

# UNEMPLOYMENT AS A HIRING PROBLEM

Robert J. Flanagan

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## INTRODUCTION

The rise in unemployment in OECD countries during the **1970s** and **1980s** remains one of the central concerns of economic analysis and policy. Within the general growth of unemployment are several varieties of unemployment experience, however. For example, developments in the **1970s** and **1980s** reversed one of the previously accepted facts of comparative macroeconomics: average unemployment rates in Europe, which were persistently lower than in the United States before the **1970s**, have been persistently higher in the **1980s**. Moreover, there is significant variation in the unemployment experience within Europe. Unemployment rates remained low and increased only modestly in some smaller European countries (such as Norway, Sweden and Switzerland) while unemployment rates doubled and tripled in other countries. Recovery from high unemployment levels has also varied among countries. In North America, Japan, and the same smaller European countries unemployment is currently below rates attained at the previous cyclical peak, while in most of the larger European countries, unemployment is still close to its highest post-war rate. Only in Norway, however, have job vacancies and business survey indicators of labour bottlenecks returned to peaks reached in the late **1960s** or early **1970s**.

Recent research attributes the rise of unemployment in the larger European countries to three factors in uncertain proportion: deficient demand, high real wages, and (in many countries) increasing maladjustment in the labour market, signalled by *an* outward shift in the Beveridge curve and a rise in the non-accelerating inflation rate of unemployment (NAIRU) (Bruno and Sachs, **1985**; Bean, Layard, and Nickell, **1986**; Flanagan, **1987b**)<sup>1</sup>. In recent years, however, some factors associated with the rise in European unemployment have reversed without a corresponding decline in unemployment rates, suggesting that different factors may account for the growth of unemployment and for its persistence.

This paper focuses on the last of the three factors mentioned above. In principle this presents a large agenda, since there are many potential sources of increased maladjustment in labour markets. Virtually anything that alters the incidence or duration of unemployment in equilibrium will shift the Beveridge curve. Thus, changes in the various incentives influencing job search and the matching of workers to jobs should ultimately influence equilibrium unemployment, and some discussions of European unemployment in the **1970s** and **1980s** have stressed the role of

unemployment insurance (which subsidises unemployed job search), rigid relative wage structures and other factors that may impede labour mobility. There has been little attention to the effects of changing incentives on the demand side of labour markets, but as will become apparent, these can be an important source of maladjustment as well.

Sections I and II of the paper use existing evidence to narrow the class of admissible explanations for the unemployment experience in large European countries compared with North America and Japan. The first section develops the unique features of the unemployment experience in these countries which an explanation of labour market maladjustment must capture. Earlier research into labour market maladjustments examined hypotheses pertaining to the supply side of labour markets. This research has shown that factors such as structural barriers to mobility and increased unwillingness of workers to accept jobs can account for very little of the increase or the persistence of European unemployment. The evidence on this point is reviewed in Section II of the paper.

Recently, a new view of unemployment as a hiring problem has emerged from both theoretical and empirical research. According to this view, the key question behind the structural element of unemployment growth is why European employers are more reluctant to hire at any given vacancy rate – not why workers are more reluctant to accept jobs. The third and main section of the paper presents the analysis and evidence pertaining to this view of the European unemployment problem.

## I. WHAT IS DIFFERENT ABOUT THE EUROPEAN UNEMPLOYMENT EXPERIENCE?

Two factors differentiate unemployment in large European countries from unemployment elsewhere: its persistence and the behaviour of unemployment flows. Unemployment in major European countries increased in two dramatic steps following the first and second oil shocks. Since OPEC II, however, high unemployment has persisted despite a reversal of many of the factors that have been linked to its rise. The persistence phenomenon is further signalled by evidence from many countries tending to undermine the conventional analytical dichotomy between actual and equilibrium unemployment: in the **1970s** and **1980s**, the equilibrium rate of unemployment appears to have followed the actual rate of unemployment (Coe, **1985**).

One current interpretation of this observation is that the equilibrium unemployment rate is a function of the path of the actual rate, reflecting a kind of hysteresis in labour markets. In this view, a shock that raises unemployment sets in

motion labour market mechanisms that tend to perpetuate higher unemployment. For example, if longer spells of unemployment produce a deterioration in the stock of human capital and employers use the length of unemployment as a screening criterion, the equilibrium rate of unemployment will rise. Alternatively, hysteresis could occur because those who remain employed have sufficient bargaining power to set wages at levels inconsistent with re-employment of the unemployed\*. An alternative view, more in the spirit of parts of this paper, is that specific institutional developments in labour markets during the 1970s effectively raised equilibrium unemployment independently of the behaviour of actual unemployment. If this view of the basis for persistence is correct, a fall in equilibrium unemployment must await specific institutional changes.

Persistence has not been a major aspect of unemployment in the United States, where unemployment, which peaked at 10.5 per cent in late 1982 dropped below its 1978-79 level in 1988. By 1988, unemployment rates in Nordic countries were also below their 1979 levels (OECD, 1988b, Chapter 1).

### ***Unemployment flows***

The change in unemployment over time is the difference between unemployment inflows and outflows. The presumption that a secular increase in unemployment results from an increase in inflows to unemployment from layoffs, quits, and labour force entry is supported by studies of unemployment flows in North America, Japan, and Australia (Darby, Haltiwanger and Plant, 1986 and Gregory and Foster, 1982). The situation has been very different in Europe, however. Studies of France, Germany, and the United Kingdom find little secular increase in flows into unemployment but a rather substantial decrease in outflows from unemployment (Barge and Salais, 1984, Flanagan, 1987b, Pissarides, 1986, and OECD Economic Surveys, 1986b). Indeed, these studies indicate that the decline in the likelihood of leaving unemployment by obtaining a job or leaving the labour force has been the main source of the secular increase in unemployment in larger European countries.

The pattern of unemployment flows has implications for the duration structure of unemployment, which are now widely recognised. Economies where job seekers have experienced a secular decrease in the odds of leaving unemployment are characterised by increasingly long-duration unemployment in comparison with those in which the rise in unemployment results mainly from increased inflows. Thus, the incidence of long-term unemployment is much higher in the larger European countries than elsewhere. In 1987, for example, the proportion of unemployment lasting more than one year was 45.5 per cent in France, 32.0 per cent in Germany, and 42.6 per cent in the United Kingdom. Elsewhere the proportion was 8-10 per cent in North America, 7-21 per cent in Austria and the Nordic countries, and 17.2 per cent in Japan (OECD, 1988b, Chapter 2, Table 2.8).

The character of European unemployment flows also channels the search for an explanation. The probability of exiting unemployment is largely controlled by the willingness of employers to hire workers and the willingness of workers to accept job offers. The fact that the probability that an unemployed person will leave unemployment has fallen means that either workers are more reluctant to accept a job offer or employers are more reluctant to hire workers. The next two sections examine these two hypotheses in turn.

## II. THE FAILURE OF SUPPLY-SIDE EXPLANATIONS

Much of the discussion of the rise and persistence of unemployment in large European countries has addressed the hypothesis that workers have become slower to accept available jobs. The discussion was a natural outgrowth of the theoretical research during the 1970s and 1980s into labour market search strategies, long-standing research interest in the processes of mobility and job matching in labour markets, and almost three decades of active labour market policies intended to adjust the structure of labour supply to labour demand. Nevertheless, there is now considerable evidence that changes in employee job search behaviour and/or changes in the effectiveness of job-matching in labour markets are not the primary sources of the structural component of increased unemployment.

Regarding the interaction between unemployment insurance (UI) programmes and job search behaviour, several studies of changes in UI regulations and other incentives influencing a worker's willingness to accept a job conclude that if anything, these incentives have moved in a direction that should have tended to reduce unemployment in recent years. Since 1980, many countries have established stricter eligibility rules for UI, reduced the proportion of the average wage paid out in unemployment benefits, and introduced taxation of unemployment benefits (Burtless, 1987; Chan-Lee, Coe, and Prywes, 1987). All formulations of labour market search theories predict that these policy changes should produce shorter periods of job search, but as noted above, unemployment durations have risen dramatically during the period in which the changes were implemented. Unemployed workers are not moving into employment more quickly.

Job matching difficulties can arise from two sources – an increased pace of structural change and/or decreased mobility of labour. Either greater structural change or increasingly inflexible adjustment mechanisms could produce structural maladjustment in the sectoral pattern of labour demand and labour supply as job vacancies increase in expanding sectors while unemployment increases in declining or stagnant sectors. However, neither of these possibilities receives significant

empirical support. Regarding the pace of structural change in Europe, the inter-industry dispersion of employment growth rates increased during the 1960s and early 1970s, but decreased from the mid-1970s and into the 1980s for most countries. (The United Kingdom is an exception, with dispersion indices rising after the early 1980s.) In contrast, structural change in employment in the United States and Japan, countries that did not experience much of a secular rise in unemployment, accelerated in the mid-1970s (Jackman and Roper, 1987). In general, the data indicate that the increase in structural change preceded by many years the sustained growth in European unemployment.

Even without a significant increase in structural change, job matching difficulties could arise if the adjustment of labour supply became increasingly unresponsive to changes in the structure of labour demand. By all available measures, labour mobility in Europe declined during the 1970s (Flanagan, 1987b, Table 6; OECD, 1986, Chapter 2). This fact has produced an often confused debate over whether European labour market institutions thwart the reallocation of labour that is necessary for economic growth and low unemployment. The confusion is partially one of interpreting the decline in mobility. Attributing the decline in labour mobility to uniquely European labour market institutions does not accord well with the fact that labour turnover and mobility declined in the United States as well during the 1970s (Flanagan, 1987b; Murphy and Topel, 1988).

