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**Research Report**

## The dynamics of low pay and unemployment in early 1990s Britain

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**The Dynamics of Low Pay and  
Unemployment  
in Early 1990s Britain**

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## **Preface**

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## **Executive Summary**

This report uses the first four waves of the British Household Panel Survey to look at the dynamics of earnings and earnings mobility, particularly among the low-paid. It asks such questions as ‘are the low-paid stuck at the bottom of the earnings distribution or do they move up?’, ‘for how long do people stay low-paid?’ and ‘what is the relationship between pay and employment?’. For while we know that earnings inequality has widened remarkably over the past 20 years, we know rather little about the dynamics of the earnings distribution. This report tries to fill some of that gap in our knowledge.

### **Pay and Employment**

Only about two-thirds of men (aged between 18 and 60 and not in full-time education) remained in continuous employment over the whole period from 1991 to 1994, while fewer than 9 per cent were out of work all the time. The rest spent some of the time in work and some of the time in unemployment.

Importantly, we also find that lower relative wages of individuals are associated with a higher probability that they will move out of work in the future. Among men, 30 per cent of those starting in the bottom quarter of the wage distribution spent some time out of work in the next two-and-a-half years (Table 1). This was true of just 12 per cent of those starting in the top quarter of the distribution. Similarly, looking at transitions into work, 56 per cent of the men moving out of unemployment moved into a job with wages in the bottom quartile of the distribution.

TABLE 1  
**Probability of moving out of work within 30 months,  
 by position in the wage distribution**

<i>Quartile</i>	<i>Per cent</i>
	<i>Percentage leaving work</i>
<i>Men</i>	
Bottom	30
2nd	19
3rd	15
Top	12
<i>Women</i>	
Bottom	33
2nd	25
3rd	15
Top	17

The clear, and not surprising, message is that movements into and out of work are overwhelmingly experienced by those on, or who can obtain, only rather low wages.

### **Employment Changes and Wage Changes**

We are not just seeing ‘churning’ between low pay and unemployment during the 1990s. It is also the case that movements into and out of work are associated with substantial wage changes. Table 2 shows that, of those men who moved out of work and then back in again,

TABLE 2  
**Percentage change in wages for men according to whether any time  
 was spent out of work between Waves 1 and 4**

<i>Percentage change in wage</i>	<i>Per cent</i>	
	<i>Percentage of those not spending time out of work</i>	<i>Percentage of those who do spend time out of work</i>
Down more than 20%	9.5	33.7
Down 10–20%	8.8	10.1
Between 10% down and 10% up	37.0	20.4
Up 10–20%	16.4	5.9
Up more than 20%	28.3	29.9

over 40 per cent experienced a significant reduction in wages, compared with fewer than 20 per cent of those who continued in work. On the other hand, three in ten of them experienced wage increases of 20 per cent or more.

### **Mobility and the Minimum Wage**

One important issue associated with wage mobility is how it alters the number of people who would be affected by a minimum wage. We know how many people would be affected by a minimum wage at any point in time, but the numbers affected over a longer period will depend on how many people move onto and off low pay.

Suppose we take half male median earnings as a possible level for a minimum wage. On this basis, something like 7 per cent of employed men and 28 per cent of employed women would be paid the minimum wage at any point in time. But over the period between 1991 and 1994, 12.5 per cent of men and 42 per cent of women, who were in work at some point, would have been affected at one time or another. The numbers vary according to the exact level at which a minimum is placed but the pattern is clear. Substantially more people are affected over just a three-year period than are affected at any one time, as a direct consequence of the degree of wage and employment mobility.

Churning between low pay and unemployment means that a minimum wage will appear to be more redistributive in terms of income measured over a few years than in terms of income measured at one point in time. Those currently unemployed might benefit from a minimum-wage job at some time in the future. This, of course, is provided a minimum wage is set at such a



## *Dynamics of low pay and unemployment*

level that it does not affect the probability of the unemployed getting a job in the future.

### **Persistence of Low Pay**

Relatively few people make it out of the bottom reaches of the earnings distribution into the top half. Of men who were in the bottom quarter of the earnings distribution in 1991, half were still there in 1994 and a further 13 per cent were out of work altogether. Just 6 per cent had made it into the top half of the earnings distribution. Among women, there was slightly more mobility into the top half of the distribution and much more movement out of work. The figures for men and women who started in the bottom two quartiles of the wage distribution are summarised in Table 3.

### **Continuing Effects of Low Pay and Unemployment**

Of those men who were low-paid in 1991, defined as earning less than £5 an hour, using usual statistical techniques we would predict that about 31 per cent would be low-paid in 1992. But if we take into account the fact that they were low-paid in 1991 in predicting their status in 1992, we find we would predict that 68 per cent of them would be low-paid in 1992.

TABLE 3  
Position of low-paid in 1994, by quartile in 1991

<i>Quartile, Wave 1</i>	<i>Position in Wave 4</i>					<i>All</i>
	<i>Bottom quartile</i>	<i>Second quartile</i>	<i>Top half</i>	<i>Self- employed</i>	<i>Out of work</i>	
<i>Men</i>						
Bottom	52	23	6	6	13	100
Second	14	44	27	5	10	100
<i>Women</i>						
Bottom	44	22	10	2	22	100
Second	20	45	22	1	11	100

This means that, for men, about half the persistence in low pay is explained by the fact that certain sorts of people — poorly educated and young — tend to be low-paid. But half of the persistence seems to be down to other things. Perhaps being in low-paid jobs itself traps people in low pay. Or possibly there are other characteristics that we cannot measure that trap people in low pay. In either case, this is an important finding. People who we observe on low wages at one point in time are likely to remain on them in the future.

The most important determinant of movement out of low pay seems to be job tenure. Low-paid men who have been in their current job for between five and 10 years are over 80 per cent more likely to move out of low pay than are those who have only been in their current job for less than two years.

### **Lifetime Wage Growth and Job Tenure**

The effects of length of job tenure are exemplified in Table 4, which is based on statistical simulations to look at the effects of work experience and job tenure on pay. In the table, low pay is defined as a wage level below half the median for men and women combined. Low pay is quite prevalent across the working population in the sense that a substantial proportion of workers will be in low pay at the start of their working lives. However, some groups of workers also face an unusually high probability of being in low pay over their entire working lives, particularly low-qualified women.

Qualification level is important for determining both the prevalence and continued likelihood of low pay. For example, the simulations suggest that over 40 per cent of men with no qualifications will be in low pay at the start of their working lives, while only just over 3 per cent of college-educated men will be low-paid.

*Dynamics of low pay and unemployment*

TABLE 4  
**Percentage of those in employment in low pay,  
 by sex, qualification and experience**

Group	Entering labour market for first time	Ten years of labour market experience			
		Direct job changes		Out of work between jobs	
		<i>Move at 5 years of tenure</i>	<i>Move at 10 years of tenure</i>	<i>Move at 5 years of tenure</i>	<i>Move at 10 years of tenure</i>
<i>Men</i>					
No qualifications	41.1	3.8	3.8	6.8	10.0
Only school qualifications	33.3	4.0	4.2	7.4	6.7
Other further qualifications	15.8	1.6	1.6	3.0	3.4
College qualifications	3.4	1.0	1.0	1.7	1.7
<i>Women</i>					
No qualifications	35.2	13.5	18.7	21.0	21.0
Only school qualifications	35.0	6.4	8.2	17.5	13.0
Other further qualifications	20.6	3.4	9.8	7.2	13.2
College qualifications	7.6	0.7	1.3	3.3	4.3

Men are slightly more likely than women to experience low pay upon entering the labour market for the first time, but are far less likely to have wages below half the median as experience increases. Men are also less likely to experience low pay when moving jobs. For example, while the simulations show that only 3.8 per cent of unqualified men will be in low pay following a job-to-job move at 10 years of labour market experience, the corresponding figure for women is 18.7 per cent. This indicates much lower returns to general employment experience for women than for men, which may be due to differences in skill growth with general employment experience or to women having more-limited possibilities for finding 'better' jobs. It may also

reflect the deterioration of general employment skills for women who spend time out of employment.

In addition, the differences in the proportions in low pay between the columns in Table 4 showing five and zero years of tenure highlight the greater importance of accumulating job tenure for women. This may reflect differences in the acquisition of job-specific skills or in the types of job contracts offered to men and women.

Finally, the simulations show that the proportions in low pay are consistently higher for those who were out of work between jobs than for those who moved directly from job to job. This was found to be true both for job starting wages (shown in the zero tenure numbers) and throughout the life of the job (illustrated in the five years of tenure numbers). This suggests a detrimental effect on wages of time out of employment and highlights the importance of finding a 'good' job for the unemployed.

## **CHAPTER 1**

### **Introduction**

The increase in the wage gap between those who earn the most and those who earn the least, and the changing allocation of jobs across families and households, have been the primary causes of the increase in the gap between rich and poor. A large body of research, describing and explaining these changes in some detail, exists but there are still crucial issues that remain to be addressed, mainly because of lack of suitable data. This report uses the British Household Panel Survey (BHPS) from 1991 to 1994 to see whether differences in labour market outcomes across individuals are permanent or temporary. Is a low-paid job a stepping-stone to more-highly-paid employment, or do people tend to remain low-paid for long periods of time? How different is experiencing low pay at the start of a career from being low-paid in one's thirties or forties? What is the relationship between low pay and unemployment — if a person is low-paid in one period, how likely are they to be unemployed in the next, and vice versa?

The distribution of wages (whether defined as weekly earnings or hourly wages) became compressed during the mid-1970s, since when it has risen dramatically (see Gosling, Machin and Meghir (1994), Schmitt (1995) and Machin (1996)). Of particular concern is the finding that the 10th percentile of male hourly wages did not rise in real terms. For women, the situation is slightly different, with the gap between female and male wages declining fast over the 1980s, particularly at the bottom of the wage distribution. All this information has been based on snapshots, and on long series of snapshots, of

the distribution. This means that we still know relatively little about individual-level dynamics — how the earnings of the individuals who make up this distribution have fared over time.

Some idea of how much wage differentials are reflections of temporary or permanent differences can be gleaned by comparing the experiences of different groups. Schmitt (1995) shows that a significant proportion of the increase in dispersion can be explained by changes in the premiums that more-highly-educated workers can command. For example, the returns to having a university degree relative to having no formal qualifications rose from 79 per cent to 90 per cent in real terms between 1974 and 1988. As people's educational status is unlikely to change significantly after entry into the labour market, we can see that at least some of the gap between high and low earners is permanent.

Schmitt (1995), however, finds large and growing differences in wages amongst workers with the same education, age and skill level. Gosling et al. (1994) decompose this evolution of the wage structure further and show that the rise in 'within-group' inequality is most dramatic amongst those workers with low levels of skill. These workers have experienced relative wage falls on *average*, but some appear to be doing a lot worse than others at any given point in time. As these results were found from datasets that compare different people over time, it is impossible to tell whether those at the bottom are always there or whether the rise in inequality amongst this group reflects greater risk or uncertainty in the labour market.

There are two reasons why understanding the dynamics of differences in wages across individuals is important. First, we may be less worried about those receiving lower wages if we know that spells on low pay

are short. Second, knowing whether wage differentials are temporary or permanent can tell us something about the underlying reasons for their existence. The UK now has its first annual panel survey which samples from all individuals, the British Household Panel Survey.<sup>1</sup> We cannot use these data to decompose the rise in inequality over the 1980s, as the first wave was in 1991. Nevertheless, we believe that looking at the nature of differences in labour market outcomes in the 1990s will allow a greater understanding of recent trends.

### **1.1. Existing Research on Earnings Mobility for the UK**

Much of the existing research is based upon the New Earnings Survey (NES). This is based on a 1 per cent sample of workers covered by the National Insurance system, identified by their National Insurance number. Information on the pay of these workers is provided each year by returns made by employers. This has provided most of the evidence to date on earnings mobility in the UK. But because it is based on returns provided by employers and contains little information on the characteristics of the individual, it is not terribly helpful for *explaining* the dynamics of wages. It also fails to follow people who move out of employment and undersamples those on low wages.<sup>2</sup>

Even so, the NES does provide good estimates on earnings mobility for the bulk of the working population. A number of studies in the 1970s focused on mobility within the earnings distribution. A Department of Employment study in 1973 looked, in particular, at

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<sup>1</sup>The New Earnings Survey, which has existed since the early 1970s, only covers workers paying National Insurance contributions.

<sup>2</sup>For a full discussion of the sampling frame and likely biases in the NES, see Dickens (1997).

movements into and out of low pay over the period 1970–72. It found that only 4.6 per cent of its sample remained in the bottom 10th of the wage distribution over the three-year period.

More recently, Dickens (1997) used the NES to look at the changes in the relative importance of permanent versus transitory earnings between 1975 and 1994. He estimates that there has been an increase in the dispersion of both the permanent and transitory elements of earnings, with each contributing about half of the increase in overall earnings inequality. Even here, there have been some worries expressed about the reliability of the data; much of the observed change appears to take place in just one or two years in the early 1980s. Other work includes that by Gregory and Elias (1994) who find that there is considerable mobility out of the bottom of the wage distribution, especially by younger workers.

The Department of Social Security (DSS) has recently attempted to overcome some of the drawbacks of the NES, by creating a new longitudinal dataset. This panel, the Lifetime Labour Market Database (LLMDB), has been constructed from administrative data held on the National Insurance Records System. These records provide some — though far from comprehensive — information on time spent out of employment. Again, the information on personal characteristics is very limited. These data have been used by Nichols, Ball and Marland (1997) to obtain some preliminary results on male earnings mobility between 1978–79 and 1992–93. The authors found a large degree of wage growth for the younger members of the sample over the period.

There have been two studies that have used the BHPS to look at movements into and out of low pay. First, Sloane and Theodossiou (1996) estimate transition probabilities between the three states of unemployment,



low pay and high pay between 1991 and 1993. The second study is that of Stewart and Swaffield (1996). They find considerable persistence in low pay, especially among those who have already been low-paid for more than one period, though those who drop from high pay into low pay often move back out of low pay again very quickly. They also find clear links between being low-paid in one period and being unemployed in the next. These are links that we confirm and explore further.

## **1.2. Measuring Low Pay**

There is no agreed measure of what constitutes ‘low pay’. Indeed, it is not just the level that needs to be defined but the period of measurement as well — should we be looking at hourly, weekly, monthly or annual earnings? In general, however, the data we have will limit our choices. The LLMDB, for example, only contains a figure for total annual earnings. Many studies of mobility focus on earnings, as opposed to hourly wages, and how these vary across time. However, changes in earnings can occur from movements both in the level of wages and in the number of hours worked. This can be particularly important for women, for whom there is a large variation in the number of hours worked.

On the other hand, hourly wage rates may be difficult to measure. People may work at a number of different pay rates — a basic rate of pay and a premium rate paid for overtime, for example. For others, pay may come in the form of a salary which is not related to the number of hours worked in a day. Typically, data will not provide enough information to divide between these different forms of pay. Additionally, even if they did, to make comparisons across individuals, we would still need some uniform measure.

For this report, we concentrate on hourly earnings — that is, the respondent's declared earnings over a certain period divided by the number of weeks in that period and the number of hours usually worked per week, including overtime. We do this precisely to avoid measuring changes in hours as changes in earnings.

Once we have decided the metric in which we are going to measure pay, we have to decide how we are going to define low pay. This question is similar to that of defining poverty — there is little disagreement that such a state exists, but equally there is little consensus about where its boundaries lie. In general, we resort to some form of threshold, which can be either absolute or relative, to mark the cut-off between low and high pay. The literature has concentrated on relative thresholds, but under a huge variety of different definitions. For example, even using the definition of half median earnings can produce a figure for our cut-off of almost anything between £3.02 and £4.41, depending on which data source is used and which other assumptions are being made.<sup>3</sup>

The use of a low-pay threshold also introduces the problem of 'wobble' around the threshold. If the threshold cuts through a dense part of the income distribution, there will be a large number of people just below and above it. A proportion of these people will move across the threshold between periods as a result of relatively small movements in their wage level. Such groups may have a significant effect on the results for the persistence of low pay.

In fact, we use a number of different cut-offs, depending on what seems most appropriate for the task at hand. The tenor of the results is actually remarkably robust to the exact cut-off chosen. Within a reasonably

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<sup>3</sup>See Gosling (1996).

wide range, one tends to observe similar proportions and types of people moving into and out of 'low pay'.

### **1.3. Outline of the Rest of the Report**

There are three major parts to what follows. Chapter 2 is largely descriptive of the data. It describes the BHPS data, looks at mobility between employment and low-pay states, and considers movements into and out of low pay. Importantly, it also considers the effect of wage mobility on the effectiveness of minimum wage policies. Chapter 3 looks in particular at the issue of persistence, both in low pay and in unemployment. Finally, we take the issue of the effect of job tenure and experience on wages and explore that in detail in Chapter 4.

## **CHAPTER 2**

### **Low-Pay Dynamics**

#### **2.1. Introduction**

The work that follows is based on the British Household Panel Survey (BHPS). This is an individual-level survey, the first wave of which interviewed the members of just over 5,000 households in 1991. The panel aims to reinterview these people once a year, giving a complete record of the events occurring in their lives over the period. Data used in this report cover the period 1991–94, a total of four interviews. Additionally, the BHPS asks questions about people's experiences before the panel started. In particular, we have a record of the amount of time people spent in work since leaving full-time education.

The BHPS therefore gives us a rich source of data with which to analyse mobility into and out of low pay. We can observe not only the levels and changes in wages, hours of work and labour market activity, but also many other personal characteristics, such as family situation, health, education, sources of other income and how these characteristics have changed over time. This chapter aims to give a descriptive overview of the dynamics of low pay using the data contained in the BHPS.

We start by providing some overall descriptions of the distributions of wages and employment status in the survey. We then look at the occurrence of low pay and the type of characteristics that are associated with people being low-paid. While we are more interested in

the dynamics of low pay, Section 2.2 helps to place the results in the rest of the report in context.

Section 2.3 focuses on the first of our dynamic questions — how are periods of low pay and movements into and out of work related? It looks at the movements between employment states of the population as a whole, and then compares the degree to which the lower-paid are more likely to move out of work and how those out of work are likely to enter low pay if they move into work.

We then examine, in Section 2.4, the movements of people within the wage distribution. We look at the degree to which wages change across points in time and also examine the extent to which periods out of work affect a person's wage growth. We show the structure of the dynamic processes of unemployment and wages contained in the data and look at the characteristics that are associated with movements between states. We also examine the effect of wage mobility on the impact of a minimum-wage policy.

## **2.2. Snapshots of Employment, Wages and Low Pay**

In this section, we set the background for the rest of the report. We begin, in Section 2.2.1, with a quick description of the sample that we are using from the BHPS. We then look, in Section 2.2.2, at the cross-sectional distribution of employment status and wages at each wave of the BHPS. Section 2.2.3 defines the measures of low pay that will be used during the rest of the report and Section 2.2.4 looks at the types of people we find in low pay when we take a snapshot of the population.

