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# *What Has Happened to Men's Wages since the Mid-1960s?*

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## I. INTRODUCTION

The gap between rich and poor has increased dramatically over the last 25 years and the incomes of the bottom 10 per cent were no higher in 1991 than in 1967 (see Goodman and Webb (1994b, this issue)). Wages are an important part of household income and the trends in the dispersion of wages mirror very closely the trends in the dispersion of income. Knowing the reasons for the changing structure of the wage distribution is thus crucial to an understanding of the trends in overall household income.

This paper uses 27 years of data from the Family Expenditure Surveys over the period 1966–92 to describe and explain changes in the structure of male wages. We look at the evolution of wage differentials within and across different groups of workers and relate the changing wage structure to the changes in the structure of supply and demand. We concentrate on men as the analysis of the growth of women's wages over time is complicated because some women

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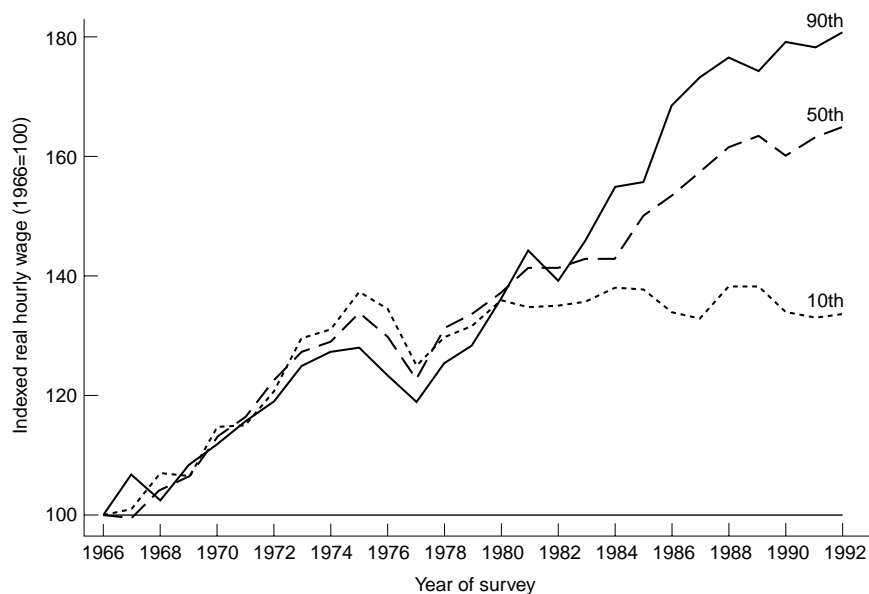
withdraw from the labour market at various points in their life cycle to have children or work in the home and it is likely that the timing of this move will be affected by wages. Thus we may see growth of wages with age for women simply because those women who leave the labour market to have children have lower wages and not because the wages of any particular women are rising. Likewise, we exclude young (aged under 23) and older (aged over 59) men from the analysis.

The structure of this paper is as follows. The next section describes the changes that have been taking place in the wage structure in the UK in recent years. Section III discusses the issues and possible reasons for the observed widening of differentials. Section IV reports empirical evidence based on data from the Family Expenditure Survey (FES) which examines and tests these arguments in more detail. Finally, the last section discusses the policy implications of the research and offers some concluding remarks.

## II. CHANGES IN THE WAGE DISTRIBUTION, 1966–92

To illustrate the magnitude of changes in the UK wage structure, Figure 1 plots indexed real hourly wages (1966=100) for different parts of the distribution. All

FIGURE 1  
Indexed real Hourly Earnings by Percentile

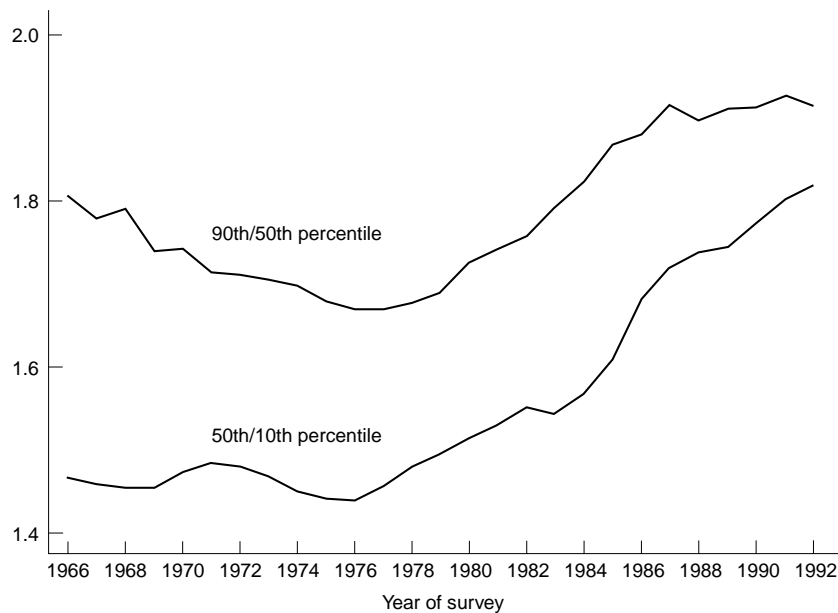


Source: Family Expenditure Surveys, 1966 to 1992.

men in the sample between the ages of 23 and 59 inclusive who worked at least one hour in the past week are included. Four distinct stages in the evolution of the UK wage structure emerge:

- (1) a period (1966–72) when there was real wage growth throughout the distribution coupled with no change in the wage structure;
- (2) a short period (1972–75) when relative differentials were falling and all wages were growing in real terms; for example, in 1974, the 10th percentile wage was 40 per cent higher than it was in 1966 and the 90th percentile wage was only 25 per cent higher;
- (3) the period following this when the Social Contract was at its toughest and where all wages were falling;
- (4) a long sustained period from 1978 to 1992 when growth rates diverged across the distribution. Over these 15 years, the 10th percentile wage did not change, never recovering its level in 1975, while the median grew by 27 per cent and the 90th percentile by 44 per cent.

FIGURE 2  
The Changing Dispersion of Male Wages, 1966-92



Source: Family Expenditure Surveys, 1966 to 1992.

To draw out the relative differences, Figure 2 plots the ratios of the 90th percentile to the median and the median to the 10th percentile between 1966 and 1992. Looking first at the top line, the 90/50 ratio, a bowl-shaped relationship emerges, with differentials falling until the mid-1970s and then rising dramatically and overtaking the 1966 level by 1984. Apart from the period 1970–76 when pay differentials between the top and the bottom were compressed, there was no real change in the 50/10 ratio until after the incomes policy period of the mid- to late 1970s, after which the ratio rose steadily. Over the whole period, median wages increased from being 47 per cent more than the 10th percentile in 1966 to being over 80 per cent more by 1992. Thus, since the mid-1970s, the real wages of low-paid workers have fallen successively further and further behind the rest. This appears to be the most dominant trend in the distribution of wages over this period.

To put the recent UK experience in context, it is interesting to look at what has happened over a longer time period. Whilst there is no consistent time series of data on wage dispersion over the last century, the data that exist (on male manual full-time weekly earnings) suggest that the gap between the highest- and the lowest-paid is now larger than at any time this century. Moreover, the size of the changes over the last 15 or so years is unprecedented. Table 1 shows this quite clearly.