Determinants of labour mobility that are common to all countries appear to be needed to explain the decline during the 1970s. One of the most important influences on labour mobility is job availability. Workers rationally resist making fruitless moves, and labour mobility declines when labour demand declines. Contrary to the "Eurosclerosis" literature, demand is a key determinant of mobility, and the general decline in labour mobility during the 1970s appears to be linked to a general decline in demand. Immobility was a result, not a cause, of macroeconomic disequilibria.

The limited power of explanations of growing unemployment based on reduced labour mobility or muted incentives for mobility is seen in the absence of growing imbalances between the structure of labour demand and supply. Studies that test for changes in the pattern of job vacancies and unemployment by industry and by region find no significant increase in the mismatch between the industrial and regional structures of unemployment and vacancies during the period during which aggregate unemployment increased (Thélot, 1985; Franz, 1987; Jackman and Roper, 1987). The problem is to explain why the Beveridge curve has shifted out in virtually *all* sectors in many European countries by the early 1980s. The failure of the supply-side explanations calls for an examination of an alternative hypothesis – employers have become more reluctant to hire.

### III. HIRING DECISIONS AND UNEMPLOYMENT

Hiring occurs to replace workers that have left a firm as quits, retirements, or dismissals and to achieve net employment changes. Standard textbook models portray a world in which companies immediately hire the workers needed to adjust employment to demand for their product or service, but in practice profit-maximizing employers attempt to implement labour-hiring decisions at least cost in an environment of adjustment costs, uncertainty, and institutional constraints on personnel strategies. Since 1970, the structure of hiring incentives in OECD countries has changed in several significant ways. We focus on the growth of fixed employment costs, the costs of resolving uncertainty over employee quality, and uncertainty regarding future output before turning to evidence on both the general influence of changes in hiring patterns and the effects of these particular hiring incentives.

#### A. Fixed employment costs

Since 1970 non-wage labour costs have grown relative to wages in every OECD country except Italy. Many of these costs are fixed employment costs – per worker costs such as health insurance and certain payroll taxes that are incurred in each time period irrespective of the number of hours worked. An increase in fixed employment costs alters hiring incentives in several ways. By raising the cost per employee relative to the cost per hour worked, it provides an incentive to achieve a given labour input with fewer workers and more hours per worker. By raising the average cost of labour, it also provides an incentive to reduce total labour input. Finally, a given increase will raise the cost of low-wage relative to high-wage labour, creating an incentive for employers to substitute skilled for unskilled labour. The growth in fixed non-wage labour costs therefore reduces employment, leads firms to favour existing employees (insiders) at the expense of job applicants (outsiders), and lowers the employment probability of unskilled and inexperienced workers relative to skilled workers.

The growth of fixed costs is unlikely to provide a dominant explanation for the comparative unemployment experience of large European countries in the 1980s, however. Both the fixed and variable elements of non-wage labour costs increased in the United States as well as in Europe during the period and by 1978 fixed labour costs constituted 11.6 (20.5 including payments for time not worked) per cent of total labour costs in the United States, 11.0 (18.7) per cent in France, 5.3 (15.8) per cent in Germany, and 9.6 (18.2) per cent in the United Kingdom. Between 1978 and 1981 there was virtually no growth in the ratio of fixed to variable labour costs, but there was no reversal either (OECD, 1986, p. 102)<sup>3</sup>.

## 5. Uncertainty about employee quality

Broadly speaking, an employer may reduce uncertainty about the quality of new employees through one of three strategies. The first is the traditional "trial and error" strategy in which unsatisfactory employees are fired after an initial period of observation on the job. The second is a "self-selection" strategy in which employers adopt compensation systems that will be accepted only by workers who intend to be stable, high-performance employees. The third is the "pre-employment screening" strategy in which employers incur substantial search and screening costs in order to determine which of the applicants for employment are most suitable for the enterprise. A variety of institutional changes in Europe have ruled out the first two personnel strategies, leaving employers with the third – incurring high screening costs to remove the inherent uncertainty about the ability of prospective employees. This costlier strategy reduces employer hiring and may be an important source of increased unemployment in some European countries. The nature of these institutional changes and their effect on employer personnel strategies and hiring are detailed below.

The trial and error strategy is circumscribed to the extent that dismissal laws restrict the termination of unsatisfactory employees. While the difference in the incentives to avoid dismissals facing European and North American employers appears to have been overstated at times<sup>4</sup>, the increasing stringency of statutory restrictions on dismissals in many European countries during the **1970s** constrained the trial and error strategy and encouraged the use of temporary (fixed-term contract) and part-time workers to the extent that they were exempted from coverage. In foreclosing this personnel strategy, dismissal legislation has an ambiguous effect on the observed unemployment rate, however. On the one hand, the legislation reduces the flows into unemployment, tending to reduce the stock of unemployed. On the other, once employers recognise that it is costlier to dismiss workers, they will hire fewer workers, and the flow out of Unemployment will fall, tending to increase the stock of unemployed<sup>5</sup>. From this perspective, neither the increased stringency of dismissal legislation during the **1970s** nor the reduced stringency during the **1980s** could by itself have a major impact on the unemployment rate.

Under the self-selection strategy employers establish compensation systems that only stable, high-performance workers will accept. Compensation schemes in which pay rises rapidly with job tenure in an organisation are a classic example. Workers are paid wages that are lower than their marginal product early in their career in exchange for wages that exceed their marginal product late in their career, so long as their performance meets standards. (Pay and marginal product over a career are thus equal in an expected value sense.) The initial low wages are effectively a "performance bond" posted by the worker in the expectation that good performance will lead to continued employment, wage increases, and high relative



wages late in the career. Under these compensation systems, workers effectively share the risk inherent in the initial recruitment decision<sup>6</sup>. Workers who do not have desirable performance characteristics or do not desire a long-term job attachment would be less inclined to accept employment at a firm offering such a compensation plan, and self-selection would substitute for costly employer screening. Those who accept employment under such compensation schemes in effect signal that they have the desired but unobservable performance characteristics (Salop and Salop, 1976; Lazear, 1981).

Beginning in the late 1960s and continuing well into the 1970s, institutional developments in labour markets in some European countries produced considerable pay compression, thereby circumscribing the ability of employers to maintain pay structures that encourage self-selection. The institutional developments proceeded from both collective bargaining and legislative action. In the collective bargaining developments, pay compression was generally an explicit union goal. The key legislative actions were revisions of national indexation systems and minimum wages in which pay compression became a by-product of the operation of the legislated indexation formulae.

In France, for example, unions pressed increasingly for wage compression following the widespread social disruptions in 1968. Although only about 20 per cent of non-agricultural employees are formally union members, the legal extension of collective bargaining settlements to unorganised firms significantly broadens union coverage. In 1972, about 75 per cent of French workers had their (minimum) wages determined as a result of collective bargaining agreements, but by 1981 collective bargaining coverage had risen to 90 per cent, largely as a result of the growing influence of collective bargaining on the wages of workers in small firms (CERC, 1985, p. 67). More recently, the decentralisation of the French collective bargaining structure achieved by the Auroux laws of November 1982 has circumscribed the use of collective bargaining as a tool of pay compression. By requiring annual company-level negotiations, these laws encourage wage adjustments tailored to company performance and individual ability, and there is evidence that by the mid-1980s, company wage payments were increasingly tailored to merit rather than egalitarian objectives (Benveniste, 1987).

Political action narrowing the wage structure in France was more far reaching. The national minimum wage, *salaire minimum interprofessionnel de croissance* (SMIC), which provides for both inflation-linked and discretionary increases, applies to all workers and has had the effect of narrowing the dispersion of wages considerably. For example, the relative wage of French production workers fell from 170 per cent to 126 per cent of the SMIC between 1967 and 1983 (CERC, 1985, p. 66). With the disinflation of the 1980s, fewer and smaller SMIC revisions were triggered, and the trend in compression was halted although not reversed<sup>7</sup>.

In Italy, developments were similar. In a wave of union militancy in the late 1960s and early 1970s, Italian unions pressed for greater pay equality and raised

the relative wage of unskilled workers. Motivated by a need to regain the allegiance of unskilled workers, who had led the "hot autumn" strikes of 1968, union leaders sought to narrow skill and occupational wage differentials (Ministero del Lavoro, 1987). Following the 1973 oil price shock, unions turned their attention to protecting the purchasing power of low-paid workers through a revision of the *scala mobile*, the nationwide automatic cost-of-living escalator. The revision passed in 1975 established more frequent inflation adjustments and shifted from percentage to absolute indexation payments. With the subsequent inflation, the *scala mobile* rapidly swamped the effects of direct collective bargaining on pay equality. By the late 1970s, *scala mobile* payments constituted two-thirds to three-quarters of the earnings increases of Italian workers and had substantially compressed both inter-industry and inter-occupational wage differentials. Wages of relatively skilled non-manual workers declined relative to the wages of manual workers in all sectors. In industry, for example, the relative wage of non-manual workers fell from 1.5 to 1.2 between 1975 and 1982 (Garonna and Pisani, 1986, pp. 140-45; Flanagan, Soskice, and Ulman, 1983, pp. 529-60).