**2.2.1. The BHPS sample**

The sample used in this report is drawn from the first four waves of the BHPS. The first set of interviews were conducted in the autumn of 1991; the fourth set were carried out in 1994. The total number of people interviewed in the first wave of the BHPS is 10,264. For our purposes, we take our basic sample to be those in the BHPS who respond at all four waves and are aged 18 or over at the start of the first wave and 60 or under at the start of the last wave. A small number of observations are also rejected as they do not have complete information on employment status, wages or date of interview. The final sample contains 2,217 men and 2,669 women. These totals are shown in Table 2.1.

The BHPS also asks retrospective questions about work histories between waves. This information allows us to look at movements in employment status that occur between the interviews, such as short periods of unemployment. We have had to make some adjustments to these data, since such retrospective questions are more likely to be prone to measurement error and people's answers are often contradictory. In constructing a history of people's employment status, we have used the answers given at the closest time after the period in question.

In all cases, results are reported using the BHPS longitudinal respondent weights. These attempt to

TABLE 2.1  
Selection of BHPS sample

	<i>Men</i>	<i>Women</i>	<i>Total</i>
All people in first wave	4,833	5,431	10,264
Interview at all four waves	3,397	4,128	7,525
Within age-group	2,313	2,785	5,098
With valid codings	2,217	2,669	4,886

compensate for the fact that the people who are interviewed at all four waves of the panel might be systematically different from those who did not respond at one or more of the waves. Also, all monetary amounts are in 1996 prices, so all changes are in real terms. In this descriptive section, wage values that have been imputed by the BHPS will be used. In the later econometric analysis, these values are not used.

**2.2.2. *The distribution of employment and wages***

Table 2.2 shows the employment status reported at the date of interview in each wave. This effectively treats the BHPS as four separate cross-sections, though of course the same people are in each wave. Additionally, for this comparison, we retain all people interviewed in each wave, not just those interviewed in all four waves. The patterns of employment status remain fairly constant across the sample period, for both men and women. Between 67 and 70 per cent of men are employees, 14–15 per cent are self-employed and 7–8 per cent unemployed. The remaining 7–10 per cent of the sample are out of work but not unemployed.

TABLE 2.2  
Employment status from BHPS cross-sections

	<i>Wave 1</i>	<i>Wave 2</i>	<i>Wave 3</i>	<i>Wave 4</i>
<i>Men</i>				
Employee	69.8	67.9	67.1	67.0
Self-employed	14.5	15.2	15.6	15.5
Unemployed	7.9	8.8	8.4	7.5
Family care	0.5	0.3	0.6	0.5
Other	7.1	7.9	8.3	9.4
<i>Women</i>				
Employee	64.4	62.6	63.4	63.6
Self-employed	5.3	4.8	5.1	5.3
Unemployed	3.5	3.6	3.2	3.3
Family care	21.0	22.3	20.3	19.6
Other	5.8	6.7	8.0	8.2

TABLE 2.3  
**Percentile points of the BHPS hourly wage distribution**

*Pounds per hour, 1996 prices*

<i>Percentile</i>	<i>Wave 1</i>	<i>Wave 2</i>	<i>Wave 3</i>	<i>Wave 4</i>
<i>Men</i>				
10th	3.94	4.17	4.00	4.06
25th	5.01	5.15	5.19	5.23
Median	6.97	7.23	7.28	7.27
75th	10.04	10.30	10.39	10.48
90th	14.03	14.18	14.48	15.13
<i>Women</i>				
10th	2.89	3.05	2.98	3.13
25th	3.62	3.81	3.74	3.83
Median	4.92	5.16	5.17	5.31
75th	6.80	7.07	7.23	7.34
90th	9.94	10.43	10.66	10.71

Women are less likely than men to be in work, both as employees and, in particular, as self-employed. Of those not in work, the noticeable difference for women is that the majority are engaged in caring for other family members. This group makes up about 20 per cent of the women at each interview.

Table 2.3 shows how wages are distributed for those in employment in the BHPS in each wave. The table shows various percentile points<sup>4</sup> of the distribution. As in all the results quoted in this report, wages have been uprated to 1996 prices, so the differences between waves are in real terms.

The median of the male wage distribution rises during the period, from £6.97 to £7.27, with the 25th percentile moving from £5.01 to £5.23. The 10th percentile point for men is about £4 an hour. One point to notice is the level of the 10th percentile in the second

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<sup>4</sup>By definition. *X* per cent of those working have a wage that is below the *X*th percentile. The median is another name for the 50th percentile. Thus, from Table 2.3, the median male wage in Wave 1 is £6.97, which means that 50 per cent of men in employment in Wave 1 had a wage below £6.97.



wave. This is out of line with the pattern presented in the rest of the table, being above the levels in both the third and fourth waves.<sup>5</sup>

Women's wages are markedly lower than those of men. Nearly half of women earn under £5 an hour as compared with about a quarter of men. In each period, about one-tenth of women are earning £3 an hour or below, which is around three-quarters of the male 10th percentile point. Again, the wages in the lower part of the wage distribution in Wave 2 seem to be out of line with the rest of the distribution.

### **2.2.3. Definitions of low pay**

We generally define low pay in relative terms; in other words, we consider someone to be low-paid if they have wages below a certain quantile of the distribution. Frequently, we report results by quartiles of the distribution, allowing comparisons to be made between the lowest-paid quarter of the population and the rest. The cut-off points for these quartiles — the 25th, 50th and 75th percentiles — are the wage levels shown in Table 2.3.

We also use three other cut-offs to divide those in work between the high-paid and the low-paid. All of these definitions are relative to the distribution of wages observed in our sample. Note that the terms 'low pay' and 'high pay' should not be taken to entail any implications about what should be considered 'adequate' or 'reasonable' wages. When we use the term 'low pay', we are referring to wages that fall below some cut-off. Similarly, 'high pay' simply refers to wages above this cut-off.

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<sup>5</sup>Comparisons with the Family Expenditure Survey (FES) reveal that this might be a peculiar feature of the BHPS in this year as the high level of the 10th percentile in Wave 2 is not reflected in the FES.

The first two cut-offs we use are the 10th and 20th percentiles of the wage distribution, differentiated by sex. This means that, in each wave, we are defining respectively 10 per cent and 20 per cent of our sample of employees to be in low pay. Note that this does not necessarily imply that, if a person moves from low pay to high pay in the next year, someone else must necessarily move from high pay to low pay. This is because the sample on which the definitions are based is those in employment at each wave. This sample will not be the same across waves, as people move into and out of employment.

As the cut-offs for these definitions are defined according to the wage distribution for each sex, under both definitions, the proportions of male and female employees who are low-paid will be the same. Results using these definitions will be presented separately for each sex, allowing us to see patterns that differ between male and female experiences of low pay.

Our third definition of low pay is those below half median full-time hourly earnings. As this cut-off is the same for both men and women, the low-paid sample produced will consist mainly of women. Additionally, the proportion of employees who are low-paid will not be fixed under this definition. If the bottom of the wage distribution becomes more compressed, a lower proportion of people will be defined as low-paid.

Table 2.4 shows the low-pay cut-offs used under each of our definitions in each of the waves. It also shows, in parentheses, the proportion of the sample that are counted as low-paid under the 'below half median' definition. Over the period, this proportion rises from 8.9 per cent to 10.0 per cent. However, in Wave 2, the compression of the lower part of the distribution means that a lower proportion (7.6 per cent) count as low-paid.

TABLE 2.4  
**Low-pay cut-offs**

	<i>Pounds per hour, 1996 prices</i>			
	<i>Wave 1</i>	<i>Wave 2</i>	<i>Wave 3</i>	<i>Wave 4</i>
<i>Bottom decile</i>				
Male	3.89	4.12	3.98	4.02
Female	2.87	3.01	2.95	3.08
<i>Bottom quintile</i>				
Male	4.65	4.75	4.77	4.78
Female	3.40	3.56	3.50	3.52
<i>Below half median</i>				
Both sexes	3.11	3.21	3.25	3.35
Proportion low-paid	(8.9%)	(7.6%)	(9.2%)	(10.0%)

### **2.2.4. Characteristics of the low-paid**

How do those who are high-paid differ from those who are low-paid? We can construct a large cross-sectional snapshot from our panel data by pooling the observations at each wave. Thus, in this section, each person at each wave is treated as a separate observation; so if a person is 20 in the first wave, that person will count as an observation at 20 in the first wave, 21 in the second and so on.

Table 2.5 compares the characteristics of the low-paid with those of the high-paid at each wave. It reports the degree of over-representation of people with the listed characteristics among the low-paid compared with those in employment. The degree of over-representation is defined as the ratio between the proportion who are in low pay and the proportion who are employees. Thus the table shows that the proportion of low-paid, as defined as being in the bottom quintile, men who are under 25 is 2.46 times the proportion of men in employment who are under 25.

As is clear from Table 2.5, those with higher levels of education are under-represented among the low-paid.

TABLE 2.5  
**Characteristics of the low-paid relative to all employees**

Characteristics	Bottom decile		Bottom quintile		Below half median
	Men	Women	Men	Women	
<i>Female</i>	—	—	—	—	1.58
<i>Age</i>					
Under 25	2.78	1.40	2.46	1.22	1.70
25–34	0.93	0.79	0.94	0.83	0.81
35–44	0.61	1.00	0.66	0.99	0.91
45–55	0.57	0.93	0.70	1.06	0.93
Over 55	0.89	1.37	0.87	1.15	1.07
<i>Education</i>					
No qualifications	1.61	1.81	1.70	1.79	1.82
O level or equivalent	1.24	0.91	1.18	0.98	1.05
A level or equivalent	0.50	0.72	0.56	0.58	0.56
Degree	0.34	0.30	0.31	0.28	0.32
<i>Years of job tenure</i>					
Under 2	1.97	1.49	1.70	1.43	1.68
2–5	1.04	0.88	1.05	0.88	0.94
5–10	0.64	0.68	0.78	0.73	0.67
Over 10	0.36	0.59	0.49	0.66	0.47
<i>Years of experience</i>					
Under 2	3.23	2.05	2.35	1.78	2.37
2–5	2.05	1.24	1.85	1.10	1.39
5–10	1.07	1.05	1.14	1.06	1.09
Over 10	0.72	0.89	0.78	0.93	0.85
<i>Region</i>					
London	0.44	0.43	0.47	0.54	0.52
Rest of South	0.88	1.07	0.92	1.01	0.96
North	1.17	1.12	1.16	1.16	1.13
Wales	1.58	1.23	1.31	1.05	1.39
Scotland	1.09	0.83	1.12	0.82	0.96
<i>Size of workplace</i>					
Under 25 employees	1.90	1.72	1.65	1.59	1.95
25–100 employees	1.02	0.73	1.04	0.78	0.76
Over 100 employees	0.49	0.43	0.62	0.53	0.42
<i>Type of contract</i>					
Permanent	0.93	0.98	0.96	0.98	0.96
Seasonal	3.66	1.54	2.60	1.78	2.23
Temporary	1.39	0.80	1.23	0.54	0.79
Full-time	0.93	0.65	0.96	0.63	0.62
<i>Occupation</i>					
Professional	0.34	0.49	0.32	0.34	0.33
Non-manual	0.96	0.80	0.89	0.86	1.07
Manual	1.43	1.98	1.47	1.91	1.32
<i>Family type</i>					
Single, no kids	1.82	0.98	1.68	0.94	1.13
Single, kids	1.94	1.93	0.97	1.68	2.85
1-earner couple, no kids	1.02	0.84	0.94	0.99	0.80
1-earner couple, kids	1.15	2.22	0.97	1.83	0.95
2-earner couple, no kids	0.61	0.75	0.80	0.77	0.74
2-earner couple, kids	0.58	1.07	0.62	1.13	1.05

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The proportion of people with no qualifications who are low-paid under all three definitions is between 60 and 80 per cent higher than the proportion of people of this type among employees.

In addition to qualifications, we would expect higher levels of work experience to reduce the probability of being low-paid, both in terms of work experience during the whole of the person's life and in terms of the person's tenure in their current job. Table 2.5 shows that this is, indeed, the case, with those with lower job tenure and with lower work experience being over-represented among the low-paid.

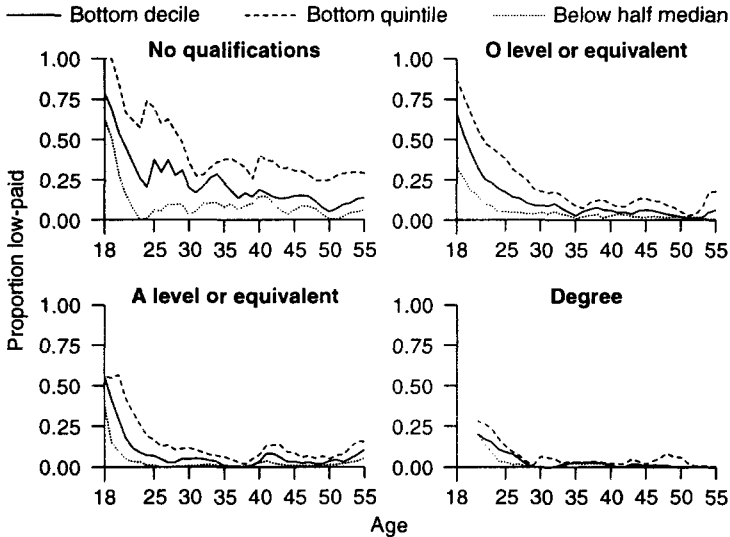
Both work experience and qualifications will be related to the age of the individual. For men, work experience is highly related to age, as men tend to be in work for most of their working lives. For women, the relationship is less direct, as women tend to leave work to raise children. As we see in Table 2.5, for men, the only age-group that is over-represented among the low-paid is the under-25s. For women, the position is less clear-cut, with only the 25- to 34-year-old group being clearly under-represented.

Educational qualifications are also related to age, as older people tend to have fewer qualifications. Some 30 per cent of men aged over 55 in work have no qualifications, compared with 5 per cent of men under 25. This interrelationship means that the raw figures in Table 2.5 tend to understate the relationship between education and low pay.

We can take a closer look at the interaction between sex, age and education. Figure 2.1 shows the percentage of men in our sample who are below the various low-wage cut-offs defined in Section 2.2.3 above. The results for each educational grouping are shown in separate graphs. The x-axis of each graph gives age and the y-axis is the proportion of people in the age-

FIGURE 2.1

**Probability of low pay for men, by age and highest qualification**

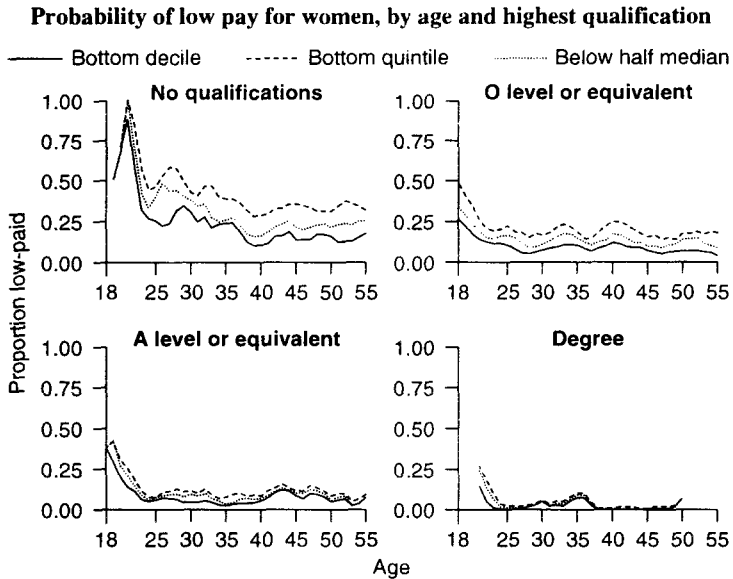


education group who are below the wage threshold. Thus we can see that 85 per cent of 18-year-old men whose highest level of educational attainment was O levels or equivalent had wages that were in the bottom quintile of the male wage distribution.

The general pattern displayed in Figure 2.1 is fairly clear. The probability of low pay in all educational groups is much higher in the age range 18–25. Between the ages of 30 and 50, the probability of low pay remains fairly constant, and after 50 there is some increase, particularly for those in the ‘A level or equivalent’ category.

There is also a clear division between the different educational groupings. As we would expect, the probability of low pay is higher for less-educated groups. For example, at age 40, some 39 per cent of men with no qualifications had wages that were in the bottom

FIGURE 2.2



quintile, compared with only 2 per cent of men with degrees.

Figure 2.2 repeats this analysis for women. Note that the increase and decline shown between the ages of 18 and 22 for the category with no educational qualifications are due to very small sample sizes. Most young women in the sample had obtained at least some formal educational qualification. The results are similar to those for men, although it should be remembered that the wage cut-offs for women are much lower.

Another point for women is that there is some evidence of a rise in the probability of low pay for women aged between 30 and 40, particularly for the more-highly-educated groups. This is likely to be associated with women re-entering the labour market after having children. It will also reflect the large amount of part-time work undertaken by this age-group.

Table 2.5 also shows a series of factors that will be jointly determined with wages. While we would expect the factors considered above to have a direct effect on wages, the factors considered here will be determined by the same types of factors that determine wages. The most obvious of these is occupation, with manual workers being more likely to be over-represented among the low-paid. However, it is not that being a manual worker causes a person to be low-paid; rather, those with lower levels of education and skill are more likely to be manual workers and more likely to be low-paid.

There is also a clear association between the size of the workplace and the incidence of low pay for both sexes. Again, it will not be the case that working in a small workplace necessarily causes low pay; rather, smaller workplaces tend to offer lower wages and these jobs are taken by people with lower potential wages.

Full-time women are largely under-represented in the low-paid category. Again, in general, part-time workers tend to receive lower wages than full-time workers. However, the relationship is less pronounced for men, although this result may be driven by the fact that only a small number of men work part-time.

The final set of factors that we look at are the sorts of families in which those on low pay live. Again, a whole series of factors will be influencing the level of wages and the person's family type. For women and lone parents, in particular, family type is also likely itself to have a strong effect on the level of wages. The proportion of lone parents in low pay is almost twice what we would expect if there were no relationship between low pay and being a lone parent.

Within couples, the effect of having children is related to low pay in different ways depending on sex. Women in couples with children are over-represented among the low-paid, while having children is not really



associated with low pay in the case of men. Rather, it is single men who are highly over-represented among the low-paid, while single women without children are, if anything, under-represented among the low-paid.

### **2.3. Movements into and out of Employment**

So far, we have looked only at the BHPS as a series of snapshots of the population. However, the data yield their richest results when we examine them as a panel. We can then track how individuals are faring over time and get an idea of the dynamic processes occurring in the UK economy. We start by examining the movements into and out of employment and, in particular, the relative risk of unemployment faced by those in low-wage jobs.

