CHAPTER 2

Earnings mobility: taking a longer run view

A. INTRODUCTION AND MAIN FINDINGS

1. Introduction

Some workers earn more than others and these differences sometimes raise important analytical and policy issues. Sound policy advice requires, however, that earnings differences are appropriately measured and interpreted. Typically, earnings are measured over a year but this snapshot provides an incomplete picture. When their earnings are computed in any given year, most workers are in the midst of an extended career. Their labour market situation can be better understood if information about their past and future earnings is also brought into the picture.

A longer-run view is useful because workers' earnings change over time. Accordingly, and following analysis in the 1996 *Employment Outlook*, earnings *mobility* is the focus in this chapter. Last year's empirical work led to three tentative stylised facts. First, earnings mobility is substantial in all countries; about one half of all workers move at least one quintile *up* or *down* the earnings distribution over a five-year period. Second, the degree of relative mobility seems similar across countries. Countries with higher cross-sectional inequality do not appear to have higher relative earnings mobility, so that comparisons of earnings inequality at a point-in-time may provide a useful indication of the differences in life-time earnings inequality. Finally, the movement into and out of low-paid jobs suggests that low-paid employment cannot be simply characterised either as a stepping-stone into a more stable and higher-paid career or as a permanent trap.

This chapter revisits the last two of these tentative stylised facts in an attempt to pin them down more precisely. The extent to which earnings mobility reduces the earnings inequality observed in a single year is more precisely and rigorously quantified. Similarly, a more complete analysis is undertaken of the incidence, persistence and recurrence of low-paid employment. This chapter also analyses several new issues that emerge when attention shifts from *relative* earnings mobility to *absolute* changes in workers' real earnings. In examining workers' real earnings paths, an attempt is made to differentiate between earnings changes that reflect predictable "career" trajectories, such as the tendency for earnings to rise with age, and more idiosyncratic and potentially unpredictable changes, such as the earnings losses experienced by many displaced workers.

The empirical analysis requires longitudinal data that track individual earnings histories, but they are neither widely available nor easy to use. As a result, the detailed mobility analysis is restricted to the period 1986 to 1991 and just six countries: Denmark, France, Germany, Italy, the United Kingdom and the United States.[1] When possible, however, results for other countries and recent trends in mobility are also discussed, including whether the strong rise since the late 1970s in earnings inequality in several OECD countries has been mitigated by increased earnings mobility.

A difficult issue that arises in any analysis of earnings mobility is how to incorporate workers with different levels of employment intensity in terms of weekly hours worked or continuous versus intermittent employment (a fuller discussion of this issue, as well as a summary of data sources and definitions, is provided in Annex 2.A). As in the 1996 *Employment Outlook*, emphasis is placed on changes in the weekly or monthly earnings of *full-time* wage and salary workers, which can be interpreted as a measure of wage-rate mobility since this measure is approximately standardised for the number of hours worked. Calculations were also performed using the *annual* earnings of full- and part-time workers.[2] In general, the results are similar for the two sets of calculations, but some important exceptions are noted. Part-time workers ideally should be included in the analysis of *wage-rate* mobility, but reliable information on their hours worked, which would be required to calculate a wage rate for them, generally is not available. Indeed, it might also be desirable to include non-employed members of the working-age population in the analysis, particularly those moving between non-employment and employment, but it is very difficult to estimate potential earnings for these workers. Since intermittent workers are of great importance for understanding policy issues related to low-paid employment, workers moving between low pay and "no pay" are briefly analysed for Germany and the United States, for

which the necessary data are available. However, no attempt is made to impute potential earnings for workers in years in which they were not employed.

Earnings mobility is complex because earnings change for many reasons and these changes can have very different implications for economic welfare. This chapter poses different questions about the level and effect of mobility, and each is best addressed using different measures of mobility. One of the conclusions is the importance of specifying exactly what type of mobility is pertinent when assessing policy choices or making international comparisons, and then using the most appropriate measure to address the issue in question.

Section B analyses the extent to which *relative* earnings mobility reduces longer-run inequality. The *quintile* transition probabilities used in the 1996 *Employment Outlook* suggested overall similarity across countries in the extent to which workers at different positions in the earnings distribution in an initial year change positions over the next five years and, hence, tend to have more equal earnings over the entire period than in any single year. The methods adopted this year provide more precise comparisons of cross-country differences in the equalising impact of mobility. The overall reduction in inequality is also decomposed into the share due to changes in the relative earnings of groups of workers who differ by age and other characteristics that affect earnings (between-group mobility), and the share due to changes in the relative earnings of workers with the same characteristics (within-group mobility).

The "dynamics" of low-paid employment, a topic of particular policy importance, is discussed in Section C. The questions addressed include: How large a share of workers in low-paid employment in a single year remain so for an extended period of time? Of those escaping low-paid employment, how many subsequently fall back into it? How much total time do workers spend in low pay? What individual characteristics and events most improve the odds of making a sustained escape from low-paid employment?

Attention shifts to *absolute* changes in workers' real earnings in Section D. Average real earnings growth rates are compared, both across countries and across groups of workers defined by age, education and other characteristics. The large dispersion of individual earnings growth rates around these averages is also analysed. The shares of workers experiencing real earnings declines or very large increases are presented as indicators of earnings volatility, useful for assessing labour market and income support policies. The chapter concludes with a brief summary of results and a discussion of policy implications.

2. Main findings

In all of the countries analysed, relative earnings mobility is substantial and cross-sectional inequality overstates longer-run inequality. Inequality averaged over the entire 1986-1991 period is 4 to 30 per cent lower than in any single year; these estimates understate lifetime mobility because they are restricted to a six-year period. The extent to which inequality is reduced depends on the choice of inequality index, because mobility is not uniformly equalising at all points in the earnings distribution. Country rankings with respect to how much mobility reduces inequality also depend on the inequality index used. Evidence on changes in relative mobility over time is thin, but suggests considerable stability. Life-time earnings inequality has probably risen in the United Kingdom, the United States and, perhaps, in other OECD countries that have seen substantial increases in cross-sectional earnings inequality. Much earnings inequality and mobility occurs among workers with similar characteristics (gender, age and education), rather than between these groups. The importance of within-group mobility may reflect a significant degree of unpredictable volatility in individual earnings.

Chronic low pay is quite common, despite most low-pay spells being short. The decline in the probability of upward mobility as a low-pay spell lengthens, plus *multiple* spells of low pay, are important explanations for this seemingly paradoxical finding. When low pay is defined as less than two-thirds of median earnings, low-paid workers in 1986 averaged from just under two years of low-paid employment over 1986 to 1991 in Denmark, to just over four years in the United Kingdom and the United States. Upward mobility rates are further lowered when workers moving between low pay and no pay are also considered. Which workers are most at risk of low-paid employment varies with the time period considered and the degree of persistence used to define low pay. Youth, not surprisingly, are among the most likely groups to experience at least one year of low pay, but older workers are often more vulnerable to being persistently low paid. Women and workers with low educational attainment are also at high risk of low pay in a single year and are even more heavily represented among the persistently low paid.

Average absolute mobility, measured as the percentage growth in real earnings during 1986-1991, differs markedly across the six countries considered. Average earnings of continuously employed workers grew most strongly in the United Kingdom, followed by Germany and Italy. There is also considerable diversity across groups. In all countries, youths and job changers have above-average earnings gains,

but other patterns vary greatly, *e.g.* the least educated workers had the largest gains in Germany, but the smallest in the United States. Individuals' real earnings paths fan out widely around the average in all countries, but particularly so in the Unites States. The variability across individual workers includes falling real earnings for a significant number, despite the tendency for earnings to rise with experience. The share of workers with real earnings reductions ranged from 6 per cent in Germany to 29 per cent in the United States.

B. EARNINGS MOBILITY AND EARNINGS INEQUALITY

1. Introduction

Although earnings inequality is most easily measured at a point in time, it is also important to analyse earnings differences over a longer period. This perspective is particularly important for assessing the equity effects of policies designed to increase labour and product market flexibility [OECD (1997)]. Some of the policies proposed to encourage more job creation, such as relaxing legislated or negotiated minimum wage standards, appear likely to increase wage dispersion, at least initially. It may not follow, however, that life-time earnings inequality will increase. Such policies may result in more dynamic labour and product markets, in which low-paid workers not only have a greater chance to gain a foothold in the labour market, but also have better opportunities to move up the earnings distribution. The six countries analysed differ considerably in terms of the nature and extent of labour and product market regulations, thereby providing a good test of the "equalising" effects of mobility.

In this section, the extent to which earnings mobility reduces long-run inequality below that measured at a point-in-time is quantified. The overall effect is also decomposed into the share due to changes in the relative earnings of workers who differ by age and other characteristics that affect earnings (called "between-group" mobility) and to changes in the relative earnings of workers with the same characteristics (called "within-group" mobility). Even if the *total* reduction in inequality due to mobility is similar for two countries, the level of earnings insecurity is likely to be higher in the country where within-group mobility is a relatively more important factor, since this form of earning mobility, by its nature, tends to be less predictable.[3]

2. Overall equalisation

The analytical framework developed by Shorrocks (1978) is used to quantify the extent to which earnings mobility reduces inequality measured over several years below that in a single year. Several comments about this methodology are in order (see Annex 2.B for a technical explanation). Most important, these calculations only provide a tentative and incomplete answer to the question posed. Because the available data only cover six years, the full equalising effect of mobility over the working lifetime is not captured. It is understated, as only a modest share of age-related differences in earnings "average out" in such a short period.[4] In another sense the equalising effects of mobility are overstated. Averaging workers' earnings over an extended period assumes that they are able to maintain a living standard based on a complete or near-complete "smoothing" of their earnings, no matter how volatile their earnings paths may be. Because it assumes that a stable earnings path provides the same welfare as a widely and, perhaps, unpredictably fluctuating path with the same average earnings, this is clearly an upper-bound estimate of how much mobility reduces inequality in the standard of living that can be supported out of earnings.[5] It is not possible to assess the quantitative importance of these two factors. The reductions in inequality reported here may, accordingly, be either too high or too low.