In January 1983, the Italian government and the unions reached an agreement to reverse the trend in pay differentials through actions in collective bargaining and through revisions of the *scala mobile*. In 1983, there was a 15 per cent reduction in the value of a *scala mobile* point. A further revision in 1986 established an indexation formula that is a mix of proportional and absolute adjustments. The changes result in a 20 per cent reduction in the degree of indexation overall. The greatest reduction in indexation has occurred at the lowest wage levels, while the degree of indexation actually increased at the highest wage levels so that during periods of inflation the *scala mobile* should now produce some widening of the pay distribution. These institutional changes have halted the trend in pay compression in Italy (Ministero del Lavoro, 1987).

Under the pre-employment screening strategy employers incur greater screening costs than with the other strategies. Unlike employment costs that must be paid on a per-worker basis *in* each time period, such as health insurance and certain payroll taxes, screening costs are a function of the gross change in a firm's employment. As such, they can have a direct impact on the speed of employment adjustment in the short run. Because higher screening costs also raise the average cost of labour over a business cycle, they should reduce average labour input<sup>8</sup>. Unlike fixed employment costs of the fringe benefit variety, screening costs are not generally recorded in official statistical measures of labour costs and thus have not entered previous comparative analyses of unemployment.

### C. Uncertainty about future demand

Adjustment costs and uncertainty over the future course of demand systematically influence the structure of labour inputs in industry. Firms restrain their

hiring and opt for overtime hours faced with expansions that they do not expect to last and restrain their firing and opt for labour hoarding during recessions that they expect to be transitory. Given adjustment costs, firms have always favoured greater utilisation of insiders at the expense of outsiders as a way of coping with uncertainty. Increasing uncertainty about future demand should be reflected in increasing preference for insiders and a growing reluctance to hire additional workers. Analytically, increased uncertainty is analogous to an increased tax on employment adjustments and has the effects on employment and unemployment reviewed above.

#### **D. General implications of the "reluctance to hire" view**

The general view that the persistence of European unemployment is a hiring problem has several implications that are independent of the particular hiring disincentives that are at work. These general implications are reviewed in this section before turning in the following section to tests of the specific hypotheses discussed above. First, if hiring is the problem, the growth of unemployment should be associated with a fall in hiring rates, and during the 1970s and 1980s, actual hiring rates declined precipitously in virtually all European countries (OECD, 1986a, p. 57). By itself, this evidence is not conclusive, however, since a decline in hiring may simply reflect a normal cyclical influence. A second implication is that jobless individuals would find it difficult to escape unemployment because of the increased reluctance to hire, and the duration of unemployment would increase. As noted earlier, both of these have been key features of the growth of European unemployment.

Third, unemployment should be increasingly concentrated among "outsiders" – new entrants to the labour force, groups with marginal labour force attachment, and individuals whose ability is difficult to judge because of a long spell of unemployment. Official statistics do not make an explicit distinction between insiders and outsiders, but a rough estimate of the number of unemployed outsiders is provided by the difference between insured and total unemployment. Entitlement to unemployment insurance is usually based on prior work experience. Total unemployment, however, includes most insured unemployed plus individuals who are considered unemployed because they are both available and searching for work (the criteria used in labour force surveys) or because they are receiving some other form of unemployment benefit (a criterion used in registration statistics)<sup>9</sup>. For example, many workers who do not qualify for unemployment insurance receive unemployment assistance, for which eligibility is often established on the basis of a means test. The insured unemployed may therefore provide a measure of unemployed "insiders" because of their prior work experience, while the difference between total and insured unemployment provides an estimate of unemployed "outsiders". Estimates of total unemployment are obtained from labour force

surveys or from registration statistics depending on the country. Insider-outsider hypotheses would obtain some descriptive support if the latter category accounted for most of the growth of unemployment in Europe during the **1970s** and **1980s**.

For the **1970s** and particularly the **1980s**, uninsured unemployment grew several times more rapidly than insured unemployment, except in France (Chart A). The growth in the gap between covered and uncovered unemployment is particularly dramatic in Germany and the United Kingdom, where the vast majority of the unemployed did not qualify for unemployment insurance during the **1980s**. Indeed, essentially *none* of the growth in unemployment occurred among the insured unemployed. Even in France, a large gap between total and insured unemployment emerges in the first half of the **1980s**. The phenomenon is not as marked in North America, although the majority of the growth of U.S. unemployment after **1980** was among the uninsured. (Data for Canada and the United States appear in Chart B.)

During the **1980s**, the gap between total and insured unemployment in some countries grew in part because of the adoption of more stringent rules governing entitlements – the decline in insured unemployment in France after **1982** is one example of such a change – and because some workers exhausted the benefits to which they were entitled. Those who were no longer eligible for insurance were typically the least experienced of the former claimants, while those who exhausted their benefits had the longest durations of unemployment and hence the lowest probabilities of re-employment. The uninsured unemployed therefore provide an estimate of the number of unemployed outsiders, although the changes in entitlement rules during the period obscure the exact trend in the size of this group. Nevertheless by this measure, unemployment appears to be increasingly concentrated among outsiders.

A fourth implication of the reluctance-to-hire view of unemployment is that when demand increases, employers have an incentive to use "insiders" – current employees whose quality is known – more intensively despite high unemployment among outsiders. On this point there is evidence of distinctive differences between larger European countries and North America. Overtime hours constitute an important measure of the intensity of utilisation of labour resources within the organisation. In the absence of changes in hiring incentives, one would expect a stable negative relationship between the unemployment rate and overtime hours, reflecting a tendency to work employees longer as qualified applicants become scarce in a general expansion of demand. Counter-clockwise "loops" in the data around the average relationship would trace out the normal tendency of employers to adjust to surprises in demand in either direction by varying hours worked before employment. This is exactly what one observes in the relationship between overtime hours and the unemployment rate for the United States (Chart C).

CHART A  
**TOTAL AND INSURED UNEMPLOYMENT**

— Unemployment  
 - - - Insured unemployment

countries

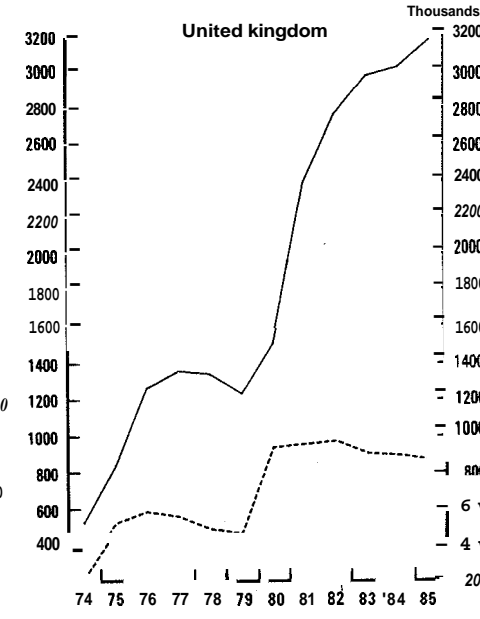
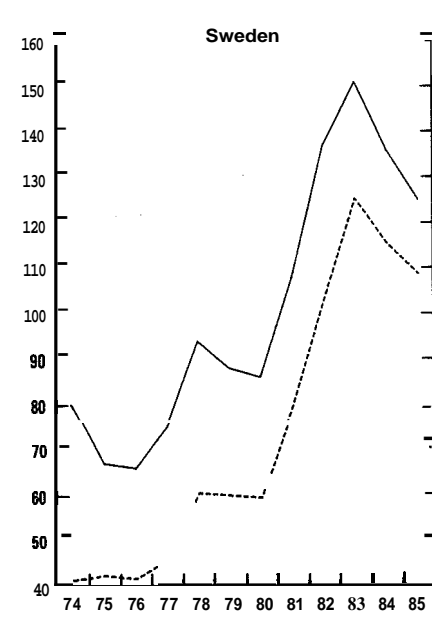
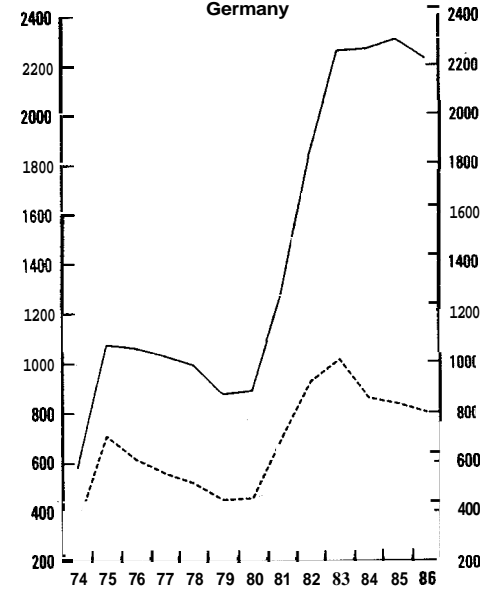
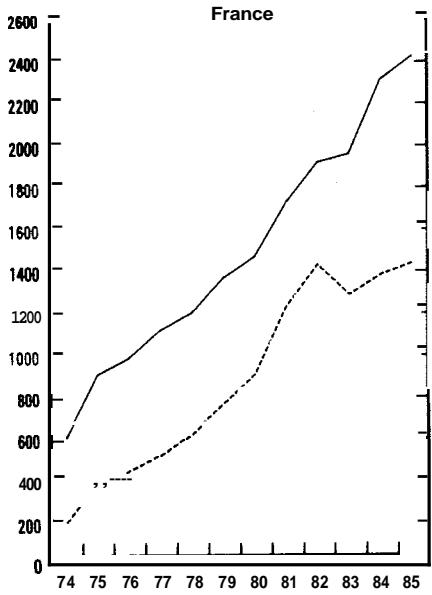
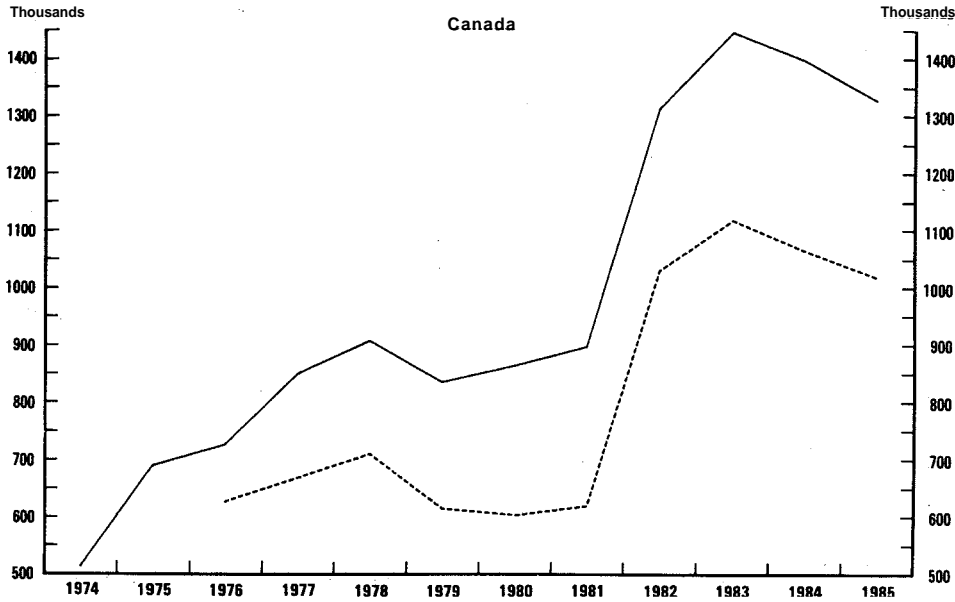