Table 2.6 shows the employment status of the sample over the four waves. Just over 70 per cent of the sampled men are working in all four waves; conversely, 30 per cent spend some time not in work over this four-year period, though only 9 per cent are out of work for

TABLE 2.6  
Sample period employment status

	<i>Per cent</i>
	<i>Percentage of sample</i>
<i>Men</i>	
Always working	70.8
Always employee	56.1
Out of work in one wave	9.9
Out of work in two waves	5.5
Out of work in three waves	4.9
Out of work at all waves	8.9
<i>Women</i>	
Always working	54.3
Always employee	49.8
Out of work in one wave	9.1
Out of work in two waves	8.0
Out of work in three waves	8.5
Out of work at all waves	20.0

the whole period. There is clearly a good deal of movement over time, with nearly 10 per cent of the men working in three of the four periods but not in the other. Another 10 per cent or so are working in one or two periods. The distinction between the proportion who are working in all waves and those who are employees in all waves is accounted for by the self-employed. So some 14 per cent of our sample are working at all waves and are self-employed for at least one of those waves.

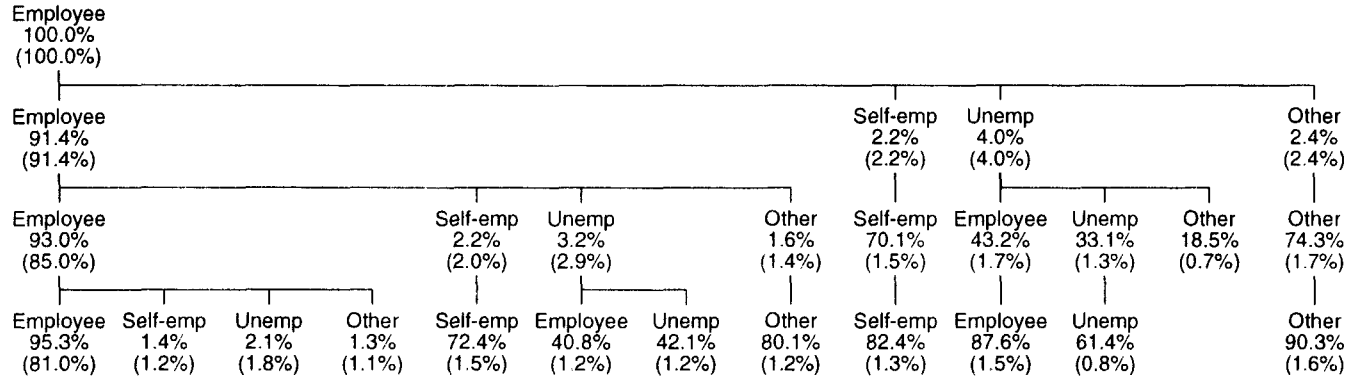
The biggest difference between women and men is that a fifth of women spend no time in work over the four waves. Even so, more than half of women are in work at all four waves, and around 50 per cent are working as an employee in each of the waves, as against 56 per cent of men.

Table 2.6 shows the overall position of those in our sample during the sample period, but does not reveal the dynamics of employment status movements. To see them, we show in 'tree' form how the employment status of those in our sample has changed over the period. The probability shown at each branch of the tree is the conditional probability of that outcome, given the history shown in the tree, and the figure shown in parentheses is the proportion of the total sample at each point on the tree. Tree branches with low numbers of observations have been dropped, both to prevent sample sizes getting too small and to ensure the tree remains at a manageable size.

Figure 2.3 shows how the employment status of men who are employed in Wave 1 varies over the period. At Wave 2, 91.4 per cent of men who reported being in employment at Wave 1 are still in employment, while 4.0 per cent have become unemployed and 2.4 per cent have moved into the 'other' category, having moved out of work but not being classified as unemployed. By

FIGURE 2.3

Men in employment at Wave 1



Number of observations: 1,549

Wave 4, the probability of being in employment conditional on being in employment at the preceding three waves is 95.3 per cent, while the conditional probability of becoming unemployed has fallen to only 2.1 per cent, with 1.3 per cent moving into the 'other' category. This is clear, and not surprising, evidence that the likelihood of becoming unemployed is related to recent labour market experience. Given even three years of continuous employment, the probability of being out of work in the next period is less than 60 per cent of the unconditional probability in the first period.

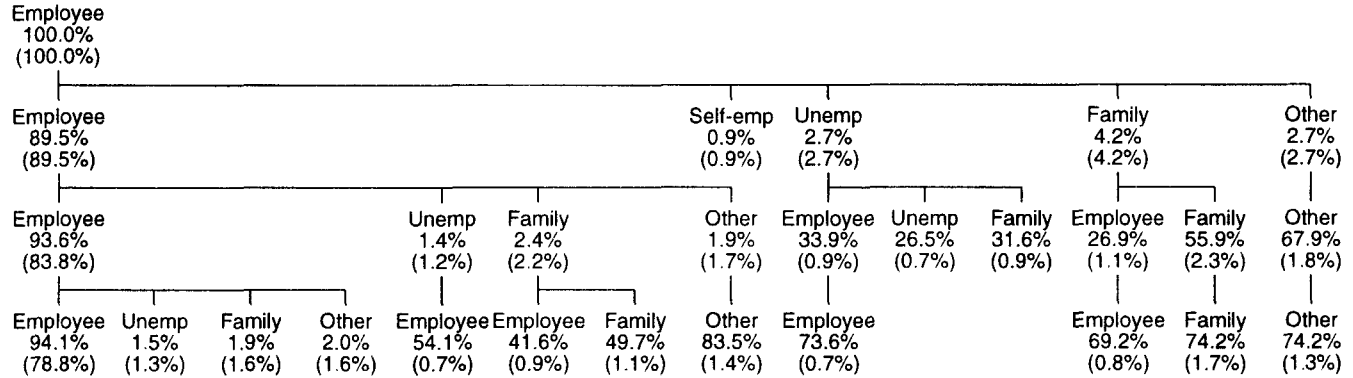
Of the 4.0 per cent of the sample who become unemployed at Wave 2, only 43.2 per cent are employees again at Wave 3, while 33.1 per cent stay unemployed and 18.5 per cent move into the 'other' category. For those who move back into employment, the chances of staying there are high, with 87.6 per cent still in employment at Wave 4.

Figure 2.4 shows the results for women in employment at Wave 1. The conditional probabilities of staying in employment are comparable to those of men. The major distinction for women is that there is much less movement into self-employment and a large movement into family care: 4.2 per cent of the sample move into family care at Wave 2, of whom only one-quarter move back into employment at Wave 3.

Figure 2.5 shows the tree for men who are unemployed in Wave 1. Here, sample sizes become quite small, so care needs to be taken when generalising these results. By Wave 2, about one-quarter of men have moved back into employment. Almost all of these remain in employment in Wave 3. Interestingly, the probability of remaining unemployed in Wave 4 conditional on being unemployed at all previous waves

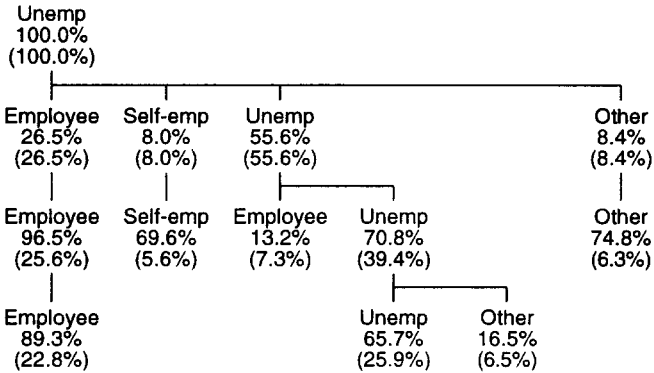
FIGURE 2.4

Women in employment at Wave 1



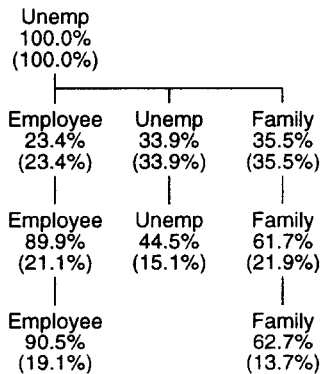
Number of observations: 1,723

FIGURE 2.5  
Unemployed men at Wave 1



Number of observations: 174

FIGURE 2.6  
Unemployed women at Wave 1



Number of observations: 88

is lower than the conditional probability of remaining unemployed at Wave 3.

Looking simply at these results taken at one point in each year ignores what happens to people's employment

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status between waves. We can also use the retrospective questions in the BHPS to pick up many of the changes that are occurring between the interviews and to look at the length of time people spend out of work.

If we consider those who we have reported being in work at all four waves, looking at the inter-wave data shows that 5.6 per cent of these men and 6.0 per cent of these women spend some period out of work between the waves. So, altogether, only two-thirds of men are in work over the whole period and one-third spend at least some time out of work.

Table 2.7 looks at the durations of periods spent out of work for those who were in employment at Wave 1. It shows the proportions of those who moved out of work after Wave 1 by the number of separate spells out of work and also by the duration of the longest period spent out of work. The duration of the spell out of work will only be known if the person has moved back into work by the end of our sample period. Otherwise, the spell will be censored; that is, we know how long it has lasted so far, but not how long it will last into the future. In Table 2.7, we divide the censored spells between

TABLE 2.7

**Number and length of periods out of work for employees in Wave 1**

Number of periods out of work	Length of longest period					Total
	Completed			Censored		
	<i>Less than 6 months</i>	<i>6-12 months (incl.)</i>	<i>More than 12 months</i>	<i>12 months or less</i>	<i>More than 12 months</i>	
<i>Men</i>						
1	28.0	7.1	7.2	11.7	21.0	75.0
More than 1	7.4	3.9	1.4	9.9	2.5	25.0
Total	35.4	11.1	8.5	21.6	23.5	100.0
<i>Women</i>						
1	17.0	10.2	9.1	14.7	29.0	80.0
More than 1	3.8	2.2	2.0	8.3	3.8	20.0
Total	20.8	12.4	11.1	23.0	32.8	100.0

those with censored spells that have lasted 12 months or less and those that have lasted more than 12 months.

The table shows that 28 per cent of men who move out of work after Wave 1 experience only one period out which lasts less than six months, while a third experience one or more spells out of work, either censored or uncensored, which last over 12 months. The persistence of being out of work is higher for women, with less than 20 per cent having a single period out lasting under six months, while nearly 45 per cent have one or more periods which last over 12 months.

### ***Low pay and the probability of unemployment***

We now look at the relationship between periods in low pay and the probability that people will not be in work at one or more of our waves. This is of particular concern for us in examining the experiences of the low-paid. For those who are not working, we do not, by definition, observe a wage. This implies that any of the analysis presented below based on the change in people's wages between periods will exclude those who are out of work in any of the periods. As we shall see, the experience of low pay is closely associated with periods spent out of work. This creates some problems for the development of measures of the persistence of low pay.

The first issue we address is the probability of becoming unemployed, given that one is low-paid. Table 2.8 shows the proportion of people who experience a spell out of work following the first-wave interview. As the table shows, the probability of unemployment is highly related to the position in the wage distribution. Men in the bottom quartile are almost three times as likely to move out of work in the 12 months following the first-wave interview as men in the top quartile.



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TABLE 2.8  
Probability of moving out of work, by wage quartile

<i>Quartile</i>	<i>Never</i>	<i>Per cent</i>				
		<i>Within 6 months</i>	<i>Within 12 months</i>	<i>Within 18 months</i>	<i>Within 24 months</i>	<i>Within 30 months</i>
<i>Men</i>						
Bottom	70.1	14.4	18.8	21.9	26.9	29.9
2nd	80.8	5.6	11.7	14.6	17.6	19.2
3rd	84.7	3.6	8.4	11.0	12.9	15.3
Top	87.9	2.8	6.7	10.1	11.4	12.1
<i>Women</i>						
Bottom	66.6	15.3	23.8	26.8	30.8	33.4
2nd	74.8	8.6	15.6	19.6	22.3	25.2
3rd	84.8	3.5	7.8	9.9	12.9	15.2
Top	82.8	5.4	10.1	11.9	15.1	17.2

For women, the relationship is less pronounced but still remains strong. Women in the bottom wage quartile are nearly three times as likely to experience a period out of employment in the six months following an interview as those in the top quartile. Interestingly, though, neither for men nor for women does there seem to be a terribly strong relationship between wage quartile and time spent out of work, conditional on spending a period out of work in the first place.

The other side of the association of low pay and periods out of work is that those who have been out of work are likely to enter low-paid jobs. Table 2.9 shows the wage quartiles for those who are in work but were out of work at the previous wave. Some 56 per cent of men and 48 per cent of women who enter employment

TABLE 2.9  
Proportion in different quartiles of those moving into employment

<i>Quartile</i>	<i>Men</i>	<i>Women</i>
Bottom	0.56	0.48
2nd	0.26	0.26
3rd	0.12	0.17
Top	0.07	0.10

between the first and second waves are in the bottom quartile of the wage distribution.

The combination of the facts that low-wage people are more likely to move out of work and that those out of work are likely to enter low-wage jobs produces a strong relationship between the number of periods in which a person is in work and the probability that that person is low-paid.

Table 2.10 shows the proportion of time spent in low pay, using our three low-pay definitions, conditional on the number of waves in which the group were working. For men who are employees in all four waves, 7.6 per cent of periods in employment are at wages that are in the bottom 10 per cent of the male wage distribution. For those men who are not in employment at one wave, this proportion rises sharply to 20.2 per cent. Those who are in employment at only one wave during the survey stand a 33.1 per cent chance of being in the bottom 10 per cent of the wage distribution in that wave.

The results for women mirror those for men, though the proportions in the bottom decile are lower, conditional on not being an employee at all four waves, than for men. Thus 27.2 per cent of wage observations are in the bottom decile for those who are employees in only one wave. The corresponding number for those who are employees at all four waves is 7.6 per cent.

TABLE 2.10

**Probability of being low-paid, by number of periods in employment**

	<i>Per cent</i>				
	Bottom decile		Bottom quintile		Below half median
	<i>Men</i>	<i>Women</i>	<i>Men</i>	<i>Women</i>	<i>All</i>
Employee in 1 wave	33.1	27.2	45.6	44.2	44.7
Employee in 2 waves	20.3	20.7	34.5	37.2	35.7
Employee in 3 waves	20.2	15.9	34.0	29.4	31.9
Employee in all waves	7.6	7.6	16.7	16.5	16.6

Overall, 36 per cent of the wage observations in the bottom decile for men come from men who are not in employment at all waves. The corresponding figure for women is 39 per cent. This relationship implies that when we look at changes in wages between any two periods, we will miss a substantial part of the story for the low-paid, as many of the potentially low-paid will not be working in both periods.

#### **2.4. Wage Mobility and Movements into and out of Low Pay**

This section examines the degree of mobility within the wage distribution and, in particular, the degree to which mobility changes the individuals in low pay between periods. We start by looking at the changes in wages of our in-work sample between waves. As we only observe a wage for those in work, our sample will be confined to those in work in the periods being compared. It is therefore important to bear in mind the relationship between low pay and being out of work. We also look at the effect that periods out of work have on wage outcomes for those who have moved back into work.

Section 2.4.2 presents transition matrices for the whole sample, broken down by quartiles of the earnings distribution. These allow the effects of movements into and out of work to be associated with movements in ranking in the wage distribution. Section 2.4.3 examines the effect that the mobility in the wage distribution has on the longer-term impact of a minimum wage, and Section 2.4.4 looks at the characteristics of both those who move out of low pay and those who move into low pay.

### 2.4.1. Wage changes between Waves 1 and 4

For those in employment at both Wave 1 and Wave 4, we can compare the real level of wages. Figure 2.7 shows a scatter plot of the wages in Wave 1 versus those in Wave 4 for men, while Figure 2.8 shows the results for women. Again, wages are in pounds per hour in 1996 prices. The horizontal and vertical lines are the 25th, 50th and 75th percentiles of the respective distributions. The 45-degree line is also shown.

FIGURE 2.7

Male wages in Wave 1 versus wages in Wave 4

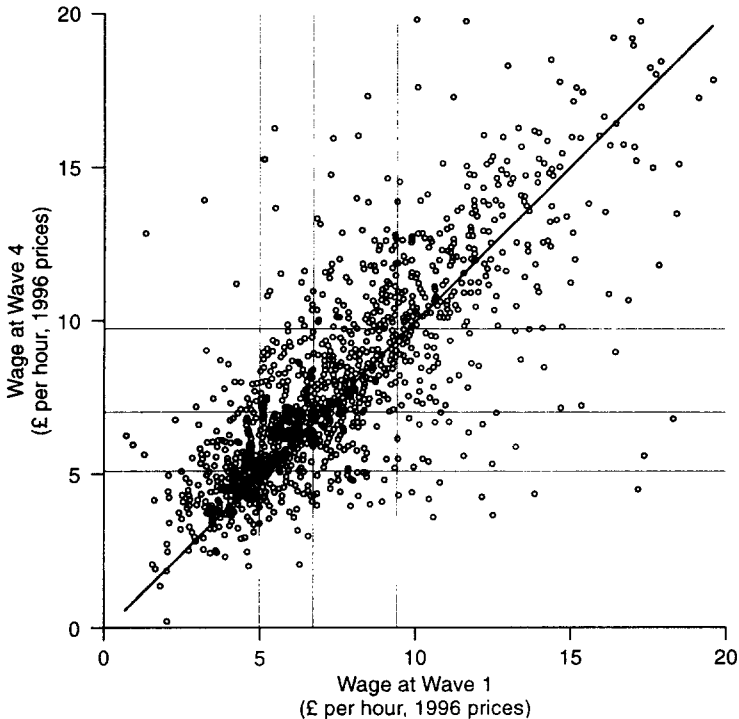
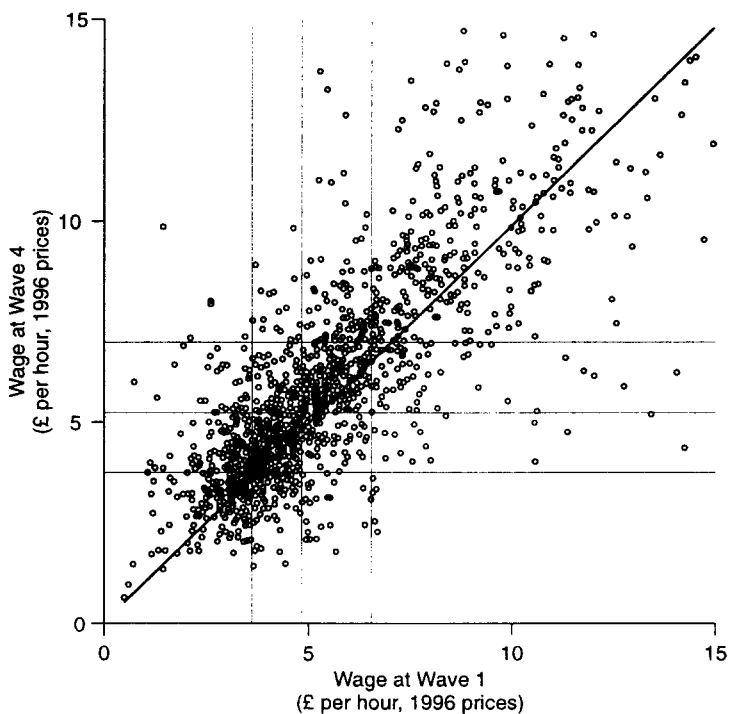


FIGURE 2.8

Female wages in Wave 1 versus wages in Wave 4



The bulk of the observations are above the 45-degree line, indicating real wage growth over the period. However, a substantial part of our sample experienced a real wage fall. Table 2.11 shows the distribution of proportional movements in wages underlying Figures 2.7 and 2.8. Roughly 12 per cent of both men and women see their wages fall by over 20 per cent in real terms over the sample period.