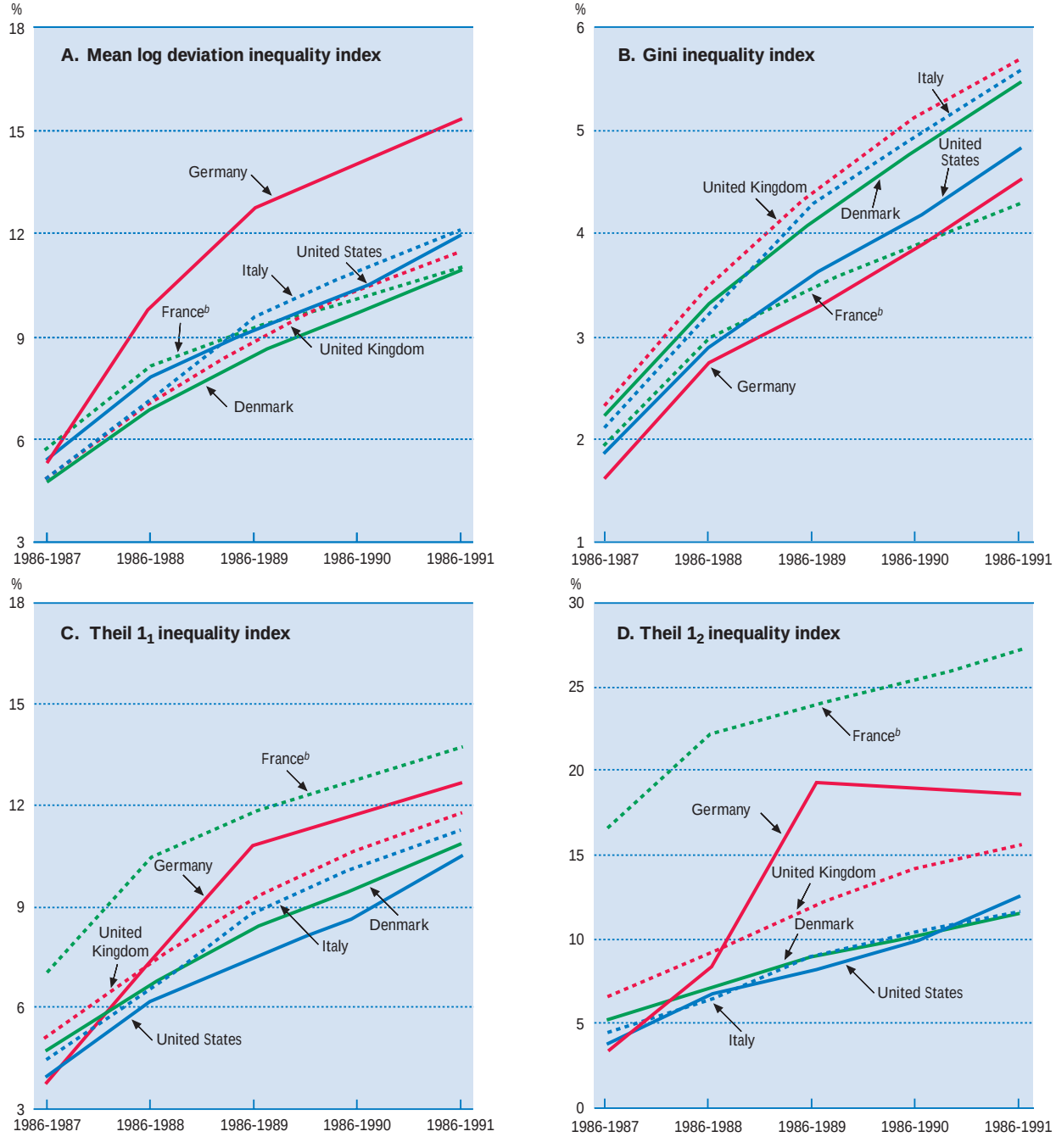
The Shorrocks' estimate is shown in Chart 2.1 as the percentage reduction in inequality when four different indices of earnings inequality are used (for details, see Annex 2.B). A value of zero indicates no equalising effect from mobility because earnings averaged over a multi-year period are no more equally distributed than earnings in a single year. If time-averaged earnings are the same for all workers, mobility is fully equalising and the index equals 100 per cent. In fact, earnings inequality falls as earnings are averaged over longer periods of time. However, at least over a six-year horizon, the overall equalising effect for the weekly/monthly earnings of full-time workers is always less than one-third and most often around 10 per cent. This suggests that a large share of cross-sectional earnings inequality is quite persistent. There is, however, no indication that the full equalising effect of mobility is exhausted within the first six years as relatively little of the earnings differences attributable to age-earnings profiles balance out in such a short period.[6]

A second important finding is that the choice of inequality index matters. The four indices reported in Chart 2.1 differ in the implicit weighting they place on earnings differences at different points in the distribution and mobility need not operate

Chart 2.1.

Percentage reduction in earnings inequality when earnings are averaged over longer periods, 1986-1991[a]

Weekly/monthly earnings of continuously employed full-time workers



a) See Annex 2.B for an explanation of these calculations.
b) Data for 1984-1989.
Source: See Table 2.A.1.

equally at all points. The mean log deviation index is most sensitive to inequality near the bottom of the distribution, the Gini is most sensitive in the middle, the Theil I_2 at the top, and the Theil I_1 at both extremes. For all countries, the Gini index indicates a much weaker equalising effect than the other three indices. It appears, therefore, that mobility smoothes out earnings differences most in the tails of the distribution. Workers in the middle of the distribution tend to have relatively stable earnings, hence, more persistent earnings differences.[7]

Country rankings according to how much mobility reduces earnings inequality depend on the inequality index selected (Table 2.1, Panel A). Although many of these differences are quite small, some are large, and this sensitivity of rankings to the index adopted suggests that there are significant national differences in the way that mobility reduces earnings dispersion, *e.g.* whether the predominant effect is to raise up low earners or to level down high earners. This is most evident for France which has the strongest mobility measured by the Theil I_1 and the Theil I_2 indices, but the least mobility measured by the mean log deviation and Gini indices. French earnings equalisation appears to be strongest at the top of the distribution, suggesting that many top earners in any single year are enjoying a temporary surge in their earnings, but relatively weak in the middle and bottom of the distribution. By contrast, Denmark, Italy and the United States appear to have the weakest equalisation at the top of the distribution. Country comparisons for the mean log deviation and Gini indices indicate relatively strong equalisation at the bottom for Germany and in the middle for the United Kingdom. These comparisons must be interpreted carefully, however, since they may reflect quite specific characteristics of national labour markets or noncomparabilities among the data sources used.[8]

Country rankings also change somewhat when annual earnings for full- and part-time workers are considered (Table 2.1, Panel C). Mobility among this broader group of workers reflects changes in both annual hours worked and wage rates, yet at least 75 per cent of cross-section inequality persists over six years. Including hours variations does significantly increase equalisation at the bottom of the earnings distribution (as reflected by the mean log deviation index), because it is more common for part-time and part-year workers to increase their annual hours strongly than for low-wage workers to enjoy large pay increases. This difference is particularly large for Italy, suggesting that, among workers with employment in six consecutive years, Italian workers are relatively likely to experience one or two years with quite low annual hours, while working a longer work schedule in the other years. However, estimates based on the Gini and Theil I_2 indices are not much changed (with the exception of Theil I_2 index for France, as discussed in note 8). This suggests that equalisation over time in annual hours worked does not contribute much additional equal-

Table 2.1. **Percentage reduction in single-year earnings inequality when earnings are averaged over 1986-1991**[a]

Inequality index	Denmark	France[b]	Germany	Italy	United Kingdom	United States
A. Weekly/monthly earnings of continuously full-time workers						
Mean log deviation	11.0	11.0	15.3	12.1	11.4	11.9
Gini	5.5	4.3	4.5	5.6	5.7	4.8
Theil I_1	10.9	13.7	12.7	11.3	11.8	10.5
Theil I_2	11.7	27.2	18.6	11.6	15.6	12.5
B. Weekly/monthly earnings of continuously full-time workers, aged 25-49 only						
Mean log deviation	11.3	11.1	8.7	11.4	11.1	11.6
Gini	5.6	4.2	3.6	5.3	5.7	4.9
Theil I_1	11.5	14.4	10.2	11.0	11.9	10.3
Theil I_2	12.5	29.7	19.7	11.4	16.6	12.2
C. Annual earnings of all continuously employed workers						
Mean log deviation	19.7	19.0	22.3	26.6	..	19.3
Gini	5.9	5.6	6.2	5.9	..	5.0
Theil I_1	12.9	12.0	15.5	15.9	..	10.9
Theil I_2	10.2	11.8	17.3	11.7	..	10.5

.. Data not available.
a) See Annex 2.B for an explanation of these calculations.
b) Data for 1984-1989.
Source: See Table 2.A.1.

isation in the middle and top of the earnings distribution, presumably because these workers are generally employed full-time and full-year.

This analysis of the equalising effect of mobility substantially enriches the more impressionistic analysis presented in the 1996 *Employment Outlook*. As a result, it appears that a large share of cross-sectional earnings inequality is quite persistent, despite the considerable movement of workers up and down the earnings distribution. This persistence increases the likelihood that earnings inequality, as conventionally measured, may have important economic and social consequences. The analysis also points towards important cross-country differences in mobility patterns. These differences do not suggest that countries with more liberalised labour and product markets, as exemplified by the United Kingdom and the United States, have higher mobility which off-sets their higher levels of cross-sectional inequality. More research will be required, however, to develop a clear picture of national differences in the overall equalising effect of mobility and, critically, their determinants.[9]

3. Group differences in equalisation

The equalising effect of mobility is much stronger for some groups of workers than for others, a fact quite uniform across countries, inequality indices and whether or not part-time workers are included in the sample (Table 2.2). Most dramatically, averaging over six years greatly reduces inequality among workers initially under age 25. The results in Table 2.2 indicate that youths' initial earnings paths are relatively volatile, reflecting frequent changes of employer, industry and occupation. Their earnings trajectories become more stable as they gain work experience and become established in their careers.[10] The equalising effect of mobility is also above-average for women (except in the United Kingdom) and for low-education workers (except in Denmark) and workers changing employers at least once during 1986-1991. Although these differences hold in most of the countries, Germany stands out for having especially strong differences by age, education and job mobility, due in large part to the apprenticeship system associated with its dual system of secondary education. One clear lesson is that a large share of earnings mobility is not due simply to a steady rise in earnings as workers gain experience. There is considerable variation in earnings paths within groups of similar workers.

