other factors might help produce stronger support for the tradeoff prediction. With so few country observations, the ability to include additional measures is limited, but Table 2 shows the results of experimenting with one potentially important control - the country's skill mix. Since labor market institutions designed to prevent extremely low wages would be expected to have less harmful employment effects in countries with low shares of very low skill workers (such as Sweden) than in countries with relatively high shares (say, France), controlling for skill mix might strengthen the effect of earnings inequality on unemployment.

We use two measures of skill mix - the 95/5 literacy ratio (those scoring in the 95th percentile relative to those in the 5th percentile) and the share of those scoring in the bottom literacy category in total employment. Given the difficulty of comparing education levels across countries, it

is almost certainly better to compare earnings and skill dispersion with “direct” test score measures. The final report of the International Adult Literacy Survey (OECD 2000b) contains prose, document, and quantitative literacy scores for countries at the 5th and 95th percentiles of the skill distribution. We first calculate mean values across the three literacy variables and then a ratio of the mean score at the 95th percentile over the mean score at the 5th percentile. Our low literacy variable is a measure of the share of workers scoring in the lowest (level 1) literacy category.

Rows 2 and 3 of Table 2 show that neither of these skill measures has a significant effect on unemployment or its change in any of the four regressions. The first two columns indicate that taking into account the skill distribution makes no difference for the relationship between the change in earnings inequality and the 1995 unemployment rate – as in Table 1, the coefficient on the change in earnings inequality is negative but barely significant at the 10% level. The right panel of the table (columns 3 and 4) shows that including the skill measures actually tends to reduce the already quite weak statistical relationship between the change in inequality (relative wage flexibility) and the change in unemployment. With or without accounting for the skill mix, our simple regression results show little or no tradeoff between levels/changes in inequality and levels/changes in unemployment in the post-1980 period.

[Table 2 about here]

2.3.2 *Earnings Inequality and Unemployment by Skill Level*

Another way to examine the tradeoff hypothesis is to compare levels and changes in inequality with levels and changes in *relative* unemployment rates - the ratio of unskilled to skilled unemployment. These relative unemployment rates may be a better way to gauge the employment consequences of rigid wages. Since labor market institutions (e.g., wage floors, unemployment benefits, employment protections, and employment taxes) mainly affect the least skilled, the gap between low and high skill unemployment rates should provide a good measure of the effects of this

rigidity. At the same time, comparing *relative* unemployment rates by education level helps control for the effects of differences across nations in macroeconomic policy, the business cycle, and particular national institutional and cultural characteristics.

The conventional hypothesis is that countries with flexible labor markets show higher earnings inequality but lower unemployment inequality: the ratio of low to high skill unemployment will be lower in flexible labor markets since adjustments to adverse demand shifts against the least skilled can occur through wage flexibility. On the other hand, with extensive shelters from wage competition, adjustment in European markets occurs on the quantity side: employment declines, unemployment rises. So across skill groups we should observe a tradeoff between relative wage inequality and relative unemployment inequality – again, the plot should show points ranging from the upper left to bottom right.

Figure 9 shows earnings inequality, defined as the ratio of the wages of the average 90th percentile worker to that of the 10th percentile worker ($D9/D1$) plotted against unemployment inequality (the difference between low and high skill unemployment rates) for male workers over the 1979-93 period. The U.S. appears in the upper right corner with the highest earnings inequality *and* the highest unemployment inequality. That is, compared to skilled workers, *low skill workers in the U.S. fare the worst in terms of both relative earnings and the probability of being unemployed*. Indeed, the trend for the U.S. shows rapidly growing earnings inequality with no improvement in unemployment inequality. Canada experienced comparable levels of unemployment inequality, but somewhat lower earnings inequality. The U.K. does somewhat worse than the U.S. on unemployment inequality but much better on earnings dispersion. On the other hand, France, Germany, Sweden, Japan, Australia, and Italy were all superior on both dimensions of inequality.

[Figures 9-10 about here]

Figure 10 also compares these two measures of inequality, but does so for all workers (male and female) for a more recent period (1989-98) using a different measure of unemployment inequality.¹⁰ The pattern is similar. Again, the U.S. and Canada have the highest levels of both earnings and unemployment inequality. Germany, France, and the U.K. share similarly high unemployment inequality but show much lower earnings inequality. Austria, Switzerland, the Netherlands, and Italy are superior on both measures. The patterns shown in Figures 9 and 10 directly challenge the conventional tradeoff view: countries with lower earnings inequality also tend to have lower unemployment inequality. Low skill workers do not tend to show a lower likelihood of unemployment in countries where their wages are relatively low.

2.3.3 *Employment Rates and Earnings Inequality*

If wage rigidity is a major source of the unemployment problem, the underlying reason must be that the absence of downwardly flexible wage rates has undermined *employment* growth. Inadequate job opportunities can be expected to raise unemployment by increasing the number of workers without jobs looking for work; but poor employment prospects may also lead workers to drop out of the labor market altogether. For this reason, employment rates are a broader measure of the employment consequences of a country's wage-setting system. But the orthodox prediction is the same: if demand shifts have been strongly biased against low skill workers throughout the developed world, these workers should have paid the price in lower relative wages (producing higher inequality) in nations with greater wage flexibility; in contrast, in the more rigid European labor markets, lower skill workers should have experienced lower employment rates, as they were priced out of the labor market. So again there is a tradeoff, this time between earnings inequality and employment rate inequality.

Comparing employment rates by skill across different OECD countries using different methodologies, Nickell and Bell (1995) and Card, Kramarz, and Lemieux (1995) find no support for the tradeoff prediction. In their study of the U.S., Canada, and France, Card et al. leave no doubt about the lack of support for the conventional view:

Consistent with the view that French labor market institutions restrict relative wage flexibility, we find that wage differentials between skill groups held constant or narrowed slightly over the 1980s. As in Canada, however, we find little evidence that this apparent rigidity in relative wages translated into greater employment losses for less-skilled workers. Indeed, the pattern of employment-population growth rates across age-education cells in France is almost identical to the pattern in the United States. Taking the evidence for the United States, Canada, and France as a whole, we conclude that it is very difficult to maintain the hypothesis that the ‘wage inflexibility’ in Canada and France translated into greater relative employment losses for less-skilled workers in these countries (Card et al. 1995: 3).

Similar results were found for Sweden (Edin, Harkman, and Holmlund, 1996) and Germany (Krueger and Pischke, 1997).¹¹

The most common approach to measuring the dispersion of employment rates by skill is to use educational attainment data. For 25- to 64-year-old males, Glyn and Salverda (2000) calculate employment rates for the top and bottom quartile of the educational distribution for fifteen OECD nations. Using their data, Figure 11 shows a plot of the difference between the top and the bottom education quartiles (Q4-Q1) against the standard D9/D1 measure of earnings inequality for 1994 (the only year for which data was available).¹² The predicted tradeoff should again show a downward sloping relationship, with the U.S. and other Anglo-Saxon countries in the upper left and the northern European welfare states in the bottom right. Clearly, there is no support for such a relationship in these data. If anything, there is an upward sloping trend. In Glyn’s data, Ireland has

the highest level of earnings inequality, followed by the U.S., whose employment rate inequality (which should be very low according to the tradeoff view) is greater than that of West Germany, Austria, Australia, Sweden, Japan, and Switzerland.

[Fig. 11 and 12 about here]

We should also observe a tradeoff between the *change* in earnings inequality and the *change* in employment rate dispersion by skill: as demand shifts work against the least skilled, countries that respond with wage flexibility (rising earnings inequality) can avoid paying the price of declining demand in the form of declining employment (falling relative employment rates for the less skilled). Again, with change in earnings inequality on the vertical axis and change in employment rate dispersion on the horizontal, nations should be arrayed from upper left to bottom right, from those with the most flexible wage setting institutions to those with the least flexible.

With data from Glyn (2000), Figure 12 shows average annual percent changes for both earnings and employment rate inequality for sixteen OECD nations. For most, we plot two points, one for the 1980s, another for the 1990s. Data limitations resulted in just a single decade observation for five nations (Japan, Switzerland, Norway, Ireland, and Denmark). As in the earlier figures on unemployment, this figure offers no suggestion of a tradeoff: since 1980, declining relative wages did not produce relatively higher employment rates for lower skill men across these sixteen developed countries.

Indeed, what is most striking is the concentration of points in the upper right quadrant. In most countries over these two decades, lower skill workers experienced both declining relative earnings *and* declining relative employment rates. Among the twenty-seven country-decade points shown in Figure 12, only Canada in the 1990s achieved declines in both earnings and employment rate inequality. Countries with the highest growth in earnings inequality ranged from the

Netherlands in the 1990s, with sharply falling employment rate inequality, to New Zealand and the U.K. in the 1980s, which had, with France, the highest growth in employment rate inequality.

The data indicate that the relative position of the least skilled has tended to decline over these two decades. But again, if the explanation is skill-biased demand shifts in labor markets in which institutions have disallowed wage flexibility, we should observe a tradeoff pattern (upper left to bottom right), even within the upper right quadrant. There is no such pattern.

Finally, regression tests offer another angle to view the association between wage dispersion and employment rate inequality for the highest and lowest educated workers. According to Glyn and Salverda (2000: 11), their tests show that “greater wage dispersion is not associated with higher employment at the bottom end of the labour market, given both the overall employment level and the educational level of the bottom end of the labour force.”

In sum, available cross-national data provide no support for the conventional wisdom that the employment problems of central and northern Europe are systematically linked to their relatively egalitarian wage-setting mechanisms.

2.4 Skills, Institutions and Earnings Inequality

In a textbook competitive world, across countries earnings inequality should mirror skill inequality. We would expect to see little evidence of inequality-unemployment tradeoffs because institutions do not (by definition) greatly affect the skill-determined earnings distribution. At least concerning the wage distribution, competitive forces trump institutional constraints (Nickell and Layard, 1997: 64).