Of course, the proportions seeing increases and decreases by various amounts are not constant by type of person. More people at the bottom of the wage distribution see big proportional wage increases than do people in the middle and upper parts of the distribution.

TABLE 2.11  
Changes in wages between Waves 1 and 4

<i>Percentage change in wage</i>	<i>Per cent</i> <i>Percentage of individuals</i>
<i>Men</i>	
Down more than 20%	12.3
Down 10–20%	9.0
Between 10% down and 10% up	35.1
Up 10–20%	15.2
Up more than 20%	28.5
<i>Women</i>	
Down more than 20%	11.5
Down 10–20%	7.7
Between 10% down and 10% up	33.9
Up 10–20%	14.2
Up more than 20%	32.8

Nearly half of men and more than half of women who started off in the bottom quartile experienced wage growth in excess of 20 per cent between 1991 and 1994. Over the three-year period, men in the top quartile were more likely to see their wages fall by 20 per cent than to see them rise by this proportion. Details are provided in Table 2.12.

High levels of wage growth are also associated with age, the young being much the most likely to experience significant wage increases. Over 40 per cent of both men and women under 30 saw their wages rise by in excess of 20 per cent over the sample period. By contrast, only around 20 per cent of the oldest groups saw their wages rise by this proportion.

So far, in looking at the change in wages between Wave 1 and Wave 4, we have excluded those not in employment at either of these waves. However, we can look at the changes in wages for those who have moved out of work at some point during the sample period and who have returned to work by the fourth period. We would expect that periods out of work would have a negative effect on wages over the sample period. Figure

## *Dynamics of low pay and unemployment*

2.9 shows the distribution of wages for men in work at Wave 1 and at Wave 4, but who have experienced at least one period out of work in between.

TABLE 2.12  
Changes in wages between Waves 1 and 4, by quartile

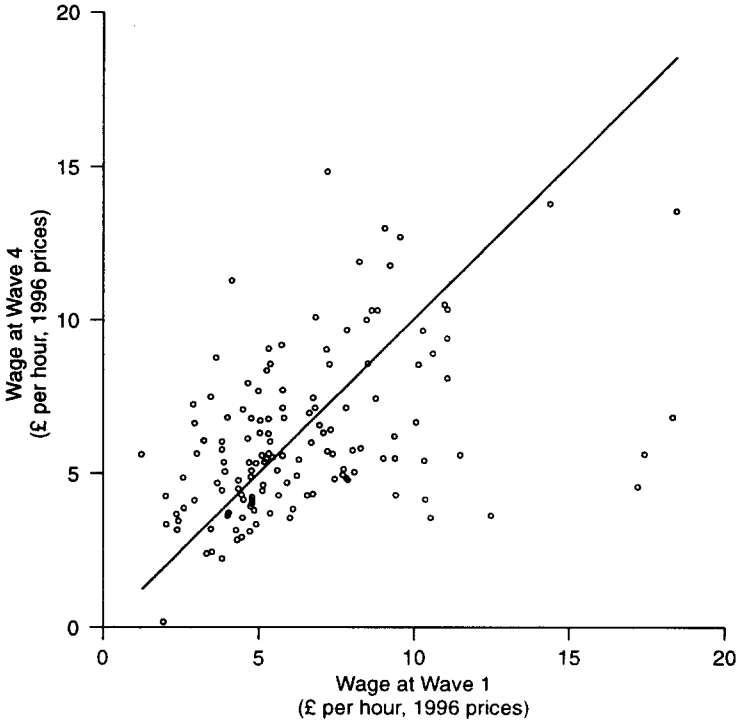
Percentage change in wage	Percentage of individuals in quartile				
	<i>Bottom</i>	<i>2nd</i>	<i>3rd</i>	<i>Top</i>	<i>Total</i>
<i>Men</i>					
Down more than 20%	7.6	9.2	13.8	18.0	12.3
Down 10–20%	5.1	8.4	11.4	10.6	9.0
Between 10% down and 10% up	27.6	34.8	36.2	41.2	35.1
Up 10–20%	13.0	16.0	14.6	17.0	15.2
Up more than 20%	46.7	31.5	24.0	13.3	28.5
<i>Women</i>					
Down more than 20%	5.6	11.5	11.0	17.0	11.5
Down 10–20%	4.7	8.9	6.7	9.9	7.7
Between 10% down and 10% up	23.0	35.4	38.8	37.0	33.9
Up 10–20%	11.6	11.8	18.4	14.5	14.2
Up more than 20%	55.0	32.5	25.1	21.6	32.8

TABLE 2.13  
Changes in wages, by whether out of work between Waves 1 and 4

Percentage change in wage	Percentage of individuals		
	<i>Not out of work</i>	<i>Out of work</i>	<i>All</i>
<i>Men</i>			
Down more than 20%	9.5	33.7	12.3
Down 10–20%	8.8	10.1	9.0
Between 10% down and 10% up	37.0	20.5	35.1
Up 10–20%	16.4	5.9	15.2
Up more than 20%	28.3	29.9	28.5
<i>Women</i>			
Down more than 20%	10.1	22.0	11.5
Down 10–20%	7.2	11.3	7.7
Between 10% down and 10% up	35.7	20.6	33.9
Up 10–20%	15.2	6.4	14.2
Up more than 20%	31.9	39.6	32.8

FIGURE 2.9

**Wages at Wave 1 versus wages at Wave 4  
for men out of work in between**



The figure shows that there is a large degree of dispersion in the changes in wages of men who have been out of work. In order to give these changes some context, we compare the proportions seeing their wages change by various amounts between those who have moved out of work during the survey period and those who have not. This is shown in Table 2.13.

Many more of those who spent time out of work in the intervening period suffered large wage falls. About a third of men who were out of work during the sample period saw their wages fall by more than 20 per cent



between Wave 1 and Wave 4 compared with only 10 per cent of men who were in work during the whole period.

By contrast, the proportions of men who saw their wages rise by over 20 per cent were almost the same for those who were out of work and those who were in work at all times. For women, the group who had been out of work actually formed a larger proportion of people seeing their wages rise by over 20 per cent.

#### ***2.4.2. Movements into and out of low pay***

We have examined the degree of wage mobility for those who are employed across our sample period. However, as Section 2.3 stressed, low pay is also closely associated with movements into and out of work. In this section, we look at both movements between low pay and high pay and movements between low pay and out of work.

We start by looking at the changes in the relative position of those in our sample between Waves 1 and 2. This is shown in Table 2.14, which presents a transition matrix. This shows the positions that the Wave 1 sample reach in Wave 2. The table shows a reasonable degree of persistence between the two waves. Of men in the bottom wage quartile in Wave 1, 63.9 per cent are still there in Wave 2, while 18.8 per cent have moved up to the second quartile. A further 3.3 per cent have moved to higher quartiles. Of the remaining 14 per cent, one-fifth have moved into self-employment while the rest have moved out of work. For the top quartile, just over three-quarters are still there one year later. As we would expect, the proportions remaining in the second and third quartiles are lower, at 51.1 per cent and 53.6 per cent respectively. This reflects the fact that people can move up as well as down the wage distribution from the second and third quartiles.

TABLE 2.14  
Changes in position between Waves 1 and 2

<b>Men</b>							
<i>Position, Wave 1</i>	<i>Position, Wave 2</i>						
	Bottom	2nd	3rd	Top	Self-emp	Out	Total
Bottom	63.9	18.8	2.6	0.7	2.9	11.1	100.0
2nd	14.4	51.1	24.6	1.6	2.1	6.3	100.0
3rd	4.7	18.7	53.6	16.5	2.2	4.3	100.0
Top	0.9	3.4	13.8	76.3	1.5	4.1	100.0
Self-emp	2.1	1.9	0.6	0.9	88.5	6.1	100.0
Out	12.1	3.7	1.7	1.1	5.1	76.3	100.0
Total	16.8	16.8	16.8	16.9	14.8	17.9	100.0

<b>Women</b>							
<i>Position, Wave 1</i>	<i>Position, Wave 2</i>						
	Bottom	2nd	3rd	Top	Self-emp	Out	Total
Bottom	60.3	18.8	2.9	0.8	2.1	15.2	100.0
2nd	17.8	50.8	18.3	2.5	0.2	10.3	100.0
3rd	4.0	17.1	59.6	14.0	0.4	4.9	100.0
Top	1.2	2.2	12.1	75.8	1.0	7.7	100.0
Self-emp	6.9	2.6	5.1	2.9	68.9	13.7	100.0
Out	5.8	3.7	1.2	1.3	1.2	86.7	100.0
Total	15.4	15.5	15.5	15.5	4.5	33.8	100.0

The results for women follow a similar pattern to those for men, with the proportion remaining in the bottom quartile only slightly lower than that of men, at 60 per cent, and the proportion remaining in the top quartile identical, at 76 per cent. However, women are more likely to move out of employment, with 15 per cent of the bottom quartile in Wave 1 moving out of work by Wave 2.

Table 2.15 shows where our sample at Wave 1 ends up by the fourth wave. As we would expect, the diagonal terms in the matrix are lower, as we are looking across a greater period of time. Only some 51.7 per cent of men who start in the bottom quartile of the wage distribution remain there in Wave 4. Nearly a quarter had moved into the second quartile, but only 6.3 per cent made it into the top two quartiles. Nearly 13 per

TABLE 2.15

**Position of sample at Wave 4, by Wave 1 position**

<b>Men</b>							
<i>Position, Wave 1</i>	<i>Position, Wave 4</i>						
	Bottom	2nd	3rd	Top	Self-emp	Out	Total
Bottom	51.7	23.5	5.7	0.6	5.7	12.7	100.0
2nd	14.2	43.6	22.9	4.3	5.0	10.0	100.0
3rd	6.3	16.4	46.6	20.1	3.1	7.6	100.0
Top	3.0	4.4	14.3	66.9	3.9	7.5	100.0
Self-emp	4.2	2.2	1.5	2.3	78.0	11.7	100.0
Out	18.1	6.5	5.0	2.2	7.7	60.6	100.0
Total	16.6	16.6	16.6	16.7	15.3	18.2	100.0

<b>Women</b>							
<i>Position, Wave 1</i>	<i>Position, Wave 4</i>						
	Bottom	2nd	3rd	Top	Self-emp	Out	Total
Bottom	43.9	22.0	8.2	1.8	2.2	21.9	100.0
2nd	20.3	45.4	18.1	4.1	1.2	10.9	100.0
3rd	5.8	14.7	50.2	18.3	0.5	10.6	100.0
Top	1.4	3.6	13.0	67.6	2.1	12.3	100.0
Self-emp	8.2	5.2	7.3	2.8	54.2	22.4	100.0
Out	12.7	5.9	3.5	3.0	3.9	71.1	100.0
Total	15.7	15.7	15.7	15.8	4.9	32.1	100.0

cent were out of work at the final interview, with the remaining 5.7 per cent moving into self-employment.

It is interesting to note that more than half of the men moving into self-employment between the start and end of the period were either in the bottom earnings quartile or not working at all at the beginning. Stability at the top was greater than at the bottom, with two-thirds of the men starting in the highest-paid quartile still being there three years later. Of the men not in work to start with, 60.6 per cent were again not in work at the end, though some will have spent some time in work in the mean while.

Women in the bottom quartile fared better than men, with only 43.9 per cent still there in the fourth wave and 10 per cent moving to the top half of the distribution by

the fourth wave. In part, the lower proportion of women remaining in the bottom quartile is explained by their higher propensity to move out of work. Women in the bottom quartile were almost twice as likely to move out of work as men. Of those who started in Wave 1 as out of work, 71.1 per cent were again not in work three years later.

The level of stability among women at the top of the distribution was comparable to that of men. About two-thirds of those starting in the top quartile remained there. Again, though, there was also a large body of women (12.3 per cent of the sample) at the top of the distribution moving out of work — nearly double the corresponding figure for men.

#### ***2.4.3. The consequences of mobility for a minimum wage***

The importance for public policy of the degree of movement into and out of low pay is perhaps best illustrated by reference to the debate over the minimum wage. At what level should it be set, and who would it affect? Accurate answers to these questions depend crucially on the numbers who would be affected, and, as we have seen, the numbers who are low-paid at any point in time are not a good reflection of the numbers who experience low pay over a longer period.

Let us illustrate this point with reference to a possible minimum wage set at half male median earnings, as is suggested by some union leaders (of UNISON and of the GMB, for example). We choose this figure purely for illustrative purposes. The important results hold for any reasonable level of minimum wage.

Figure 2.10 shows the proportions of the BHPS sample aged between 22 and 59 who had earnings less than the male median at any one time. On the left-hand

side, it shows the proportions of all 22- to 59-year-olds, including the unemployed, and on the right-hand side, it shows the proportions of those 22- to 59-year-olds who were in work. Figure 2.11 shows the proportions who ever held a low-paying job between 1991 and 1994, split by gender and employment status.

FIGURE 2.10

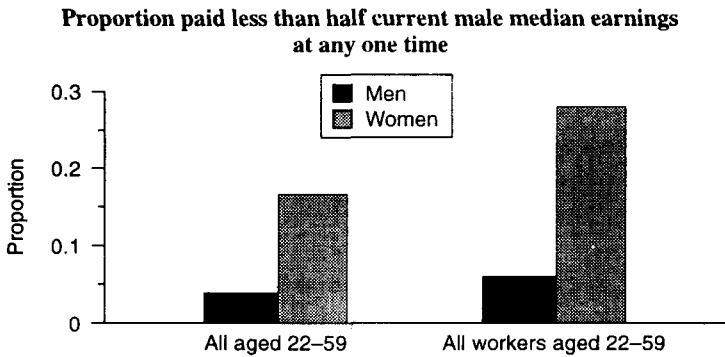


FIGURE 2.11

**Proportion aged 22-59 who ever worked in a job paying less than half current male median earnings between 1991 and 1994**



The graphs show that 10 per cent of men and 30 per cent of women in this age-group had at least one low-paying job (on this definition) between 1991 and 1994, but at any one time just under 5 per cent of men and 17 per cent of women were in a low-paid job. Among those who had some spell of employment over the period, 12.5 per cent of men and 42 per cent of women worked in a low-paid job at some point. The final pair of bars in Figure 2.11 look at those who were in work throughout the period, and the proportions here lie somewhere between the first and second sets of bars. This means that there are movements between low-paid jobs and unemployment as well as moves up the earnings ladder from low pay into high-paid jobs.

This churning between low pay and unemployment means that the effect of a minimum wage may be more redistributive in terms of lifetime income than in terms of income at one point in time. This is because the unemployed now may benefit from a minimum-wage job at some point in the future. The general levels of mobility mean that many more people are affected by a minimum wage over only a few years than would be guessed at by looking just at cross-sectional data.

#### **2.4.4. *Characteristics of our movers***

We complete our description of wage mobility by considering some of the characteristics associated with those who are moving between high pay, low pay and out of work. In this section, we pool the sample of people who move across states regardless of the wave at which the transition occurred. Thus the results below are based on all the transitions that occurred during our sample period.

*Dynamics of low pay and unemployment*

TABLE 2.16  
**Characteristics of movers from low to high pay relative to low-paid**

Characteristics	Bottom decile		Bottom quintile		Below half median
	<i>Men</i>	<i>Women</i>	<i>Men</i>	<i>Women</i>	
<i>Female</i>	n.a.	n.a.	n.a.	n.a.	0.94
<i>Age</i>					
Under 25	0.86	0.81	0.67	0.97	1.01
25-34	1.12	1.15	1.11	1.08	1.06
35-44	1.01	1.02	1.07	1.09	1.03
45-55	1.25	1.16	1.28	0.95	1.02
Over 55	0.75	0.60	1.14	0.75	0.69
<i>Education</i>					
No qualifications	0.94	0.91	0.88	0.80	0.81
O level or equivalent	0.96	1.14	0.99	1.10	1.13
A level or equivalent	1.15	0.79	1.16	1.18	0.91
Degree	1.48	1.29	1.40	1.24	1.42
<i>Years of job tenure</i>					
Under 2	0.83	0.93	0.83	0.94	1.00
2-5	1.04	1.04	0.85	1.14	1.02
5-10	1.52	1.14	1.41	0.94	0.91
Over 10	1.00	1.08	1.37	0.99	1.04
<i>Years of experience</i>					
Under 2	0.68	0.69	0.78	0.53	0.91
2-5	0.94	0.79	0.62	0.98	0.96
5-10	1.32	1.00	1.25	1.01	0.87
Over 10	1.01	1.10	1.12	1.05	1.07
<i>Region</i>					
London	1.14	1.30	1.13	1.29	1.46
Rest of South	1.00	1.01	1.02	0.94	1.05
North	1.11	1.02	1.07	0.99	0.97
Wales	0.77	0.55	0.74	0.60	0.53
Scotland	0.41	0.84	0.66	1.27	0.95
<i>Size of workplace</i>					
Under 25 employees	0.76	0.87	0.69	0.80	0.90
25-100 employees	1.11	1.24	0.93	1.19	1.16
Over 100 employees	1.40	1.30	1.53	1.46	1.19
<i>Type of contract</i>					
Permanent	1.02	1.00	1.02	1.01	1.02
Seasonal	0.85	1.04	0.81	0.94	0.76
Temporary	0.37	0.89	0.61	0.77	0.91
<i>Full-time</i>	1.08	0.94	1.04	1.09	1.10
<i>Occupation</i>					
Professional	1.45	0.75	1.30	0.89	1.15
Non-manual	0.78	1.15	0.96	1.14	1.09
Manual	1.01	0.84	0.97	0.79	0.87
<i>Family type</i>					
Single, no kids	0.94	0.86	0.88	0.96	1.06
Single, kids	—	1.04	—	0.68	0.90
1-earner couple, no kids	0.78	0.56	0.99	0.49	0.65
1-earner couple, kids	0.81	0.54	1.04	0.85	0.61
2-earner couple, no kids	1.31	1.05	1.15	1.08	1.04
2-earner couple, kids	1.09	1.14	1.10	1.13	1.06

Table 2.16 looks at the types of characteristics that are associated with the group of people moving out of low pay relative to the type of people who are low-paid. As in Section 2.2.4, we report the degree of over-representation of people with certain characteristics among the group who move from low pay to high pay.