To highlight the potential role that changes in the structure of earnings may have played in shaping the changes in the distribution of household income, we can compare the trends discussed above with trends in the overall distribution of income. Data on the distribution of income are usually defined at family level and then *equivalised* (normalised by household size and presence of children) to control for different family size. This means that the two trends are not directly comparable. Nevertheless, Figure 3 plots the 90th/10th percentile ratio of hourly

TABLE 1  
**Wage Dispersion of Full-Times Male Manual Workers, 1886-1990**

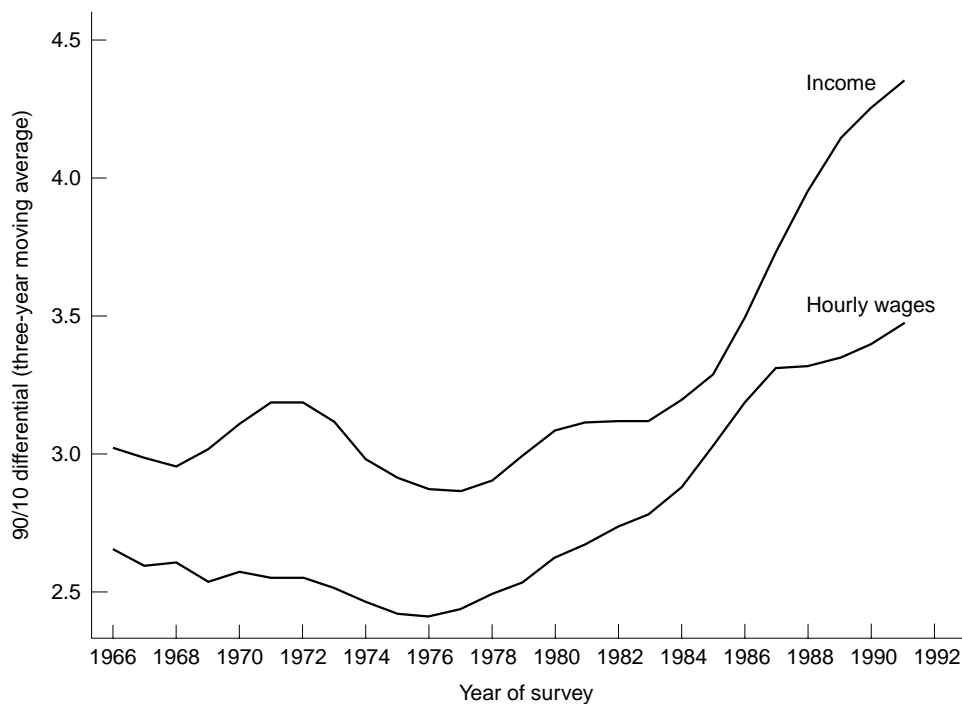
	<i>50<sup>th</sup>/10<sup>th</sup> differential</i>	<i>90<sup>th</sup>/50<sup>th</sup> differential</i>
1886	1.458	1.431
1906	1.504	1.568
1938	1.477	1.399
1970	1.486	1.475
1976	1.425	1.449
1982	1.464	1.526
1988	1.556	1.565
1990	1.570	1.591

Sources: New Earnings Surveys; British Labour Statistics: Historical Abstract 1886-1968, Table 79.

earnings with that of equivalised household income.<sup>2</sup> As can be seen, the two series are very similar. Both household income and hourly real wages of men were less dispersed in the mid-1970s than in either the 1960s or the 1980s. According to these data, wage dispersion has been rising steadily since 1976 and income dispersion since 1977. Moreover, Gardiner (1994) claims that, in the 1980s, the economies with the fastest increase in the dispersion of incomes (i.e. the UK and the US) were also the countries with the fastest increase in the dispersion of wages.

The two series diverge slightly after the mid-1980s: the 90/10 differential of hourly wages does not widen as fast as that of income. One reason for this is that the distribution of employment income across households is not only a function of the wage that different people are offered but also a function of the

FIGURE 3  
Income and Wage Dispersion, 1966-91



Note: Figure shows equivalised weekly income.  
Source: Goodman and Webb, 1994a.

<sup>2</sup> See Goodman and Webb (1994b, this issue) for details of how these figures were computed.

distribution of employment and hours worked across households. It is likely, however, that both the stagnation of wage levels at the bottom of the distribution and the growth in unemployment have similar underlying economic causes. Other factors that have been important in explaining the rise in income inequality are changes in taxes, increases in returns to investment income and the growth of self-employment.<sup>3</sup>

### III. CHANGES IN THE UK LABOUR MARKET, 1966–92

This increase in wage inequality has prompted a large body of research both in the US and in the UK.<sup>4</sup> Changes in the structure of wages have been related to several factors, including changes in the structure of the demand for labour, changes in the composition of skills among the work-force and changes in the influence of pay-setting institutions.

The increased integration of international product and capital markets (globalisation) has been suggested as a reason why the demand for unskilled workers in developed economies such as the UK and the US should have fallen (Murphy and Welch, 1992). Investment is now more mobile and thus more likely to move in response to cross-country differences in unit wage costs. Similarly, in order to maintain their competitive position, firms that face international competition are under more pressure to keep their unit wage costs down. Skilled workers are thus at more of a premium than before and there are fewer unskilled jobs at any given wage.

It has also been suggested (see Bound and Johnson (1992) or Berman, Bound and Griliches (1994) for the US and Van Reenen (1993) or Machin (1994) for the UK) that technological change has increased the relative productivity of skilled versus unskilled workers. Examples of this are the rapid influx of computers into many workplaces and the introduction of machines to do assembly tasks previously done by unskilled or semi-skilled workers in sectors such as the automobile industry. This seems to have created an increase in the demand for skilled workers to run these machines and an increase in the proportion of workers needed for administrative and supervisory roles. This stands in direct contrast to technological changes implemented earlier this century and during the industrial revolution which tended to reduce the need for skilled labour.

There is also considerable evidence that important compositional changes have occurred in the UK labour market. In 1969, for example, 39 per cent of the

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<sup>3</sup> See Goodman and Webb (1994b, this issue) for a comprehensive study of the possible influences that have shaped changes in the distribution of income.

<sup>4</sup> For the US work, see the collection of papers in the February 1992 issue of the *Quarterly Journal of Economic* or the surveys by Levy and Murnane (1992) or Freeman and Katz (1994), among many others; for the UK, see Gregg and Machin (1994) or Schmitt (1994).

total work-force worked in manufacturing, whilst by 1990 this had fallen to 23 per cent. In 1969, the private service sector employed 49 per cent of the work-force, whilst by 1990 it employed 70 per cent.<sup>5</sup> It is likely that the return to skill is higher in these new types of employment where jobs are more heterogeneous. It may also be likely that the increase in female participation, itself perhaps a consequence of the decline in the relative earning power of unskilled married or cohabiting men (Machin and Waldfogel, 1994), has increased the numbers competing for unskilled jobs, although what evidence there is suggests that the increase in participation has come from educated women (see, for example, Gregg and Wadsworth (1995)).

Other authors (for example, Freeman and Katz (1994)) have stressed the importance of labour market institutions, particularly trade unions and minimum-wage-setting mechanisms, in shaping the way that labour markets have responded to these changes in the structure of supply and demand. In this light, Freeman and Katz (1994) and Gregg and Machin (1994) cite evidence showing that the UK and the US are alone in experiencing such a widening of wage differentials in the 1980s (with the US still having a much higher level). While earnings differentials in most countries became more compressed in the 1970s, and the 1980s saw rises in a number of countries, the increases in dispersion of the 1980s are much smaller elsewhere than in the US or the UK. It is clear that the recent rise in earnings dispersion is not a global phenomenon. This is illustrated in Table 2, which reports the 90/10 male earnings ratios for several countries.

TABLE 2  
Cross-Country Evidence on Male 90/10 Earnings Ratios

	<i>Early 1970s</i>	<i>Late 1970s/ Early 1980s</i>	<i>Late 1980s</i>
UK	2.48 (1973)	2.41 (1979)	3.39 (1991)
US	4.71 (1975)	4.48 (1980)	5.58 (1989)
Canada	—	3.60 (1981)	3.94 (1990)
France	3.22 (1973)	3.25 (1980)	3.42 (1991)
Sweden	2.06 (1973)	1.97 (1981)	2.16 (1991)
Norway	—	2.05 (1979)	1.97 (1991)

Source: Gregg and Machin

The first point to make is that the fall in demand for unskilled labour may result in both falls in employment and declines in the relative wages of the less skilled. In this light, one important difference between the experience of the US

<sup>5</sup> Source: *Employment Gazette*.

and that of Europe over recent years is that the US has not experienced such large and persistent levels of unemployment. In the UK, inactivity rates of men of working age doubled from 7 to 14 per cent from 1973 to 1991.<sup>6</sup> Moreover, real wages at or below the median have been falling steadily in the US over the last 20 years. By contrast, in the UK, real wages at the 10th percentile have been flat since the late 1970s. In many US states, there is no universal benefit available to able-bodied unemployed men without children, and benefit is instead restricted to those who have worked if only for a few weeks over the past year. The collapse in demand for unskilled workers then seems more likely to affect their wages rather than their employment.