Assuming that competitive forces ensure that the skill distribution dominates the effects of institutions (and social norms) in determining the wage structure can explain the failure of the data to confirm a tradeoff between earnings inequality and unemployment. But this skill dispersion

variant of the OECD-IMF orthodoxy requires that developed world labor markets produce textbook-like outcomes, and that efforts to produce more egalitarian outcomes will be achieved much more effectively by equalizing the skill distribution rather than directly through institutional constraints. The answer to low wages is not interference with market outcomes, but skill upgrading. Indeed, the main complaint by the OECD Jobs Study (1994: 30) about U.S. labor markets concerns skills: in the face of collapsing demand in the U.S. “workers have not upgraded their skills fast enough.”

While the last section presented evidence that challenges the conventional view that labor market institutions raise unemployment by compressing the wage distribution, does the evidence also suggest that the reason is that competitive forces dominate the effects of institutional differences across countries in the setting of relative wages?

Nickell and Layard (1997) make their case for a skill dispersion explanation for the cross-country pattern of earnings inequality on the basis of evidence for six countries: Germany, the Netherlands, Sweden, Switzerland, Canada, and the U.S. Using literacy scores from the OECD’s 1994 International Adult Literacy Survey, they show graphically that relative earnings appear to correspond to relative test scores for workers with high and low levels of educational attainment for these six countries. We begin by extending the analysis of Nickell and Layard (1997) by including additional countries, using the OECD’s original 1994 literacy survey and two more recent surveys (from 1996 and 1998), also produced by the OECD.¹³ We use the quantitative literacy test scores to calculate a measure of skill inequality by educational attainment group (those with completed tertiary education relative to those with less than upper secondary education).

These test score ratios are combined in Figure 13 with the OECD’s (2000a) measure of earnings inequality for 1996-98, based on the same educational attainment groups as those used to measure skill inequality (tertiary education, less than upper secondary education). The figure suggests

a positive correlation ($R^2 = 0.36$), but it is not particularly strong. For example, four of the sixteen countries have identical earnings inequality scores (Czech Republic, U.K., Hungary, U.S.), but range from the bottom to the top of the skill dispersion scale – from 1.2 for the Czech Republic to 1.5 for the United States. At a lower level of earnings inequality, the same can be said for Germany, Finland, New Zealand, and Canada, which have literacy ratios that range from the lowest (most equal) to the third highest. A lack of correspondence can also be read along the vertical axis: the Netherlands and the Czech Republic have the same literacy ratio, but dramatically different levels of earnings inequality.

An alternative approach to the measurement of skill inequality is to simply take a ratio of top to bottom percentiles of the literacy distribution (rather than taking test scores by education category, as in Figure 13). Figure 14 plots earnings inequality and this measure of skill inequality for fourteen OECD countries. It appears to highlight two sets of nations. Among the more “laissez-faire” and largely Anglo-Saxon countries – New Zealand, Ireland, Australia, the U.K., Canada, and the U.S. – there is a strong positive relationship between earnings inequality and skill dispersion. On the other hand, among the central and northern European nations – Denmark, Germany, Netherlands, Finland, Sweden, Norway, Belgium and Switzerland – there is no apparent relationship. Another way to read these results is that the U.S., Canada, Ireland and the U.K. have high earnings and skill inequality, but for the countries with moderate-low earnings inequality (a D9/D1 ratio below 3), six countries have very compressed skill distributions and four show considerable skill inequality (New Zealand, Australia, Switzerland, and Belgium).

[Fig. 13-14-15 about here]

In the conventional world of the Unified Theory, collapsing demand for the least skilled describes the post-1980 period in the OECD, and in this setting we should observe earnings inequality rising most dramatically for countries with the greatest skill inequality. Figure 15 is based

on the same sources of data as Figure 14, but relates skill inequality to the *change* in earnings inequality for the 1980-95 period. Again, if there is a positive relationship between the skill mix and earnings inequality growth, it appears to be limited to the Anglo-Saxon countries. Indeed, Figure 15 suggests that any positive association between skill dispersion and the change in earnings inequality is driven almost entirely by the presence of the U.S., which appears here as a clear outlier. Most of the countries are distributed across the figure horizontally. Thus, countries with low skill inequality (Denmark and Sweden), moderate skill inequality (Switzerland and New Zealand), and high skill inequality (Australia and Canada) all show slight increases in earnings inequality.

The regression results in rows 1 and 2 of Table 3 confirm a strong and statistically significant relationship between our two skill measures and the level and change in earnings inequality for the thirteen to fourteen countries for which we had data. While the literacy ratio can account for 61% of the variation in mid-1990s earnings inequality across fourteen OECD countries, from Figure 14 we know that these apparently strong results reflect an averaging of the strong association that exists for Anglo-Saxon countries and the lack of any association for the European countries. Column 2 reports that the literacy ratio can account for 30% of the differences in earnings inequality changes in the 1980s and 1990s, and Figure 15 suggests that that result depends entirely on the presence of the United States. Indeed, dropping the U.S. reduces the literacy coefficient from .03 (significant at the 5% level) to and insignificant .002, and its explanatory power drops from 30% to 7% (not shown in Table 3).

[Table 3 about here]

The last five rows of Table 3 report the results of separate regression tests of conventional measures of the institutions that figure most prominently in the literature on unemployment. All have statistically significant negative effects on earnings inequality; all but the unemployment protection index and the summary unemployment benefits indicator have highly significant negative

effects for the change in earnings inequality (column 2). In each case, scatterplots (similar to Figures 13-15, but with measures of institutions on the horizontal axis) show that the association between the change in earnings inequality and labor market institutions is due to the location of the U.S. and the U.K. in the upper left corner of the graph. These two countries consistently provide the least shelter from labor market forces and show the highest increases in earnings inequality.

As we noted in Section 1, there is good reason to expect a strong link between labor market institutions and the skill composition of the workforce. Skill formation is closely linked to social protection. Workers face risks when they invest in specific skills and thus need insurance in the form of employment or unemployment protection. In countries where firm-specific and industry-specific skills are important (such as Japan and Germany), the transition from education to work is relatively institutionalized, for example in the form of vocational training systems. Estevez-Abe et al. (2000: 31) find that “earnings dispersion ... is closely related to particular skill systems as well as the wage bargaining institutions that tend to go with these systems.”

The real test for the competitive hypothesis that institutions play a decidedly secondary role in explaining the pattern of earnings inequality across countries is whether this association between earnings inequality and skill dispersion holds *independently* of the institutional context. It seems unlikely - and it is difficult to test - because the standard institutional variables are so highly correlated with the best measures of skill mix. For example, our skill inequality measure shows a correlation of .88 with employment protection, .694 with unemployment benefits, and .747 with bargaining coverage (all significant at the .001 level).

The univariate regression results shown in Table 4 make clear that countries with strong protective labor market institutions tend to have low skill inequality and low shares of very low-skilled workers. Indeed, the relationship is so strong that the institutional variables could serve well as proxies for skill inequality. The relationship between the literacy ratio and the employment

protection index constructed by Estevez-Abe et al. (2000) is particularly strong (adj. $R^2 = 0.75$).

Measures of bargaining coordination and coverage are also closely correlated with measures of skill inequality.

This evidence suggests that support for strong egalitarian educational and labor market institutions tends to be closely linked across countries. Both wage compression and skill compression reflect the extent to which a society has made strong institutional interventions in the labor market and in the education and training sector. Countries with institutions designed to shelter workers from labor market competition also establish institutions to promote skill equality. Based on our data, we cannot say which is more important for the wage structure, the skill mix or labor market institutions. But the answer given by Devroye and Freeman (2000) is clear: protective labor market institutions are substantially *more* important than the skills distribution. Based on their examination of the pattern of skills, institutions, and relative earnings in Germany, Holland, Sweden, and the United States, they conclude that “differences in skill dispersion across countries explain only a modest proportion of differences in the dispersion of earnings across countries.” Recent work by Blau and Kahn comes to a similar conclusion (2002). We conclude that, at a minimum, labor market institutions matter a great deal for the earnings distribution, both by directly compressing the wage structure and by helping to determine the level and mix of worker skills.

2.5 Conclusions

In this chapter we evaluated alternative explanations of recent trends in earnings and employment outcomes across OECD countries. On one side, the *wage compression* version of the OECD-IMF orthodoxy blames a variety of welfare state institutions for compressing the wage distributions and effectively “disallowing” low wage jobs in an economic environment in which demand is shifting strongly away from the least skilled. The consequence of this wage rigidity is a

substantial inequality-unemployment tradeoff. The *skill dispersion* variant, on the other hand, suggests that while welfare states try to compress the earnings distribution, in the end markets ensure that this distribution closely mirrors the skill distribution. These market pressures help explain the failure of earnings inequality/unemployment rate tradeoffs to appear in the data. In sum, supply and demand stories produce contradictory accounts of the role of institutions: on the one side, institutions are the culprits in the battle against unemployment because they cause “too much” wage compression; on the other, they may play a key role in raising the inflation-steady level of unemployment, but not mainly via wage compression.

These supply and demand approaches assume that the labor market produces a determinate set of wage-employment equilibria. We suggest an alternative institutionalist vision of the labor market, one in which wage-setting is characterized by a meaningful range of indeterminacy. Within this feasible range, social norms and labor market institutions play key roles in determining where the wage is actually set. Under these circumstances, institutions may strongly influence the pattern of wages across countries but need not necessarily be a key determinant of persistent differences in unemployment (or employment) rates.