In general, the factors associated with moving from low pay to high pay once a person is low-paid are the same as the factors that are related to being low-paid given that a person is working. Again, age and qualifications play an important role, with the young and those with low qualifications being under-represented in the group exiting from low pay.

The group with job tenures between five and 10 years are largely over-represented among those who exit low pay, while those with tenures under two years tend to be under-represented. Additional job tenure beyond 10 years has little effect on the probability of exiting from low pay. The pattern of results for lifetime work experience is broadly similar to that for job tenure. Those in larger workplaces are between 30 and 50 per cent over-represented among the group exiting low pay.

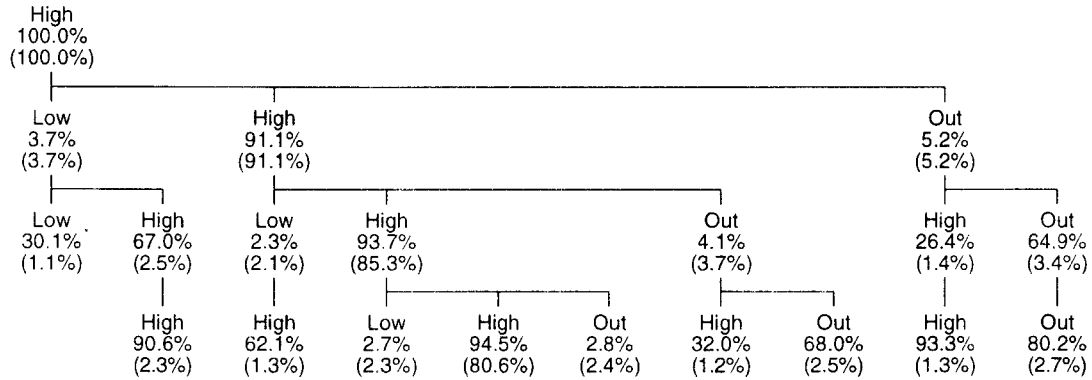
Again, Table 2.16 includes a number of measures that are associated with movements out of low pay but that do not directly cause it. Interestingly, there does not seem to be a big difference between full-time and part-time workers. For women, under the bottom decile definition, full-timers are slightly under-represented among those exiting low pay, while under the bottom quintile definition, they are slightly over-represented.

We can repeat the above analysis looking in the opposite direction — what is the pattern of movements for those in high pay into low pay? Figures 2.12 to 2.16 present these transitions for our three definitions of low pay. The sample is those who are in high pay in the first



FIGURE 2.12

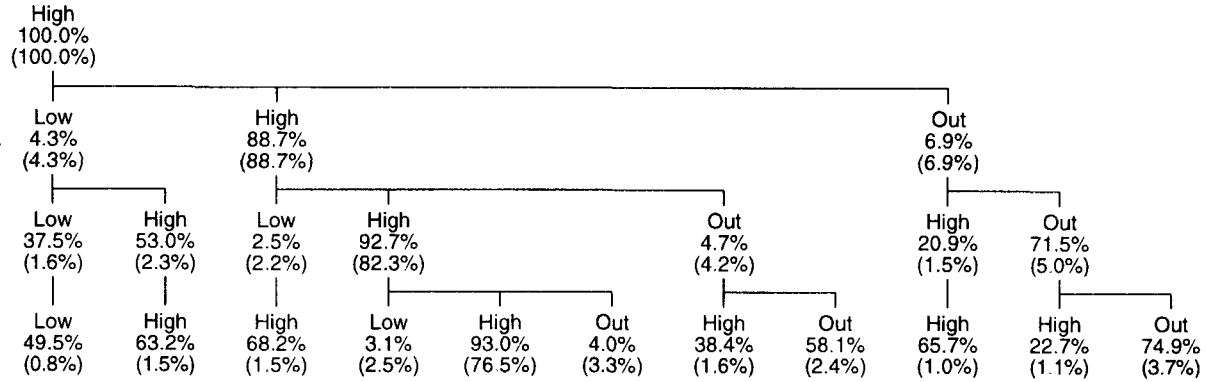
Men in the top nine deciles at Wave 1



Number of observations: 1,401

FIGURE 2.13

Women in the top nine deciles at Wave 1



Number of observations: 1,563

FIGURE 2.14

Men in the top four quintiles at Wave 1

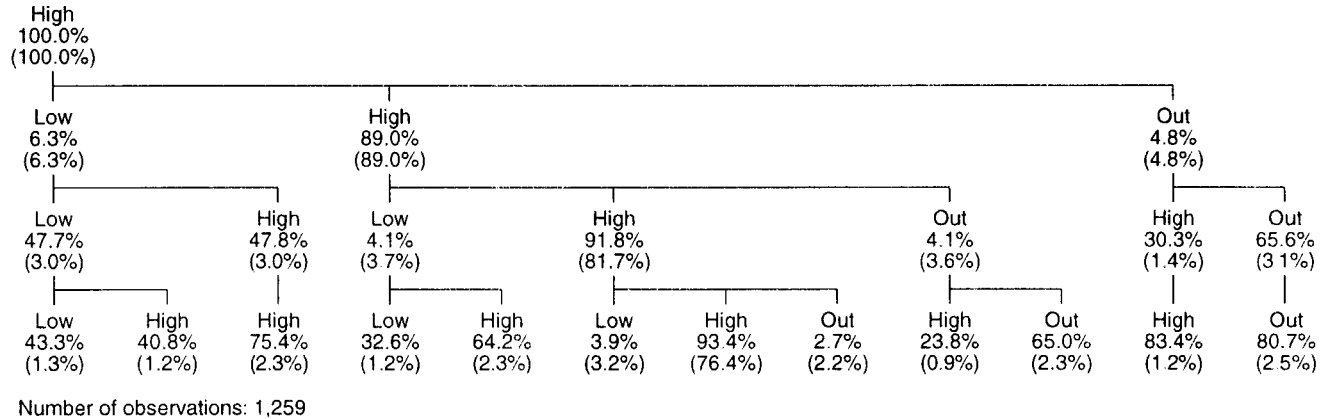
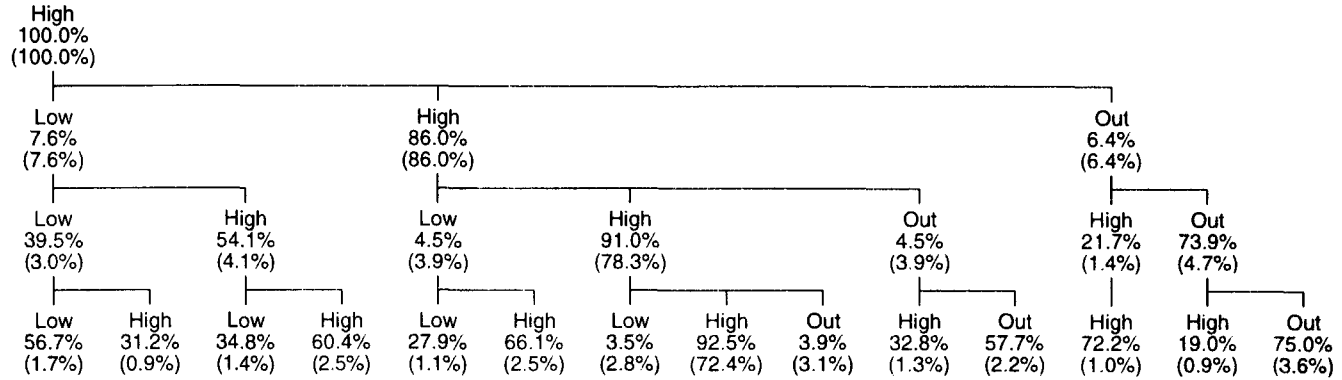


FIGURE 2 15

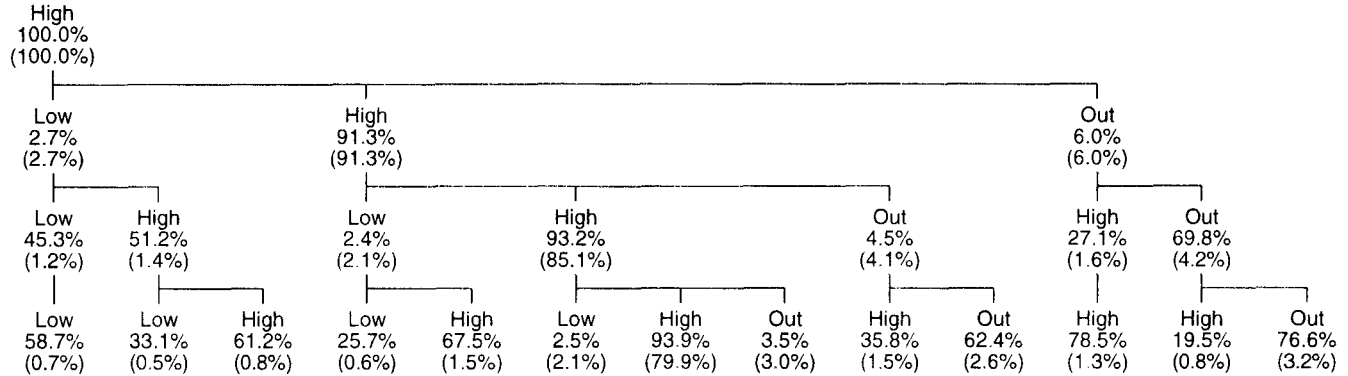
Women in the top four quintiles at Wave 1



Number of observations: 1,397

FIGURE 2.16

All above half median earnings at Wave 1



Number of observations: 2,983

wave. As these graphs show, the bulk of the sample remain in high pay throughout the period. Under the bottom quintile definition of low pay, the proportions remaining in high pay at all four waves are 76.4 per cent for men and 72.4 per cent for women.

Of those men who enter low pay in Wave 2, some 67 per cent move back into high pay under the bottom decile definition of low pay, while about half move back under the bottom quintile definition. We find that the conditional probability of moving into low pay falls, given two periods in high pay. However, under the bottom decile definition of low pay, for both men and women, the probability of low pay conditional on three periods of high pay actually increases compared with the figure for two periods. In the case of men, it increases from 2.3 per cent to 2.7 per cent, while for women it increases from 2.5 per cent to 3.1 per cent. However, in both cases, the result is reversed when the bottom quintile is used as the definition of low pay.

We can look at the characteristics that are associated with movements into low pay relative to those associated with staying in high pay. Table 2.17 again shows the degree of over-representation of different groups among those moving from high pay to low pay compared with the group of people in high pay.

The risk of entering low pay is substantially greater among young men than for any other age-group. This is associated with the more-experienced groups of men also being under-represented among the low-paid. For women, it is the older age-groups that are over-represented among those entering low pay and the effect of experience is less clear-cut than it is for men.

The other major distinction between men and women is the association between low pay and having children.

*Dynamics of low pay and unemployment*

TABLE 2.17  
**Characteristics of movers from high to low pay relative to high-paid**

Characteristics	Bottom decile		Bottom quintile		Below half median
	<i>Men</i>	<i>Women</i>	<i>Men</i>	<i>Women</i>	
<i>Female</i>	—	—	—	—	1.70
<i>Age</i>					
Under 25	1.93	0.82	2.00	0.97	1.26
25–34	1.13	0.84	0.97	0.86	0.86
35–44	0.71	1.17	0.73	1.20	1.04
45–55	0.90	1.11	1.01	1.06	1.11
Over 55	0.80	0.91	1.21	0.66	0.68
<i>Education</i>					
No qualifications	2.07	1.87	2.45	1.82	1.77
O level or equivalent	0.99	0.96	1.10	1.08	1.10
A level or equivalent	0.66	0.72	0.48	0.64	0.63
Degree	0.41	0.20	0.24	0.20	0.25
<i>Years of job tenure</i>					
Under 2	1.79	1.39	1.33	1.54	1.77
2–5	1.04	0.82	0.95	0.73	0.83
5–10	0.87	0.89	1.11	0.94	0.82
Over 10	0.45	0.68	0.74	0.60	0.43
<i>Years of experience</i>					
Under 2	1.84	1.31	1.68	0.84	1.44
2–5	1.08	0.72	0.74	0.92	0.99
5–10	1.18	1.09	1.16	1.15	1.15
Over 10	0.92	1.01	0.98	0.98	0.94
<i>Region</i>					
London	0.34	0.46	0.58	0.44	0.66
Rest of South	0.88	1.11	0.89	0.98	1.03
North	1.32	1.16	1.21	1.18	1.10
Wales	1.45	0.52	1.13	0.87	1.04
Scotland	0.58	0.85	1.05	1.12	0.84
<i>Size of workplace</i>					
Under 25 employees	1.34	1.57	1.21	1.35	1.78
25–100 employees	1.25	1.11	1.05	0.97	1.00
Over 100 employees	0.71	0.40	0.89	0.74	0.48
<i>Type of contract</i>					
Permanent	0.93	0.99	0.96	0.98	0.98
Seasonal	4.81	1.63	3.24	1.89	2.37
Temporary	1.42	0.23	1.36	0.44	0.26
<i>Full-time</i>	0.98	0.61	0.98	0.60	0.59
<i>Occupation</i>					
Professional	0.37	0.50	0.46	0.37	0.31
Non-manual	0.84	0.91	0.61	0.95	1.21
Manual	1.52	1.72	1.68	1.84	1.17
<i>Family type</i>					
Single, no kids	1.43	0.88	1.47	0.99	1.07
Single, kids	1.96	2.00	1.11	1.82	3.11
1-earner couple, no kids	0.72	0.75	0.88	0.67	0.86
1-earner couple, kids	1.10	2.30	0.96	2.22	0.66
2-earner couple, no kids	0.98	0.84	0.91	0.73	0.78
2-earner couple, kids	0.67	1.08	0.81	1.22	1.14

The proportion of female lone parents entering low pay is between 1.8 and 2.0 times the proportion of lone parents who start in the high-paid category.

## **2.5. Conclusions**

This chapter has provided a descriptive overview of the BHPS data on movements between low pay, high pay and being out of work. There is a large degree of wage mobility across time, with significant groups seeing large real wage increases and real wage declines. This mobility substantially increases the number affected by a given minimum wage policy relative to the effect estimated from standard cross-sections.

We have also seen that there is a strong association between low pay and being out of work. This association is caused both by the low-paid being more likely than other groups to move out of work and by the fact that those entering employment tend to start in low-paid jobs. This association has an effect on the measured persistence of low pay. Confining ourselves to looking just at those who are in employment at each interview understates the extent to which those who were low-paid at the beginning of the sample period have remained at the bottom of the wage distribution.

The interaction of all the factors considered in this chapter makes it difficult to capture the dynamic process of wage mobility adequately using simple descriptive statistics. This is especially true when we look at the characteristics of people associated with movements between states. These associations are caused by a large number of interactions between people's choices and the structure of the labour market. A more formalised model of wage dynamics is needed if we are to draw together these disparate elements.



## *Dynamics of low pay and unemployment*

This is what the other two chapters in this report attempt to do. Chapter 3 follows on from the work presented here on movements between low pay, high pay and being out of work. It brings the various strands together into a single model of labour market behaviour and predicts the probabilities of being low-paid and the degree of persistence of low pay for different groups in our sample.

Chapter 4 looks at issues that we have only touched on here — how wages when entering a job rise with work experience and how quickly wages rise with time spent in a particular job. This allows us to estimate the probability that a person entering a low-wage job will see their wages rise above a low-wage cut-off within a certain period of time.

## **CHAPTER 3**

### **The Persistence of Low Pay and Unemployment**

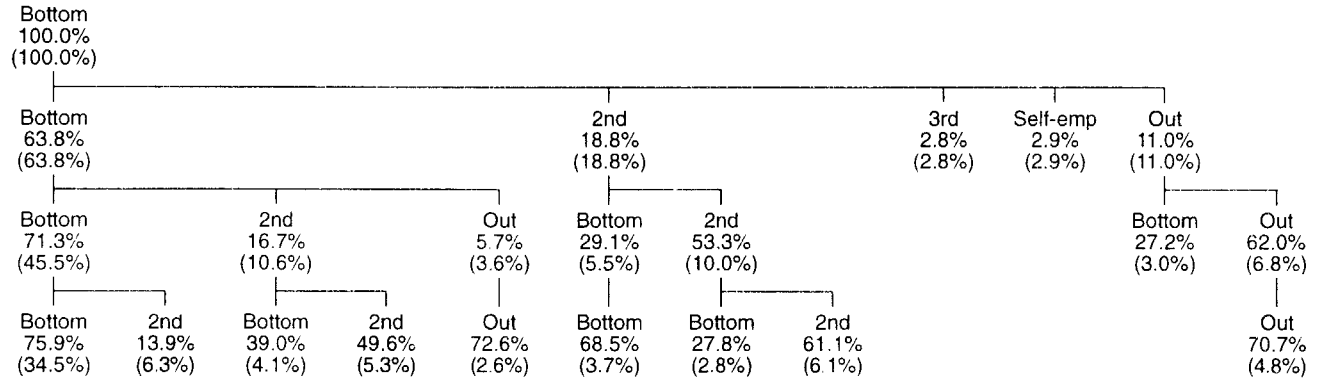
It is clear enough that, while there is some mobility out of low pay and unemployment, there is also a good degree of persistence. A majority of those at the bottom of the wage distribution in Wave 1 are still there in Wave 2. Here we provide a little more description of the persistence in these states. We start, in Section 3.1, by extending our descriptive analysis, again making use of ‘tree diagrams’. We then go on, in Section 3.2, to investigate the phenomenon of persistence further, in particular trying to answer the question ‘to what extent is there persistence in low pay and unemployment because the people in these states have certain characteristics, such as being poorly educated, and to what extent is there persistence because low pay in one period seems to “breed” low pay in the next?’.

#### **3.1. The Degree of Persistence**

We focus on persistence at the bottom of the wage distribution by repeating our ‘tree’ analysis, this time looking at movements in the wage distribution for men and women from the bottom quartile. This allows us to extend our analysis to a number of different points in time, rather than being confined to comparing two time periods.