Secondly, the ability of the work-force to respond to the increasing demand for skilled labour by upgrading their skills is likely to depend on their educational background and their opportunities for training. The education and training systems then become very important. It has been argued that not only are UK workers less skilled on average than those in the rest of Europe, but that they also lack the general skills obtained from basic education that are necessary for further training (see Finegold and Soskice (1988)).

There have been significant changes in public policy towards education in the last century. The minimum school-leaving age was raised from 14 to 15 in 1948 and again to 16 in 1973. The 1960s and 1970s saw the expansion of further and higher education after the Robbins Report of 1963. It is evident that the level of wages among particular age-groups is likely to be affected by the returns to and the distribution of education (Becker, 1975). How the variance of wages is then affected by education policies will depend on what is happening to the structure of demand. In the face of increasing relative demand for educated workers, we should expect policies such as those described above to mitigate the increased educational premiums.

Even if there had been no changes in the structure of demand in the UK, we should expect the dispersion of wages to rise, given the recent moves away from national and industry-level wage-setting and the overall decline in union presence. There have been important changes in government policy towards pay over the last three decades. Up until 1978, there were explicit controls over wage increases through incomes policies. These will compress pay differentials if they contain a flat-rate element as in the 1975–77 period of the Social Contract, a maximum level of pay increase as in the £250 limit imposed during 1973, or any preferential arrangement for lower-paid workers. Moreover, they constrained the growth of relative pay differentials even when all workers received the same rate

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<sup>6</sup> Source: *OECD Employment Outlook*. This definition includes the unemployed, the long-term sick, those taking early retirement and other inactive individuals.



of pay increase. For the last 15 years, there has been no such centrally imposed restraint.<sup>7</sup>

Since 1980, two institutional arrangements that held up the wages of low-paid workers have been removed or weakened. Although Wages Councils (committees made up of employers and worker representatives to set industry-level minimum wages) were not abolished until 1993, the number of inspectors was reduced and young workers were taken out of the net in 1986 (see Machin and Manning (1994)). The 'fair wages resolution' was abolished in 1980. This protected not only the wages of public sector workers in low-paid occupations but also the wages of workers in any organisation contracted to do work for central or local government. The effect of the abolition on low wages is thus magnified, given the recent trend towards the subcontracting of many local government tasks such as cleaning.

The actual mechanisms by which pay is set are also important. There is evidence that the variance of wages is smaller when pay is set at an industry or national level and/or between unions and firms than when it is set unilaterally by the employer. Gosling and Machin (1995) for Britain and Freeman (1980, 1982 and 1993) and Card (1991) for the US show that trade unions are associated with lower levels of wage dispersion. Between 1980 and 1990, there was a large drop in union presence in Britain: the proportion of the work-force belonging to a trade union fell from 58 per cent to 42 per cent over this period (see Waddington (1992)); the proportion of workplaces with recognised unions fell from 64 per cent in 1980 to 53 per cent by 1990 (see Millward, Stevens, Smart and Hawes (1992) and Disney, Gosling and Machin (1995)). Moreover, even in the union sector, national or industry-level pay agreements have all but disappeared over the 1980s and pay is now more likely to be set within the firm or the workplace.

#### **IV. EVIDENCE ON THE CHANGING STRUCTURE OF SUPPLY AND DEMAND**

We have thus summarised the main reasons why we should expect the shape of the earnings distribution to have changed. We now present some preliminary evidence from our data on shifts in composition and raw returns to skill. The FES gives us three measures of skill: occupation, education and potential experience (age now minus age left full-time education). Unfortunately, we only have information on years of schooling from 1978, and the definition of skill changed fundamentally in 1987 so it is not comparable across years. We thus only look at skill differentials before 1987 and educational differentials after 1977.

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<sup>7</sup> See Clegg (1979) for a detailed discussion or Goodman and Webb (1994b, this issue) for a summary of the different incomes policies in force.

1. Composition

In the absence of any other offsetting factors, we should expect that an increase in the relative demand for skills should result in an increase in the skilled proportion of the work-force, as some workers upgrade their skills and those who cannot are dislodged from the work-force.

The first panel of Table 3 shows the percentage of workers in six broad occupational categories in the three years 1968, 1978 and 1986. It shows a steady increase in the proportion of workers in the higher-grade non-manual occupations (professional and managerial workers) from just under a quarter of the work-force in 1968 to over a third in 1986, and a decline in the proportion in the low-grade semi-skilled and unskilled occupations from 28 per cent to 17 per cent. Overall, the proportion employed in manual occupations has fallen.

TABLE 3  
Changes in Skill Composition, 1968-92

<b>Occupation</b>			
	<i>1968</i>	<i>1978</i>	<i>1986</i>
Professional	13.48	15.94	18.54
Managerial	10.62	14.44	16.61
Clerical	9.38	6.97	7.48
<b>All non-manual</b>	<b>33.48</b>	<b>37.35</b>	<b>42.63</b>
Skilled	38.60	39.85	40.15
Semi-skilled	18.09	18.34	13.13
Unskilled	9.83	4.45	4.36
<b>All manual</b>	<b>66.52</b>	<b>62.64</b>	<b>57.64</b>
<b>Education</b>			
<i>Age left full-time education</i>	<i>1978</i>	<i>1986</i>	<i>1992</i>
14 or under	26.71	9.87	2.81
15	35.29	30.89	27.66
16	16.50	28.56	34.78
<b>All 16 or under</b>	<b>78.50</b>	<b>69.32</b>	<b>65.25</b>
17 or 18	10.26	14.42	16.32
Over 18	11.24	16.25	18.43
<b>All over 16</b>	<b>21.50</b>	<b>30.67</b>	<b>34.75</b>

Note: Numbers may not sum exactly due to rounding.  
Source: Gosling, Machin and Meghir, 1994b.

The next panel shows how workers in later years are more educated than their predecessors. In 1978, for example, only 11 per cent of workers had some form of post-school education; by 1992, this proportion had increased to over 18 per cent. Changes in the minimum school-leaving age have resulted in declines in the proportions leaving school at or before 16. In 1978, for example, over 25 per cent of the work-force left school at or before 14; this dropped to just under 3 per cent by 1992. There have also been increases in the numbers staying on past the minimum school-leaving age.

These compositional changes could have taken place because workers are becoming more skilled, perhaps in response to changes in demand, or because lower-qualified workers can no longer find work. We cannot evaluate the relative importance of these effects for occupation as very few out-of-work men in our sample report an occupation. For education, however, it is possible to decompose the changes into that driven by the changing characteristics of the sample as a whole and that driven by differential employment rates.<sup>8</sup> Doing this for the change in the proportion of the work-force who left full-time education at or before 16 (which declined from 79 per cent in 1978 to 65 per cent by 1992) generates the results described in Table 4. As can be seen, almost a quarter of the change is due to the fact that a greater proportion of those who left full-time education at 16 do not work.

TABLE 4

**Decomposing the Fall in the Proportion of Low-Education Workers in the Sample**

<i>Change attributable to:</i>	<i>Change</i>	<i>Percentage of total change</i>
Changing characteristics of the sample	-0.105	-78.42
Differential employment rates	-0.033	-24.91
Interaction term	0.004	3.32
Total change, 1978-92	-0.14	100

Note: Numbers may not sum exactly due to rounding.

*2. Occupational and Educational Differentials, 1968–92*

There are various ways of presenting the growth in wages across skill groups. Plotting the level of wages over time is misleading if one is interested in *proportionate* changes, as an increase of £5 over two years means a smaller percentage increase for those on higher wages but corresponds to the same slope. For that reason, economists usually use logs,<sup>9</sup> but this often makes it difficult to interpret.  $\ln(\pounds 5)$  is inherently more meaningful than 1.609 even though they are both the same number. One way of getting round this problem is to use a log

<sup>8</sup> See the Appendix for the precise derivation of this decomposition.