CHART B  
**TOTAL AND INSURED UNEMPLOYMENT**

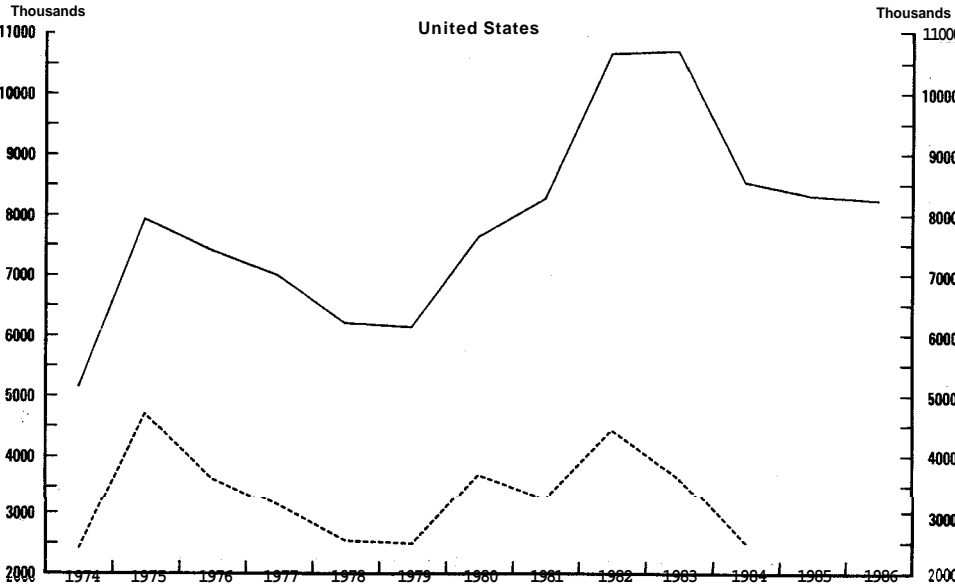
— Unemployment  
 - - - Insured unemployment

**North America**

**Canada**



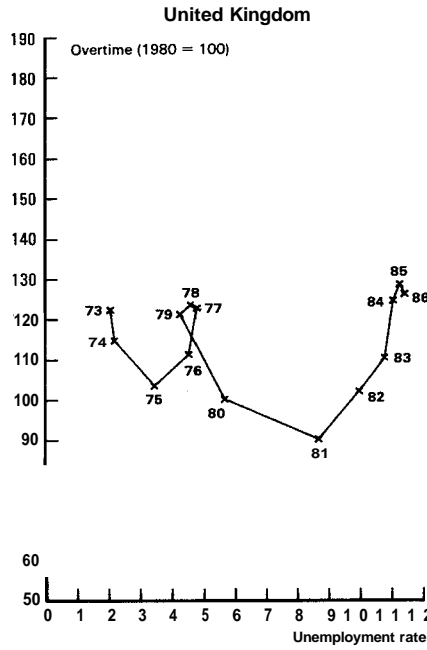
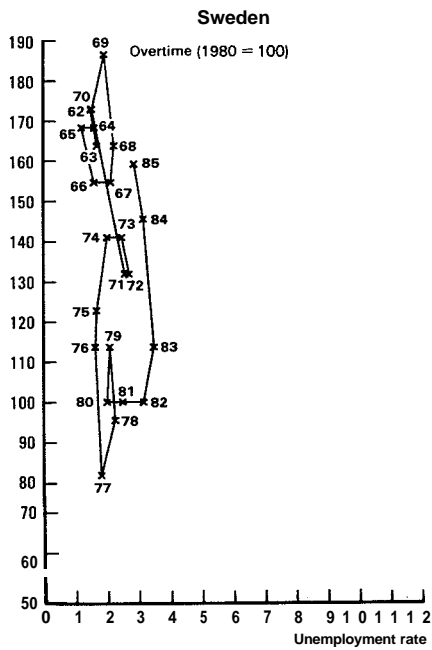
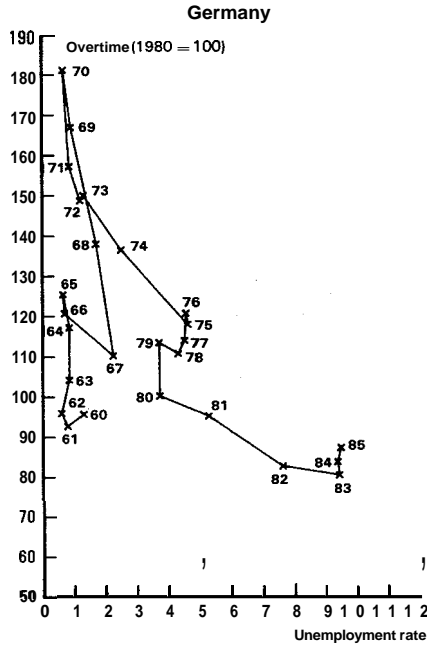
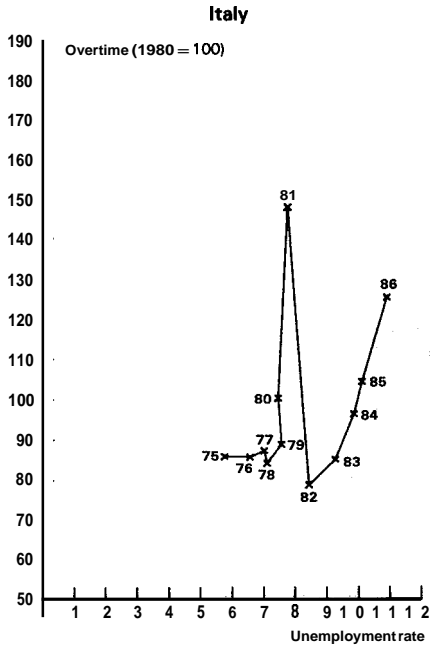
**United States**



Source: OECD (1988B)