We addressed three empirical predictions that follow directly from the conventional supply and demand model and reflect the conventional wisdom. First, if increasing earnings inequality in the U.S. is mainly caused by technology-driven skill-biased demand shifts, we should observe a tendency for rising inequality across all developed countries. In fact, we conclude that only the U.K., the U.S., and New Zealand have experienced strong and persistent rises in earnings inequality over the last two decades. It seems clear that other OECD countries have adopted similar technologies without experiencing comparable earnings outcomes.¹⁴

In the wage compression (Unified Theory) view, the failure of more countries to substantially increase the dispersion of earnings (by allowing the relative wages of the least skilled to

fall) may explain the widespread experience of high unemployment in the 1980s and 1990s. We find no evidence of meaningful tradeoffs between earnings inequality and either employment or unemployment rates (or between changes in them) across OECD countries. These results challenge the conventional view that too much wage compression is the main source of European employment problems.

It is possible that the reason for the absence of an unemployment-earnings inequality tradeoff is that it is differences in skill dispersion, not in institutions, that mainly determine national differences in earnings inequality. We find evidence in support of a positive link between skill dispersion and earnings inequality. But our results also suggest a more complicated view. First, for whatever reason, the correspondence appears to exist only across the Anglo-Saxon countries (the U.S., U.K., New Zealand, Australia, and Canada). Indeed, without the U.S. and the U.K. there is little or no association between our two measures of skill dispersion and the *change* in earnings inequality. Second, a number of measures of labor market institutions (employment and unemployment protection, bargaining coverage, and bargaining coordination) are also closely associated with earnings inequality trends. And third, the high correlation between skill dispersion and institutional variables lends support to the view that labor market institutions and social policies may jointly help determine both the skill mix of the workforce *and* earnings inequality. Underlying a country's skill mix and labor market institutions are policies and programs that in turn reflect ideologies and social norms – and it is these that ultimately determine the patterns of earnings inequality that we observe. Countries that protect low-skill workers from extremely low wages also provide more and better education and training for them. And countries with relatively literate “low-skill” workers (Sweden, Denmark, Germany) tend to set wages collectively through highly centralized and coordinated systems.

A convincing explanation for differences in earnings and employment trends across developed countries requires moving beyond simple supply and demand stories. Since real-world wage-setting is best characterized by indeterminacy within some feasible range, bargaining power and labor market institutions can be expected to play important and complicated roles, with outcomes not always consistent with the textbook supply-demand model. Our conclusions regarding earnings inequality and unemployment trends across the OECD are illustrative. As Freeman (2000: 1) has put it, “The institutional organization of the labour market has identifiable large effects on distribution, but modest hard-to-uncover effects on efficiency.” The evidence suggests that while labor market institutions and related government policies are central to both skill formation and wage-setting (and therefore earnings inequality), they need not be the main source of the recent European unemployment problem.

REFERENCES

- AKERLOF, GEORGE A. 2002. Behavioral macroeconomics and macroeconomic behavior. *The American Economic Review* 92, no. 3 (June): 411-433.
- ATKINSON, ANTHONY B. 1998. The distribution of income in industrialised countries. Paper presented at the Symposium on “Income Inequality: Issues and Policy Options,” sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming, August 27-29.
- . 1999. Is rising inequality inevitable?: A critique of the transatlantic consensus. WIDER annual lecture, presented at University of Oslo, November 1.
- BERTOLA, GIUSEPPE, FRANCINE D. BLAU, AND LAWRENCE M. KAHN. 2002. Comparative analysis of labor market outcomes: Lessons for the United States from international long-run evidence. In *The roaring nineties: Can full employment be sustained?*, edited by Alan Krueger and Robert Solow. New York: Russell Sage Foundation.
- BHASKAR, V., ALAN MANNING, AND TED TO. 2002. Oligopsony and monopsonistic competition in labor markets. *The Journal of Economic Perspectives* 16, no. 2 (Spring): 155-174.
- BJORKLUND, ANDERS, AND RICHARD B. FREEMAN. 1997. “Generating equality and eliminating poverty, the Swedish way.” In *The welfare state in transition: Reforming the Swedish model*, edited by

- Richard B. Freeman, Robert H. Topel, and Birgitta Swedenborg. Chicago: University of Chicago Press.
- BLANCHFLOWER, DAVID G., AND ANDREW J. OSWALD. 1995. International wage curves. In *Differences and changes in wage structures*, edited by Richard B. Freeman and Lawrence F. Katz. Chicago: University of Chicago Press.
- BLANK, REBECCA M. 1997. *No easy answers: Comparative labor market problems in the United States versus Europe*. Working Paper no. 188, Northwestern University/University of Chicago Joint Center for Poverty Research.
- BLAU, FRANCINE D., AND LAWRENCE M. KAHN. International Differences in Male Wage Inequality: Institutions versus Market Forces. *Journal of Political Economy* 104(4): 791-837.
- BLAU, FRANCINE D., AND LAWRENCE M. KAHN. 2002. *At home and abroad: U.S. labor market performance in international perspective*. New York: Russell Sage Foundation.
- BOUND, JOHN, AND GEORGE JOHNSON. 1995. What are the causes of rising wage inequality in the United States? *Economic Policy Review* 1, no. 1 (January): 9-17.
- CARD, DAVID. 1995. The wage curve: A review. *Journal of Economic Literature* 33, no. 2 (June): 785-99.
- CARD, DAVID, FRANCIS KRAMARZ, AND THOMAS LEMIEUX. 1995. *Changes in the relative structure of wages and employment: A comparison of the United States, Canada, and France*. Working Paper 355 (December), Industrial Relations Section, Princeton University.
- DEVROYE, DANIEL, AND RICHARD FREEMAN. 2000. Does inequality in skills explain inequality of earnings across countries? Unpublished manuscript, Harvard University (April 19).
- EDIN, PER-ANDERS, ANDERS HARKMAN, AND BERTIL HOLMLUND. 1996. Unemployment and wage inequality in Sweden. Mimeo, Uppsala University.
- ESTEVEZ-ABE, MARGARITA, TORBEN IVERSEN, AND DAVID SOSKICE. 2000. Social protection and the formation of skills: A reinterpretation of the welfare state. Paper presented at Wiener Inequality & Social Policy Seminar, March 13, Harvard University.
- Fortin, Nicole M. and Thomas Lemieux. Institutional Changes and Rising Wage Inequality: Is There a Linkage? *Journal of Economic Perspectives*, Vol. 11, No. 2 (Spring): 75-96.
- FREEMAN, RICHARD B. 2000. *Single peaked vs. diversified capitalism: The relation between economic institutions and outcomes*. Working Paper 7556 (February), National Bureau of Economic Research.
- FREEMAN, RICHARD B., AND LAWRENCE KATZ. 1994. Rising wage inequality: The United States vs. other advanced countries. In *Working under different rules*, edited by Richard B. Freeman. New York: Russell Sage Foundation.

- FREEMAN, RICHARD B., AND RONALD SCHETTKAT. 2000. *Skill compression, wage differentials and employment: Germany vs. the US*. Working paper 7610 (March), National Bureau of Economic Research.
- GALBRAITH, JAMES K., PEDRO CONCEIÇÃO, AND PEDRO FERREIRA. 1999. Inequality and unemployment in Europe: The American cure. *New Left Review* no. 237 (September/October): 28-51.
- GLYN, ANDREW. 2000. Unemployment and inequality. In *Readings in macroeconomics*, edited by Tim Jenkinson. 2nd ed. Oxford: Oxford University Press.
- GLYN, ANDREW, AND WIEMER SALVERDA. 2000. Employment inequalities. In *Labour market inequalities: Problems and policies of low-wage employment in international perspective*, edited by M. Gregory, W. Salverda, and S. Bazen. Oxford: Oxford University Press.
- GOTTSCHALK, PETER. 1997. Inequality, income growth, and mobility: The basic facts. *Journal of Economic Perspectives* 11, no. 2 (Spring): 21-40.
- HOWELL, DAVID R. 1999. Theory-driven facts and the growth in earnings inequality. *Review of Radical Political Economics* 31, no. 1 (March): 54-86.
- . 2002. Increasing earnings inequality and unemployment in developed countries: Markets, institutions and the “Unified Theory.” *Politics & Society* 30, no. 2 (June): 193-243.
- INTERNATIONAL MONETARY FUND (IMF). 1999. Chronic unemployment in the euro area: Causes and cures. Chapter IV in *World Economic Outlook* (May). Washington, DC: IMF.
- KRUEGER, ALAN B., AND JÖRN-STEFFEN PISCHKE. 1997. *Observations and conjectures on the U.S. employment miracle*. Working Paper 6146 (August), National Bureau of Economic Research.
- LEUVEN, EDWIN, HESSEL OOSTERBEEK, AND HANS VAN OPHEM. 1998. *Explaining international differences in male wage inequality by differences in demand and supply of skill*. Discussion paper 392 (May), Centre for Economic Performance, London School of Economics and Political Science.
- LUCIFORA, CLAUDIO. 2000. Wage inequalities and low pay: The role of labour market institutions. In *Labour market inequalities: Problems and policies of low-wage employment in international perspective*, edited by Mary Gregory, Wiemer Salverda, and Stephen Bazen. Oxford: Oxford University Press.
- NICKELL, STEPHEN, AND BRIAN BELL. 1995. The collapse in demand for the unskilled and unemployment across the OECD. *Oxford Review of Economic Policy* 11, no. 1 (Spring): 40-62.