The results for the movements of those in the bottom quartile of the Wave 1 wage distribution are shown in Figure 3.1 for men and Figure 3.2 for women. The conditional probability of men being in the bottom

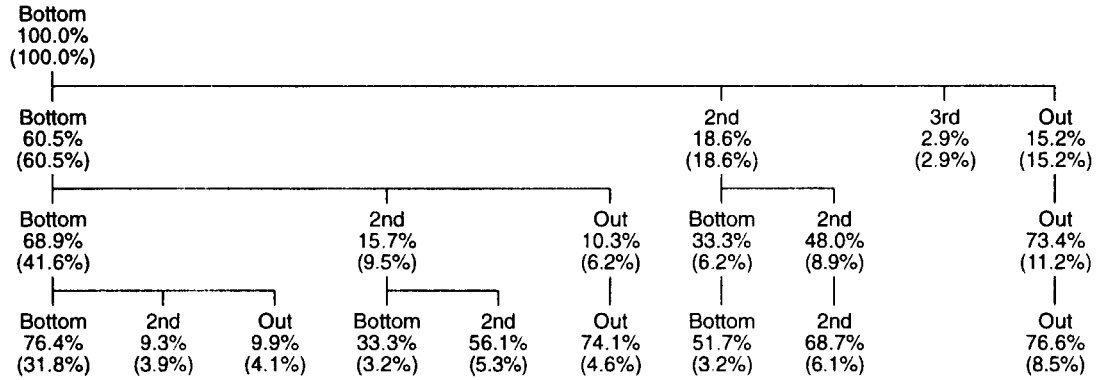
FIGURE 3.1  
Men in the bottom quartile at Wave 1



Number of observations: 366

FIGURE 3.2

Women in the bottom quartile at Wave 1



Number of observations: 415

quartile rises from 63.8 per cent conditional on being in the bottom quartile in Wave 1 to 75.9 per cent conditional on being there in Waves 1, 2 and 3. Of the 18.8 per cent of men who move into the second quartile in Wave 2, over two-thirds stay there or move into the third quartile in Wave 3. However, some 29.1 per cent move back to the bottom quartile again in Wave 3. While Table 2.15 in the previous chapter showed that about half the men in the bottom quartile in Wave 1 were also in the bottom quartile in Wave 4, Figure 3.1 shows that just 34.5 per cent of men were actually in the bottom quartile at all four waves.

For women, the conditional probabilities of staying in the bottom quartile are lower, but correspondingly the probability of moving out of work is higher. The probability of falling back into the bottom quartile at Wave 3 having moved to the second quartile in Wave 2 is slightly higher than for men, standing at 33.3 per cent. Of those who move out of work, the probability of staying out of work is higher than that for men, with about three-quarters of women remaining out of work in Wave 3 having moved out in Wave 2. The corresponding figure for men is just over 60 per cent.

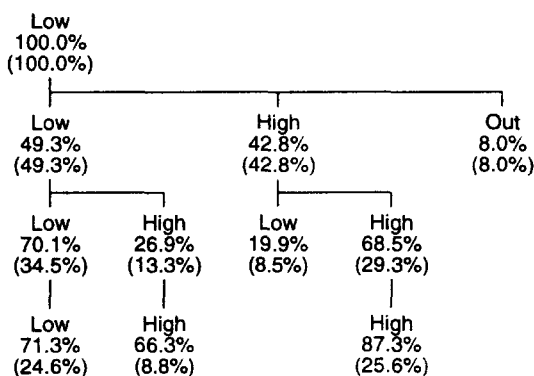
Figures 3.1 and 3.2 show a great deal of detail about the movements of the bottom quartile. However, this level of detail leads to rather small sample sizes, particularly by the fourth wave. To overcome this, we have had to choose a very wide definition of the bottom of the wage distribution, the bottom quartile. We now extend our analysis to look more explicitly at the bottom of the distribution, using tighter definitions of low pay. The trade-off we make is that we must restrict the number of categories between which we can distinguish.

We use the three definitions of low pay set out in Section 2.2.3. We restrict ourselves to just three categories of interest. The first category is those who are

out of work, the second is those in work with wages below our low-pay cut-off and the third is those in work earning above our cut-off. Given this restriction on the number of categories that will be used, for the moment we exclude from the sample anyone who moved into self-employment at any point during the four waves.

Figures 3.3 to 3.7 show the transitions for each of the definitions of low pay. Table 3.1 summarises the most important features for these trees. First, the proportion who remain in low pay throughout the period is relatively small, particularly for women. It also varies according to the definition of low pay used, with 24.6 per cent of men who start in the bottom decile staying there for the whole period, while 33.3 per cent are permanently low-paid under the bottom quintile definition. Again, the conditional probability of low pay rises with the number of periods in low pay, from 61.6 per cent for bottom-quintile men in Wave 2 to 77.8 per cent by Wave 4. That is to say, 77.8 per cent of those men who are in the bottom quintile in Waves 1, 2 and 3 remain there in Wave 4.

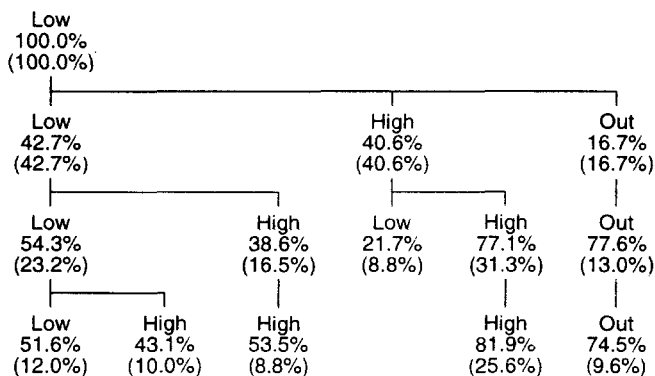
FIGURE 3.3  
Men in the bottom decile at Wave 1



Number of observations: 133

FIGURE 3.4

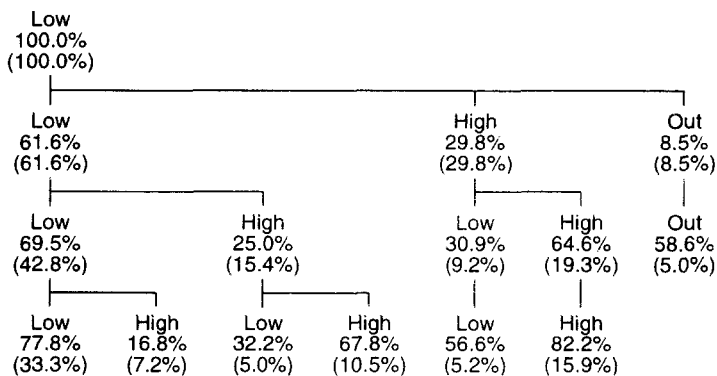
**Women in the bottom decile at Wave 1**



Number of observations: 150

FIGURE 3.5

**Men in the bottom quintile at Wave 1**



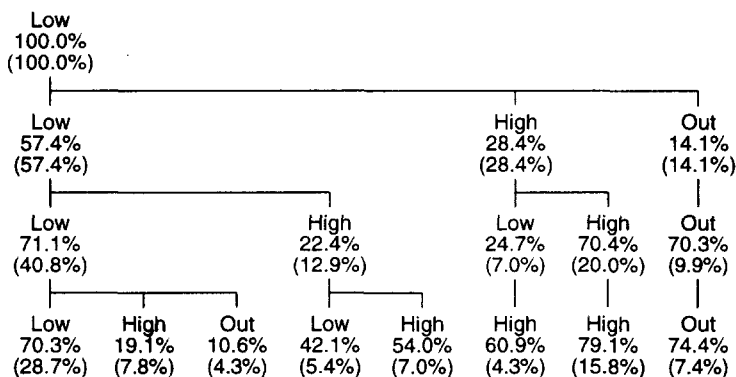
Number of observations: 267

There are some other interesting points to note about our low-pay trees. About 15 per cent of the low-paid under the bottom quintile definition and 25 per cent under the bottom decile definition move out of low pay in Wave 2 and remain out of it in subsequent waves.

*Persistence of low pay and unemployment*

FIGURE 3.6

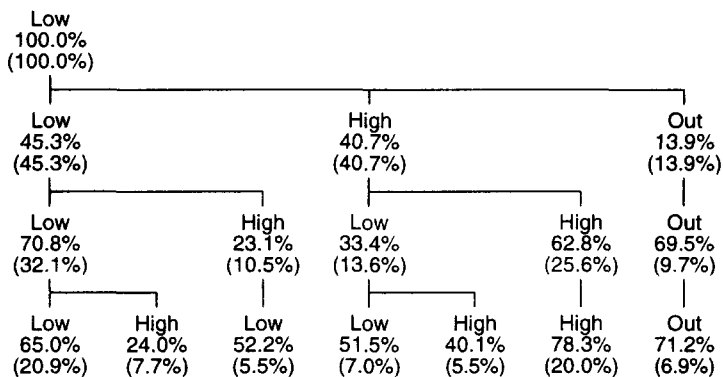
**Women in the bottom quintile at Wave 1**



Number of observations: 311

FIGURE 3.7

**All below half median earnings at Wave 1**



Number of observations: 233

Again, the conditional probability of staying in high pay rises with the number of periods spent in this state. By Wave 4, the probability of remaining high-paid conditional on being high-paid at Waves 2 and 3 has risen to around 80 per cent under all our definitions.



*Dynamics of low pay and unemployment*

TABLE 3.1  
Summary of low-pay trees

	<i>Per cent</i>				
	Bottom decile		Bottom quintile		Below half median
	<i>Men</i>	<i>Women</i>	<i>Men</i>	<i>Women</i>	<i>All</i>
Percentage always low-paid	24.6	12.0	33.3	28.7	20.9
<i>Conditional probability of low pay</i>					
Wave 2	49.3	42.7	61.6	57.4	45.3
Wave 3	70.1	54.3	69.5	71.1	70.8
Wave 4	71.3	51.6	77.8	70.3	65.0
Percentage high-paid at Wave 2	42.8	40.6	29.8	28.4	40.7
Percentage always high-paid after Wave 1	25.6	25.6	15.9	15.8	20.0

The main conclusion to be drawn seems to be that, among the low-paid, there is a substantial group who move up the wage distribution quite readily, but also many who get stuck year after year. Being in low pay for just two or three years implies that the probabilities of being low-paid again the next year are substantially higher.

We have already shown the relationship between low pay and periods spent out of work, so it is clearly important to add to the information in Table 3.1 by including information on those out of work in subsequent waves with those in low pay. This is done in Table 3.2. For the bottom quintile definition, the results for men and women are strikingly similar. Just under half of the sample are in the bottom quintile or out of the labour market at Waves 2, 3 and 4. Again, the conditional probability of staying low-paid or out of work increases, given the number of previous periods of low pay. Also, the conditional probabilities are higher

*Persistence of low pay and unemployment*

TABLE 3.2  
**Summary of low-pay trees combining low pay and out of work**

	<i>Per cent</i>				
	Bottom decile		Bottom quintile		Below half median
	<i>Men</i>	<i>Women</i>	<i>Men</i>	<i>Women</i>	<i>All</i>
Percentage always low-paid or out of work	32.8	26.5	44.9	47.0	36.0
<i>Conditional probability of low pay or being out of work</i>					
Wave 2	57.2	59.4	70.2	71.6	59.3
Wave 3	74.1	67.0	77.0	78.7	76.6
Wave 4	77.4	66.5	82.5	83.4	79.3

than when we looked at only the low-pay category, reflecting the fact that unemployment is a more persistent state than low pay. About 70 per cent of both men and women remain low-paid (under the bottom quintile definition) or out of work in Wave 2, and by Wave 4 over 80 per cent remain low-paid or out of work, given that they have been low-paid or out of work in the previous three waves.

Under the bottom decile definition of low pay, over 40 per cent of the sample move out of low pay and being out of work in Wave 2, compared with about 30 per cent using the bottom quintile definition. However, while the conditional probabilities of remaining low-paid or out of work at Wave 2 are quite different between the two definitions, the subsequent conditional probabilities of remaining low-paid or out of work become much closer between the two low-pay definitions.

### **3.2. Effects of Status in 1991 on Future Status**

So far, we have seen how earnings and employment status in one year are correlated with earnings and employment status in following years. It is possible that some of this persistence in wages and employment status across years can be explained by factors such as age and education. These last can be seen as determinants of the unconditional probability of low pay and employment. The focus of the next stage of the analysis is to see how much extra variation in wages and employment status can be explained by adding information about wages and employment status in the previous year, holding these unconditional predictions constant. Thus we are interested in the difference between the conditional and the unconditional probabilities for each individual.

Comparing the conditional with the unconditional probability gives us a measure of persistence in the determination of wages and employment, controlling for other observable characteristics. For example, information on age, skill level and family status in 1992 might lead us to predict someone to have, say, a 10 per cent chance of being unemployed in that year. If he was unemployed in 1991, however, we might predict that he would have a 20 per cent chance of being unemployed in 1992. Thus the fact of being unemployed in year 1 doubles the chances of being unemployed in year 2. The same comparisons can be made for the probabilities of being in a high- or low-paid job.

If, given observable characteristics, the probability of being unemployed, say, is increased by the fact of being unemployed in the previous period, this tells us one of two things: either being unemployed in one period has a direct effect on the probability of being unemployed next period because, for example, it reduces skills or

motivation, or there are some unobservable characteristics of the individuals concerned which remain across time and which affect employment probability in both periods. While we cannot separately evaluate these explanations, in either case we learn a good deal about the persistence of unemployment or low pay. In addition, some of the potential reasons why labour market outcomes differ across individuals, controlling for observed characteristics such as education and age, (and why these differences have risen over time) can be assessed by looking at whether these differences are permanent. We cannot possibly see any of this from cross-section data. Nor can we see it from the sorts of description presented earlier because this does not tell us whether the correlations in unemployment probabilities across time are the result of observable characteristics or of the sorts of correlations described above.

One particular difficulty that we have to face in dealing with this issue is the possibility that those who move into unemployment are, in any case, more likely to have lower wages. This means that when we look at changes in wages over time, we will tend to overstate the growth in potential wages of those in low pay. Moreover, we have to predict wages for everyone, not just those in work. This is dealt with here in the standard way by using a two-step procedure to predict the distribution of wages available to the unemployed.

The results presented here show two separate sets of probabilities. The first is the probability that an individual is employed. The second is the probability that the wages offered to the individual are below a certain threshold. These probabilities are computed for the whole sample for each year, and then separately for different groups defined by age, education and status (low-paid, high-paid and unemployed in 1991). The

differences between these probabilities can then be thought of as picking up the degree to which the risks of low pay and unemployment affect some people more than others.

### **3.2.1. *Estimating the determinants of low pay***

Only brief details of the estimation procedure used are given here.<sup>6</sup> We start off with the observation that if the shape of the distribution of (log) wages within a group is normal, then we only need to know the mean and the variance of the distribution to predict the proportion with wages below a certain threshold. So it is easy to use the results of a regression relating (log) wages to a set of characteristics to estimate the probability that an individual will have wages below a certain threshold.

We then have the problem of estimating the complete distribution of wages, controlling for the fact that allocation into employment is not random. This is a well-known problem, which we solve using the usual Heckman (1979) estimator.<sup>7</sup>

For all our sample,<sup>8</sup> we estimate the probability of employment separately for men and women for each year. We then construct a measure of the importance of unobservable factors affecting employment from these estimates. These residuals can then be used to correct for sample selection bias (the fact that those with lower

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<sup>6</sup>Further details are available from the authors on request.

<sup>7</sup>As sources of variation in employment probabilities across individuals that do not directly affect wages, we use, for men, the number of children (picking up the differing effect of the tax and benefit system on different households) and, for women, the education of other people in the household (picking up some of the determinants of out-of-work income for women).

<sup>8</sup>This includes all those who were between 19 and 57 (inclusive) in 1991 and who were present in the survey in 1991.

potential wages are less likely to work) in the estimation of the determination of wages.

The next stage is to estimate the relationship between wages and both the observed characteristics (principally, age and education) and the residuals in the employment equations (to control for selection bias and also to see how far potential wages differ between the unemployed and the employed). We can then see how far the determination of wages, controlling for the factors described above, is correlated over time.<sup>9</sup>

From these estimates, we obtain the predicted hourly wage and the estimated residuals, or errors, for each individual. The correlation of these residuals across years is then a measure of persistence in the unobserved part of the determination of wages. So a positive residual indicates that, given observable characteristics, the wage of the individual under consideration is higher than we would predict. If this is true for a number of years, then there is clear persistence in wages that cannot be explained just by looking at the individual's characteristics.

So the residuals can be used to predict the relationship (other things equal) between wages in one year and the next. The relationship between the unobserved determinants of *employment* across years is not so easy to estimate but it is needed in order to predict the probabilities of low pay, given status in 1991. We do this by estimating the correlation between the residuals in the employment equations across years after estimating the coefficients.

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<sup>9</sup>This can be achieved by estimating wages in two years (1991 and 1992, 1991 and 1993, and 1991 and 1994) at the same time by using a 'seemingly unrelated regression' procedure. The possibility that the average growth as well as the level of potential wages will be higher for those who work in both years is controlled for by the inclusion of the selection term.

This will then give us the following set of results:

- the predicted wage for each individual each year;
- the predicted probability of employment in each year;
- the predicted wage in 1992, 1993 and 1994, conditioned on employment status in 1991 and on the fact that the individual is predicted to work; this allows us to predict how many of the unemployed who move into work will have low wages;
- the predicted probability of employment in each year, given employment status in 1991;
- the predicted wage in each year, given wages in 1991.

These predictions are then used to compute the conditional and unconditional probabilities of being low-paid, high-paid or unemployed in each year.

### **3.2.2. *The data and results***

As before, we use data from the first four waves of the BHPS. We only look at people who were of working age in the sample in 1991, excluding students. Observations with imputed or missing values on wages who were in work are also removed.<sup>10</sup>

The results from the initial regressions<sup>11</sup> are used to predict the effects of observable characteristics (including status in 1991) on the probability of being low-paid. We look separately at two definitions of low pay, which, for men, are having potential wages below £4 and below £5 an hour. Because women typically earn less than men, the thresholds for women are lower (£3 and £4). The first line in Tables 3.3 and 3.4 gives the

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<sup>10</sup>We remove these observations because the imputed values are themselves generated from correlations between wages and observed characteristics elsewhere in the data.

<sup>11</sup>Details available from the authors on request.