CHART C

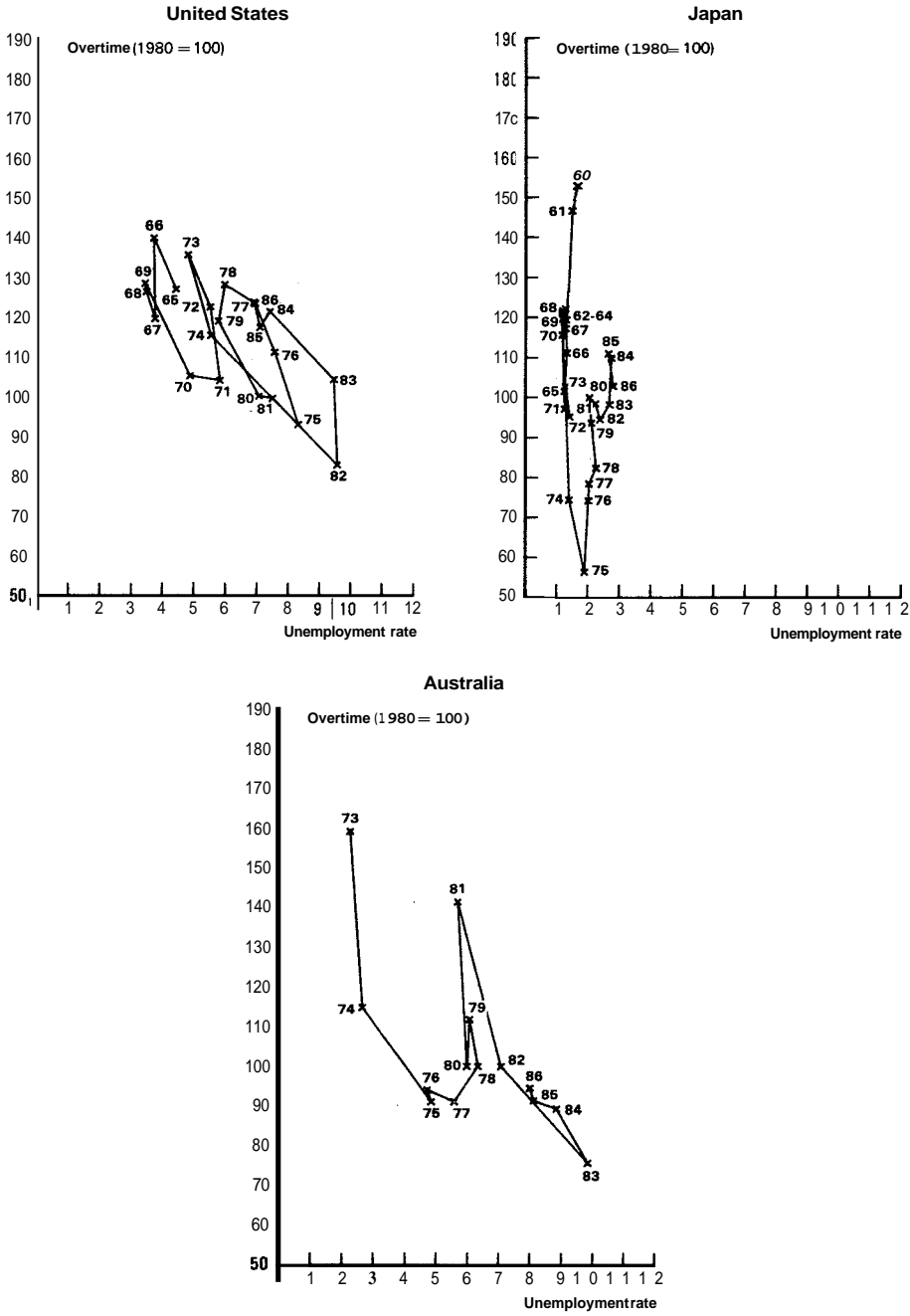
## UNEMPLOYMENT RATE AND OVERTIME



Sources: See Annex

CHART C (continued)

**UNEMPLOYMENT RATE AND OVERTIME**

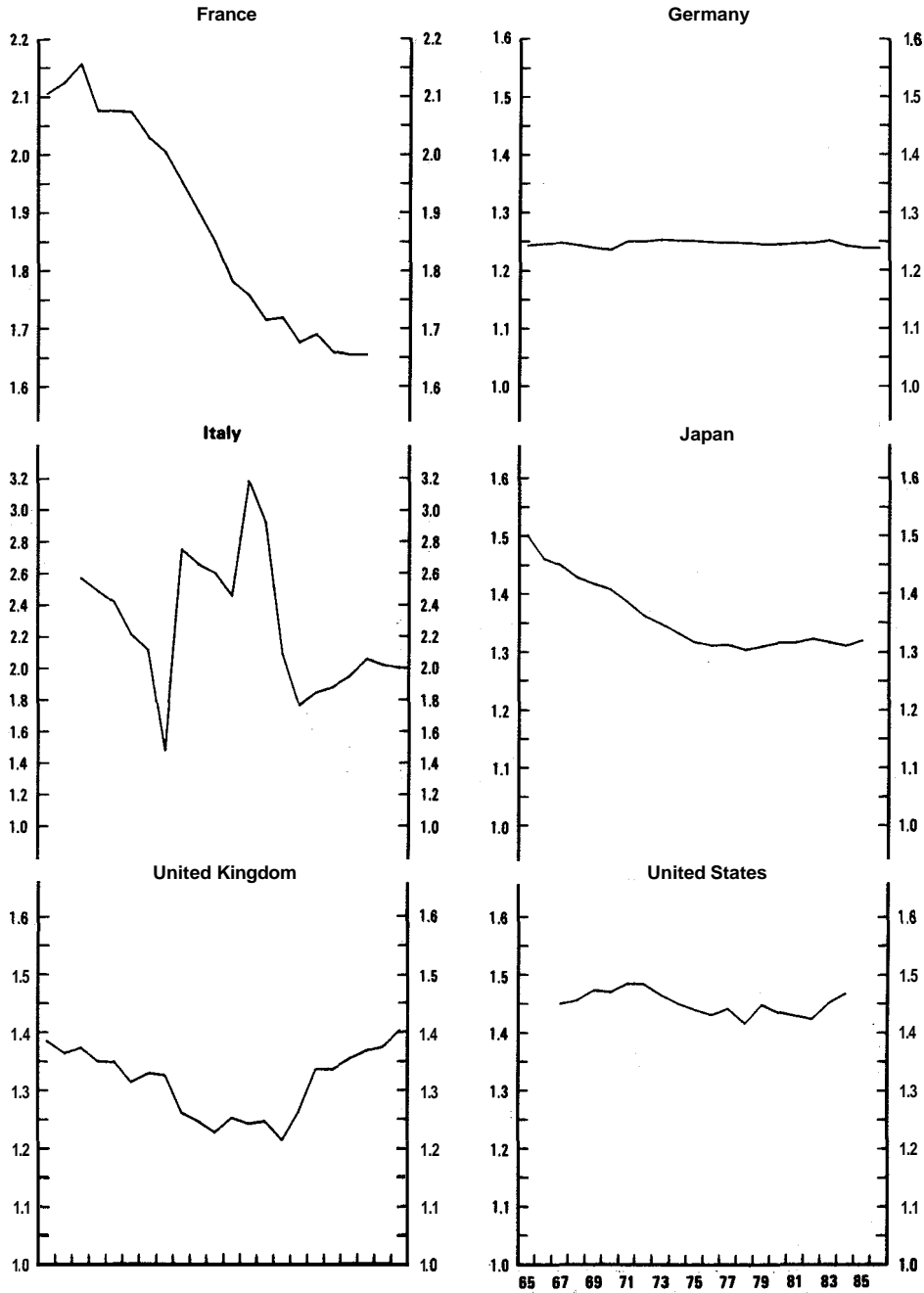


Sources: See Annex.



CHART D

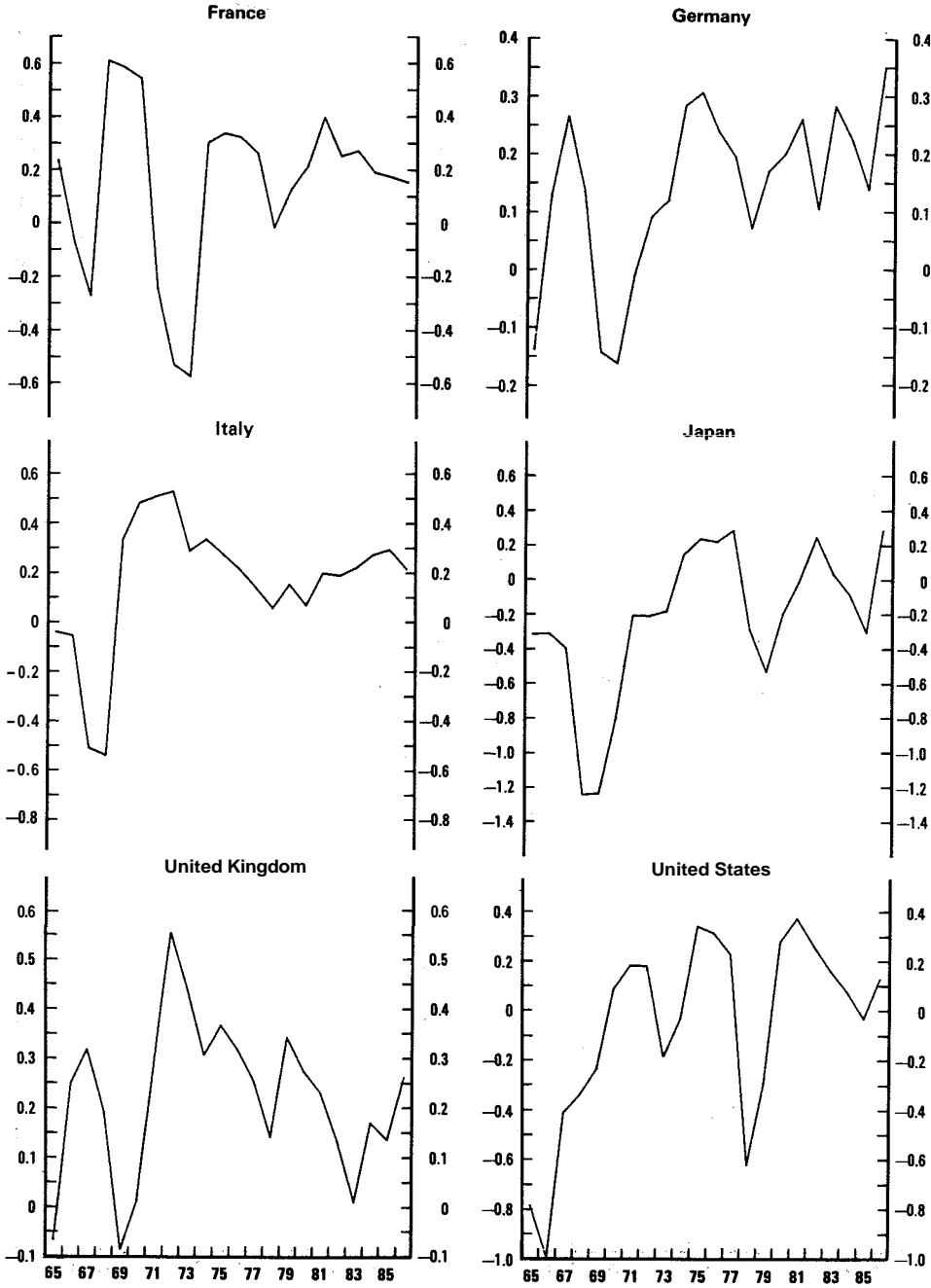
### INTER-OCCUPATION RELATIVE WAGES



Sources: See Annex.