- NICKELL, STEPHEN, AND RICHARD LAYARD. 1997. *Labour market institutions and economic performance*. Discussion paper, Centre for Economic Performance, University of Oxford.
- ORGANIZATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD). 1994. *OECD Jobs Study: Evidence and explanations, part II: The adjustment potential of the labour market*. Paris: OECD.
- . 1996. *Employment Outlook* (July). Paris: OECD.
- . 1997a. *Employment Outlook* (July). Paris: OECD.
- . 1997b. *Implementing the OECD Jobs Strategy: Member countries' experience*. Paris: OECD.
- . 1999. *OECD Economic Outlook* no. 66. Database. Paris: OECD.
- . 2000a. *Education at a glance: OECD indicators*. Paris: OECD.
- . 2000b. *Literacy in the information age: Final report of the International Adult Literacy Survey*. Paris: OECD.
- SCHETTKAT, RONALD. 1993. Compensating differentials? Wage differentials and employment stability in the U.S. and German economies. *Journal of Economic Issues* 27, no. 1 (March): 153-170.
- SIEBERT, HORST. 1997. Labor market rigidities: At the root of unemployment in Europe. *Journal of Economic Perspectives* 11, no. 3 (Summer): 37-54.
- SNOWER, DENNIS J. 1998. Causes of changing earnings inequality. Paper presented at the Symposium on "Income Inequality: Issues and Policy Options," sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming, August 27-29.

Table 2.1: Regression Results: Inequality and Unemployment

Explanatory Variables	Unemployment Rate, 1995		Change in Unemployment Rate, 1980-95	
	Coefficient		Coefficient	
	(Standard error)		(Standard error)	
	Adj. R ²		Adj. R ²	
	No. of countries		No. of countries	
	All countries	Without U.S.	All countries	Without U.S.
Earnings Inequality	-0.319	0.340	-0.130*	-0.091
D9/D1, 1995	(1.107)	(1.319)	(0.074)	(0.094)
	-0.06	-0.06	0.11	-0.005
	18	17	17	16
Change in Earnings Inequality	-79.30**	-90.80*	-2.32	0.491
D9/D1, 1980-95	(35.39)	(45.72)	(2.91)	(3.57)
	0.20	0.16	-0.02	-0.07
	17	16	17	16

* significant at the 0.10 level, ** significant at the 0.05 level.

Each cell shows the result of a separate OLS regression test. In many cases the D9/D1 ratio was not available for 1980 or 1995; for those countries the inequality and unemployment figures for the nearest year were used.

See Appendix A for the data and Appendix B for data sources.

Table 2.2: Regression Results: Inequality and Unemployment

Explanatory Variables	Unemployment Rate, 1995		Change in Unemployment Rate, 1980-95	
	Coefficient		Coefficient	
	(Standard error)		(Standard error)	
Change in Earnings Inequality	-92.98*	-90.33*	-0.112	-0.231
D9/D1, 1980-95	(49.01)	(46.83)	(4.864)	(4.626)
Literacy Ratio	1.598		-0.173	
95th/5th pctile test scores, 1994-98	(2.518)		(0.250)	
Low Literacy Share		0.105		-0.012
Percent at level 1, 1994-98		(0.167)		(0.017)
Adj. R ²	0.14	0.28	-0.11	0.08
Number of countries	13	13	13	13

* significant at the 0.10 level.

Each column shows the result of a separate OLS regression test. In many cases the D9/D1 ratio was not available for 1980 or 1995; for those countries the inequality and unemployment figures for the nearest year were used.

See Appendix A for the data and Appendix B for data sources.

Table 2.3: Univariate Regression Results: Skills, Institutions, and Earnings Inequality

Explanatory Variables	Earnings Inequality (D9/D1), 1995	Change in Earnings Inequality, 1980-95
	Coefficient (Standard error) Adj. R ² No. of countries	Coefficient (Standard error) Adj. R ² No. of countries
Literacy Ratio	1.76***	0.031**
95th/5th percentile test scores, 1994-98	(0.383) 0.61 14	(0.012) 0.30 13
Low Literacy Share	0.106***	0.002**
Percent at level 1, 1994-98	(0.026) 0.55 14	(0.001) 0.24 13
Employment Protection Index 0-1, 1990s	-1.72*** (0.627) 0.28 18	-0.042** (0.017) 0.24 17
Unemployment Protection Index 0-1, 1990s	-1.26** (0.574) 0.18 18	-0.018 (0.017) 0.01 17
Unemployment Benefits Summary indicator, 1995	-0.029** (0.011) 0.26 18	-0.0004 (0.0003) 0.04 17
Bargaining Coverage Percent, 1994	-0.014** (0.006) 0.26 17	-0.0004*** (0.0001) 0.30 17
Bargaining Coordination 1-3, 1994	-0.461* (0.248) 0.14 16	-0.016** (0.006) 0.29 16

* significant at the 0.10 level, ** significant at the 0.05 level, *** significant at the 0.01 level.

Each cell shows the result of a separate OLS regression test. In many cases the D9/D1 ratio was not available for 1980 or 1995; for those countries the inequality figures for the nearest year were used. See Appendix A for the data and Appendix B for data sources.

Table 2.4: Univariate Regression Results: Skills and Institutional Characteristics

Explanatory Variables	Literacy Ratio, 1994-98 Coefficient (Standard error) Adj. R ² No. of countries	Low Literacy Share, 1994-98 Coefficient (Standard error) Adj. R ² No. of countries
Employment Protection Index 0-1, 1990s	-1.315** (0.205) 0.75 14	-19.95** (3.716) 0.68 14
Unemployment Protection Index 0-1, 1990s	-0.931** (0.241) 0.52 14	-13.6** (4.190) 0.42 14
Unemployment Benefits Summary indicator, 1995	-0.018** (0.005) 0.44 14	-0.256* (0.094) 0.33 14
Bargaining Coverage Percent, 1994	-0.011** (0.003) 0.52 13	-0.154** (0.044) 0.48 13
Bargaining Coordination 1-3, 1994	-0.492** (0.107) 0.63 13	-6.86** (1.633) 0.58 13

* significant at the 0.05 level, ** significant at the 0.01 level.

Each cell shows the result of a separate OLS regression test.

See Appendix A for the data and Appendix B for data sources.

Figure 2.1: The Conventional Model: Skill-Biased Demand Shifts and Rising Earnings Inequality in the U.S.

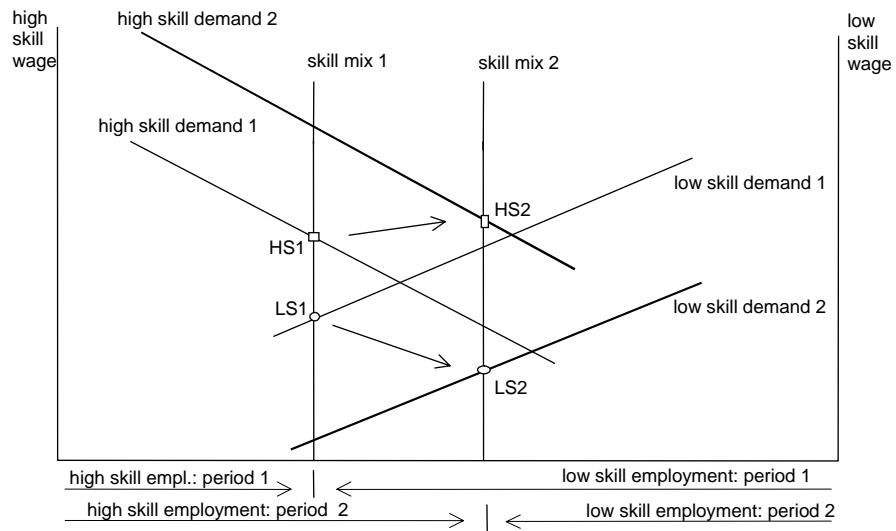


Figure 2.2: The Conventional Model: Skill-Biased Demand Shifts and High Unemployment in Europe