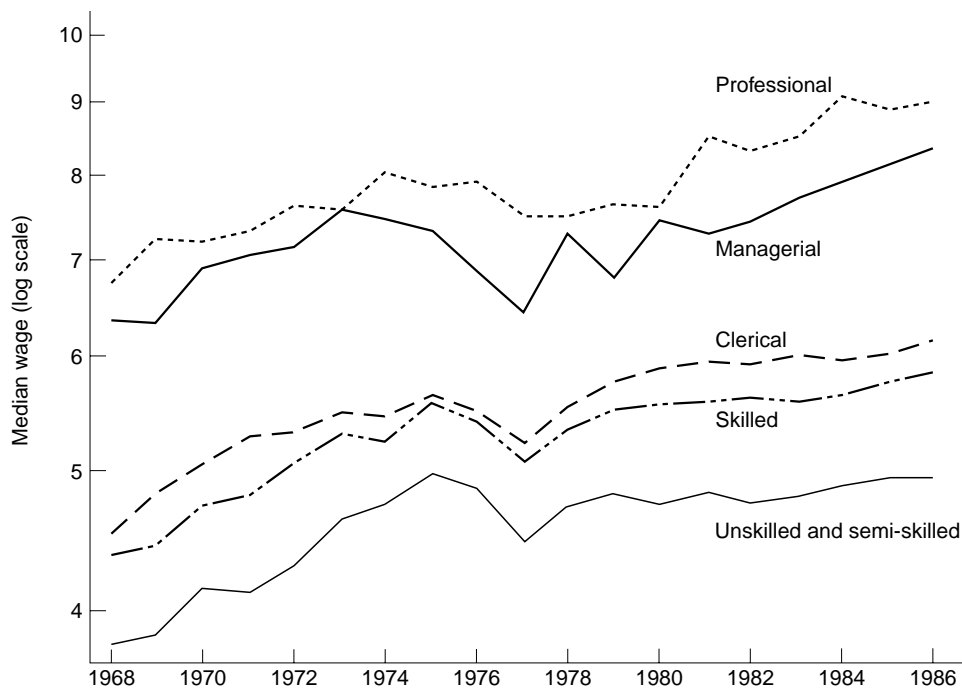
<sup>9</sup> As  $\ln(x/y) = \ln(x) - \ln(y)$ , differences in logs are always proportionate.

scale. The graphs are constructed in logs but the labels are transformed back into levels. This is why 4 and 5 on Figure 4(a) are further apart than 9 and 10.

Figures 4(a) and 4(b) show real wage growth over the 1970s and 1980s by skill level. Figure 4(a) plots the median wage over time for five occupational groups and Figure 4(b) does the same for three education groups: those leaving full-time education at or before 16, those leaving at 17 or 18 and those leaving after 18. It is clear that differential growth rates across occupations and education levels do reflect the differential growth rates across the wage distribution, with growth rates being higher for the lower-skilled and the bottom of the wage distribution during the late 1960s and 1970s and higher for those at the top during the 1980s.

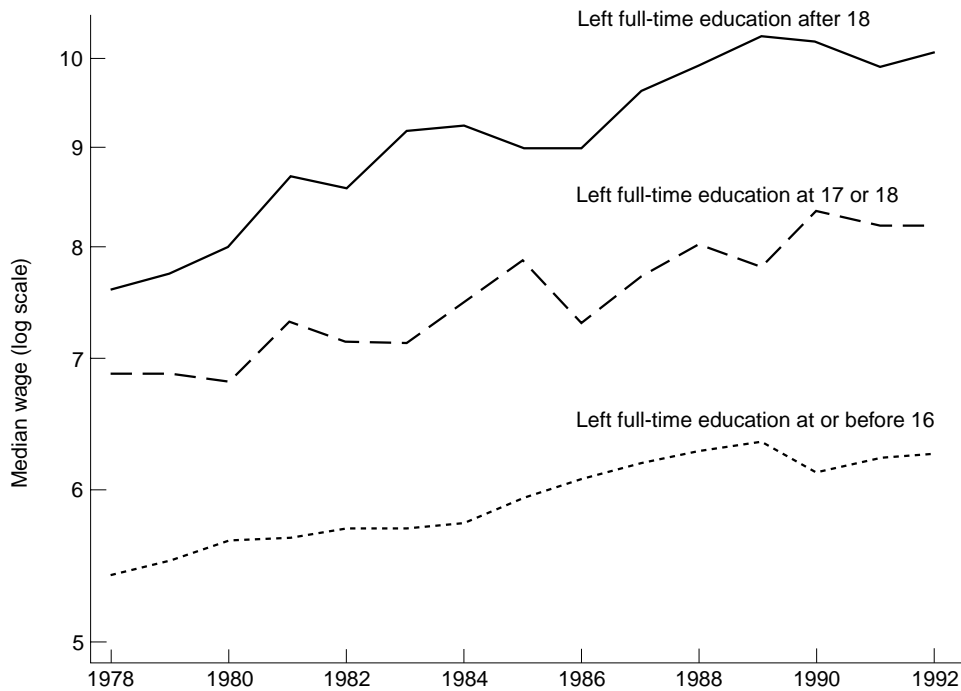
Taking the unskilled and semi-skilled first, it is clear that most of the growth in real wages occurred in the late 1960s and early 1970s. Median wages increased from about £3.90 an hour in 1968 to just under £5 an hour in 1975.

FIGURE 4(a)  
Wage Growth by FES Occupation, 1968-86



Notes: Log scale given, so slopes are equal to proportional rates of change. All wages are in 1994 prices.

FIGURE 4(b)  
Wage Growth by Years of Full-Time Education, 1978-92



Notes: Log scale given, so slopes are equal to proportional rates of change. All wages are in 1994 prices.

After the falls of the Social Contract period, wages of unskilled workers never recovered this level, as growth rates after 1978 are approximately zero. The wage profile of skilled workers follows a similar trend, although skilled wages have risen significantly over the 1980s from just under £5 to just under £6 an hour. The wages of clerical workers rose at a steady rate throughout the period, except during the years of the Social Contract.

This picture reverses when one considers the wages of managerial workers, which increased during the late 1960s and early 1970s, fell from 1973 to 1977 and then rose dramatically after that, increasing by almost a third over the period in real terms. Likewise, the wages of professional workers increased faster during the 1980s and growth rates were comparatively flat during the 1970s.

Median wages of those who have had some form of post-18 education (see Figure 4(b)) rose by a third over this period from £7.50 an hour in 1978 to over £10 an hour in 1992. Median wages of those workers who left full-time education at or before 16 rose by only 10 per cent, from about £5.50 an hour to £6 an hour. Thus while there has been wage growth across all education groups

since 1978, it is clear that the workers who have done best are those who left full-time education after 18.

Figures 5(a) and 5(b) show that there has been a U-shaped relationship between skill differentials over time and that the increase in occupational differentials after 1978 is mirrored by the concurrent increase in the educational premiums. Thus in 1978, median wages of workers who left full-time education after 18 were 40 per cent higher than those of workers who left at or before 16. By 1992, this differential has increased to over 60 per cent. Similarly, the percentage differential between managerial and unskilled workers fell from 70 per cent in 1968 to 40 per cent in the mid-1970s and then rose back to the level of 1968 by 1986.