CHART B

### OUTPUT UNCERTAINTY



Sources: See Annex.

Changes in the incentives to hire, such as those discussed earlier in this section, will alter the relationship between overtime hours and unemployment. As insiders become more preferred over outsiders, the amount of overtime worked at any given unemployment rate will increase. There will be an outward shift in the overtime-unemployment relationship, similar to outward shifts in the Beveridge curve relationship between vacancy and unemployment rates. This is exactly what one observes during the 1980s for the major European countries (Chart D). The shift is particularly dramatic in Italy and the United Kingdom, where a **positive** relationship between overtime and unemployment has emerged since the early 1980s. Similar shifts are also observed in Australia in the early 1980s and in Japan since 1975 (Chart E).

### ***Inside versus outside pressure on wages***

The existence of screening, hiring, and dismissal costs creates "economic rents" that must be divided between firms and their workers (insiders) through formal or informal bargaining processes. To the extent that insiders have sufficient bargaining power to capture at least some of these rents, they will receive a higher wage than unemployed outsiders may be willing to work for (Lindbeck and Snower, 1986b). Yet firms will not substitute outsiders for insiders as long as the wage premium paid to insiders is less than the costs of hiring outsiders. Hiring and firing costs are therefore one source of a wage differential between insiders and **outsiders**<sup>10</sup>. Increases in such costs or in the relative bargaining power of workers will increase the relative wage of insiders.

Once the wage differential between insiders and outsiders is established, however, it is not clear that insiders should have more influence than outsiders on general wage movements when hiring and screening costs are the main motivating factor. In contrast, theories motivated by the idea that employed union members may ignore the interests of unemployed union members when bargaining over wages raise the possibility that general wage changes will be governed by the utilisation rates of insiders rather than the utilisation rates of outsiders. The regression analysis of wage determination in several OECD countries reported below addresses this issue. The research strategy is a simple one in which a standard wage adjustment model is estimated first using measures of market-wide labour utilisation, second using measures of firm-specific labour utilisation, and finally, using both measures in an effort to judge relative performance. For each country, the measure of external labour utilisation is the inverse of the standardized unemployment rate. Measures of internal labour utilisation include overtime hours and qualitative measures of current and anticipated labour utilisation at the company level from business surveys<sup>11</sup>. The qualitative measures from business surveys include the relationship between current and normal employment levels in the company (EL), and a forecast of whether the company's employment will grow, decline or remain unchanged over the subsequent three months (FEL)<sup>12</sup>.

**Table 1. Inside-outsider regressions (A): influence of unemployment and overtime hours on wages<sup>a, b</sup>**

country (estimation period)	Constant	$U^{-1}$	OT	$\rho_c$	$\bar{R}^2$	DW	SEE
Germany (1973 Q1-1986 Q4)	-0.0056 (1.91)	0.0193 (2.96)		0.36 (1.47)	0.62	2.17	0.0094
	-0.214 (3.45)		0.0002 (3.34)	0.34 (1.42)	0.63	2.27	0.0092
	-0.0231 (1.83)	-0.0026 (0.16)	0.0002 (1.42)	0.35 (1.41)	0.62	2.27	0.0093
Italy (1975 Q1-1985 Q4)	-0.2167 (4.20)	0.6027 (1.44)		1.34 (1.24)	0.83	1.84	0.0523
	-0.1523 (3.43)		-0.0002 (0.70)	2.13 (2.22)	0.82	1.82	0.0534
	-0.2025 (3.58)	0.5840 (1.38)	-0.0001 (0.61)	1.39 (1.28)	0.82	1.87	0.0527
United Kingdom (1972Q2-1987Q2)	0.0252 (4.22)	0.0409 (2.59)		0.47 (3.29)	0.51	1.48	0.0139
	-0.0082 (0.40)		0.0003 (1.97)	0.73 (5.14)	0.49	1.28	0.0142
	-0.0065 (0.32)	0.0370 (2.36)	0.0002 (1.68)	0.57 (3.74)	0.53	1.35	0.0136
United States (1965 Q1-1986 Q4)	0.0087 (2.98)	0.0070 (0.60)		0.57 (7.19)	0.44	1.35	0.0055
	0.0041 (0.56)		0.00005 (0.84)	0.59 (6.94)	0.44	1.35	0.0055
	0.0044 (0.58)	0.0030 (0.23)	0.00004 (0.62)	0.59 (6.90)	0.43	1.35	0.0056
Japan	0.1634 (12.32)	0.0631 (3.06)		0.84 (2.76)	0.99	2.94	0.0301
	0.1363 (4.54)		0.0005 (2.01)	1.58 (4.75)	0.99	2.76	0.0312
	0.1563 (5.12)	0.0589 (2.23)	0.00008 (0.26)	0.92 (2.10)	0.97	2.93	0.0303

a) The dependent variable is the rate of growth of hourly earnings as defined in the Annex. The variables  $U^{-1}$  and OT represent, respectively, the reciprocal of the total unemployment rate and overtime hours as defined in the data annex. All equations are estimated by ordinary least squares on quarterly data, and percentage changes refer to quarterly changes. Seasonal dummy variables are included.

b) Absolute  $t$ -values appear in parentheses below the coefficient estimates. The proportion of explained variation adjusted for degrees of freedom ( $\bar{R}^2$ ), the Durbin-Watson statistic (DW), and the standard error of the estimate (SEE) are also reported.

c) Sum of distributed lag coefficients on third-degree polynomial over four quarters of the quarterly rate of change in the consumer price index, except for Germany, where the coefficient on a one-quarter lag is reported.

Sources: See Annex.

The regression results reported in Tables 1 and 2 show little support for extreme insider-outsider views of aggregate wage determination. When entered alone with price changes, insider variables were only significant in Germany, the United Kingdom and Japan. When entered with unemployment, however, the insider influence did not survive in any country. (The results for Germany are, however, clouded by multicollinearity.) Nevertheless, some arguments that have

**Table 2. Inside-outsider regressions (B): influence of company labour demand expectations on wages<sup>a, b</sup>**  
**Absolute *t*-values in parentheses**

Country (estimation period)	Constant	Labour force expectations		$U^{-1}$	$\dot{p}_c$	$\bar{R}^2$	<i>DW</i>	<i>SEE</i>
		EL	<i>FEL</i>					
France (1978Q4-1987Q4)	-0.0053 (0.97)	0.0375 (0.68)			1.09 (7.28)	0.81	2.02	0.0057
	0.0083 (1.36)	-0.0003 (0.88)	0.0005 (1.52)		1.05 (8.98)	0.82	2.34	0.0054
	0.0159 (1.22)	-0.0003 (0.79)	0.0006 (1.63)	<b>-0.0500</b> (0.67)	1.11 (7.45)	0.82	2.34	0.0055
United Kingdom (1972Q2-1987Q2)	0.0318 (5.47)	-0.0003 (1.41)	0.0004 (1.89)		0.65 (4.85)	0.48	1.17	0.0143
	0.0232 (3.47)	-0.0003 (1.65)	0.0002 (1.10)	0.0511 (2.32)	0.40 (2.40)	0.52	1.29	0.0137
Sweden (1971Q2-1987Q4)	0.0060 (0.39)	0.0201 (0.68)			0.23 (0.48)	0.11	2.04	0.0234
	0.0121 (1.05)	-0.0002 (0.37)	0.0003 (0.64)		0.47 (0.97)	0.09	2.09	0.0236
	0.0077 (0.47)	-0.0001 (0.20)	0.0002 (0.39)	0.0128 (0.38)	0.38 (0.68)	0.08	2.08	0.0238
Japan (1968Q1-1986Q4)	0.1979 (21.28)	0.0018 (1.17)	-0.0025 (1.52)		1.07 (3.80)	0.99	2.88	0.0303
	0.1779 (8.50)	0.0014 (0.89)	-0.0018 (1.01)	0.0362 (1.07)	0.91 (2.86)	0.99	2.93	0.0302

*a/* The dependent variable is the rate of growth of hourly earnings and  $U^{-1}$  is the reciprocal of the total unemployment rate. *EL* and *FEL* are business survey responses regarding expectations of current and future employment levels, respectively. See data annex for definitions of all variables. All equations are estimated by ordinary least squares on quarterly data, and percentage changes refer to quarterly changes. Seasonal dummies are included.

*b/* Absolute *t*-values appear in parentheses below the coefficient estimates. The proportion of explained variation adjusted for degrees of freedom ( $\bar{R}^2$ ), the Durbin-Watson statistic (*DW*), and the standard error of the estimate (*SEE*) are also reported.

*c/* Sum of distributed lag coefficients on third-degree polynomial over four quarters of the quarterly rate of change in the consumer price index, except for Germany, where the coefficient on a one-quarter lag is reported.