The distinction between within- and between-group mobility is examined more formally in Table 2.3.[11] The work force is divided into 24 or 32 groups according to gender, age (four groups) and

Table 2.2. **Percentage reduction in single-year earnings inequality when earnings are averaged over 1986-1991, by workers' characteristics**[a]

Weekly/monthly earnings of continuously full-time workers

	Denmark	France[b]	Germany	Italy	United Kingdom	United States
Total	**11.0**	**11.0**	**15.3**	**12.1**	**11.4**	**11.9**
Sex						
Men	11.0	10.6	16.2	11.7	13.6	12.5
Women	18.3	15.4	19.2	16.9	10.7	16.1
Age						
Under 25	25.3	29.3	48.5	30.5	19.5	27.3
25-34	14.9	15.4	12.3	16.3	14.7	14.7
35-49	9.4	9.3	6.8	9.1	9.4	9.4
50-64	6.0	8.4	6.9	9.7	8.8	8.9
Education						
Less than upper secondary	15.1	..	27.5	..	..	18.6
Upper secondary	13.4	..	18.2	..	..	15.9
Non-university tertiary	20.5	..	6.2	..	..	15.7
University degree	10.1	..		..	..	12.2
Change of employer						
No change	6.1	10.2	11.7	9.2	9.9	8.1
At least one change	15.5	15.8	24.5	18.8	13.2	17.3

.. Data not available.
a) Earnings inequality is measured by the mean log deviation index. See Annex 2.B for an explanation of these calculations.
b) Data for 1984-1989.
Source: See Table 2.A.1.

Table 2.3. **Earnings inequality and mobility "within" and "between" groups, 1986-1991**[a]

Weekly/monthly earnings of continuously employed full-time workers

	Earnings averaged over:	Inequality index		Mobility index	
		Total inequality	"Between" share of total inequality[b] (percentage)	Total mobility (percentage)	"Between" share of total mobility[b] (percentage)
Denmark	1986	0.044	38.8	0.0	x
	1986-1987	0.042	40.6	4.8	3.5
	1986-1988	0.040	41.2	6.9	3.8
	1986-1989	0.040	41.5	8.6	4.0
	1986-1990	0.039	41.6	9.8	4.5
	1986-1991	0.039	41.6	11.0	4.5
France	1984	0.116	45.8	0.0	x
	1984-1985	0.110	47.8	5.7	0.5
	1984-1986	0.110	48.1	8.1	0.5
	1984-1987	0.109	48.5	9.2	1.1
	1984-1988	0.108	48.8	10.1	1.4
	1984-1989	0.109	48.9	11.0	1.8
Germany	1986	0.098	44.2	0.0	x
	1986-1987	0.088	45.6	5.2	5.7
	1986-1988	0.079	44.1	9.8	16.2
	1986-1989	0.073	43.3	12.7	15.3
	1986-1990	0.068	42.5	14.0	16.4
	1986-1991	0.065	41.9	15.4	15.8
Italy	1986	0.053	41.7	0.0	x
	1986-1987	0.052	43.9	4.8	3.6
	1986-1988	0.052	44.9	7.2	4.5
	1986-1989	0.052	45.4	9.5	4.6
	1986-1990	0.052	45.6	10.9	5.0
	1986-1991	0.053	45.7	12.1	5.0
United Kingdom	1986	0.103	41.9	0.0	x
	1986-1987	0.097	42.6	4.8	2.3
	1986-1988	0.094	42.0	7.1	4.4
	1986-1989	0.093	41.5	8.9	5.9
	1986-1990	0.091	41.1	10.3	7.1
	1986-1991	0.090	41.1	11.4	8.1
United States	1986	0.185	38.7	0.0	x
	1986-1987	0.170	41.1	5.1	3.0
	1986-1988	0.166	42.1	7.5	3.8
	1986-1989	0.162	43.0	9.0	4.4
	1986-1990	0.162	43.1	10.1	4.7
	1986-1991	0.163	43.1	11.7	5.3

x Not applicable.
a) Earnings inequality is measured using the mean log deviation index. See Annex 2.B for an explanation of these calculations.
b) The total work force is divided into 24 or 32 groups defined by sex (2 groups), age (4 groups) and education/occupation (3 or 4 groups).
Source: See Table 2.A.1.

education/occupation (three or four groups). The second column shows that between 39 and 46 per cent of cross-sectional earnings inequality in 1986 was due to differences in average earnings between the various groups, while the remainder reflected differences within them. The third and fourth columns report the total equalising effect of mobility and the share due to cross-group convergence of average earnings. The between-group mobility effect always accounts for less than 20 per cent of the total effect. In other words, most of the equalising effect of mobility occurs within groups. The predominance of within-group mobility means that much of the year-to-year change in workers' earnings does not reflect smooth increments to their earnings as they acquire more experience and may represent, in part, unpredictable fluctuations that are a source of economic insecurity.

C. PERSISTENCE AND RECURRENCE OF LOW-PAID EMPLOYMENT

1. Introduction

The underlying issues considered in this section are how the incidence and severity of low pay are affected by earnings mobility and what sorts of policies might effectively facilitate upward earnings mobility among low-paid workers. The detailed questions posed include: How large a share of workers in low-paid employment in a single year remains so for an extended period of time? Of those escaping low-paid employment, how many subsequently fall back into such jobs? How many years of low-paid employment do workers accumulate over a multi-year period? Do patterns vary across countries and demographic groups?

The low-paid threshold is defined alternatively as the upper limit of the first quintile of the earnings distribution (the 20th percentile) or as 0.65 times median earnings. The first quintile definition is comparable across counties in the sense that attention is focused on the lowest fifth of all earners in each country. However, it is not comparable because the extent to which these workers' earnings fall short of average earnings varies greatly across countries. Standardising the threshold at 0.65 of median earnings unambiguously identifies those earning significantly less than a typical worker. This threshold produces a different noncomparability, however, which has important implications for low-pay mobility patterns: a far larger share of the work force is classified as low paid in countries with widely dispersed earnings, such as the United States, than in countries with less cross-sectional wage inequality, such as Denmark and Italy. These two threshold definitions are applied using both the weekly or monthly earnings of full-time workers (the proxy wage rate) and the annual earnings of full- and part-time workers.[12]

Both thresholds for low pay are calculated each year using the distribution of earnings across *all* workers in that year, regardless of whether they were continuously employed during 1986-1991. This yields thresholds comparable to those studied in the 1996 *Employment Outlook* and in the cross-sectional literature on low-paid employment [US Bureau of the Census (1992); International Labour Office (1996); Keese and Swaim (1997)]. However, most of the low-pay incidence and persistence measures examined below are calculated *only* for workers continuously employed during 1986-1991, because of the extreme difficulty in determining potential earnings in those years in which a worker was not employed. Since the continuously employed group tends to have higher earnings than intermittent workers (see Annex 2.A), the single-year low-pay incidence rates for this group are lower than they would be if intermittent workers were also included. The low-pay incidence measures reported below can be meaningfully compared with each other, but are not easily compared with incidence measures calculated with cross-sectional data.

The analysis in the 1996 *Employment Outlook* revealed large movements between low-paid jobs and non-employment. Depending on the reasons for these movements, workers who cycle between "no pay" and low pay may be among those of greatest concern to policy makers. In the following analysis, low-pay persistence when intermittent workers are included in the calculations is briefly discussed for Germany and the United States.[13] These results confirm that the border between low-paid employment and non-employment is highly permeable when a multi-year period is considered, and that a full account of low-pay dynamics would have to treat intermittent workers more extensively.

2. Measuring the incidence of low pay

Most often, low-pay patterns are assessed using data for a single year. A longer-run view, incorporating worker mobility, can either increase or decrease the incidence of low pay, depending on whether the emphasis is placed on all workers who were *ever* low paid or only those persistently low paid. Due to the considerable movements into low-paying jobs, the share of continuously employed workers who were in the bottom quintile at any time during 1986-1991 is one and one-half to two times as high as the share in a single year, such as 1986 (Chart 2.2, Panel A).[14] Although many of these spells were short, this larger group may be relevant for assessing the share of the work force at risk of low pay and the hardship that even temporarily low earnings may produce.