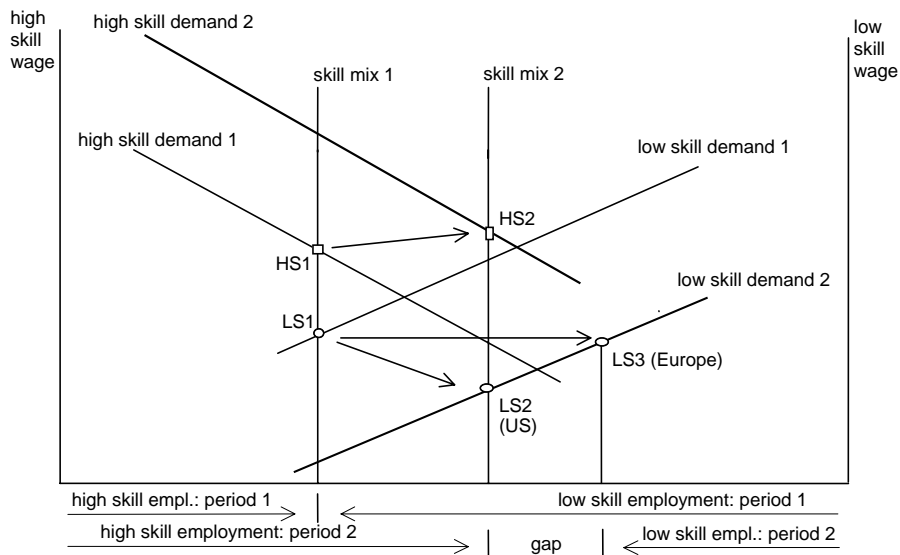
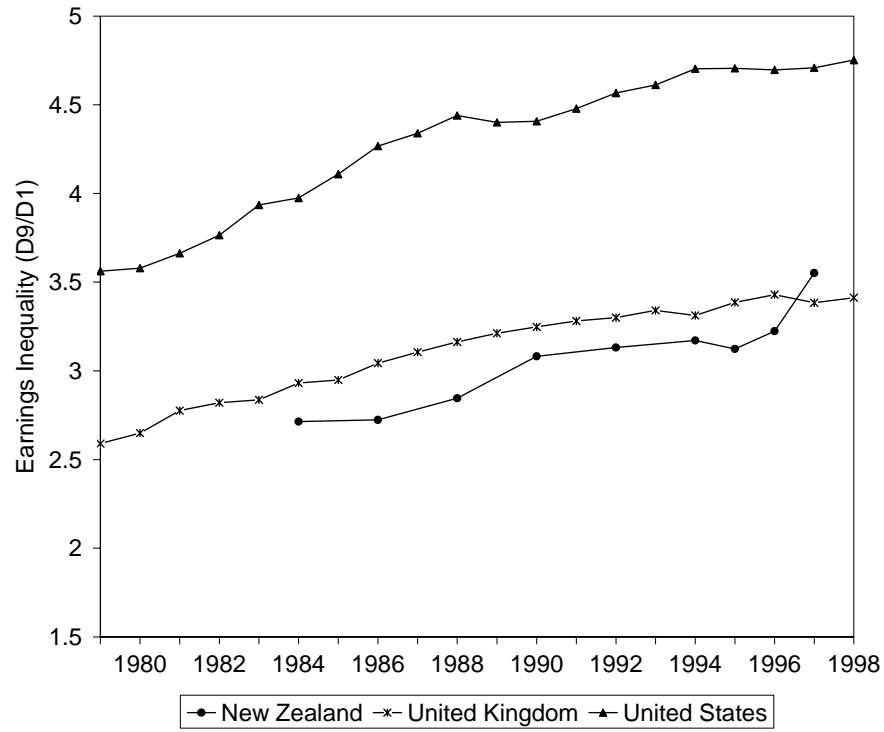
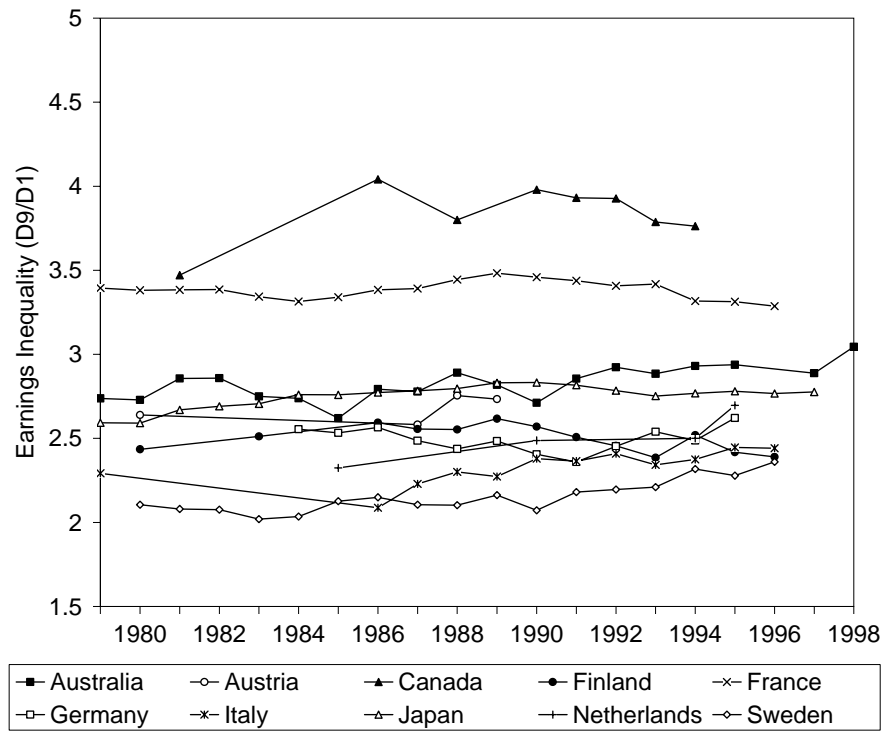


Figure 2.3: Trends in Earnings Inequality, Male Workers, 1979-98: Countries with Increasing Inequality



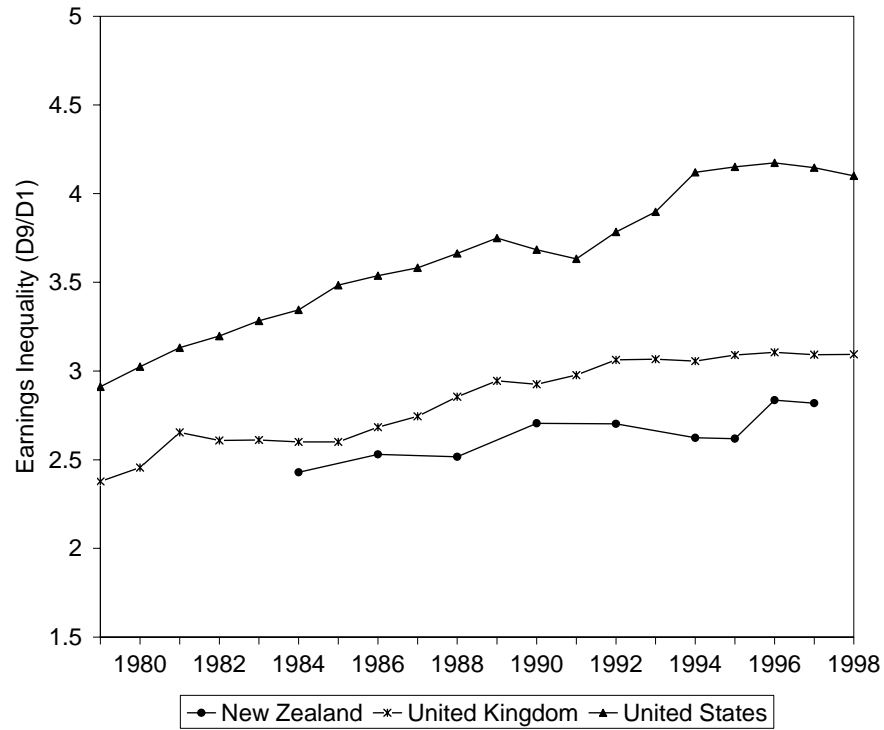
Data source: see Appendix B.

Figure 2.4: Trends in Earnings Inequality, Male Workers, 1979-98: Countries with Stable or Declining Inequality



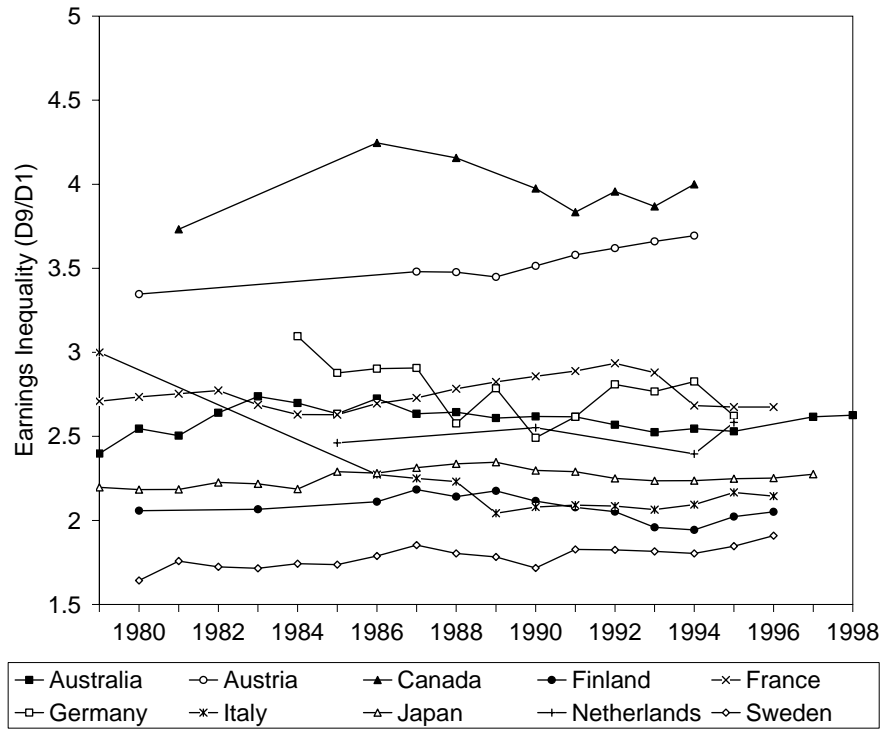
Data source: see Appendix B.

Figure 2.5: Trends in Earnings Inequality, Female Workers, 1979-98: Countries with Increasing Inequality



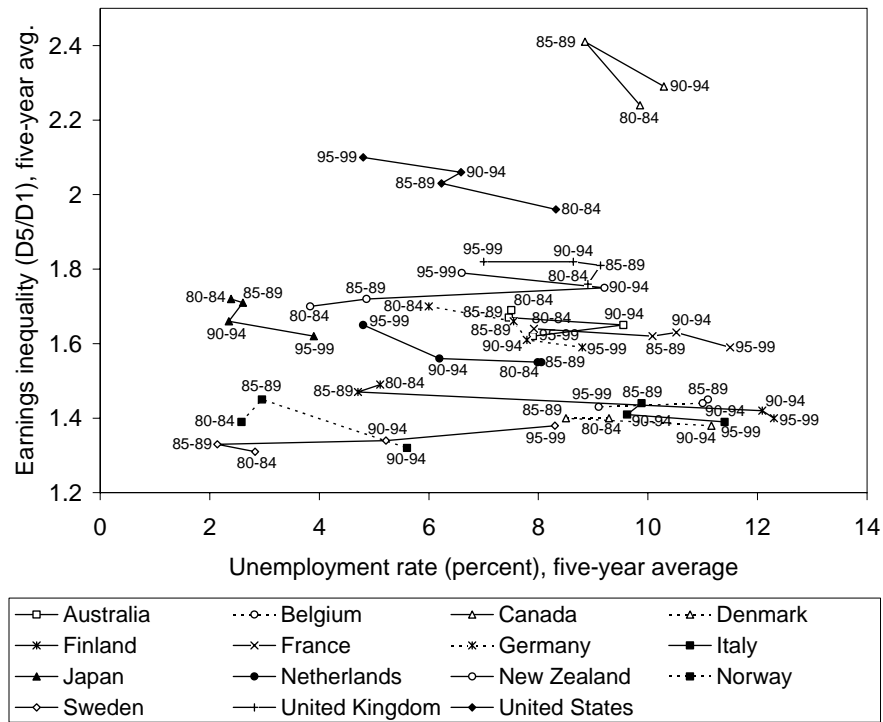
Data source: see Appendix B.