As we only observe education after 1978 and occupation before 1987, we cannot use data from the FES to see whether the compression in occupational differentials in the 1970s was accompanied by a similar fall in educational differences or whether occupational differences continued to rise after 1986. Research using other data sets does, however, suggest that this has been the case

FIGURE 5(a)  
Occupational Differentials, 1968-86

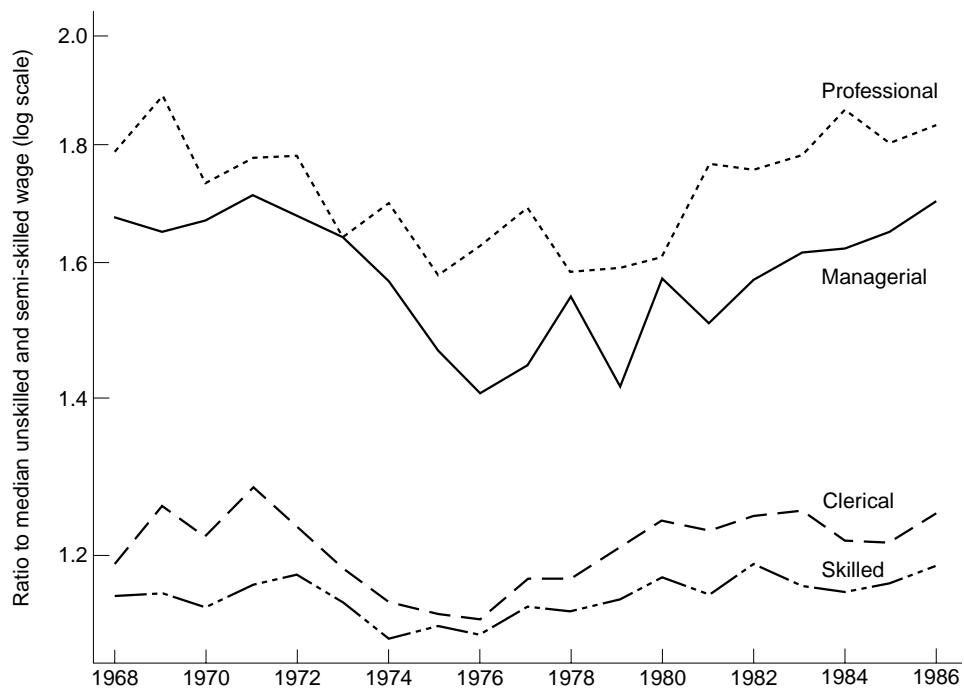
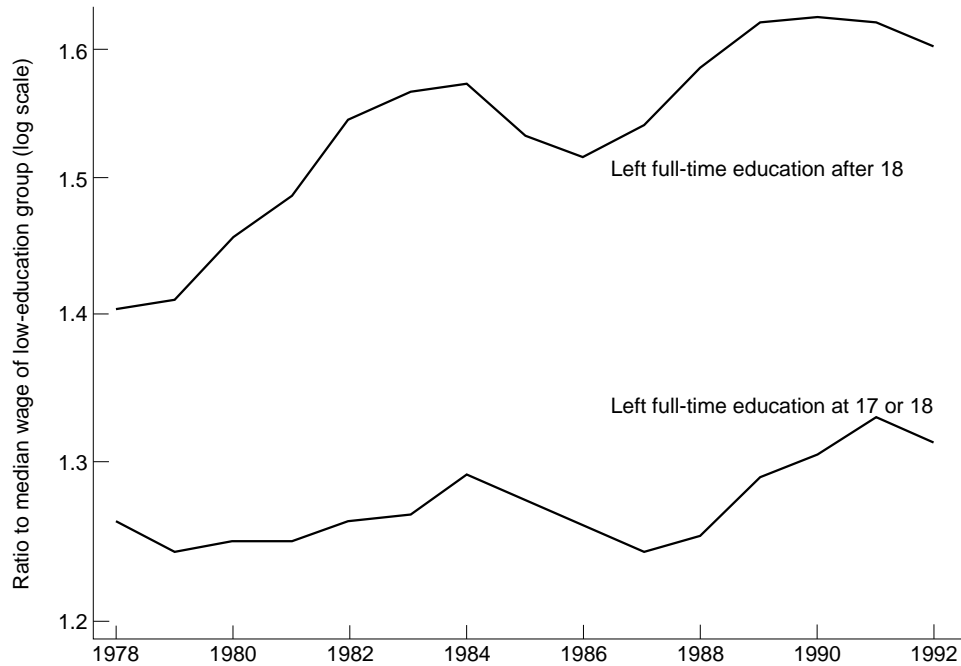


FIGURE 5(b)  
Educational Differentials, 1978-92



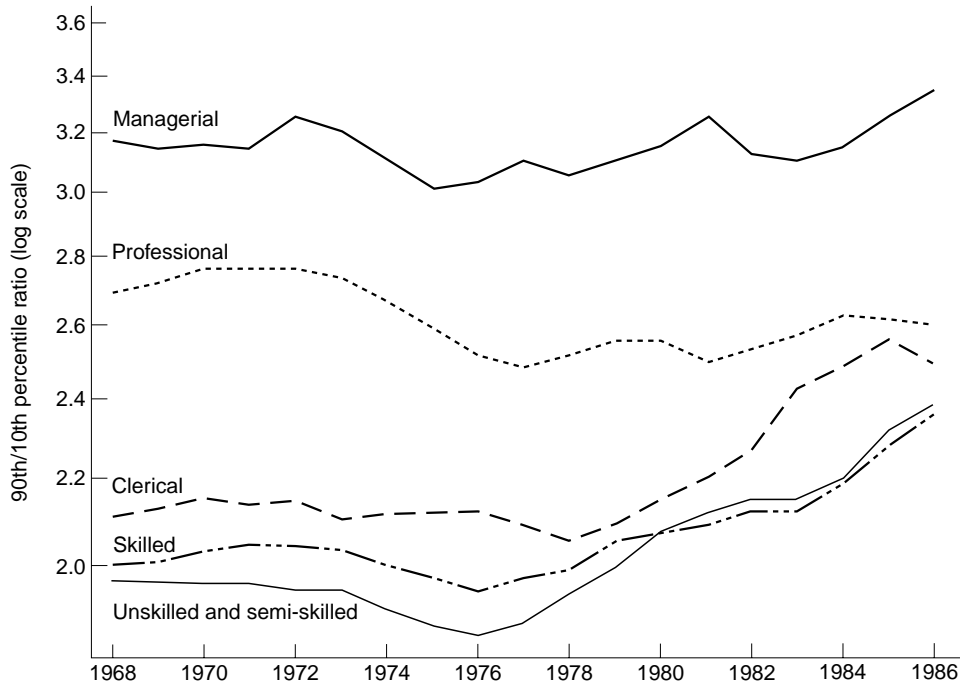
(see Chennells and Van Reenen (1994) and Schmitt (1994)). Moreover, there does not seem to be any systematic change in the relationship between education and occupation during the nine years when we have data on both skill definitions.

The data on educational and occupational differentials and on the skill composition of the work-force would seem to suggest that there has been an increase in the relative demand for skills proxied by these very broad categories. Figures 6(a) and 6(b) show, however, that there has been a similar rise in differentials *within* the lower-skilled occupations and the lower-education groups.

Figure 6(a) demonstrates that dispersion is highest within the heterogeneous managerial category. The 90/10 differential within this group fluctuates about the level of 3.2 from 1968 to 1986. This means that the top 10 per cent of male wage-earners in this category earn more than 3.2 times the bottom 10 per cent. Similarly, dispersion measured by the 90/10 ratio amongst professional workers fluctuates around 2.6 over the period. Looking at the lower-skilled occupations, we see that wage inequality within these groups rises after the mid-1970s, so that by 1986, dispersion within these groups was very close to that found within the

professional category of workers. Similarly, wage dispersion amongst those workers leaving full-time education at or before 16 (see Figure 6(b)) rises constantly over this period.