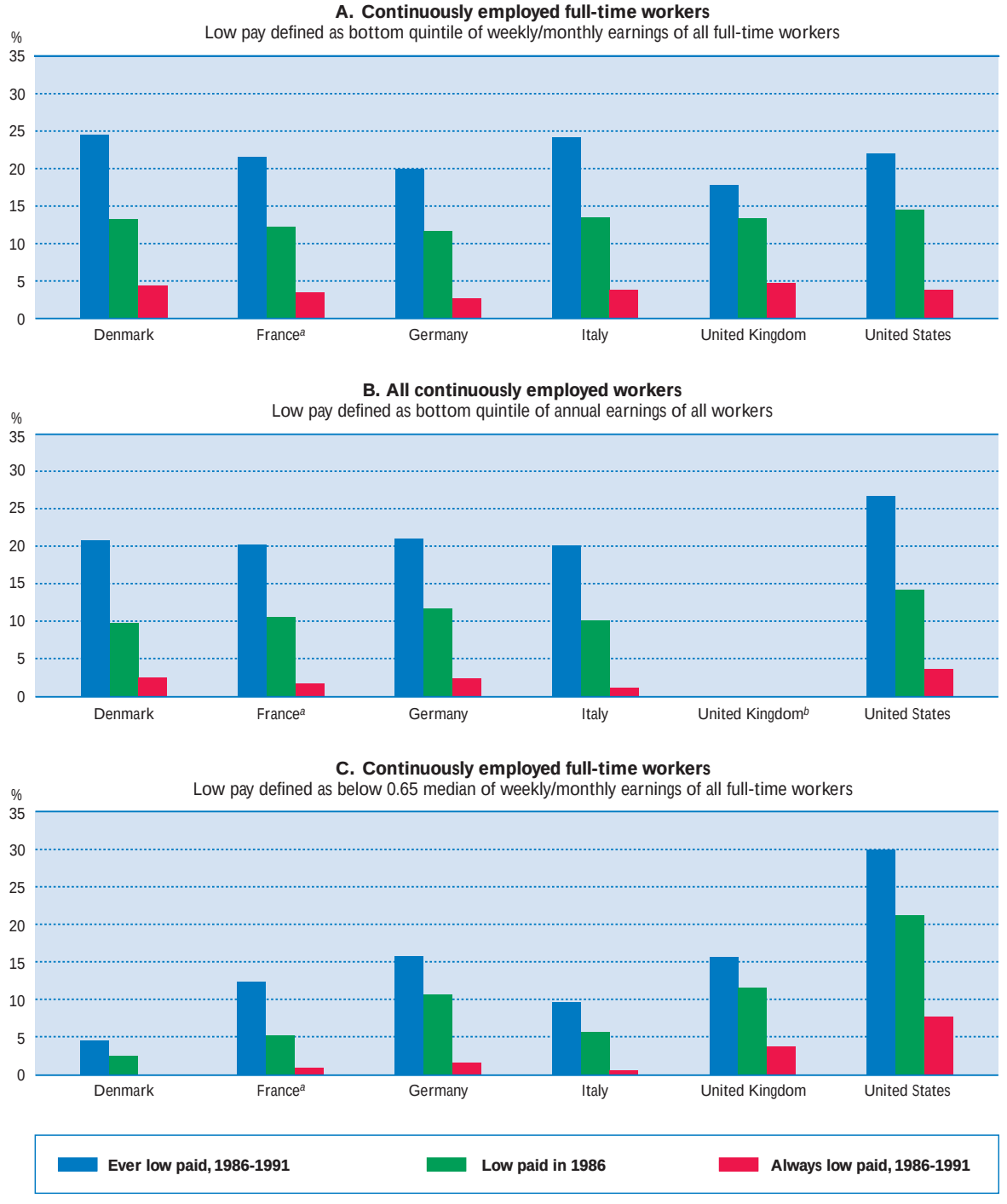
When low-pay "careers", rather than low-pay jobs, are the focus of policy concern, the proportion of continuously employed workers *always* low paid over a multi-year period is a natural incidence measure. The share of continuously low-paid workers over the period 1986-1991 is much lower than the low-paid share in any single year. While the shares of continuously full-time employed workers who were ever in the bottom quintile over the period 1986-1991 ranged from 18 to 24 per cent, the shares who were always low paid ranged from 3 to 5 per cent. Low-pay traps appear to be much less common than low-pay stop-overs. It does not follow, however, that low-paid employment is confined to a single, short spell for most workers who are low paid at any given time (see below).

Cross-country differences in the incidence of low pay using the bottom quintile threshold are modest and not much affected by whether one compares the

Chart 2.2.

Alternative incidence measures for low-paid employment, 1986-1991

Percentage of specified group



a) Data for 1984-1989.
b) Data not available.
Source: See Table 2.A.1.

shares ever low paid, low paid in a single year or always low paid, so long as attention is restricted to the weekly/monthly earnings of continuously employed full-time workers. The picture changes when differences in hours worked are taken into account or the alternative low-pay threshold is used (Chart 2.2, Panels B and C). When the bottom quintile threshold is applied instead to the annual earnings of full- and part-time workers, the picture is largely unchanged, except that the ever low-paid rate jumps 5 percentage points in the United States (Chart 2.2, Panel B). Temporarily low annual hours appear to push workers, who usually earn more, into low-paid employment more often in the United States than in the other countries. Much larger differences emerge when low pay is defined as 0.65 times median earnings (Chart 2.2, Panel C). All three incidence measures are significantly higher in the United States than elsewhere, due the greater dispersion of wages there. Denmark, with its more equal wage distribution, has very low incidence rates.

The relative propensities of different demographic groups to being in low-paid employment (*i.e.* in the bottom quintile) vary depending on whether interest centres on the ever low paid, the low paid in 1986 or the always low paid (Table 2.4, Panel B). Youths are particularly likely to have been low paid at least once during 1986-1991 and at the beginning of the period (when they were youngest). However, they move up the earnings distribution more rapidly than older workers, causing their always low-paid rate to fall relative to older workers. This pattern holds in all of the countries examined, but is particularly strong in Germany: workers aged less than 25 in 1986 were four times as likely as all workers to be low paid in that year, but only a little more than twice as likely to be always low paid during 1986-1991. Workers aged 50-64 in 1986 showed the opposite pattern, being just 0.7 times as likely to be low paid in 1986 as all workers, but nearly twice as likely to be continuously low paid.

Women and less-educated workers have a particularly high risk of being in low-paid jobs, regardless of the measures or time-frame adopted. Like young workers, these groups have above-average risks of being low paid in a single year. Unlike youths, women and less-educated workers also have above-average risks of remaining low paid, so that their risks of being always low paid are higher relative to other workers than their risks of being ever or single-year low paid. The gender pattern is strongest in Germany (women have 2.1 times the average incidence of 1986 low-paid employment, but are 3.4 times more likely to be always low paid) while the education pattern is especially strong in the United States (American workers who have not finished upper secondary schooling were 2.4 times as likely to be low paid in 1986, but 4.3 times as likely to be always low paid).

Of particular importance for targeting policy interventions designed to ameliorate problems resulting from low pay, the demographic mix of low-paid employment varies depending on whether interest centres on the ever low paid, the single-year low paid or the always low paid (Table 2.4, Panel C). Women, older and less-educated workers account for significantly larger shares of always low paid workers than of the ever low paid or low paid in 1986, although the extent of these differences varies considerably across these six countries. Although not reported in Table 2.4, these demographic comparisons look very similar when low pay is instead defined as below 0.65 times median earnings.

3. Time spent in low pay

As is clear from Chart 2.3 (Panel A), in all countries, only a minority of low-paid workers in a given year remain so for an extended, consecutive period of time. Among bottom-quintile workers in 1986, between 60 and 75 per cent move above this low-pay threshold at some point over the next five years. International differences are much more pronounced when low pay is defined as under 0.65 times median earnings: essentially, all Danish and more than 80 per cent of French, German and Italian workers who were low paid in 1986 escaped by 1991; the corresponding rate for the United Kingdom and the United States was 60 per cent. Despite these differences, most workers who are low paid in any selected year move higher in the earnings distribution within a few years, *provided* they remain employed.[15]

Focusing on these cumulative exit rates can exaggerate the extent of upward mobility and understate the amount of time workers spend in low-paid jobs. Despite the high exit rates, the average cumulated time in low pay grows quite steeply when such workers are followed over time (Chart 2.3, Panel B). By 1991, workers who were low paid in 1986 had cumulated an average of three to four years in low pay. It should also be borne in mind that these figures understate total time low paid, since they do not account for low-pay years prior to 1986 or subsequent to 1991. Accounting for intermittent workers would also indicate greater persistence in low pay, as is discussed below.

When low pay is defined as earnings in the bottom quintile, both persistence measures tell much the same story in all six countries. However, low-paid employment is more persistent in the United Kingdom and the United States than elsewhere, when low pay is defined as below 0.65 times median earnings (Chart 2.3). Workers who were low paid in

Table 2.4. **Incidence and distribution of low-paid employment by workers' characteristics, 1986-1991**[a]