Figure 2.6: Trends in Earnings Inequality, Female Workers, 1979-98: Countries with Stable or Declining Inequality



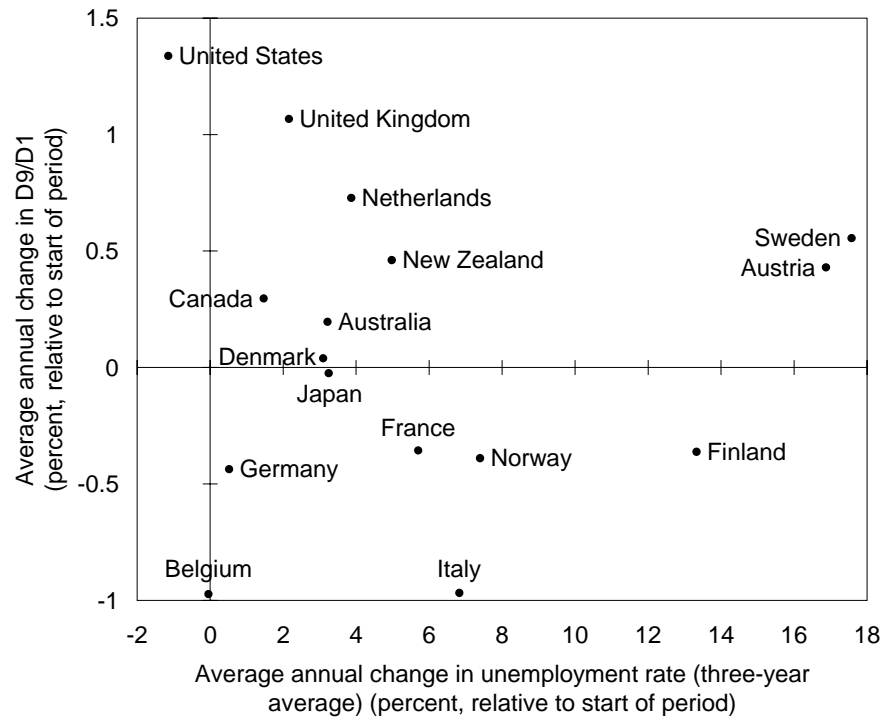
Data source: see Appendix B.

Figure 2.7: Earnings Inequality and Unemployment, 1980-1999



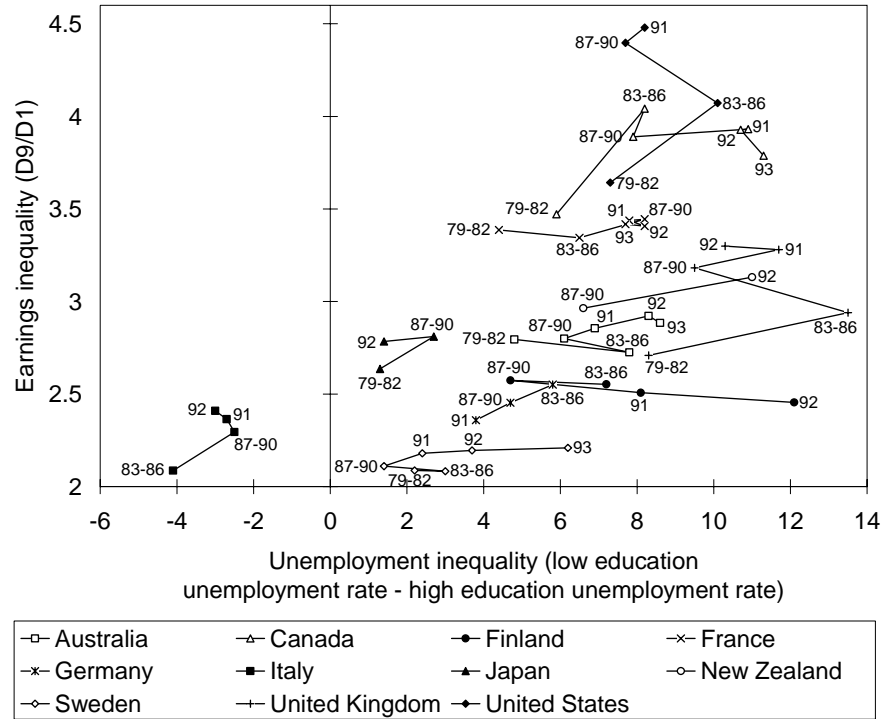
Data sources: see Appendix B; and Appendix 2, Chapter 1 of this volume.

Figure 2.8: Unemployment Rate and Earnings Inequality Average Annual Change, All Workers, 1980-1995



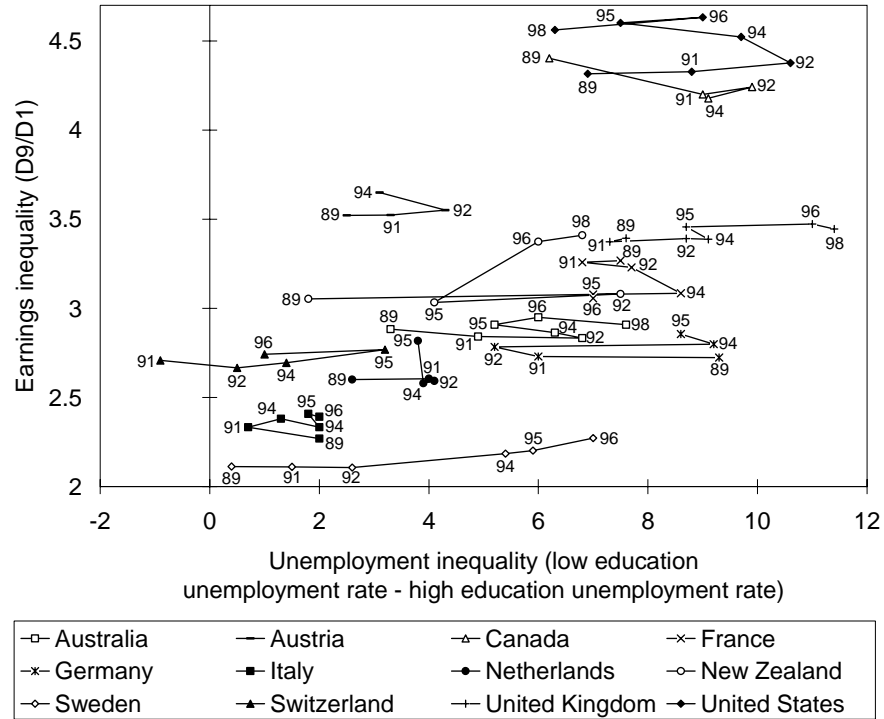
Data sources: see Appendix B.

Figure 2.9: Earnings Inequality and Relative Unemployment Rates by Education Level, Male Workers, 1979-1993



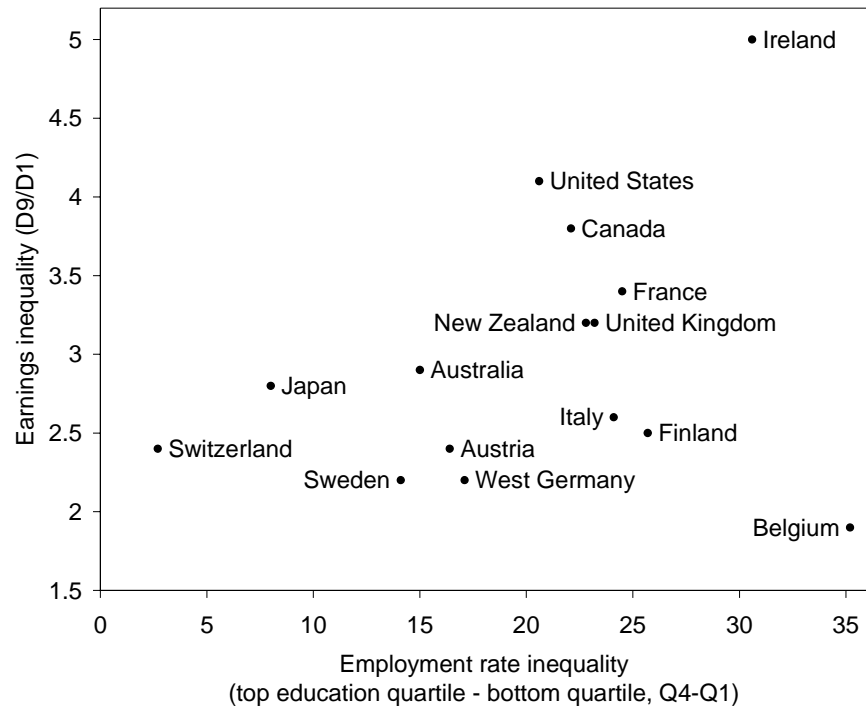
Data sources: see Appendix B.