FIGURE 6(a)  
Dispersion within Occupations, 1968-86



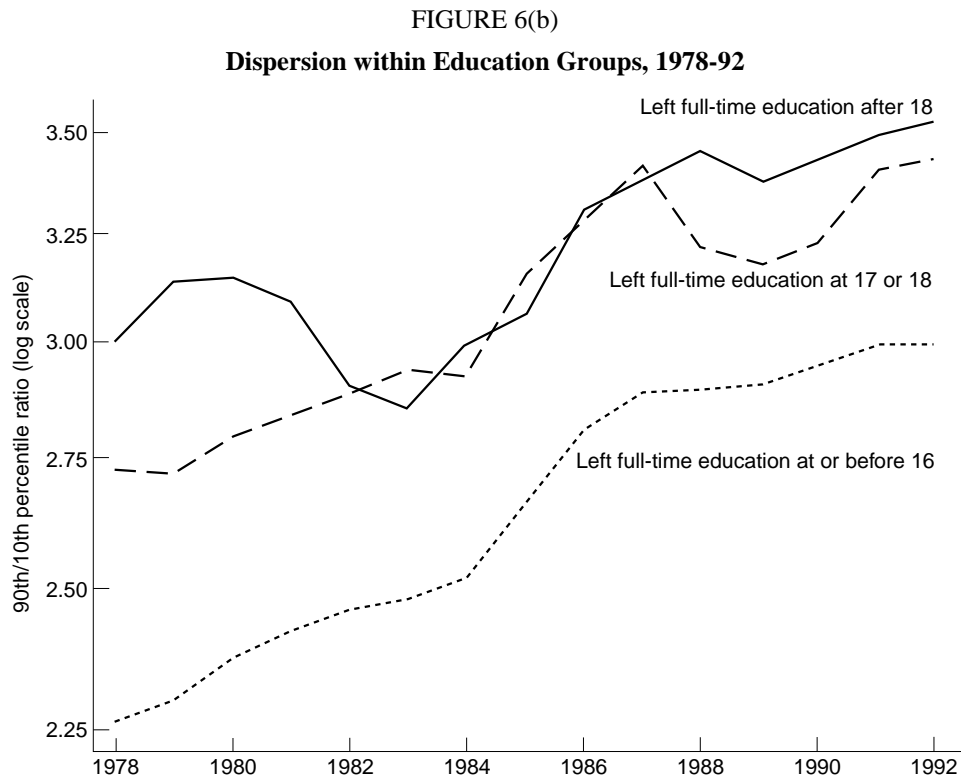
If all the increase in wage inequality could be explained by changes in the pattern of demand and supply for these broad skill categories, then we would expect there to be no sustained changes in dispersion *within* each group. The fact that we do observe increases in dispersion amongst these groups suggests that the changes in the labour market involve more than simple shifts of demand and supply between these categories.

### 3. The Returns to Experience

We next look at how the level and the growth of wages differ across age-groups. If the return to experience is rising, we would expect to see an increase in the difference between the wages of young and older workers. This has been stressed by researchers looking at the US as one of the driving forces behind the rise in wage inequality (see Bushinsky (1994) and Juhn, Murphy and Pierce



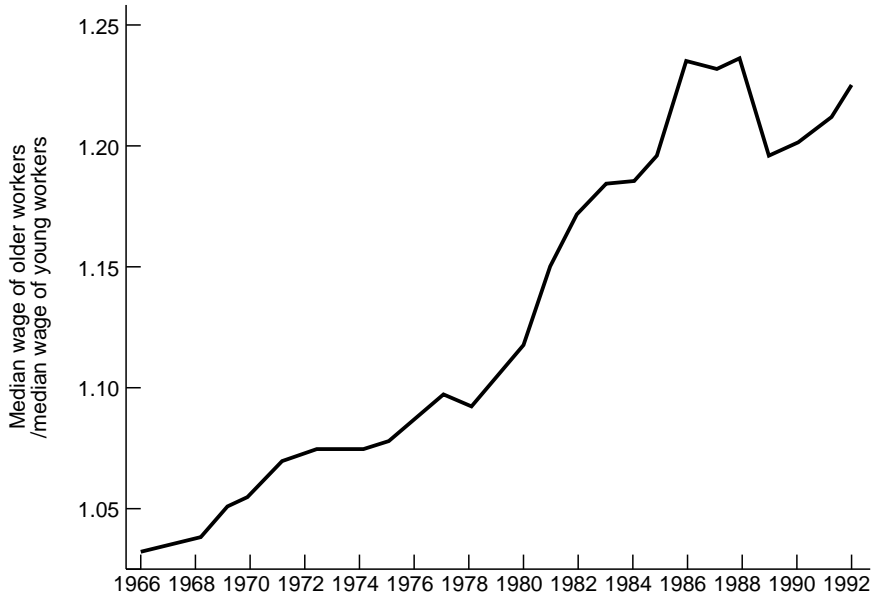
(1993)). We shall discuss in more detail below the interpretation of this growing gap, but we will first present evidence from our data on how it has changed, both before and after controlling for education.



Figures 7(a) and 7(b) show how the gap between older and young workers measured by the ratio of median wages has changed over the last 27 years. Essentially, this measures the cross-sectional age-earnings profile over time. Looking at the graph that does not control for education (Figure 7(a)), the first thing to notice is the small size of the gap between young and older workers in the beginning of the period. In 1966, the median wages of 40-year-olds was only 38 per cent more than the median wage of 23-year-olds. This gives little evidence for the presence of any returns to experience during the late 1960s and early 1970s. By 1992, the wage gap between young and older workers increased to nearly 25 per cent, so that the median wage of 40-year-old men is now 65 per cent more than the median wage of 23-year-olds. If the only factor determining the size of this gap were the returns to experience, then we could say not only that these had increased dramatically but that they were almost non-existent during the late 1960s and early 1970s.

FIGURE 7(a)

**The Growing Difference Between the Wages of Young (aged 23-28) and Older (aged over 28) Workers, 1966-92**



Note: The graph shows a three-year moving average.

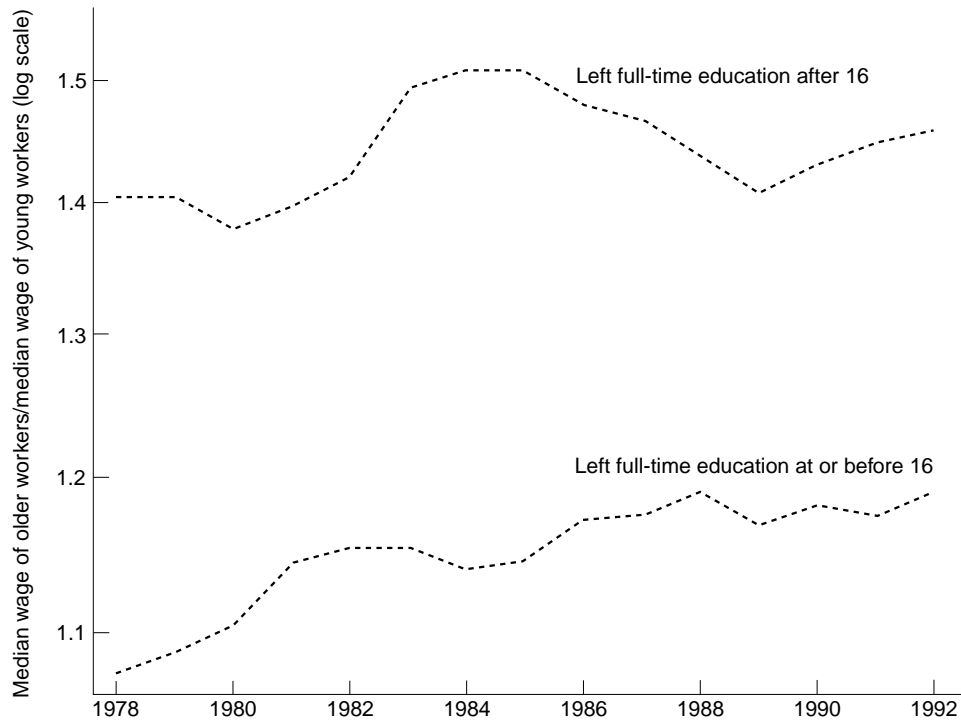
Human capital models of wage growth (Becker, 1975; Mincer, 1974) predict that workers with more education will experience faster earnings growth as they accumulate more experience than those workers with less education. Figure 7(b) shows that the gap between older and young workers is indeed bigger for workers who stayed on in full-time education to a later age. It cannot be the case that the increase in the proportion of the work-force who have stayed on in full-time education post-16 can explain the overall increase in the gap between older and young workers, however, as this gap rises fast over the period amongst workers who left full-time education at or before 16.

*4. Interpreting the Wage Gap between Young and Older Workers*

The growing gap between the wages of young and older workers does *not* necessarily mean that the returns to experience have risen. First, the wage gap between young and older workers is not only a result of the fact that older workers have more experience. It is conceivable that there are 'cohort' effects on wages. An example of these might be the long-run effect of the 1979-82

FIGURE 7(b)

**The Growing Difference Between the Wages of Young (aged 23-28) and Older (aged over 28) Workers, by Education Group, 1978-92**



Note: Log scale given, so slopes can be interpreted as proportional rates of increase.