*Persistence of low pay and unemployment*

TABLE 3.3

**Probabilities of low pay and employment for men in the BHPS**

	1992		1993		1994	
	£4	£5	£4	£5	£4	£5
Sample average	6.9%	18.0%	6.2%	16.0%	5.9%	15.6%
<i>Predicted effects of observed characteristics for whole sample</i>						
35- to 45-year-olds v. under-35s	-10.1%	-18.3%	-9.6%	-17.8%	-9.9%	-18.9%
45- to 55-year-olds v. 35- to 45-year-olds	-1.5%	-3.5%	-1.2%	-2.8%	-1.0%	-2.4%
Low qual. v. no qual.	-14.2%	-22.0%	-10.1%	-16.6%	-12.5%	-20.2%
Medium qual. v. no qual.	-21.7%	-39.7%	-16.7%	-31.6%	-19.1%	-36.0%
High qual. v. no qual.	-22.3%	-42.2%	-17.5%	-34.7%	-19.6%	-38.1%
Prob. employed	81.8%		81.1%		82.4%	
<i>Employed in 1991: conditional on characteristics</i>						
Prob. low-paid	6.1%	16.2%	5.5%	14.6%	5.2%	14.1%
Prob. employed	83.5%		83.1%		84.3%	
<i>Employed in 1991: conditional on characteristics &amp; employment status in 1991</i>						
Prob. low-paid	6.1%	16.3%	5.8%	16.3%	4.5%	13.7%
Prob. employed	93.7%		92.5%		92.8%	
<i>Unemployed in 1991: conditional on characteristics</i>						
Prob. low-paid	11.8%	26.7%	10.4%	23.0%	9.9%	23.2%
Prob. employed	74.1%		72.7%		73.8%	
<i>Unemployed in 1991: conditional on characteristics &amp; employment status in 1991</i>						
Prob. low-paid	11.7%	26.7%	6.8%	18.2%	7.5%	20.1%
Prob. employed	23.1%		25.1%		29.2%	
<i>Not low-paid in 1991: conditional on characteristics</i>						
Prob. low-paid	5.3%	12.8%	4.8%	11.7%	4.5%	11.3%
<i>Not low-paid in 1991: conditional on characteristics &amp; employment status in 1991</i>						
Prob. low-paid	0.4%	1.9%	0.3%	1.7%	0.6%	2.5%
<i>Low-paid in 1991: conditional on characteristics</i>						
Prob. low-paid	16.9%	30.9%	14.8%	27.3%	13.3%	26.1%
<i>Low-paid in 1991: conditional on characteristics &amp; employment status in 1991</i>						
Prob. low-paid	60.1%	68.1%	53.5%	61.9%	47.6%	58.9%

Notes: These probabilities are computed from regression estimates available from the authors on request. Sample is men aged 19-57 inclusive in 1991. 'Low qual.' means 'O level or equivalent', 'Medium qual.' means 'A level or equivalent' and 'High qual.' means 'degree'.



*Dynamics of low pay and unemployment*

predicted proportions in low pay for the whole sample (including the unemployed). The fact that there has been some wage growth in our sample can be seen by the fall

TABLE 3.4  
**Probabilities of low pay and employment for women in the BHPS**

	1992		1993		1994	
	£3	£4	£3	£4	£3	£4
Sample average	24.0%	45.5%	24.7%	45.3%	23.1%	44.1%
<i>Predicted effects of observed characteristics for whole sample</i>						
35- to 45-year-olds v. under-35s	-17.7%	-20.7%	-18.0%	-21.4%	-19.2%	-23.6%
45- to 55-year-olds v. 35- to 45-year-olds	-3.9%	-5.6%	-3.5%	-5.0%	-3.0%	-4.6%
Low qual. v. no qual.	-18.4%	-20.3%	-14.7%	-16.4%	-17.7%	-19.9%
Medium qual. v. no qual.	-36.8%	-50.4%	-32.0%	-42.9%	-35.7%	-49.5%
High qual. v. no qual.	-41.6%	-64.2%	-38.9%	-59.5%	-40.3%	-62.7%
Prob. employed	65.9%		66.6%		67.0%	
<i>Employed in 1991: conditional on characteristics</i>						
Prob. low-paid	19.1%	39.2%	20.2%	39.5%	18.7%	38.1%
Prob. employed	70.8%		71.3%		71.1%	
<i>Employed in 1991: conditional on characteristics &amp; employment status in 1991</i>						
Prob. low-paid	5.1%	19.8%	4.2%	17.6%	3.4%	15.7%
Prob. employed	90.7%		90.9%		89.1%	
<i>Unemployed in 1991: conditional on characteristics</i>						
Prob. low-paid	34.9%	54.8%	34.9%	56.7%	33.0%	55.8%
Prob. employed	56.3%		57.5%		58.9%	
<i>Unemployed in 1991: conditional on characteristics &amp; employment status in 1991</i>						
Prob. low-paid	26.5%	54.8%	25.5%	53.9%	21.1%	49.9%
Prob. employed	15.4%		16.8%		21.0%	
<i>Not low-paid in 1991: conditional on characteristics</i>						
Prob. low-paid	17.6%	32.9%	18.8%	33.6%	17.4%	32.3%
<i>Not low-paid in 1991: conditional on characteristics &amp; employment status in 1991</i>						
Prob. low-paid	0.2%	1.7%	0.8%	3.5%	0.7%	3.2%
<i>Low-paid in 1991: conditional on characteristics</i>						
Prob. low-paid	31.7%	51.9%	31.9%	51.4%	30.1%	50.2%
<i>Low-paid in 1991: conditional on characteristics &amp; employment status in 1991</i>						
Prob. low-paid	57.7%	68.8%	45.3%	58.4%	39.2%	53.6%

Notes: These probabilities are computed from regression estimates available from the authors on request. Sample is women aged 19-57 inclusive in 1991. 'Low qual.' means 'O level or equivalent', 'Medium qual.' means 'A level or equivalent' and 'High qual.' means 'degree'.

in the predicted proportions in low pay from 1992 to 1994. For example, the predicted proportions of men with potential wages below £4 an hour fall from 6.9 per cent in 1992 to 5.9 per cent in 1994.

The next panel of the tables shows the effect of observable skill characteristics on the probability of being low-paid in 1992, 1993 and 1994. These probabilities are just transformations from the coefficients in the wage equations.

### *Age/Cohort*

The inverse-U-shaped age-earnings profiles are shown strongly. It is suggested that middle-aged men (35- to 45-year-olds) are about 10 percentage points less likely to have wages below £4 an hour than are younger men (19- to 35-year-olds) and about 20 percentage points less likely to have wages below £5 an hour. The difference between the predicted probabilities for older men (45- to 55-year-olds) is less dramatic. For women, the same picture emerges but the differences between the probabilities at £3 and at £4 an hour are much less dramatic.

### *Education*

By far the most important observable determinant of whether we predict someone to have potential wages below the thresholds considered is education. For example, women with degrees are 42 per cent less likely to have wages below £3 an hour and 64 per cent less likely to have wages below £4 an hour in 1992 than women with no qualifications. For men, the differences are less dramatic, which picks up the smaller average probability of being in low pay for men even when the definitions of low pay differ.

*Conditioning on being employed in 1991*

The next panel of the tables looks at the relationship between employment status in 1991 and the probabilities of being low-paid and employed in later years. There are two sets of numbers, in each case relating to probabilities of low pay and unemployment in 1992, in 1993 and in 1994 for the group that was in work in 1991. The first two rows make these predictions conditional *only* on observed characteristics in the relevant year, i.e. 1992, 1993 or 1994. They make no use of the information that the individuals concerned were employed in 1991. The next two rows repeat the same calculations but *conditional* on employment status in 1991 — in other words, using the information that these people were in work in 1991.

In either case, the probability of being low-paid for men is not much different from the probability for the male population as a whole, and the figures do not change much over time. But using the information on employment status in 1991 does make a significant difference to the predicted probability of employment in the future years. Using that information, about 94 per cent were predicted to be in work in 1992. Ignoring it, only 84 per cent were predicted to be in work. In other words, those who are employed in 1991 have a 10 percentage points higher probability of being in work the next year, even given all the other observable characteristics that we have picked up.

The results for women are different inasmuch as conditioning on employment status in 1991 also makes a big difference to the probability of being low-paid in 1992. This difference between men and women is a reflection of the fact that we found no selection bias on wages of unemployment for men but we did for women. There are also fewer men out of work, which means that

### *Persistence of low pay and unemployment*

probabilities for those in work are likely to be close to those for the sample as a whole. In addition, the effect of conditioning on working in the previous year on employment probabilities the next year is greater for women than for men. Ignoring the information on employment status in the previous year, we predict 71 per cent of women to be working the following year. Using it, we predict 91 per cent of them to continue in employment.

#### *Conditioning on being out of work in 1991*

The results conditioning on being out of work in 1991 are shown in the next four rows. Some of the results here are quite dramatic. Of those men unemployed in 1991, we would predict nearly three-quarters to be in work in 1992 if we ignore the information that they were out of work in 1991. If we use that information, we predict fewer than a quarter to be in work in 1992. This is extremely strong evidence of the persistence of unemployment for reasons that we are unable to observe in the data. This degree of persistence is even more marked for women, with unemployment in 1991 almost quartering the probability of observing the same people in employment in 1992. Many individuals seem to be out of work in 1992 either just because they were out of work the year before or because they have a set of characteristics that we cannot observe that make them likely to be out of work. This is extremely important when we come to consider much of the cross-sectional work in this area.

Interestingly, though, using the fact of unemployment in 1991 makes no difference to our predictions of the likelihood of being low-paid (under our definitions) the next year. That is not the same as saying that unemployment in 1991 is unrelated to low pay in 1992

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— we predict nearly twice as many of the unemployed to be offered low-wage employment as of the population as a whole. But this appears to be entirely driven by their characteristics.

### *Conditioning on pay in 1991*

The last two panels in the tables show results for the high-paid and then the low-paid in 1991.

The most interesting results relate to those who were low-paid in 1991. Using just their characteristics, we predict that in 1992 17 per cent of men would be earning less than £4 an hour and 31 per cent less than £5 an hour. These predictions increase to 60 per cent and 68 per cent respectively if we use the information that they were low-paid in 1991. This indicates a massive degree of persistence in low pay that is not associated with observable characteristics.

The results for women are similar except for those who were high-paid in 1991. Not controlling for the fact that we observe them to be in high pay in 1991, we predict 18 per cent of them to be earning less than £3 an hour in 1992 and a third of them to be earning less than £4. But if we condition on their being high-paid, we predict virtually none to be low-paid later on. There is great persistence in both low and high pay for women. To some extent, the greater effects for those starting high-paid reflect the fact that observable characteristics are less good at predicting women's wages than they are at predicting men's.

### **3.3. Conclusions**

The main conclusion of this chapter is that knowledge of pay and employment status in a previous period adds immensely to our chances of predicting pay and employment status in the next period, even given

characteristics. So, much of the correlation over time in low pay that we observed earlier in the report does not result just from the fact that the low-paid are less educated or at either end of the age distribution, for example, but arises also because either they are different in other ways or there is independent persistence in status. Perhaps some people are lucky or unlucky, perhaps people of equal ability get 'stuck' in particular places, perhaps unobservable characteristics such as motivation are of overwhelming importance.

In any case, these results chime in well with previous findings that, even within age-groups and education groups, for example, there is a good deal of inequality that is not easily explained. This inequality appears to be persistent, at least over the four years of our data, and not a result of measurement error or of people of similar apparent characteristics moving up and down the earnings distribution from year to year. When we come to think about estimating 'permanent' incomes, this type of information is of central importance.

## **CHAPTER 4**

### **Returns to Experience and Tenure**

One of the most important issues in understanding wage distributions and the extent of low-pay mobility is an understanding of the growth of wages as experience in the labour market increases and as tenure in any particular job rises. In this chapter, we use data from the BHPS job histories to estimate the returns to labour market experience and job tenure.<sup>12</sup>

The returns to extra years of work experience and job tenure are estimated for men and women with different levels of qualifications. We carefully differentiate between jobs that immediately followed a previous job ('second jobs', as we call them) and jobs that followed a period out of work ('entry jobs'). Using these estimated returns and information on wage levels, we predict average wage levels and the proportion of workers in low pay at selected combinations of tenure and experience for different groups of workers. Using additional information on observed lengths of job tenure, we can then estimate the proportion of workers who will remain in their job long enough to move out of low pay.

We use data on all wage observations with complete information on job tenure, employment experience and education level. Students and the self-employed are excluded. In addition to the labour market experience for the previous year recorded at each wave of the

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<sup>12</sup>In this report, we concentrate on the essentials of the model and the main results. The details of the econometric techniques and the regression results underlying the figures presented here are published in Paull (1997).

BHPS, we use the lifetime employment experience data collected at Wave 3, which contains information on all job periods that each individual has experienced since entering the labour market. Those workers who remain in the same job between waves provide information on within-job wage growth.

It is worth mentioning at this point that the derivation of a job tenure variable created two problems. First, the starting date for each job requested in the wave data is for the last job change within employer or for the date of employer change, which truncates the measure of employer tenure. However, the starting date in the lifetime history is the date of the employer change that is used to measure tenure by matching the spells into the wave data. Second, spells may overlap across waves, generating inconsistencies both in employment status reported for the time of interview and in employment starting dates. This problem was addressed using the principle that the closer report is considered the more accurate.

An indication of the raw returns for men and women by qualification group is provided in Table 4.1. Throughout the chapter, wages are indexed both to the average price level and to a group-specific average wage, so that wage growth reflects the pure effect of one worker having more years of experience or tenure over another. The table shows the average percentage return

TABLE 4.1  
Mean annual within-job wage growth

	<i>Per cent</i>	
	<i>Men</i>	<i>Women</i>
Qualification 1: No qualifications	1.43	0.25
Qualification 2: Only school qualifications	2.53	0.74
Qualification 3: Other post-school qualifications	1.64	3.49
Qualification 4: College qualifications	2.94	4.30



to an additional year in the same job, which combines the effects of an additional year of experience and an additional year of job tenure. The return rises with qualification, ranging from 1.4 per cent for men with no qualifications to 2.9 per cent for college-educated men and from 0.3 per cent for women with no qualifications to 4.3 per cent for college-educated women.

#### **4.1. Estimates of the Returns to Experience and Tenure**

##### **4.1.1. Methodology**

It is hypothesised that wages grow with general employment experience both because workers accumulate work skills that enhance their productivity and because they gradually find better job matches — that is, positions and occupations where they can be most productive. In addition, wages are argued to grow with job tenure, either through the accumulation of job-specific skills or because job contracts are designed to encourage workers to remain with the employer for such reasons as reducing staff turnover costs.

It is not possible to use a straightforward wage equation to estimate the returns to tenure and experience. The problem is that individuals who earn more may also have a tendency to remain longer with the same employer for reasons that cannot be seen in the data. Indeed, research in the US has shown that workers who stay longer tend to earn more in every year with that employer.<sup>13</sup> Hence, high tenure and high wages may be associated, but the first may not cause the latter. The question of interest is how wages grow with tenure for each individual worker, which means we must take out

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<sup>13</sup>See Abraham and Farber (1987).

the effects of the unobserved characteristics that affect both wages and tenure.

The approach used is a two-step method developed in Topel (1991). The first step uses information on wage changes for workers who remain in the same job between two waves. Rather than computing a simple regression of wage level on tenure and experience levels, the change in wages is regressed on the change in experience and tenure. Hence, the unobserved individual element is constant and the estimated wage change reflects the benefit of an additional year of tenure for an individual rather than the spurious association between high earners and those having long tenure. However, since the change in tenure and change in experience are identical, it is not possible to separately identify their effects, and the combined return is a measure of both the effects of accumulating general skills and the effects of rising job tenure.

The second step uses the data for all wage observations. We calculate a kind of 'starting wage' for each job in the data by subtracting the estimated growth during the current job from each wage observation and averaging over all wage observations for each job. This 'starting wage' is then regressed on the experience level at the start of the job<sup>14</sup> to produce an estimate of the return to experience that reflects both the accumulation of general skills and improvements in job match from moving employers. The difference in returns from the first and second steps therefore shows the relative advantage of remaining in the same job and is called the 'return to tenure'.

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<sup>14</sup>Since starting experience is inversely related to current job tenure and may therefore be negatively related to the unobserved individual characteristics influencing both wages and tenure, it is instrumented with total experience for men and potential experience for women.

In order to complete the picture of wage profiles over the working life, we also predict a wage at the time of initial labour market entry by subtracting the estimated growth in wages over the working life from the average wage for each job. This initial wage is termed the 'base wage'.

**4.1.2. Results**

Table 4.2 presents the estimates of the average base wage for each group, together with a summary of the growth rates. The growth rates are presented as the returns accumulated over the first 10 years in order to include the effects of higher-order terms. The starting

TABLE 4.2  
Wage profile parameters

	Entry jobs		Second jobs	
	Men	Women	Men	Women
<b>Qualification 1</b>				
Base wage	£3.25	£3.42	£3.51	£3.73
<i>Percentage growth after 10 years</i>				
Starting wage	46.7%	13.8%	50.7%	9.8%
Within-job	68.1%	10.8%	56.4%	21.5%
Return to tenure	21.4%	-3.0%	5.7%	11.7%
<b>Qualification 2</b>				
Base wage	£3.70	£3.62	£3.55	£4.34
<i>Percentage growth after 10 years</i>				
Starting wage	54.7%	25.8%	60.7%	12.8%
Within-job	51.3%	12.6%	65.6%	21.9%
Return to tenure	-3.4%	-13.2%	4.9%	9.1%
<b>Qualification 3</b>				
Base wage	£5.04	£4.52	£5.20	£5.28
<i>Percentage growth after 10 years</i>				
Starting wage	42.7%	13.8%	49.7%	3.8%
Within-job	72.2%	38.7%	51.9%	53.5%
Return to tenure	29.5%	24.9%	2.2%	49.7%
<b>Qualification 4</b>				
Base wage	£6.64	£6.00	£6.19	£7.06
<i>Percentage growth after 10 years</i>				
Starting wage	36.7%	9.8%	58.7%	9.8%
Within-job	60.6%	39.9%	60.5%	63.0%
Return to tenure	23.9%	30.1%	1.9%	53.2%

wage growth reflects the returns to experience and improved job match. So the 46.7 per cent figure indicates that a man in the lowest qualification group can expect to see his job starting wage rise by 46.7 per cent in the first 10 years as a result of his work experience and improved job match. The next figure down indicates the expected wage increase from the first 10 years in the same job of 68.1 per cent, which includes the effects of general experience and tenure gained in the job. The third figure is the difference between the first two and shows the gains arising from remaining in the same job throughout the first 10 years in the labour market.

Qualification level is most important in determining the base wage level, with the average base wage being almost double for the college-educated over those with no qualifications, in all cases. For men, it ranges between £3.25 for those with no qualifications to £6.64 for the college-educated in entry jobs. For women, the lowest average base wage is £3.42 for those with no qualifications in entry jobs and the highest is £7.06 for the college-educated in second jobs. Even though the percentage growth rates do not generally rise with qualification for men, the rising base wage implies higher absolute growth with experience and tenure for the more-highly-qualified. For women, within-job wage growth rises dramatically with qualification, implying increasing dispersion in wage levels between the groups as tenure increases.