Figure 2.10: Earnings Inequality and Relative Unemployment Rates by Education Level, All Workers, 1989-1998



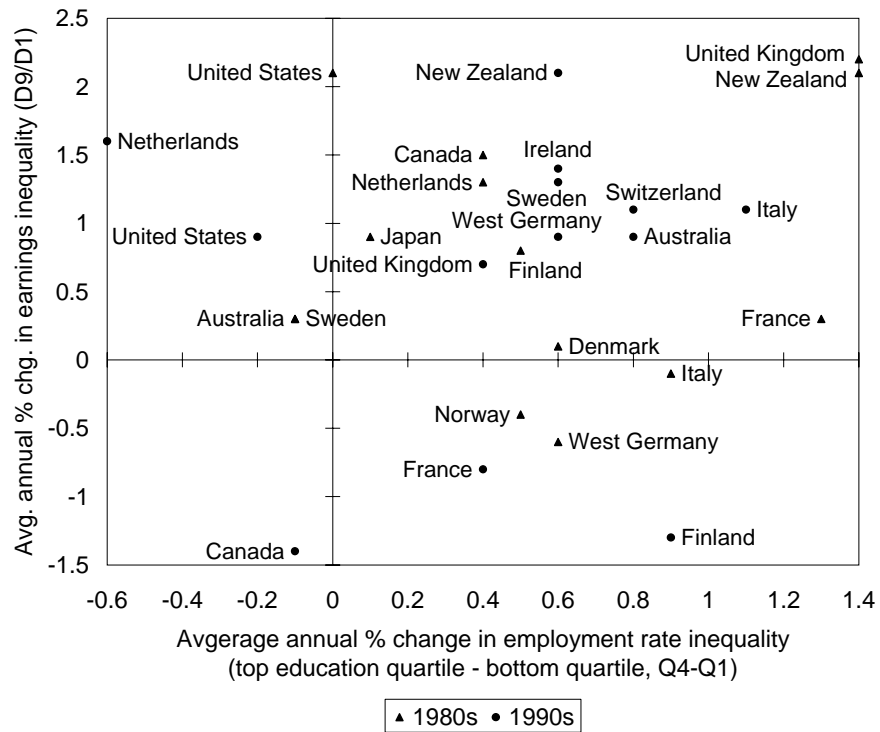
Data sources: see Appendix B.

Figure 2.11: Earnings Inequality and Employment Rate Inequality, Male Workers, 1994



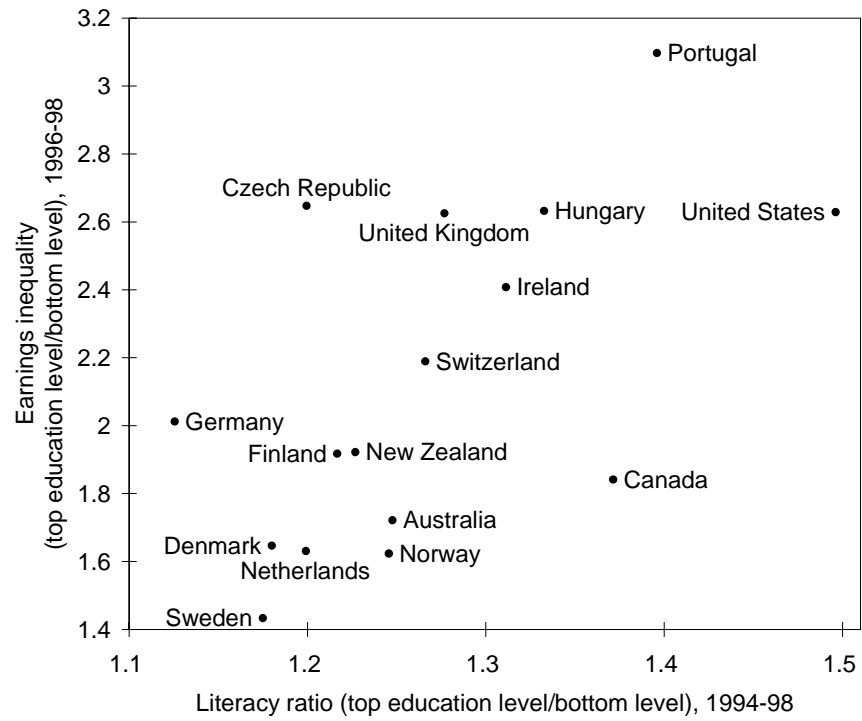
Data source: see Appendix B.

Figure 2.12: Changes in Earnings Inequality and Employment Rate Inequality, Male Workers, 1980s and 1990s



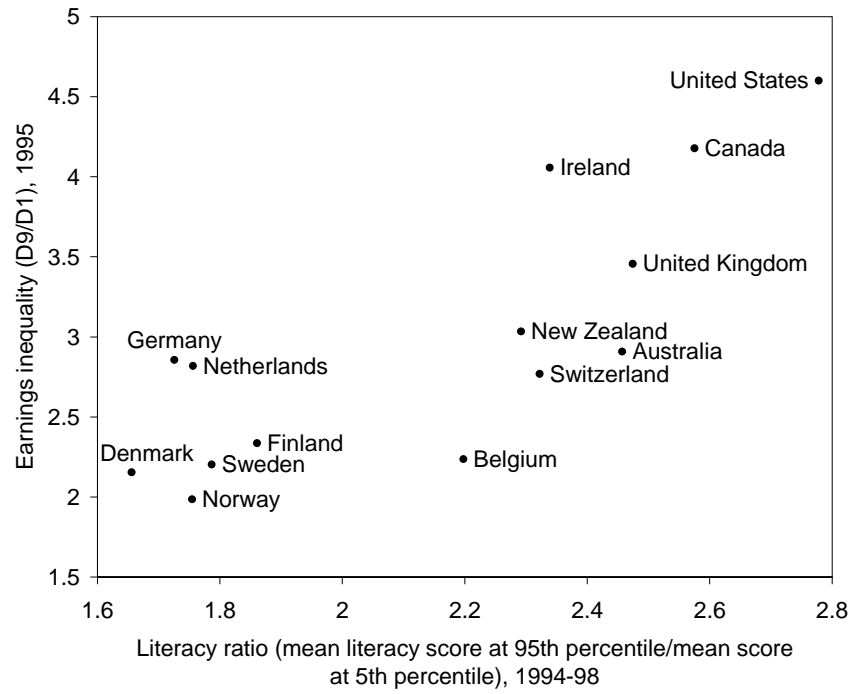
Data source: see Appendix B.

Figure 2.13: Skill Dispersion and Earnings Inequality (Education Ratios), All Workers, 1994-1998



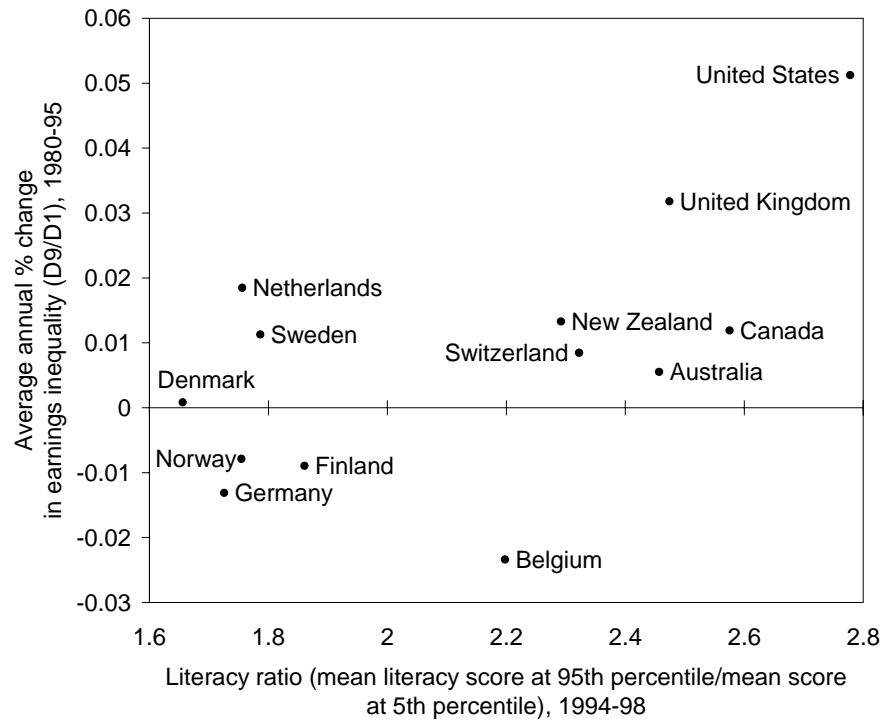
Data sources: see Appendix B.

Figure 2.14: Skill Dispersion and Earnings Inequality (Percentile Ratios), All Workers, 1994-1998



Data sources: see Appendix B.

Figure 2.15: Literacy Ratio and Change in Earnings Inequality, All Workers, 1980-1995



Data sources: see Appendix B.