Weekly/monthly earnings of continuously employed full-time workers

		Denmark			France[b]			Germany			Italy			United Kingdom			United States		
		Ever low paid, 1986-1991	Low paid in 1986	Always low paid, 1986-1991	Ever low paid, 1984-1989	Low paid in 1984	Always low paid, 1984-1989	Ever low paid, 1986-1991	Low paid in 1986	Always low paid, 1986-1991	Ever low paid, 1986-1991	Low paid in 1986	Always low paid, 1986-1991	Ever low paid, 1986-1991	Low paid in 1986	Always low paid, 1986-1991	Ever low paid, 1986-1991	Low paid in 1986	Always low paid, 1986-1991
A. Incidence (percentage of workers in each category who are low paid)																			
Total		**24.5**	**13.6**	**4.4**	**21.5**	**12.2**	**3.4**	**19.9**	**11.7**	**2.7**	**24.2**	**13.4**	**3.8**	**17.8**	**13.3**	**4.8**	**22.0**	**14.5**	**3.9**
Sex:	Men	12.4	3.9	0.4	17.6	9.7	2.0	13.0	7.4	0.6	17.2	9.0	1.8	10.7	6.7	1.8	16.0	9.3	2.3
	Women	44.9	29.8	11.3	30.1	17.6	6.5	41.1	24.9	9.3	41.2	24.2	8.6	35.8	30.4	12.3	30.9	22.2	6.1
Age:	Under 25	45.0	31.5	6.2	46.3	32.4	6.8	58.1	47.0	6.1	55.5	37.5	9.6	46.4	43.1	9.4	50.9	37.1	5.2
	25-34	26.6	13.2	3.3	22.2	12.6	3.7	15.4	6.5	2.1	21.8	10.1	2.5	10.0	6.6	2.7	20.5	14.6	3.2
	35-49	19.3	10.3	4.6	14.4	6.9	2.3	9.6	2.7	1.1	12.7	5.6	2.1	11.0	6.7	3.5	17.3	9.3	3.7
	50-64	19.6	10.1	5.0	19.8	9.2	3.5	15.9	7.7	5.2	16.8	7.9	3.5	18.3	10.2	6.8	16.5	11.2	5.0
Education:	Less than upper secondary	34.5	18.1	8.0	..	..	..	37.6	23.5	5.8	..	..	..	..	..	..	47.0	35.4	16.4
	Upper secondary	22.7	13.5	3.4	..	..	..	16.3	8.5	2.1	..	..	..	..	..	..	27.9	17.5	4.7
	Non-university tertiary	16.5	8.2	0.5	..	..	..	3.7	3.1	0.0	..	..	..	..	..	..	19.3	12.0	1.0
	University degree	5.4	2.7	0.0	..	..	..				..	..	..	..	..	..	5.4	2.9	0.0
B. Relative incidence (incidence of low-paid employment in each category relative to overall incidence of low-paid employment)																			
Total		**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**
Sex:	Men	0.5	0.3	0.1	0.8	0.8	0.6	0.7	0.6	0.2	0.7	0.7	0.5	0.6	0.5	0.4	0.7	0.6	0.6
	Women	1.8	2.2	2.5	1.4	1.4	1.9	2.1	2.1	3.4	1.7	1.8	2.3	2.0	2.3	2.6	1.4	1.5	1.6
Age:	Under 25	1.8	2.3	1.4	2.2	2.7	2.0	2.9	4.0	2.3	2.3	2.8	2.5	2.6	3.2	2.0	2.3	2.6	1.4
	25-34	1.1	1.0	0.7	1.0	1.0	1.1	0.8	0.6	0.8	0.9	0.8	0.7	0.6	0.5	0.6	0.9	1.0	0.8
	35-49	0.8	0.8	1.0	0.7	0.6	0.7	0.5	0.2	0.4	0.5	0.4	0.5	0.6	0.5	0.7	0.8	0.6	1.0
	50-64	0.8	0.7	1.1	0.9	0.8	1.0	0.8	0.7	1.9	0.7	0.6	0.9	1.0	0.8	1.4	0.7	0.8	1.3
Education:	Less than upper secondary	1.4	1.3	1.8	..	..	..	1.9	2.0	2.1	..	..	..	..	..	..	2.1	2.4	4.3
	Upper secondary	0.9	1.0	0.8	..	..	..	0.8	0.7	0.8	..	..	..	..	..	..	1.3	1.2	1.2
	Non-university tertiary	0.7	0.6	0.1	..	..	..	0.2	0.3	0.0	..	..	..	..	..	..	0.9	0.8	0.3
	University degree	0.2	0.2	0.0	..	..	..				..	..	..	..	..	..	0.2	0.2	0.0
C. Distribution (percentage share of low-paid employment in each category)																			
Total		**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Sex:	Men	31.8	18.3	5.2	56.6	55.3	40.9	49.2	47.5	16.2	50.4	47.5	34.3	43.3	35.8	27.2	43.3	38.1	36.0
	Women	68.2	81.7	94.8	43.4	44.7	59.1	50.8	52.5	83.8	49.6	52.5	65.7	56.7	64.2	72.8	56.7	61.9	64.0
Age:	Under 25	20.7	26.1	15.7	23.9	29.6	22.0	47.9	66.1	37.0	45.1	54.8	49.7	44.1	54.5	33.2	25.0	27.7	14.6
	25-34	33.8	30.2	23.1	38.9	39.0	40.1	20.5	14.9	20.4	27.0	22.6	19.6	14.8	13.1	14.8	34.1	36.9	30.2
	35-49	34.9	33.7	46.3	26.5	22.6	26.2	21.0	10.2	17.1	21.8	17.5	22.7	26.2	21.4	31.4	31.7	25.8	39.1
	50-64	10.7	10.0	14.9	10.7	8.8	11.7	10.7	8.9	25.5	6.1	5.2	8.0	14.9	11.0	20.6	9.2	9.5	16.1
Education	Less than upper secondary	48.9	46.3	62.7	..	..	..	52.1	55.5	58.5	..	..	..	..	..	..	23.3	27.0	46.5
	Upper secondary	44.3	47.6	36.6	..	..	..	44.6	39.7	41.5	..	..	..	..	..	..	49.7	48.1	47.6
	Non-university tertiary	4.3	3.9	0.7	..	..	..	3.3	4.8	0.0	..	..	..	..	..	..	20.0	19.1	5.8
	University degree	2.4	2.2	0.0	..	..	..				..	..	..	..	..	..	7.0	5.8	0.1

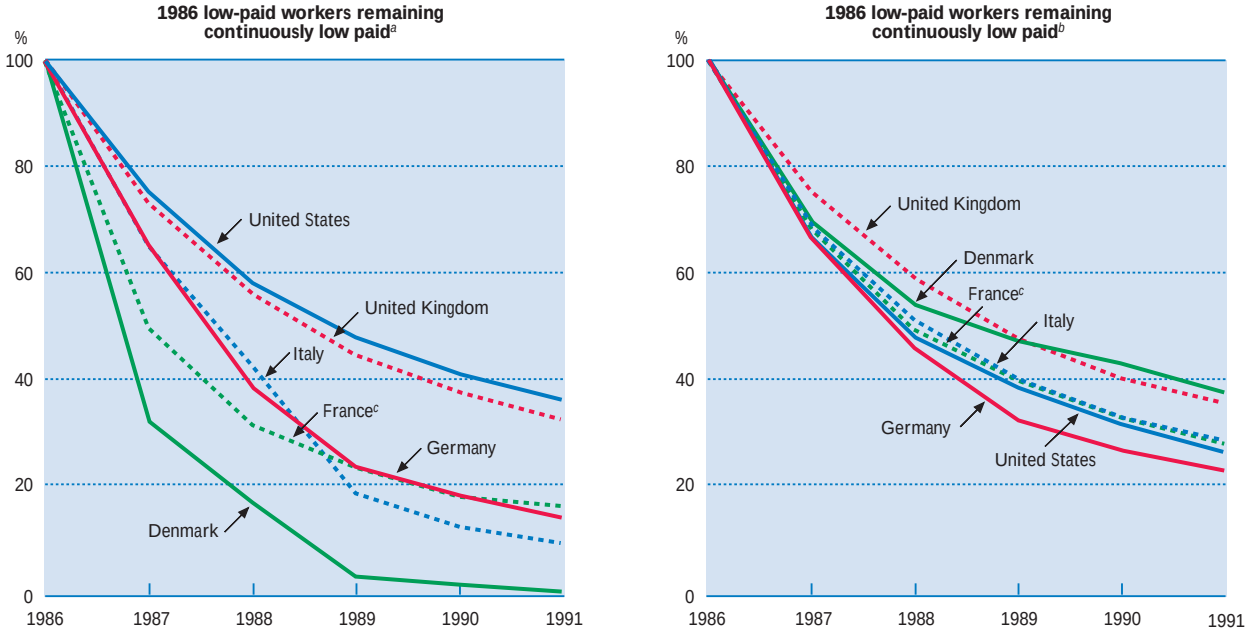
.. Data not available.
a) Low pay defined as bottom quintile of weekly/monthly earnings of all full-time workers.
b) Data for 1984-1989.
Source: See Table 2.A.1.

Chart 2.3.

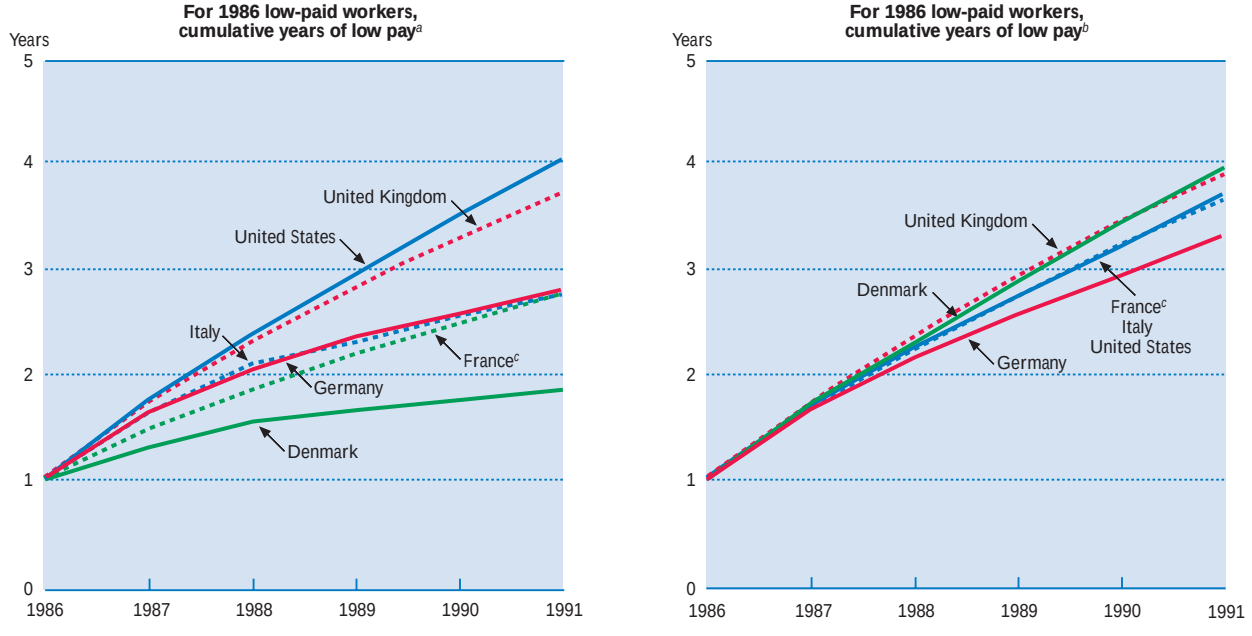
Two views of the persistence of low pay, 1986-1991

Continuously employed full-time workers

A. Persistence rates in low pay



B. Mean years in low pay



a) Low pay defined as below 0.65 median of weekly/monthly earnings of all full-time workers.
b) Low pay defined as bottom quintile of weekly/monthly earnings of all full-time workers.
c) Data for 1984-1989.
Source: See Table 2.A.1.