**Sources:** See Annex.

been advanced in support of insider-outsider models pertain to shifts in incentives that would have influenced unemployment during the 1980s, but not before. Therefore, a second set of regressions were run with the specification amended to test for (a) a stepwise shift and (b) a gradual increase in the influence of "insider" variables during the 1980s. Neither of these variables was significant for any of the countries. (The results are not reported but are available from the author.) At this level of aggregation, market forces external to the firm have dominated wage determination in each of the countries during the 1970s and 1980s.

These results are consistent with recent studies showing that market-wide influences have a significant, if not exclusive influence on wage determination. At the macro level, for example, unemployment (a measure of the number of outsiders) outperforms employment (a measure of insiders) in studies of wage determination (Grubb, 1986). Analyses of aggregate data can provide only a rough indication of the power of theories that rest on the relative influence of firm-specific influences on wages, however. Analyses of micro data for insider and outsider effects currently seem limited to the United Kingdom, but their conclusions parallel those reported above. For example, a study of 219 large British manufacturing firms over the period 1972-82 finds a significant but small impact of insider forces on wage determination, while the influence of aggregate and industry unemployment is large (Nickell and Wadhvani, 1987, 1988).

To summarise, the wage results reported in Tables 1 and 2 together with the evidence in Charts D through F of more intensive utilisation of employed insiders in some countries are more consistent with models of insider preference driven by screening and hiring costs than with models driven by direct wage pressure by insiders.

## E. Hiring relationships

The preceding section found evidence of a general shift in hiring behaviour in Europe and Japan but not the United States. This section explores the influence of two specific hiring incentives discussed earlier – pay compression and output uncertainty. Greater pay compression or output uncertainty should reduce accessions for any given level of demand by effectively raising the cost of each accession. In principle, one could study the accessions relationship directly, but in practice accessions data are sparse. It is therefore more practical to focus on dynamic employment demand relationships.

The demand for labour in a dynamic setting falls out of each firm's effort to maximize its real discounted stream of profits taking account of turnover rates and the cost of adjusting the work force. The long literature on this topic has produced the following solution to the firm's problem<sup>13</sup>:

$$N_t = \lambda N_{t-1} + (1-\lambda)(1-\alpha\lambda) \sum (\alpha\lambda)^i N_{t+i} \quad [1]$$

The parameter  $(1 - \lambda)$ , is the speed of adjustment. Therefore,  $\lambda$  is a function of adjustment costs, the separations rate, and  $\alpha$ , which itself is the reciprocal of one plus the real interest rate.  $N^*$  is the firm's forecast of the optimal employment level for period  $i$ , formulated on the basis of past changes in real factor prices and knowledge of probable adjustment costs.

Thus, the empirical analog to equation [1] is

$$N_t = \lambda N_{t-1} + \sum_{k=1}^k \theta_k X_{k,t-1} + \epsilon_t \quad [2]$$

in which  $X$  represents the vector of currently observable variables that determine future employment,  $N^*$ . Longer lag structures are admissible and even desirable when using quarterly or semiannual data, but the absence of more frequent observations on a key variable limit the present study to annual data. The variables in the  $X$  vector include lagged capital stock, real energy prices, and real wages plus supplements per employee (which includes employer expenditures on non-wage labour costs). The wage measure therefore includes employer expenditures on fixed and other non-wage labour costs, but not the unobserved costs of hiring.

The discussion of pay compression in Section III emphasized the relationship between hiring incentives and wage-tenure profiles, but these are difficult to introduce into the analysis directly because of data limitations<sup>4</sup>. This study adopts measures of wage differentials by skill or occupation to test for pay compression effects on the grounds that part of any steepness of wage-tenure profiles reflects pay gains associated with promotions into higher-level positions within an organisation. (Inter-industry wage differentials, on the other hand, are not appropriate proxies for the internal pay compression effects stressed in this paper.) Chart F traces the movements in the relative wage measures for several countries (see Annex for definitions and sources). Extensive pay compression occurred in France, Italy, and Japan during the 1970s. In the United Kingdom a period of pay compression during the 1970s gave way to widening differentials in the 1980s, while in Germany no clear trend emerges.

The measure of output uncertainty used in the analysis assumes that the confidence with which employers forecast future demand is a function of the variability of past output growth. The variable, **UNC**, is the coefficient of variation of quarterly growth rates of real GDP over the past twelve quarters (three years). Output uncertainty should be positively correlated with this variable. Chart G shows the measure for several countries.

The effects of pay compression and output uncertainty on permanent employment (and, for a given labour force, unemployment) are tested by entering variables directly into equation [2] as elements of  $X$ . This procedure provides a test of the hypothesis that these variables influence expectations of  $N^*$  – that is desired future employment. Permanent employment should be positively correlated with the

Table 3. Employment demand equations<sup>a, b</sup>

Country (estimation period)	Constant	$N_{t-1}$	$W_{t-1}$	$MFP_{t-1}$	$K_{t-1}$	$RW_{t-1}$	$UNC_{t-1}$	$\bar{R}^2$	DW	SEE
France (1967-1984)	7.19 (1.84)	0.65 (2.19)	0.37 (1.39)	-0.05 (1.26)	-0.19 (0.86)			0.98	1.70	0.0082
	12.29 (2.51)	0.19 (0.56)	0.79 (2.28)	-0.08 (1.98)	-0.27 (1.15)	0.003 (2.12)	-0.005 (0.72)	0.98	1.26	0.0075
Germany (1964-1986)	6.85 (1.65)	0.50 (2.58)	-0.03 (0.19)	0.05 (1.62)	0.66 (0.45)			0.61	1.09	0.0148
	10.76 (3.46)	0.29 (1.87)	0.08 (0.62)	-0.06 (2.95)	0.02 (0.24)	-0.009 <sup>c</sup> (1.88)	-0.057 (2.64)	0.78	1.89	0.0110
	10.14 (2.87)	0.40 (2.19)	0.16 (0.78)	-0.06 (1.94)	-0.06 (0.37)	0.001 <sup>d</sup> (0.84)	-0.065 (2.51)	0.74	1.53	0.0120
Italy (1968-1986)	4.71 (1.59)	0.66 (3.75)	0.11 (1.30)	-0.01 (0.51)	-0.03 (0.34)			0.98	1.97	0.0072
	4.86 (1.65)	0.55 (3.21)	0.09 (1.04)	-0.04 (1.76)	0.03 (0.40)	-0.0004 (1.52)	-0.014 (1.71)	0.98	2.10	0.0067
United Kingdom (1966-1986)	7.64 (1.60)	0.68 (4.21)	0.17 (0.94)	-0.02 (0.47)	-0.14 (0.87)			0.74	1.29	0.0150
	9.30 (1.22)	0.58 (1.56)	0.12 (0.47)	-0.02 (0.30)	-0.12 (0.49)	-0.001 (0.03)	0.001 (0.03)	0.70	1.28	0.0160
United States (1968-1984)	3.16 (0.88)	1.04 (2.79)	-1.29 (1.55)	-0.12 (1.82)	0.30 (1.89)			0.97	1.67	0.0194
	2.87 (0.621)	0.85 (1.581)	-1.27 (1.16)	-0.11 (1.53)	0.42 (1.91)	0.003 (0.36)	0.025 (0.99)	0.96	1.84	0.0203
Japan (1967-1985)	5.48 (1.71)	0.27 (0.58)	-0.37 (1.23)	-0.01 (0.45)	0.38 (1.37)			0.99	1.91	0.0096
	7.55 (3.00)	-0.10 (0.27)	-0.02 (0.08)	-0.01 (0.99)	0.35 (1.56)	0.012 (3.69)	-0.0001 (0.024)	0.99	2.39	0.0068

a/ Dependent variable is total employment in all activities, or (for France and the United States) non-agricultural activities. Independent variables, all lagged one period are employment ( $N_{t-1}$ ), real wages plus supplements per employee ( $W_{t-1}$ ), real energy prices ( $MFP_{t-1}$ ), real capital stock ( $K_{t-1}$ ), relative wage ( $RW_{t-1}$ ) and demand uncertainty ( $UNC_{t-1}$ ). All real variables are deflated by the GDP deflator. All variables are in natural logarithms. Details on variable definitions and construction are in the Annex. All equations are estimated by ordinary least squares on annual data.

b/ Absolute *t*-values appear in parentheses below the coefficient estimates. The proportion of explained variation adjusted for degrees of freedom ( $\bar{R}^2$ ), the Durbin-Watson statistic (*DW*), and the standard error of the estimate (*SEE*) are also reported.

c/ Blue-collar workers.

d/ White-collar workers.

Sources: See Annex.



relative wage measures and negatively correlated with the uncertainty measure. These effects may also influence the speed of employment adjustment to a new equilibrium, but such short-run effects will not affect long-run employment. For this reason and owing to concerns about the power of the statistical tests with relatively few degrees of freedom, tests for these effects have not been performed.

Table 3 reports the results of the regression analysis of equation [2]. The pattern of impacts varies substantially by country. The predicted relative wage effects are observed for France and Japan. In each of these countries, pay compression has lowered permanent employment and raised unemployment, for an unchanged labour force. The predicted output uncertainty effects are also observed for Germany and Italy. Increased uncertainty over demand is associated with lower employment in these countries. On the other hand, the relative wage effects in these two countries are perversely signed, although significant only for blue-collar workers in Germany. No statistically significant effects are observed for the United Kingdom or the United States. The performance of the rest of the employment equation also varies by country. The expected pattern of signs are obtained in the results for the United States, with reasonable significance. In other countries variables are occasionally perversely signed and/or measured imprecisely.