Appendix 2.A: Data Used for Regressions in Tables 1, 2, 3 and 4

Country	Period Start	Period End	Start D9/D1	End D9/D1	D9/D1 Change	Start Unemp. Rate	End Unemp. Rate	Unemp. Rate Change
Australia	1980	1995	2.83	2.91	0.0055	5.98	8.87	0.1925
Austria	1980	1994	3.44	3.65	0.0148	1.79	6.03	0.3026
Belgium	1986	1993	2.40	2.24	-0.0234	11.76	11.72	-0.0055
Canada	1981	1994	4.02	4.18	0.0119	8.71	10.37	0.1277
Denmark	1980	1990	2.15	2.15	0.0008	7.35	9.62	0.2275
Finland	1980	1995	2.47	2.34	-0.0089	5.17	15.51	0.6892
France	1980	1995	3.25	3.08	-0.0116	6.49	12.04	0.3702
Germany	1984	1995	3.00	2.86	-0.0131	7.95	8.41	0.0415
Ireland	.	1994	.	4.06	.	.	14.20	.
Italy	1979	1995	2.85	2.41	-0.0276	5.52	11.54	0.3766
Japan	1980	1995	3.01	3.00	-0.0007	2.10	3.13	0.0684
Netherlands	1980	1995	2.54	2.82	0.0185	4.49	7.10	0.1739
New Zealand	1984	1995	2.89	3.03	0.0133	4.42	6.84	0.2198
Norway	1989	1993	2.02	1.99	-0.0079	4.45	5.77	0.3293
Sweden	1980	1995	2.03	2.20	0.0113	2.17	7.90	0.3819
Switzerland	1991	1995	2.71	2.77	0.0085	1.38	4.54	0.7899
United Kingdom	1980	1995	2.98	3.46	0.0318	6.54	8.65	0.1413
United States	1980	1995	3.83	4.60	0.0513	6.88	5.69	-0.0788
Mean			2.85	2.99	0.0044	5.48	8.77	0.2558
Standard deviation			0.5722	0.7503	0.0196	2.7368	3.3293	0.2275

Country	Literacy Ratio 95th/5th	Low Literacy Share	Emp. Protectn. Index	Unemp. Protectn. Index	Unemp. Benefits	Bargain. Coverage	Coordination	Centralization
Australia	2.46	16.93	0.27	0.22	27.3	80	1.5	1.5
Austria	.	.	0.84	0.81	25.8	98	3	2
Belgium	2.20	16.80	0.56	0.82	41.6	90	2	2
Canada	2.58	17.23	0.30	0.30	27.3	36	1	1
Denmark	1.66	7.87	0.53	0.91	70.3	69	2	2
Finland	1.86	11.33	0.64	0.43	43.2	95	2	2
France	.	.	0.61	0.54	37.5	95	.	2
Germany	1.73	10.03	0.86	0.77	26.4	92	3	2
Ireland	2.34	24.23	0.36	0.37	26.1	.	.	.
Italy	.	.	0.81	0.18	19.7	82	2.5	2
Japan	.	.	0.76	0.33	9.9	21	3	1
Netherlands	1.76	10.30	0.80	0.89	45.9	81	2	2
New Zealand	2.29	20.07	0.29	0.27	29.8	31	1	1

Norway	1.75	8.27	0.66	0.64	38.8	74	2.5	2
Sweden	1.79	6.77	0.94	0.63	27.3	89	2	2
Switzerland	2.32	16.93	0.49	0.86	29.5	50	2	2
United Kingdom	2.47	22.77	0.25	0.11	18.1	47	1	1.5
United States	2.78	21.80	0.14	0.10	11.8	18	1	1
Mean	2.14	15.10	0.56	0.51	30.9	68	2.0	1.7
Standard deviation	0.3735	5.9309	0.2467	0.2864	14.0494	27.6905	0.7181	0.4351

Data sources: see Appendix B.

Appendix 2.B: Data Sources

Bargaining coverage, 1994: OECD, 1997a, Table 3.3, p. 71.

Centralization, 1994: OECD, 1997a, Table 3.3, p. 71.

Coordination, 1994: OECD, 1997a, Table 3.3, p. 71.

Earnings inequality (D5/D1), 1980-99 (Fig. 7): OECD statistics (personal communication from Paul Swaim, OECD, Paris).

Earnings inequality (D9/D1), 1979-98 (Fig. 3-6, 8-10, 14 and 15): OECD database on earnings dispersion, 1999.

Earnings inequality (D9/D1), 1980s and 1990s (Fig. 12): Glyn, 2000.

Earnings inequality (D9/D1), 1994 (Fig. 11): Glyn and Salverda, 2000.

Earnings inequality (top education level/bottom level), 1996-98 (Fig. 13): OECD, 2000a, Table E5.1, p. 297.

Employment protection index, 1990s: Estevez-Abe et al., 2000, Table 1.

Employment rate inequality (top education quartile - bottom quartile), 1994 (Fig. 11): Glyn and Salverda, 2000.

Employment rate inequality (top education quartile - bottom quartile), 1980s and 1990s (Fig. 12): Glyn, 2000.

Literacy ratio (mean literacy score at 95th percentile/mean score at 5th percentile), 1994-98 (Fig. 14 and 15): OECD, 2000b, Table 2.1, pp. 135-136.

Literacy ratio (top education level/bottom level), 1994-98 (Fig. 13): OECD, 2000b, Table 2.4, pp. 138-139.

Low literacy share (percent at literacy level 1), 1994-98: OECD, 2000b, Table 2.2, pp. 136-137.

Relative unemployment rate by education level (low education unemployment rate - high education unemployment rate), 1979-93 (Fig. 9): Nickell and Bell, 1995, Table 2a, pp. 47-48.

Relative unemployment rate by education level (low education unemployment rate - high education unemployment rate), 1989-98 (Fig. 10): Education at a glance: OECD Indicators, 1993, 1995, 1996, 1997, 1998, 2000.

Unemployment benefits (summary measure), 1995: OECD, 1997b, Table 5, p. 54.

Unemployment protection index, 1990s: Estevez-Abe et al., 2000, Table 2.

Unemployment rate (three-year average), 1980-95 (Fig. 8): OECD, 1999.

ENDNOTES

-
- ¹ This is a substantially revised version of CEPA Working Paper 2001-02 (May 2001). The authors thank CEPA and the MacArthur Foundation for their support, and John Schmitt and Andrew Glyn for both valuable comments and data.
- ² A recent paper by Bertola, Blau, and Kahn (2002) illustrates this. The authors point out that according to the Unified Theory “the United States allowed real and relative wages to adjust, while, in Europe and other Western nations, employment took the brunt of the shocks” (Bertola et al. 2002: 164). They interpret their results to support this view, concluding that “The relevant shifts are partly common across industrial countries, and, while essentially unobservable, they may correspond to the popular notion that globalization and new technologies make it increasingly difficult for OECD countries to deliver favorable employment and wage opportunities to some of their workers. Thus, the same flexibility that allows the U.S. labor market to absorb macroeconomic shocks with smaller changes in unemployment than occur in other countries also makes for more flexible real wages and relative wages” (Bertola et al. 2002: 206).
- ³ Nickell and Layard (1997: 64), for example, make the case for “the very simple hypothesis that variations in earnings distributions across countries correspond rather closely to variations in true skill distributions. Thus, Sweden has a very compressed earnings distribution relative to the United States, because it has a very compressed skill distribution. There is no need to wheel on the all-purpose ‘European institutions’ to explain the differences – supply and demand does fine.”
- ⁴ According to Freeman and Katz (1994: 46), “In the 1980s, the increased use of microcomputers and computer-based technologies shifted demand toward more educated workers... Whether because of computerization or other causes, the pace of relative demand shifts favoring more skilled workers accelerated within sectors.” Similarly, Bound and Johnson (1995: 13) write that “Our suspicion is that a secular shift in production functions in favor of workers with relatively high intellectual as opposed to manual ability – a process that accelerated during the 1980s because of computers – is responsible, in concert with the slowdown of the growth in the relative supply of skilled labor, for most of the wage phenomena that have been observed.” For a critical assessment of this skill-biased technological change explanation of earnings inequality, see Howell (1999).
- ⁵ It seems reasonable to assume that low skill labor markets tend to be characterized by persistent labor surplus. For instance, shifts in product mix (agriculture to manufacturing to services),

technological change, and firm failures ensure some regular worker displacement. At the same time, there is generally imperfect information about opportunities, work conditions, and pay levels. Closely related, there is limited mobility among those already established (jobless workers stay when they “should” leave). On the other hand, given large inequalities in earnings opportunities across regions, there is also substantial migration to richer regions that already have a labor surplus. And if wages rise sufficiently over the reservation wage, labor market participation in the region will rise.

- ⁶ As David Card notes in his review (1995: 785), “causality is to be thought of as running from the amount of joblessness to the level of wages.”
- ⁷ This alternative view is consistent with recent work by Galbraith, Conceição, and Ferreira (1999: 29-30), who find that “wage-rate inequality, in manufacturing at least, has risen and fallen *in step with* changes in unemployment in America ... over virtually the entire century ... [and] the same appears to be true for Europe in recent years.”
- ⁸ Estevez-Abe et al. (2000: 10) conclude that “institutionally we would expect to find coordinated wage bargaining systems in economies in which specific skills are important, and non-coordinated systems where they are not. And in terms of outcomes we would expect to find stable distributions of earnings across occupations in the first, but not necessarily the second case.”
- ⁹ It should be noted that these results are in some cases extremely sensitive to the years chosen as endpoints, although we tried to compensate by using three-year averages for the unemployment rate. Sweden, for example, has cut its unemployment rate in half (from over 10% to 5.3%) since the mid 1990s, which would put it far to the left of its position in these figures. Interestingly, far from a tradeoff, both earnings inequality and unemployment increased from 1990 through 1997. We thank John Schmitt for this point.
- ¹⁰ Figure 9 uses unemployment data by skill for males from Nickell and Bell (1995), who define skill categories differently for different countries (e.g., across educational attainment categories in some cases, across high and low skill occupations in others). In contrast, for all workers, Figure 10 uses data from the OECD in which skill categories are defined consistently across countries according to educational attainment.
- ¹¹ “If demand fell for less skilled workers, we would expect to find employment declining most among the lowest wage groups; instead, there appears to be little relationship” (Krueger and Pischke 1997: 13).

¹² The ratio of the top to bottom quartile produces broadly similar results. Andrew Glyn has convincingly argued that the absolute difference is the better measure.

¹³ The results of all three studies were published in the final report of the International Adult Literacy Survey (OECD 2000b).

¹⁴ Nor do relative unemployment rates by education level show the predicted pattern: rather than rising, the ratio of low skill to high skill unemployment rates tended to be stable or fall since the early 1980s (Howell 2002).