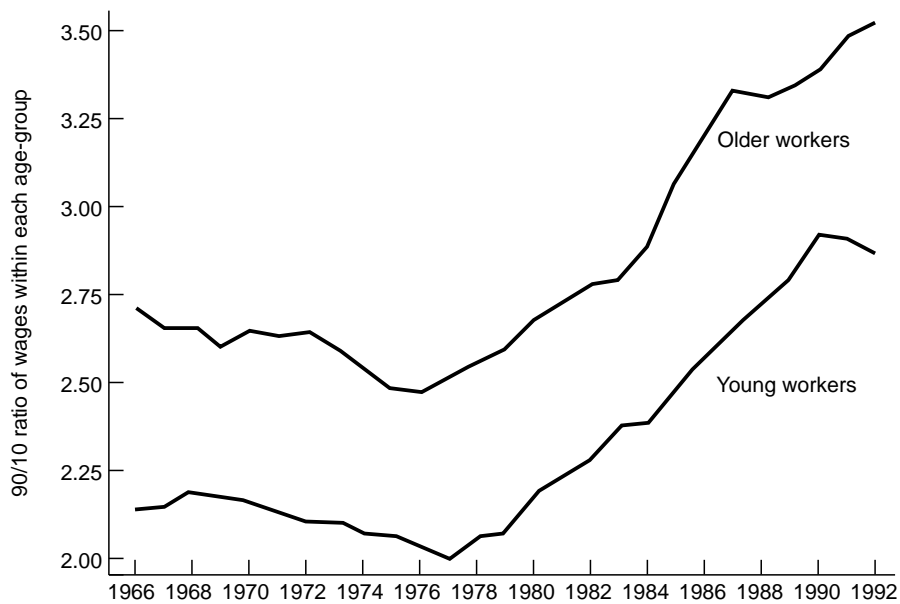
recession on the wage and employment opportunities of those workers who had recently entered the labour market. Similarly, cross-generational differences in the quality of education may be reflected in wages. Second, if the returns to experience are higher for those workers with more education, then it is perhaps likely that these workers will also be affected by increases in the returns to experience. This does not happen, as the cross-sectional age-earnings profile for workers who left full-time education after 16 shows no sustained trend, unlike the profile for the low-education group (see Figure 7(b)).

In another paper (Gosling, Machin and Meghir, 1994b), we test whether the returns to experience have changed, once one controls for the possibility of permanent differences (i.e. differences irrespective of age) in wages across generations, our definition of cohort effects. Essentially this is done by testing whether the *growth* in wages with age is significantly different across date-of-birth cohorts.

We find no evidence that the returns to experience have changed, and conclude that the increasing difference between young and older workers over time is entirely attributable to cohort effects. Moreover, we only find evidence of *any* returns to experience for workers who left full-time education after 16 and those at the top of the wage distribution. There is thus nothing to suggest that the low wages of some of the new entrants into the labour market will increase as they accumulate more labour market experience.

Figures 8(a) and 8(b) suggest that there are important cross-generational differences in the dispersion as well as the level of wages. Figure 8(a) shows that the 90th/10th percentile ratio has risen amongst men of similar experience levels, and Figure 8(b) suggests that this is even the case within education and experience groups. In the mid-1970s, for example, the highest-paid 10 per cent of workers between the ages of 23 and 28 earned about twice what the lowest-paid 10 per cent earned; in 1992, this figure had risen to almost three times.

FIGURE 8(a)  
Within-Age-Group Dispersion



Note: The graph shows a three-year moving average.

FIGURE 8(b)  
**With-Age-Group Dispersion by Education Group, 1978-92**

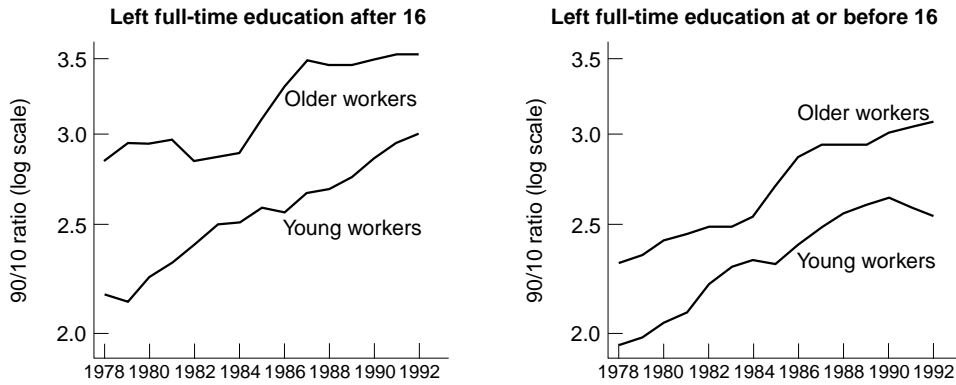
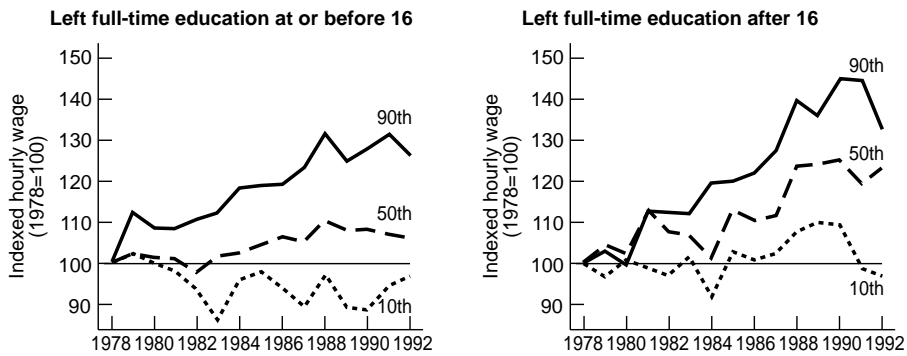


Figure 9 shows what this rise in dispersion means for the growth of wages across generations of workers at different points in the distribution. The graphs plot indexed real hourly earnings for workers between 23 and 28 at the 10th, the 90th and the 50th percentile (median) for those who left full-time education at or before 16 and those who left after 16.

FIGURE 9  
**Wage Growth across Generations of 23- to 28-Year-Olds, by Education Group, 1978-92**



Many young workers who left full-time education at or before 16, as the first panel of Figure 9 shows, receive lower wages than they would have done in the past. The bottom 10 per cent, for example, have hourly wages about 5 per cent lower than they would have had in 1978. Again, the highest-paid amongst this group are doing much better than they would have done in the past.

The second panel shows that the 10th percentile wage of 23- to 28-year-olds with some post-compulsory education has fluctuated around the level it was in 1978, being slightly lower in 1992. The median wage is 20 per cent higher and the 90th percentile wage is over 30 per cent higher than it was in 1978. Thus while most young workers who have stayed on later in full-time education receive higher wages than they would have done in the past, this is not so for all of them.

## V. CONCLUDING REMARKS

In the UK, wage inequality has risen at an unprecedented rate since the late 1970s. In this paper, we document, using micro-data from the Family Expenditure Survey, the key facts underpinning this rise and consider what factors may have been behind the observed increase.

It is clear that the dispersion of real hourly wages for men in work was fairly flat between 1966 and 1972, and that the distribution became more compressed between 1972 and 1977, after which there was a very sharp rise. During this later period, the real wages of the 10th percentile of the earnings distribution displayed zero growth, the median grew by 27 per cent and the 90th percentile grew by over 44 per cent.

The increasing gap between the wages of skilled versus unskilled men suggests that the demand for skill has increased, either because of changes in technology or because of changes in the structure of product markets, and that the supply of skilled labour has not changed fast enough to compensate. This may be because of failures in the education and training system which prevent unskilled workers obtaining, at least in the short run, the skills that the labour market demands. It is likely that policies that encourage children to stay on at school and more people to go into adult and further education are needed to reduce these skills shortages and to improve opportunities for workers at the bottom of the distribution.