## CONCLUSIONS

By a process of elimination, the early sections of this paper conclude that the sources of structural problems in labour markets impeding the reduction of unemployment in larger European countries should be sought in the hiring behaviour of employers. Many sources of hiring reluctance might be postulated, but all have the implication that firms will increasingly favour current employees ("insiders") at the expense of the unemployed ("outsiders"). On this point there is considerable supporting evidence, except in North America, where the persistence of unemployment has not been an issue. The growth of unemployment in large European countries appears to be predominantly among relatively inexperienced outsiders, and in both Europe and Japan there has been increased utilisation of insiders at the expense of outsiders. There is a limit to the advantages granted insiders, however: aggregate wage movements still appear dominated by the degree of utilisation of outsiders. In no country do the data indicate an important, let alone a dominant, role for insiders in wage determination. Nor can a shift in the importance of insiders be discerned during the 1980s. Insider influence is apparently limited to the wage structure.

This paper argues that the reluctance to hire is tied to specific economic and institutional developments that alter hiring incentives, such as pay compression and

growing uncertainty about the future course of output. The paper demonstrates both the development of a general reluctance to hire and some specific effects tied to these particular incentives in some countries. The specific effects are not found in all countries, however, and it seems likely that hiring incentives not specifically delineated in the empirical analysis have also played a role. The analysis of unemployment would benefit from empirical analyses of the nature and effect of other hiring incentives. The results provide general support to the idea that increased demand is less likely to translate into increased employment in large European countries and possibly in Japan because of the development of hiring reluctance among employers.

On the other hand, it is difficult to extrapolate these results to explain the unemployment experience in some smaller European countries. Indeed, Norway and Sweden have had favourable unemployment experience despite considerable institutionally-driven pay compression. While hiring disincentives may have been at work (note that the overtime-unemployment relationship also shifted for Sweden), their effect apparently has been overbalanced by other forces. For example, one frequently advanced, but still controversial, hypothesis attributes superior macro-economic performance to centralised collective bargaining structures (Calmfors and Driffill, 1988; OECD, 1988a). A discussion of this issue is beyond the scope of this paper, however.

To the extent that increased screening costs are one source of lower hiring and employment in some European countries during the 1970s and 1980s, policies that reduce these costs will contribute to lowering unemployment. One approach is to reverse institutional developments that have forced companies to adopt relatively costly screening methods. Altering the design of indexation systems to minimize the effects of inflation on wage differentials is one such policy. This approach may only halt trends in pay compression, however, leaving the hiring disincentives in place. A second approach is to develop institutions that facilitate screening by reducing uncertainty over worker quality. For example, work experience programs may provide a cost-effective method for employers to observe performance directly and to resolve their uncertainty about the abilities of new workers. One value of well-designed government training programs may be that they provide a publicly funded alternative to employer screening.

## NOTES

1. The Beveridge curve is the inverse cyclical relationship between the unemployment (**U**) and vacancy (**V**) rates in a country – sometimes referred to as the **UV** relationship. Increasing maladjustment in the labour market produces an outward shift in the **UV** relationship. For evidence on the rise in the **NAIRU**, see Coe (1985).
2. Union membership provides only one possible source of bargaining power. Employers may also be reluctant to reduce wages because of the high cost of screening applicants and a desire to lower turnover costs. For a sample of the hysteresis arguments, see Lindbeck and Snower (1986a), Gregory (1986), and Blanchard and Summers (1986).
3. The United Kingdom is an exception when payments for time not worked are included in fixed costs.
4. Under European dismissal legislation, unjustly dismissed workers receive monetary awards that compensate them for lost wages for a limited period. Although there is no general federal dismissal statute in the United States, state courts have increasingly recognised causes of "wrongful termination" and awarded both compensatory and, for certain causes, punitive damages. These are usually orders of magnitude larger than the awards under European dismissal laws (Flanagan, 1987b, pp. 193-99; Mendelsohn, 1988).
5. Since the hiring decision is influenced by the present value of prospective dismissal costs, the reduction in the flow of hires should be less than the reduction in the flow of layoffs as a result of discounting. See Bentolila and Bertola (1987).
6. There are other ways to reduce this risk. One recent study (OECD, 1987, p. 138), noted that:

"in Europe, wage differentials – both within and between occupations – have generally been greater in countries lacking nation-wide, certified vocational training than in those with comprehensive training structures; moreover, earnings have tended to rise more sharply with age and seniority in the former than in the latter group of countries. Likewise in the **United States**, large pay disparities at least partly reflect the lack of certified, transferable skills in the labour force. This fragments the market for labour and makes it virtually impossible for a uniform rate to emerge for a given set of skills, even within industries; but wide pay differentials have also traditionally provided young employees with a set of low-paid "stepping stones" into secure employment. Finally, in **Japan**, the seniority wage system is consistent with low levels of formal vocational training and certification in the labour force and the corresponding need for large firms to gradually develop employees' skills through costly internal training programmes over long periods of time. Correspondingly, seniority differentials are wide".
7. The French Government also has raised the SMIC independently of inflation and average wage developments. Following the 1981 presidential election, the SMIC was raised by 10 per cent, for example. Following the 1988 election, the SMIC was raised by only 0.4 per cent, however.

8. Hamermesh (1988) includes a clear discussion of these issues.
9. Not all individuals receiving unemployment benefits would be considered unemployed under sample survey definitions. For a discussion of this issue, see United Kingdom, Department of Employment (1988).
10. The differential may also arise from costs that insiders are able to impose directly by refusing to train or co-operate with new hires, etc. Some of these possibilities are discussed in Lindbeck and Snower (1986b).
11. The business surveys are typically conducted on fixed samples of firms, smaller in number than the samples from which production and employment data are normally gathered. Respondents are asked for their judgement on whether their company's labourforce, orders, capacity utilisation, etc. are above, at or below normal levels or in what direction they expect these factors to change in the next one to three months. Responses are weighted according to the size of the firm to calculate the final figure. Respondents are usually instructed to adjust their replies for normal seasonal variations, but apparently are only partially successful in applying their judgement to this task.
12. EL is derived from the question, "For this time of year, are the number employed in the past month compared with the previous month higher, the same, or lower". FEL is derived from the question "Over the next three months, will employment be higher, the same, or lower". In each case, the data consist of the per cent of "positive" or "higher" replies minus the per cent of "negative" or "lower" responses, weighted by size of responding firm.
13. Nickell (1986) provides an excellent survey of the literature.
14. A comparison of wage-tenure profiles for France in the Eurostat *Structure of Earnings Surveys* for 1972 and 1978 shows that the profile became less steep during that period. Unfortunately, data from the 1978 survey are not generally available for the larger European countries.

## Annex

### SOURCES AND DEFINITIONS

#### 1. Wage regressions and overtime charts

Hourly earnings, the unemployment rate and the rate of change of consumer prices are from OECD, *Main Economic Indicators*. The definitions and sources of the overtime hours data used in Tables 1 and 2 and in Charts C to E are as follows: United States: average weekly overtime hours of production workers in manufacturing, *Employment and Earnings*; Germany: average weekly paid overtime hours per employee in mining and manufacturing, *Arbeits und Sozialstatistisches Jahrbuch*; Italy: average monthly overtime hours per operative in manufacturing, *Statistiche del Lavoro*; Sweden: average weekly overtime hours as a percentage of total hours worked in mining and manufacturing, *Loner*, del 2; United Kingdom: average weekly overtime hours per operative in manufacturing, *Department of Employment Gazette*; Japan: average monthly overtime hours as a per cent of total hours worked in all industries, *Monthly Labour Statistics and Research Bulletin*; Australia: average weekly overtime hours per employee in industry, *Labour Statistics* and *Australian Yearbook*.

#### 2. Employment equations

Employment data are from OECD *Quarterly Labour Force Statistics* and give the total employees in all activities (except for France and the United States where data cover non-agricultural activities). The capital stock,  $K$ , and wage (wages plus supplements per employee),  $W$ , variables are from OECD *National Accounts*. The energy price variable,  $MFP$ , is the energy prices for business series from OECD, *Energy Balances of OECD Countries*. The output uncertainty variable,  $UNC$ , is the standard deviation of quarterly growth rates of industrial production over the past twelve quarters divided by the mean growth rate over the twelve quarters, constructed from series in *Main Economic Indicators*.

The relative wage variables are constructed as  $100 * (\ln W_i - \ln W_j)$ , where  $\ln W_i$  is the natural log of the high-wage occupational category and  $\ln W_j$  is the natural log of the low-wage category. France: wage of cadre moyen relative to wage of ouvriers from l'INSEE. Germany: for blue collar workers – wage of category 3 workers relative to wage of category 1 workers; for white collar workers – wage of category 5 workers relative to wage of category 2 workers from Statistisches Bundesamt, *Statistisches Jahrbuch, 1959-1987*. Italy: annual earnings of workers 41-50 years of age relative to annual earnings of workers less than 20 years, Banco d'Italia, *Bollettino Statistico*. Japan: non-manual earnings relative to manual earnings from *Japan Yearbook of Labour Statistics*. United Kingdom: earnings of non-manual workers relative to earnings of manual workers from Department of Employment *Gazette*. United States: earnings of non-manual workers relative to earnings of manual workers from *Current Population Reports*, series P-60.

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