1986 on average accumulated roughly three additional years of low pay, during the next five years, in these two countries. The labour market conditions or institutions that result in greater low pay persistence are not well understood, but this outcome may be related to the lesser level of regulation in the UK and American economies, including fewer barriers to low-paid employment. These two countries also experienced much greater increases in earnings inequality in recent years than other OECD countries [OECD (1996), Chapter 2], but have had considerable success at lowering unemployment.[16]

Comparing estimates of average cumulated time in low pay shows that women, as well as older and less educated workers, who were low paid at the outset, experience more time in low-paid employment than other workers (Table 2.5). Once in a low-

Table 2.5. **Average cumulative years in low-paid employment during 1986-1991**
Workers who were low paid in 1986

		Denmark	France[a]	Germany	Italy	United Kingdom	United States
A. Continuously employed full-time workers[b]							
Total		**3.8**	**3.7**	**3.3**	**3.7**	**3.9**	**3.7**
Sex:	Men	2.6	3.3	2.4	3.3	3.4	3.4
	Women	4.0	4.1	4.1	4.1	4.2	3.8
Age:	Under 25	3.1	3.4	3.0	3.7	3.3	3.3
	25-34	3.6	3.7	3.1	3.4	4.2	3.5
	35-49	4.3	3.9	4.4	4.0	4.7	4.0
	50-64	4.4	4.1	5.3	4.2	5.2	4.4
Education:	Less than upper secondary	4.4	. .	3.5	. .	. .	4.7
	Upper secondary	3.4	. .	3.3	. .	. .	3.7
	Non-university tertiary	2.7	. .	1.2	. .	. .	3.0
	University degree	1.8	. .		. .	. .	1.8
B. All continuously employed workers[c]							
Total		**3.6**	**2.8**	**3.1**	**2.5**	**. .**	**3.5**
Sex:	Men	2.6	2.3	2.5	2.2	. .	2.7
	Women	3.8	3.3	3.6	2.8	. .	3.7
Age:	Under 25	2.7	2.2	2.5	2.1	. .	2.9
	25-34	2.9	2.5	3.9	2.5	. .	3.3
	35-49	4.0	3.3	4.4	3.2	. .	3.5
	50-64	4.9	4.0	4.3	3.9	. .	4.7
Education:	Less than upper secondary	4.0	. .	3.2	. .	. .	4.3
	Upper secondary	3.4	. .	3.0	. .	. .	3.3
	Non-university tertiary	2.8	. .	3.5	. .	. .	3.2
	University degree	2.1	. .		. .	. .	3.7
C. Continuously employed full-time workers[d]							
Total		**1.8**	**2.8**	**2.8**	**2.8**	**3.8**	**4.1**
Sex:	Men	1.4	2.6	2.2	2.7	3.3	3.8
	Women	1.9	3.1	3.4	2.9	4.0	4.2
Age:	Under 25	1.6	2.6	2.4	2.5	3.1	4.0
	25-34	1.6	2.8	3.0	2.7	4.1	3.9
	35-49	2.2	3.0	3.5	3.5	4.6	4.2
	50-64	2.0	3.3	5.1	3.8	5.1	4.2
Education:	Less than upper secondary	2.1	. .	2.9	. .	. .	4.8
	Upper secondary	1.6	. .	2.9	. .	. .	4.0
	Non-university tertiary	1.0	. .	1.2	. .	. .	3.8
	University degree	1.0	. .		. .	. .	2.7

. . Data not available.
a) Data for 1984-1989.
b) Low pay defined as bottom quintile of weekly/monthly earnings of all full-time workers.
c) Low pay defined as bottom quintile of annual earnings of all workers.
d) Low pay defined as below 0.65 median earnings of weekly/monthly earnings of all full-time workers.
Source: See Table 2.A.1.

paid job, these groups have particular difficulty moving up the earnings distribution, at least in a sustained way. Nonetheless, once in low-paid employment virtually all groups cumulate significant additional low-paid years.

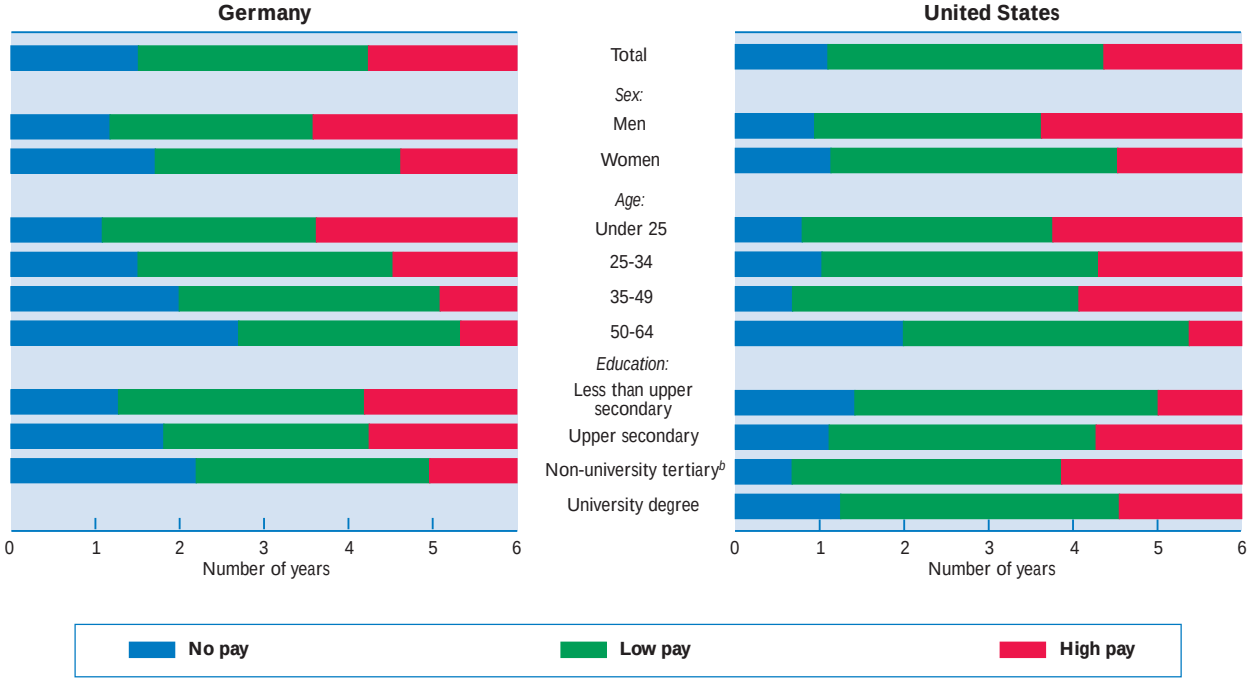
The population of workers who appear vulnerable to becoming chronically low paid is increased when intermittent workers are considered (Chart 2.4). In both Germany and the United States, workers who were in the bottom quintile of annual earnings in 1986 averaged fewer than two years in "high pay" (*i.e.* above the bottom quintile) during 1986-1991. The remainder of the period was divided between "no pay" (one to one and one-half years) and low pay (approximately three years). Women and older workers were particularly likely to exit employment. A full analysis of the flows between low pay and no pay is not attempted here, but incorporating intermittent workers into the analysis strengthens the finding that high mobility among the low paid does not imply that most soon move on to stable, higher paying jobs [OECD (1996), Chapter 3; Eriksson (1997); Stewart and Swaffield (1997)].

It remains to reconcile the two, apparently paradoxical, faces of low pay: few of the 1986 low-paid workers were continuously low paid during 1986-1991, yet, on average, these workers were in low-paid jobs half or more of the time over this period. Two factors are involved in understanding this paradox. First, while many low-pay spells are short, so are many of the escapes into higher earnings (see below). The second factor is more purely mathematical, but contains an important lesson for

Chart 2.4.

Mean years of no pay, low pay and high pay, 1986-1991, by selected characteristics

For all workers who were low paid in 1986[a]



a) Low pay defined as bottom quintile of annual earnings for all workers.
b) All tertiary (including university) education for Germany.
Source: See Table 2.A.1.

Table 2.6. **Distribution and concentration of years spent in low-paid employment, 1986-1991**

Workers with at least one year of low pay

Years spent in low pay	Denmark		France[a]		Germany		Italy		United Kingdom		United States	
	Share of workers[b]	Share of years[c]	Share of workers[b]	Share of years[c]	Share of workers[b]	Share of years[c]	Share of workers[b]	Share of years[c]	Share of workers[b]	Share of years[c]	Share of workers[b]	Share of years[c]
A. Continuously employed full-time workers[d]												
1	35.5	12.0	38.4	13.6	41.7	15.7	32.7	11.1	27.2	8.0	32.8	10.9
2	14.7	10.0	17.2	12.2	15.3	11.5	17.3	11.7	15.1	8.8	17.7	11.7
3	14.3	14.5	10.3	11.0	13.8	15.7	13.4	13.6	10.4	9.2	11.2	11.1
4	7.3	9.9	8.6	12.2	8.2	12.3	11.1	15.0	9.6	11.2	9.4	12.5
5	10.0	16.9	9.5	17.0	7.4	13.9	9.8	16.7	10.8	15.8	11.4	19.0
6	18.1	36.7	16.0	34.0	13.7	30.9	15.7	31.9	26.9	47.1	17.5	34.8
B. All continuously employed workers[e]												
1	39.0	14.9	53.7	25.3	43.1	17.3	55.9	28.2	..	..	35.5	12.8
2	20.4	15.5	19.6	18.5	17.4	14.0	19.9	20.0	..	..	20.3	14.7
3	12.0	13.7	9.2	13.0	15.1	18.2	9.7	14.6	..	..	12.3	13.4
4	9.3	14.1	5.4	10.2	8.0	12.8	5.0	10.1	..	..	9.4	13.5
5	6.1	11.6	3.4	7.9	5.0	10.0	3.5	8.9	..	..	8.8	15.9
6	13.2	30.2	8.8	25.0	11.5	27.7	6.0	18.2	..	..	13.7	29.7

.. Data not available.
a) Data for 1984-1989.
b) Percentage of workers with at least one year of low pay, who were low paid for the specified number of years.
c) Percentage of total years spent in low pay attributable to workers who were low paid for the specified number of years.
d) Low pay defined as bottom quintile of weekly/monthly earnings of all full-time workers.
e) Low pay defined as bottom quintile of annual earnings of all workers.
Source: See Table 2.A.1.