Average base wages exhibit no particular advantage to men or women, but the estimated growth rates differ considerably between men and women. The accumulated growth in starting wages over 10 years of experience is around 40 to 60 per cent for men, but a meagre 4 to 25 per cent for women. The gender difference may reflect the nature of occupational choice,

with men choosing career areas where the returns to general human capital are greater. It may also indicate a wider distribution of job-match quality for men, yielding higher returns to improvements in job-match quality over time. Alternatively, the much lower growth in the returns to general human capital for women may be a consequence of the greater propensity of female workers to spend time out of employment during their careers, leading to a deterioration in general skills. Of course, some of the difference might relate to discrimination in the labour market becoming evident as people progress through the labour market.

Within-job wage growth is also much higher for men than for women. Men of all qualification levels who remain in the same job for 10 years can expect to accumulate around 50 to 70 per cent growth in their wages. Women in the lowest two qualification groups will accumulate only 10 to 20 per cent growth over the same period, although those with qualifications above school level can expect to see their wages rise by 40 to 60 per cent over 10 years. For most groups of men, the low returns to tenure suggest that increasing general human capital plays the major role in generating within-job wage growth. Indeed, the highest estimate of the accumulated return to 10 years of tenure is 30 per cent, while the figure is much lower for many groups. For most groups of women, the return to tenure is much more important. For women with higher levels of qualification, tenure is the main source of growth, reaching an accumulated return over 10 years of over 50 per cent for the college-educated in second jobs. This indicates that highly-qualified women are most likely to be in occupations where job-specific human capital is important or where job contracts have steep wage profiles.

The accumulated return to tenure can be compared with estimates for men produced in previous studies. The lower bound on the accumulated return to 10 years of tenure ranges from basically zero per cent to 30 per cent, although none of the estimates is significantly different from zero. This compares with estimates of 6.6 per cent (Altonji and Shakotko, 1987) and 22 per cent (instrumental variable estimate in Topel (1991)) for men in the US.

The differences between entry and second jobs produce a complex picture of their comparative advantages. Nevertheless, Table 4.2 indicates that second jobs generally offer higher average base wages and growth. Possible explanations include time out of employment leading to a deterioration of work skills or potential employers interpreting time out as a sign of poor ability. Alternatively, a gap between jobs may be an indication of an involuntary move, with the worker being fired from the previous job rather than quitting for a better job offer.

#### **4.2. Average Wages**

A more complete picture of wage dynamics must combine the effects of the base wage levels with the growth rates. Table 4.3 presents the predicted wages at various combinations of total experience and current tenure, using the base wages and growth rates estimated above for each group. Naturally, there are an infinite number of results that could be shown, but we choose an illustrative subset which gives a good indication of the general results.

As an example of how to read the table, consider a male worker with no qualifications and 10 years of experience (qualification 1, Exp = 10). The average

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TABLE 4.3  
Simulated average wage levels

Exp <sup>a</sup>	Ten <sup>b</sup>	Entry jobs		Second jobs	
		Men	Women	Men	Women
<i>Qualification 1</i>					
0	0	3.25	3.42	—	—
5	0	4.55	3.76	5.01	4.01
5	5	5.07	3.78	—	—
10	0	5.19	3.93	5.83	4.11
10	5	5.78	3.94	6.00	4.44
10	10	6.43	3.82	—	—
20	0	4.94	3.94	5.77	3.96
20	10	6.12	3.82	6.11	4.45
20	15	6.82	3.57	6.29	4.46
20	20	7.59	3.21	—	—
<i>Qualification 2</i>					
0	0	3.70	3.62	—	—
5	0	5.39	4.22	5.34	4.75
5	5	5.30	4.03	—	—
10	0	6.39	4.68	6.52	4.93
10	5	6.28	4.47	6.68	5.26
10	10	6.17	4.10	—	—
20	0	6.59	5.29	7.14	4.89
20	10	6.37	4.64	7.50	5.36
20	15	6.26	4.11	7.69	5.31
20	20	6.15	3.51	—	—
<i>Qualification 3</i>					
0	0	5.04	4.52	—	—
5	0	6.91	4.97	7.39	5.52
5	5	8.01	5.73	—	—
10	0	7.72	5.19	8.54	5.48
10	5	8.95	5.99	8.64	7.16
10	10	10.37	6.66	—	—
20	0	7.06	5.20	8.38	4.97
20	10	9.48	6.67	8.56	8.17
20	15	10.99	7.15	8.66	9.92
20	20	12.74	7.40	—	—
<i>Qualification 4</i>					
0	0	6.64	6.00	—	—
5	0	8.84	6.46	9.20	7.60
5	5	9.97	7.64	—	—
10	0	9.58	6.61	11.13	7.78
10	5	10.80	7.83	11.23	10.34
10	10	12.18	8.93	—	—
20	0	8.25	6.37	11.94	7.49
20	10	10.49	8.60	12.16	12.75
20	15	11.82	9.46	12.28	15.75
20	20	13.32	10.05	—	—

<sup>a</sup>Exp = total experience.

<sup>b</sup>Ten = current tenure.

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hourly wage is £6.43 if he has been in the same job for the entire 10 years (Ten = 10) and £5.19 if he has just moved jobs with a gap in employment (Ten = 0, entry job). Alternatively, he will earn an average £5.83 per hour if he has just made a job-to-job move (Ten = 0, second job) or £6.00 if he made a job-to-job move five years ago (Ten = 5, second job).

As expected, the table shows that average wages rise with experience and with qualification level. In addition, average wages increase with current job tenure for any given level of total employment experience. For example, an unqualified male worker with total experience of 20 years earns an average £4.94 an hour if he has just started an entry job, but £7.59 if he has accumulated 20 years of job tenure. A college-educated woman with total experience of 20 years earns £6.37 an hour if she has just started an entry job, but £10.05 if she has 20 years of job tenure. The only cases where tenure is not beneficial are for men with only school qualifications (qualification 2) in entry jobs and for women in the lowest two qualification groups in entry jobs.

Men and women in the lowest two qualification groups experience very similar average wages upon labour market entry (Exp = 0, Ten = 0). However, men experience much more rapid growth in their average wage as experience increases. Wage growth is especially low for women with no qualifications, regardless of their tenure accumulation. Moving jobs, with time out or through job-to-job moves, is more important for women than for men in raising the average wage. In the highest two qualification groups, men have higher average wages upon labour market entry than women and experience much more rapid growth, especially in entry jobs. Women fare relatively better in second jobs,



but maintaining job tenure is very important for average wage increases.

A comparison of entry and second jobs shows that time out of employment has very different effects for men and women. Male workers generally command the highest average wage in entry jobs with long tenure, but are better off in second jobs than entry jobs if they do move employers. One exception to this is workers with only school qualifications (qualification 2), for whom second jobs are always better, suggesting that employment following time out is permanently worse than that following job-to-job moves. A second exception is the mixed bag of workers with other further qualifications (qualification 3), for whom entry jobs are often better, possibly because off-the-job search may be unusually beneficial for these types of occupations. On the other hand, female workers nearly always command higher average wages in second jobs than entry jobs, suggesting that time out is generally detrimental to employment prospects, both in job starting wage and wage growth with tenure.

### **4.3. Proportions in Low Pay**

In this section, we focus on the lower end of the wage distribution by considering the proportion of individuals below an arbitrarily defined low-wage cut-off point. This cut-off is defined for both men and women as half overall median wages, or £2.81 an hour. This is a particularly low cut-off for men, but when separate cut-offs for men and women were considered, the qualitative results were just the same except that, obviously, rather more men at any experience or qualification level were in low pay. Since wages and the returns to tenure and experience are indexed for real

>Returns to experience and tenure

TABLE 4.4  
Simulated percentage in low pay

Exp <sup>a</sup>	Ten <sup>b</sup>	Entry jobs		Second jobs	
		Men	Women	Men	Women
<i>Qualification 1</i>					
0	0	41.1	35.2	—	—
5	0	13.7	25.3	7.2	21.1
5	5	10.5	24.7	—	—
10	0	10.0	21.0	3.8	18.7
10	5	6.8	21.0	3.8	13.5
10	10	5.5	23.7	—	—
20	0	11.9	21.0	3.4	23.1
20	10	5.5	23.1	3.8	13.5
20	15	4.6	30.0	3.8	13.5
20	20	3.7	45.4	—	—
<i>Qualification 2</i>					
0	0	33.3	35.0	—	—
5	0	11.6	22.0	7.7	10.4
5	5	12.2	25.6	—	—
10	0	6.7	13.0	4.2	8.2
10	5	7.4	17.5	4.0	6.4
10	10	7.6	24.2	—	—
20	0	6.3	8.6	3.5	6.2
20	10	6.7	13.8	2.9	6.0
20	15	7.5	24.0	2.7	8.5
20	20	7.6	38.2	—	—
<i>Qualification 3</i>					
0	0	15.8	20.6	—	—
5	0	4.7	14.5	2.7	9.8
5	5	3.4	9.2	—	—
10	0	3.4	13.2	1.6	9.8
10	5	3.0	7.2	1.6	3.4
10	10	2.4	3.9	—	—
20	0	3.7	13.2	1.6	14.6
20	10	2.7	3.9	1.6	2.2
20	15	1.7	3.1	1.6	1.7
20	20	0.7	2.4	—	—
<i>Qualification 4</i>					
0	0	3.4	7.6	—	—
5	0	1.7	4.9	1.5	1.3
5	5	1.7	3.3	—	—
10	0	1.7	4.3	1.0	1.3
10	5	1.7	3.3	1.0	0.7
10	10	0.6	2.2	—	—
20	0	2.3	5.4	0.5	1.3
20	10	1.7	3.3	0.5	0.7
20	15	0.6	2.2	0.5	0.7
20	20	0.6	1.6	—	—

<sup>a</sup>Exp = total experience.

<sup>b</sup>Ten = current tenure.

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wage growth, these cut-off points illustrate how a worker's position in the wage distribution may change with tenure and experience.

The proportions in low pay using this half median earnings cut-off are presented in Table 4.4. This should be read in just the same way as Table 4.3, except that the figures refer to the proportion of the group in low pay rather than to average wage levels.

The estimated proportions in low pay at labour market entry are 41 per cent and 33 per cent for men in the lowest two qualification groups, and about 35 per cent for their female counterparts. These proportions fall to 16 per cent and 21 per cent for men and women respectively in the third qualification group and are just 3 per cent and 8 per cent respectively for men and women with college qualifications.<sup>15</sup>

This suggests that low pay will affect a substantial proportion of low-qualified workers at the start of their working lives. However, it is also striking how rapidly the fractions in low pay decline with experience. At 10 years of experience, only a small proportion of men remain in low pay, even for the lowest-qualified workers. The decline is less dramatic for women, but the probability of low pay still drops considerably for more-highly-qualified women. Nevertheless, the fraction of women in low pay is still some two or three times the fraction of men for anything beyond initial experience levels. In addition, women generally face a higher risk of low pay when moving jobs, whether with or without time out. These results reconfirm the previous findings

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<sup>15</sup>Were we to use a gender-specific 10th percentile cut-off for men, of about £3.60 an hour, the proportions in low pay in the bottom qualification groups would be very much higher — 71 per cent and 59 per cent respectively at labour market commencement. For women, the gender-specific 10th percentile cut-off happens to equal the common half median measure presented.

that the higher wage growth experienced by men means that low pay exhibits less persistence for men than for women.

Although job tenure has been shown to be important for raising average wages, Table 4.4 shows that it does not have such a great impact on the lower end of the wage distribution in reducing the proportion in low pay. Indeed, for low-qualified women in entry jobs, job moves appear to be more beneficial than the accumulation of job tenure. Only for higher-qualified women does tenure appear to have a significant role in reducing the likelihood of low pay.

The figures do suggest, however, that a very important factor for reducing the probability of low pay is the movement from an entry job to a second job. For example, women with no qualifications, 20 years of experience and 15 years of tenure face a 30 per cent probability of low pay if in an entry job compared with a 14 per cent probability if in a second job. It is noteworthy that large differences remain, even at high levels of tenure, emphasising again that the relative disadvantages of entry jobs extend beyond initial pay levels.

#### **4.4. Job Tenure**

These wage profiles provide a picture of the likelihood of moving out of low pay for each group, conditional on remaining in a job for a given amount of time. The expected duration of a job is critical in determining whether workers are likely to remain sufficiently long in a particular job to make the transition out of low pay. In this section, the wage profiles are combined with information on job tenure at different starting experience levels for each group to derive a measure of the

proportion of workers who will still be in low pay at the conclusion of a job.

A number of different methods could be used to estimate completed job duration from observed current job tenure. Here, we use the most straightforward approach of calculating completed job duration as twice current job tenure, on the basis that workers are halfway through their jobs on average. The wage at the time of expected completed job duration was then estimated for each job and the proportion of workers below the low-pay cut-off was calculated.

Table 4.5 presents the mean levels of expected job durations for each of four categories of starting experience. Some of the cell sizes are small and the conclusions drawn from the estimates should be treated with due caution. The expected duration exhibits a slight

TABLE 4.5  
Expected completed job duration

Starting experience	<i>Mean duration in years [Number of observations]</i>							
	Entry jobs				Second jobs			
	Men		Women		Men		Women	
<i>Qualification 1</i>								
0-4 years	20.2	[80]	11.7	[84]	23.3	[31]	16.9	[15]
5-9 years	16.5	[21]	16.6	[95]	32.4	[34]	15.5	[27]
10-19 years	11.8	[33]	12.9	[117]	20.9	[68]	11.8	[115]
20 years and over	6.9	[85]	5.7	[76]	13.2	[103]	9.6	[94]
<i>Qualification 2</i>								
0-4 years	9.5	[447]	6.4	[367]	13.5	[171]	7.7	[173]
5-9 years	7.1	[77]	8.1	[171]	15.1	[130]	7.2	[163]
10-19 years	8.2	[63]	7.2	[163]	11.2	[157]	7.5	[203]
20 years and over	5.4	[67]	6.1	[40]	8.8	[90]	6.8	[58]
<i>Qualification 3</i>								
0-4 years	14.3	[149]	8.7	[168]	16.0	[69]	9.4	[87]
5-9 years	8.0	[34]	12.3	[89]	20.0	[88]	6.4	[114]
10-19 years	11.8	[45]	8.8	[137]	14.5	[142]	7.4	[138]
20 years and over	6.2	[69]	4.8	[62]	9.4	[142]	7.5	[78]
<i>Qualification 4</i>								
0-4 years	10.1	[124]	6.4	[97]	11.2	[69]	8.7	[51]
5-9 years	12.6	[16]	6.3	[52]	8.8	[55]	5.1	[43]
10-19 years	7.7	[24]	6.2	[22]	9.1	[51]	6.4	[44]
20 years and over	9.3	[10]	4.6	[13]	5.5	[24]	7.0	[12]

tendency to rise as starting experience initially increases, but then generally declines with starting experience. Not surprisingly, women exhibit considerably shorter job tenures across all qualifications and job types, and second jobs tend to last longer than entry jobs.

Table 4.6 shows the proportion of workers in each starting experience category who are expected to be in low pay when the job concludes. The observed patterns arise from the dual forces of the speed of exit from low pay in a given job and the expected job duration.

For many groups of workers, the probability of failing to reach high pay before leaving the job initially falls with starting experience, as the returns to experience rise rapidly and expected tenure lengthens. For example, 19 per cent of men with only school qualifications are likely to be in low pay when the job

TABLE 4.6

**Simulated percentage remaining in low pay for expected job duration**

Starting experience	Entry jobs		Second jobs	
	Men	Women	Men	Women
<i>Qualification 1</i>				
0-4 years	13.8	42.9	9.7	33.3
5-9 years	14.3	28.4	11.8	14.8
10-19 years	9.1	21.4	14.7	12.2
20 years and over	12.9	28.9	7.8	10.6
<i>Qualification 2</i>				
0-4 years	18.6	24.8	10.5	12.2
5-9 years	3.9	17.5	3.8	6.1
10-19 years	0.0	8.6	3.2	7.9
20 years and over	3.0	7.5	3.3	5.2
<i>Qualification 3</i>				
0-4 years	6.0	11.3	5.8	4.6
5-9 years	8.8	5.6	4.5	2.6
10-19 years	2.2	8.0	0.7	3.6
20 years and over	5.8	6.5	3.5	7.7
<i>Qualification 4</i>				
0-4 years	1.6	3.1	4.3	0.0
5-9 years	0.0	3.8	0.0	2.3
10-19 years	4.2	0.0	2.0	0.0
20 years and over	10.0	7.7	0.0	0.0

terminates if they begin with four years or less of starting experience in an entry job, compared with 4 per cent or less for those with more than four years of experience at the time the job starts.

The probability of escaping from low pay rises with qualification, due mostly to higher pay levels rather than longer job durations. This is most marked for women. For example, women making job-to-job moves with 10 to 19 years of experience have a 12 per cent probability of remaining low-paid for the entire job duration if they have no qualifications, but this figure falls to 8 per cent for those with school qualifications and to 4 per cent for those in the third qualification group.

We should not be surprised to find that the probability of still being in low pay at the conclusion of a job is considerably higher for women than for men. Shorter expected job durations for women serve to make low pay even more likely relative to men with the same qualifications and starting experience.

Finally, longer job durations and higher wage levels combine to make it generally less likely that those in second jobs will be in low pay at the end of the job than those in entry jobs. For example, of women with school qualifications making job moves with five to nine years of experience, 17 per cent will still be in low pay at the end of an entry job compared with only 6 per cent at the end of a second job.

#### **4.5. Conclusions**

The overriding conclusion from this analysis of low pay is that the accumulation of job tenure and work experience plays a major role in reducing the probability of being low-paid, especially for men. Indeed, the returns to general employment experience are adequate to move most workers up the pay distribution quite

quickly. However, the results also highlight the diversity in wage profiles across qualification group and gender.

Average wages grow with general employment experience and also rise with job tenure. Qualification level has greatest impact on the average wage at the time of labour market entry, but highly-qualified women also enjoy higher wage growth than their less-qualified counterparts. Men and women have similar average wages upon labour market entry, but men experience much more rapid growth. This may be due to greater benefits for men in accumulating general experience or improving job match. Alternatively, it may reflect a deterioration in general skills for women who have a greater propensity to spend time out of the labour force, or it may result from gender discrimination. Second jobs generate higher average wages than entry jobs, possibly due to the actual or perceived deterioration of skills during time out of employment or time out being an indication of an involuntary job move.

A large proportion of workers experience low pay upon labour market entry, especially those in the lowest two qualification groups. However, with the exception of low-qualified women, the likelihood of low pay declines rapidly within the first 10 years of labour market experience. Although similar proportions of men and women are in low pay at the time of labour market entry, a much higher fraction of women are below the low-pay cut-off at higher levels of experience than men. Maintaining job tenure is especially important for highly-qualified women to reduce the likelihood of low pay, possibly due to the accumulation of job-specific skills or to the types of job contract for this group. Finally, movement into second jobs is very important for reducing the proportion in low pay, even at high levels of tenure, highlighting the need to ensure the attainment



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of 'good' jobs for those who spend time out of employment.

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