Further examination reveals that, whilst the return to education and skill increased during the 1980s, there have been important rises in within-group wage inequality. Similarly, the wages of younger, new entrants to the labour force in the 1980s declined very markedly compared with those of older cohorts, and dispersion has risen fast amongst young workers with similar levels of education.

The lack of growth of real wages at the bottom of the male distribution may be an important cause of the decline in male employment rates and the increase

in the numbers in relative poverty. The knock-on effect of a choice between low pay on the one hand and unemployment on the other for men residing in some inner-city areas may have worrying implications for the transmission of poverty across generations. Those concerned about these trends have to consider whether feasible labour market policies exist that will improve incentives to work and the relative living standards of those on low wages. It may be possible to increase the coverage and take-up of 'in-work' benefits such as family credit, for example. More direct policies that influence the pre-tax hourly wage may also be considered. These latter may include a suitably targeted sectoral minimum wage, perhaps combined with job subsidies and funding given to employers and workers for training.

**APPENDIX: DECOMPOSING THE CHANGE IN THE PROPORTION OF WORKERS IN THE LOW-EDUCATION GROUP**

Define the following variables:

- $n_t$  = the number of men in the sample in the low-education group at time  $t$ ;
- $N_t$  = the number of men in the sample at time  $t$ ;
- $u_t$  = the unemployment rate of the low-education group at time  $t$ ;
- $U_t$  = the unemployment rate at time  $t$ ;
- $P_t$  = the proportion of workers in the low-education group at time  $t$ .

Thus the proportion  $P_t$  at any point in time can be written:

$$P_t = \frac{n_t}{N_t} \times \frac{1-u_t}{1-U_t}$$

and the change in  $P_t$  can therefore be expressed as:

$$\Delta P_t = \left[ \Delta \frac{n_t}{N_t} \times \frac{1-u_t}{1-U_t} \right] + \left[ \frac{n_t}{N_t} \times \Delta \frac{1-u_t}{1-U_t} \right] + 2 \times \left[ \Delta \frac{n_t}{N_t} \times \Delta \frac{1-u_t}{1-U_t} \right]$$

where:

$\Delta \frac{n_t}{N_t} \times \frac{1-u_t}{1-U_t}$  is the change attributable to changing characteristics of the sample;

$\frac{n_t}{N_t} \times \Delta \frac{1-u_t}{1-U_t}$  is the change attributable to differential employment rates across groups in the sample; and

$2 \times \Delta \frac{n_t}{N_t} \times \Delta \frac{1-u_t}{1-U_t}$  is the interaction term.

## REFERENCES

- Becker, G. (1975), *Human Capital*, New York: Basic Books.
- Berman, E., Bound, J. and Griliches, Z. (1994), 'Changes in the relative demand for skilled labour within US manufacturing industries: evidence from the Annual Survey of Manufacturing', *Quarterly Journal of Economics*, vol. 109, pp. 367–98.
- Bound, J. and Johnson, G. (1992), 'Changes in the structure of wages in the 1980s: an evaluation of alternative explanations', *American Economic Review*, vol. 82, pp. 371–92.
- Bushinsky, M. (1994), 'Changes in the US wage structure 1963–87: applications of quantile regressions', *Econometrica*, vol. 62, pp. 405–58.
- Card, D. (1991), 'The effect of unions on the distribution of wages: redistribution or relabelling', Princeton University, Industrial Relations Section, Discussion Paper no. 287.
- Chennells, L. and Van Reenen, J. (1994), 'The rising price of skill: investigating British skill premia in the 1980s using complementary data sets', Institute for Fiscal Studies, mimeo.
- Clegg, H. (1979), *The Changing System of Industrial Relations in Britain*, Oxford: Basil Blackwell.
- Disney, R., Gosling, A. and Machin, S. (1995), 'British unions in decline: an examination of the 1980s fall in trade union recognition', *Industrial and Labor Relations Review*, forthcoming.
- Finegold, D. and Soskice, D. (1988), 'The failure of training in Britain: analysis and prescription', *Oxford Review of Economic Policy*, vol. 4, pp. 21–53.
- Freeman, R. (1980), 'Unionism and the dispersion of wages', *Industrial and Labor Relations Review*, vol. 34, pp. 3–24.
- (1982), 'Union wage practices and wage dispersion within establishments', *Industrial and Labor Relations Review*, vol. 36, pp. 3–21.
- (1993), 'How much has de-unionization contributed to the rise in male earnings inequality?', in S. Danziger and P. Gottchalk (eds), *Uneven Tides: Rising Inequality in America*, New York: Russell Sage Foundation.
- and Katz, L. (1994), 'Rising wage inequality: United States vs. other advanced countries', in R. Freeman (ed.), *Working under Different Rules*, New York: Russell Sage Foundation.
- Gardiner, K. (1994), 'A survey of income inequality over the last twenty years: how does the UK compare?', London School of Economics, STICERD, Welfare State Programme Discussion Paper no. WSP/100.
- Goodman, A. and Webb, S. (1994a), *For Richer, for Poorer: The Changing Distribution of Income in the United Kingdom, 1961–91*, Commentary no. 42, London: Institute for Fiscal Studies.
- and — (1994b), 'For richer, for poorer: the changing distribution of income in the UK, 1961–91', *Fiscal Studies*, vol. 15, no. 4, pp. 29–62 (this issue).
- Gosling, A. and Machin, S. (1995), 'Trade unions and the dispersion of earnings in British establishments, 1980–90', *Oxford Bulletin of Economics and Statistics*, forthcoming.
- , — and Meghir, C. (1994a), *What Has Happened to Wages?*, Commentary no. 43, London: Institute for Fiscal Studies.



- , — and — (1994b), 'The changing distribution of male wages in the UK 1966 to 1992', Institute for Fiscal Studies, mimeo.
- Gregg, P. and Machin, S. (1994), 'Is the UK rise in inequality different?', in R. Barrell (ed.), *The UK Labour Market*, Cambridge: Cambridge University Press.
- and Wadsworth, J. (1995), 'More work in fewer households', National Institute of Economic and Social Research, mimeo. Forthcoming in the Joseph Rowntree Commission book on the distribution of income and wealth.
- Juhn, C., Murphy, K. and Pierce, B. (1993), 'Wage inequality and the rise in returns to skill', *Journal of Political Economy*, vol. 108, pp. 410–42.
- Levy, F. and Murnane, R. (1992), 'US earnings levels and earnings inequality: a review of recent trends and proposed explanations', *Journal of Economic Literature*, vol. 30, pp. 1333–81.
- Machin, S. (1994), 'Changes in the relative demand for skills in the UK labour market', in A. Booth and D. Snower (eds), *Acquiring Skill: Market Failures, their Symptom and Policy Responses*, Cambridge: Cambridge University Press, forthcoming.
- and Manning, A. (1994), 'Minimum wages, wage dispersion and employment: evidence from the U.K. Wages Councils', *Industrial and Labor Relations Review*, vol. 47, pp. 319–29.
- and Waldfogel, J. (1994), 'The decline of the male breadwinner', London School of Economics, STICERD, Discussion Paper no. 103.
- Millward, N., Stevens, M., Smart, D. and Hawes, W. R. (1992), *Workplace Industrial Relations in Transition*, Aldershot: Dartmouth Publishing.
- Mincer, J. (1974), *Schooling, Experience and Earnings*, New York: Columbia University Press.
- Murphy, K. and Welch, F. (1992), 'The structure of wages', *Quarterly Journal of Economics*, vol. 107, pp. 285–326.
- Robbins Report (1963), *Higher Education*, report of a committee chaired by Lord Robbins, Cmnd 2154, London: HMSO.
- Schmitt, J. (1994), 'The changing structure of male earnings in Britain, 1974–88', in R. Freeman and L. Katz (eds), *Differences and Changes in Wage Structures*, Chicago: University of Chicago Press, forthcoming.
- Van Reenen, J. (1993), 'Getting a fair share of the plunder? Technological change and the wage structure', Institute for Fiscal Studies, Working Paper no. 93/3.
- Waddington, J. (1992), 'Trade union membership in Britain 1980–87: unemployment and restructuring', *British Journal of Industrial Relations*, vol. 30, pp. 282–324.