policy. Even though a large share of the workers ever low paid during 1986-1991 experienced only one or two years of low pay, the smaller group who experienced many years of low pay form a disproportionately large share of low-paid workers in any single year and have a large weight in the calculation of the average cumulative time low paid (Table 2.6). For example, French workers with only one or two low-paid years represent 56 per cent of the (continuously employed full-time) workers ever low paid, but they account for only 26 per cent of the total *years* of low-paid employment. Workers with four or more low-paid years account for 34 per cent of workers ever low paid, but 63 per cent of the total years of low-paid employment.[17] Even though low pay is a transitory phenomenon for a majority of workers ever becoming low paid, a large share of the time spent in low-paid jobs is attributable to workers for whom low pay appears to be a chronic condition.[18]

4. Transitions in and out of low pay

A closer inspection of the diverse paths in and out of low pay provides some clues as to the causes and possible cures of chronically low-paid employment. Table 2.7 presents measures of several types of transitions, using the bottom quintile threshold, which offer further insights into the finding that low pay can be either transitory or quite persistent. The first column in each panel traces the exit rate from low pay as a 1986 spell continues.[19] The main message is that workers' prospects of moving up worsen, the longer they have been low paid. Falling exit rates indicate that the distribution of completed durations for low-pay spells is strongly right-skewed: while most spells are quite short, some are very long. This pattern is remarkably similar across the six countries, when low pay is defined as the bottom quintile of weekly/monthly earnings of full-time workers. The only significant difference is that the probabilities of upward mobility are lower in the first two years in the United Kingdom than elsewhere. If the 0.65 times median threshold is used instead, escape rates in the United Kingdom and the United States begin lower than elsewhere and decline more steeply, indicating greater persistence of low-pay spells.

A falling exit rate may be either causal or due to so-called "sorting". If it is causal, the exit rate declines because the experience of low pay progressively undermines a worker's potential to move up in the job market, for example, through the prolonged absence of opportunities to apply or acquire job skills. The sorting explanation assumes that workers entering low pay in a given year already differ in their future earnings prospects, *e.g.* due to differences in education and aptitudes. Over time, the workers with the best prospects move up the earnings ladder, leaving behind a pool of workers with the poorest prospects. For policy purposes, knowing the relative importance of these two factors is of some import. The more strongly being in low-paid employment progressively undermines a workers' future prospects, the more important it becomes that any policy interventions be as prompt as possible. Conversely, if the declining exit rate is mostly due to sorting, it may be an efficient targeting strategy to focus interventions on long-duration low-paid workers. However, it is very difficult to distinguish these two explanations empirically [Heckman and Singer (1984)].

The remaining four columns of Table 2.7 examine paths into, or back into, the bottom quintile. If the entire group of workers above the low-pay threshold in 1986 is considered, relatively few enter *low-paid employment* in any of the subsequent years. However, this is a large group, and the total number of workers falling into low pay is quite high, as indicated by the much greater number of workers ever low paid in 1986-1991 than low paid in 1986. Furthermore, entry rates are two to four times higher among moderate-earning workers (defined as the second quintile in 1986), who begin not too far above the low-pay threshold. This suggests that the division between low- and better-paid workers is not clear cut, once multiple years are considered. There is a continuous gradation in workers' vulnerabilities to spending time in low-paid employment.

The permeability of the border between low- and better-paid employment is especially clear when multiple spells of low pay are considered. Of the low-paid workers in 1986 who moved higher in the earnings distribution in 1987, a significant number were back in low-paid employment in subsequent years. By 1991, this group had accumulated, on average, between 0.6 and 1.0 additional years in low pay.[20] In short, while relatively few of the low-paid workers in 1986 remained continuously low paid during 1986-1991, many of the escapes were transitory. When assessing policies to enhance the upward mobility of low-paid workers, it is, therefore, important to consider the durability of the earnings gains achieved.

The dynamics of low pay are complex and no one measure of *low-pay* incidence or persistence will adequately reflect all of its dimensions. It seems clear, however, that the substantial rates of upward mobility among low-paid workers do not, by themselves, vitiate policy concerns associated with low-paid employment. The large flows in and out of low pay do mean, however, that low-paid workers in a

Table 2.7. **Probabilities of making transitions into and out of low-paid employment, 1986-1991**[a]

Weekly/monthly earnings of continuously employed full-time workers

	Exits	Entries		Repeat spells	
	Exit low pay in the year if have been continuously low paid[b] (percentage)	Low pay in the year if not low pay in 1986[c] (percentage)	Low pay in the year if in second quintile in 1986[c] (percentage)	Low pay in the year if exited low pay in 1987[d] (percentage)	Average post-1987 years of low pay if exited low pay in 1987[e] (years)
Denmark					
1987	33.7	3.0	9.9	0.0	0.0
1988	25.4	3.8	12.1	15.9	0.2
1989	12.8	5.7	18.2	20.3	0.4
1990	12.4	5.9	17.4	27.5	0.6
1991	13.5	6.3	19.2	23.2	0.9
France					
1985	30.3	4.0	13.4	0.0	0.0
1986	29.4	3.1	9.8	16.7	0.2
1987	18.5	3.2	10.2	17.0	0.3
1988	18.2	3.4	10.2	16.6	0.5
1989	14.1	4.4	13.1	16.7	0.7
Germany					
1987	33.1	2.5	11.5	0.0	0.0
1988	30.1	2.6	10.8	14.0	0.1
1989	30.6	2.8	11.3	14.5	0.3
1990	17.9	3.4	12.8	16.2	0.4
1991	12.5	4.6	16.9	16.0	0.6
Italy					
1987	31.6	3.2	9.8	0.0	0.0
1988	25.0	4.2	12.4	17.7	0.2
1989	22.8	5.2	15.0	21.7	0.4
1990	17.2	5.7	15.7	22.6	0.6
1991	13.7	6.5	17.5	23.4	0.9
United Kingdom					
1987	24.7	1.0	4.2	0.0	0.0
1988	21.4	1.3	5.6	13.6	0.1
1989	19.0	1.9	8.0	14.1	0.3
1990	15.4	2.5	10.5	14.9	0.4
1991	11.8	3.3	11.9	15.7	0.6
United States					
1987	33.4	2.9	11.2	0.0	0.0
1988	28.2	2.8	10.0	20.2	0.2
1989	18.9	2.5	8.2	22.7	0.4
1990	18.0	3.4	9.4	22.3	0.7
1991	16.6	3.4	11.1	25.5	0.9

a) Low pay defined as bottom quintile of weekly/monthly earnings of all full-time workers.
b) Probability of earning more than the low-pay threshold in the specified year, conditional on being continuously low paid in earlier years.
c) Probability of earning less than the low-pay threshold in the specified year, conditional on earning more in the initial year.
d) Probability of earning less than the low-pay threshold in the specified year, conditional on exiting low pay between the initial and second years.
e) Average additional years of low pay for workers who exited low pay in the second year.
Source: See Table 2.A.1.

given year have very different prospects and, hence, differ greatly in whether they require public assistance and, if so, what sorts of assistance would be most appropriate. Further study of the individual characteristics, career events and policy interventions that most improve the odds of making a sustained escape from low pay would be especially useful.

D. REAL EARNINGS PATHS OF INDIVIDUAL WORKERS

1. Introduction

In Sections B and C, changes in a worker's earnings were measured *relative* to those of other workers. Relative earnings measures do not, however, provide a reliable indication of how rapidly a worker's real earnings grow over time; the latter, in turn, is a good proxy for growth in living standards. For example, a worker persistently in low pay may nonetheless enjoy a substantial increase in real wages if the wage structure for the entire economy is shifting upwards. Furthermore, workers experiencing the same *relative* mobility in two countries may experience very different *absolute* mobility. A fuller international comparison of mobility is produced when absolute mobility is also considered. This section analyses changes in individual workers' real earnings over the period 1986-1991.

Many factors influence whether, and how strongly, any particular worker's earnings rise or fall. In part, the rate at which a worker's real earnings grow are influenced by macroeconomic conditions, such as national trends in average productivity and real wages. Typical career progressions, as captured by age-earnings profiles, will also be reflected in individual worker's earnings paths. In addition to these common factors, a wide range of factors specific to that worker, such as the onset of a serious health problem, may also be important. A key question addressed by this analysis is the relative importance of these latter factors. In other words, how closely do the earnings histories of individual workers follow the smooth trajectories defined by the common factors? A related question is which worker characteristics (such as gender, age and education) and career events (such as changing employers, industry or occupation) are most strongly associated with whether, and how strongly, real earnings rise or fall?

Before discussing the results, three measurement issues require discussion. First, earnings growth rates are calculated here for fixed samples of continuously employed workers, as they age six years. The average wage growth for this population is conceptually distinct from estimates of national average earnings for (the changing population of) all workers, which are more commonly reported. Second, the growth rates are calculated from three-year averages of workers' earnings taken at both endpoints.[21] This averaging should provide a better picture of longer-run trajectories by smoothing out very short-lived fluctuations in individual earnings. Another advantage of averaging is that it reduces the effect of measurement error in the earnings variable on the calculated earnings growth rates.[22] Finally, consumer price indices were used to convert nominal earnings growth into real earnings growth. If, as is sometimes argued, these deflators make inadequate allowance for quality improvement and a number of other factors [Advisory Commission to Study the Consumer Price Index (1996)], real earnings growth will be understated. Comparisons of growth rates across groups within a country would not be affected, however, and international comparisons would be so only to the extent that the overstatement of inflation differs.

2. The distribution of real earnings growth

Data on the distribution of real earnings growth rates over 1986-1991 are presented in Table 2.8.

Table 2.8. **Dispersion of real earnings growth, 1986-1991**
Weekly/monthly earnings of continuously employed full-time workers

Percentage of workers whose earnings grew[a] by:	Denmark	France[b]	Germany	Italy	United Kingdom	United States
Less than –40%	0.4	2.8	–	0.4	0.4	3.7
–40% to –22%	2.7	4.0	0.3	1.5	1.6	8.1
–22% to –14%	3.9	4.0	1.4	2.4	2.3	5.6
–14% to –5%	10.9	11.4	4.2	5.8	5.4	11.4
–5% to +5%	30.4	28.0	16.3	14.6	12.4	17.4
5% to 16%	26.9	22.2	30.2	26.1	20.9	17.2
16% to 28%	13.0	11.9	23.4	22.3	20.1	11.0
28% to 65%	10.0	10.8	18.5	20.9	27.9	16.9
65% to 112%	1.5	3.1	2.9	4.7	7.1	5.2
More than 112%	0.4	1.7	2.7	1.4	2.0	3.4
Mean growth	**7.2**	**6.2**	**19.3**	**18.1**	**22.4**	**9.3**

a) Negative values indicate that real earnings fell.
b) Data for 1984-1989.
Source: See Table 2.A.1.

Mean growth of real, weekly/monthly earnings of continuously employed full-time workers over this six-year period varied significantly among these six countries, being lowest in Denmark, France and the United States, and highest in the United Kingdom. International comparisons of how rapidly the real earnings of continuing workers rose generate very different rankings than do the comparisons of relative earnings mobility presented last year and in Sections B and C. The United Kingdom provides a good illustration, having medium to low relative mobility, but ranking at the top in tearms of absolute mobility.

The spread of individual earnings growth is wide in all countries, but particularly so in the United Kingdom and the United States (Chart 2.5, Panel A). Although real earnings rose by 9.3 per cent on average in the United States, about 30 per cent of continuously full-time American workers experienced a fall in real earnings of at least 5 per cent. At the other extreme of fortune, one-quarter had an increase greater than 28 per cent. One notable difference between the United States and the other countries is the higher probability of large reductions in real earnings. Earnings fell by more than 14 per cent for about 17 per cent of full-time workers in the United States, 11 per cent of French workers, 7 per cent of Danish workers, 4 per cent of Italian and British workers and under 2 per cent of German workers (Table 2.8). In part, the higher incidence of large earnings declines in the United States and – to a lesser extent – France and Denmark, reflects their lower average earnings growth. A second important factor for the United States is the greater fanning out of individual earnings paths around the average path.

The dispersion is somewhat larger when the annual earnings of full- and part-time workers are considered (Chart 2.5, Panel B). While individual earnings paths vary more widely when variations in annual hours worked are considered along with changes in wage rates, neither average earnings growth nor international comparisons are much affected. The fact that individual earnings growth rates vary substantially is consistent with the widespread belief that even workers in stable jobs may face considerable – and possibly rising – employment and earnings insecurity (see Chapter 5).[23]

3. Group differences in average real earnings growth

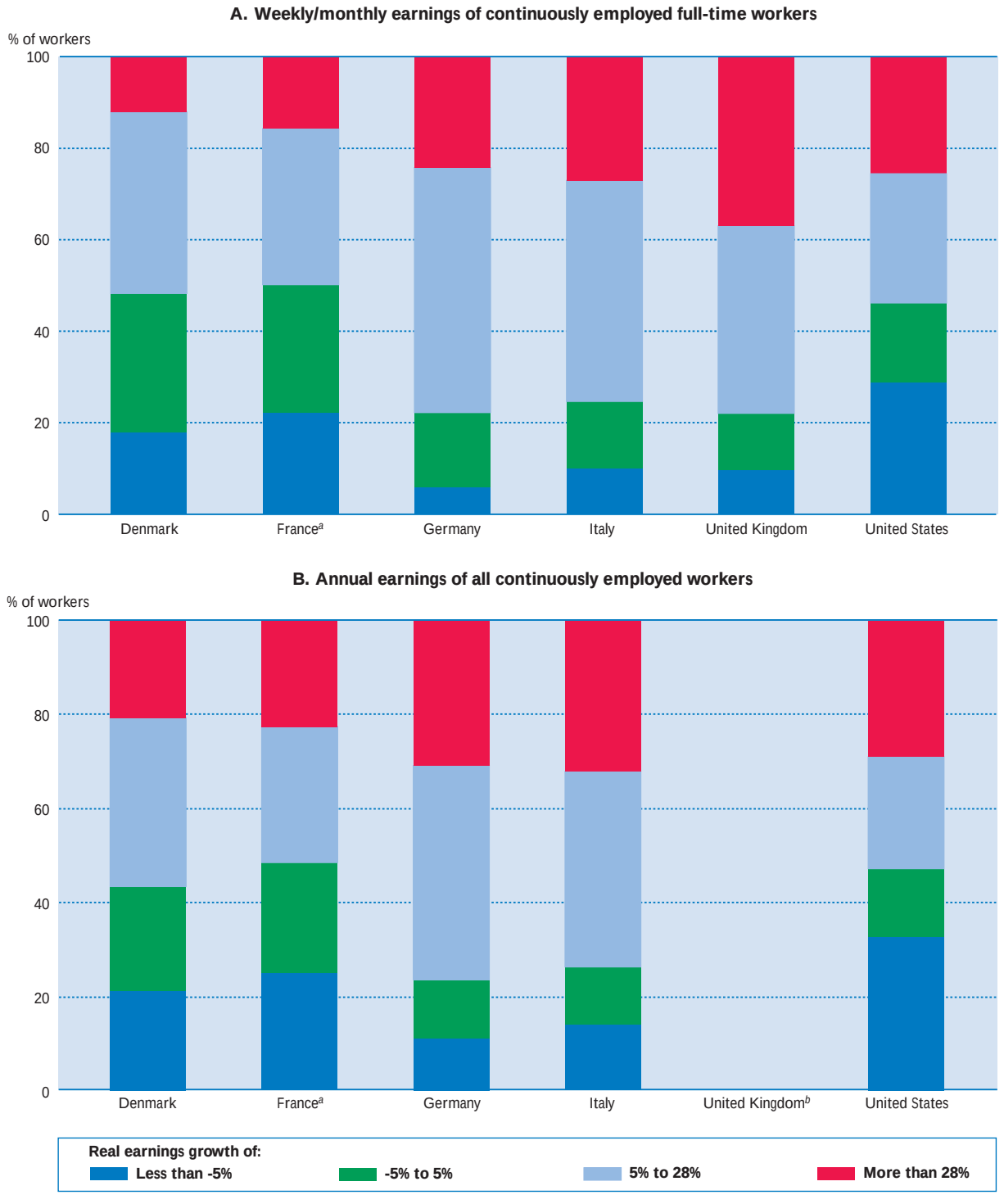
Earnings growth tends to be much higher for some groups of workers than for others (Table 2.9). Young workers just establishing their careers have much more rapid real earnings growth, on average, than do older workers. Growth rates are especially high for German workers under the age of 25 (at the beginning of the period) due to the movement of many such workers from apprenticeship allowances to adult pay schedules. At the other extreme, average growth for American workers aged 50-64 was slightly negative. Earnings growth declined with age in all of the countries, but age differences were less pronounced in Italy than elsewhere. Cross-country differences are more striking by gender and education. The earnings of women grew much more rapidly than those for men in Denmark, the United Kingdom and the United States, and a little more rapidly in Germany, but less rapidly in France and Italy. Better educated workers in Denmark and the United States had much stronger real earnings growth than less educated workers, but earnings growth decreased modestly with educational attainment among German workers.

Do these large differences in earnings growth rates tend to equalise or magnify initial differences in earnings? Consistent with the analysis in Sections B and C, mobility over these six years reduces earnings inequality. When workers are grouped into initial-year earnings quintiles, real earnings grow much more rapidly for workers beginning near the bottom (Table 2.9). For example, over the 1986-1991 period, earnings growth averaged 40 per cent for bottom quintile workers in the United Kingdom, compared with 15 per cent for the top quintile. However, it is important to note that the detailed analysis of relative mobility in Sections B and C indicates that these comparisons can give a misleading impression of how strongly equalising mobility was over the period in questions. The more precise quantification of the equalising effect provided by the Shorrocks method indicates that mobility over 1986-1991 reduced earnings inequality by only between 5 and 30 per cent. Similarly, the analysis of time spent in low-paid employment showed that low-paid jobs cannot be generally characterised as providing a stepping-stone into higher-paid employment.

Another question is whether the international differences in the relationship between worker characteristics and average earnings growth are persistent features of these national labour markets or one-time perturbations of career earnings patterns caused by contemporaneous shifts in the structure of relative wages, such as the rapid increase in educational differentials in the United States during the 1980s. Both factors appear to be important. For example, the very high earnings growth of the youngest age group in Germany reflects the special nature of the school-to-work transition associated with the dual system of secondary education. However, the above-average real wage gains of women in the United Kingdom and the United States, as

Chart 2.5.

Distribution of workers by real earnings growth over 1986-1991



a) Data for 1984-1989.
b) Data not available.
Source: See Table 2.A.1.

Table 2.9. **Mean real earnings growth by workers' characteristics, 1986-1991**

Weekly/monthly earnings of continuously employed full-time workers

	Denmark	France[a]	Germany	Italy	United Kingdom	United States
Sex						
Men	5.5	6.2	18.8	18.1	19.8	6.7
Women	10.3	5.1	20.9	17.9	29.6	13.6
Age						
Under 25	13.8	17.4	55.6	23.8	47.9	27.0
25-34	9.7	8.3	21.4	19.1	26.6	17.7
35-49	6.1	2.0	12.6	15.5	16.3	2.6
50-64	1.8	0.0	7.7	13.8	10.1	–1.0
Education						
Less than upper secondary	4.8	..	21.5	..	..	0.7
Upper secondary	7.2	..	18.9	..	..	7.2
Non-university tertiary	9.1	..	17.1	..	..	8.4
University degree	14.2	..		..	..	16.4
Change of employer						
No change	6.2	5.1	16.9	17.2	18.4	8.1
At least one change	8.3	13.9	34.4	19.7	29.3	11.9
Earnings in 1986[b]						
1st quintile	20.0	12.7	66.3	26.6	40.3	29.5
2nd quintile	9.2	7.3	22.1	14.7	28.0	18.4
3rd quintile	6.5	4.1	16.4	14.5	24.1	8.3
4th quintile	4.5	4.1	13.7	15.5	19.2	3.3
5th quintile	3.9	1.0	12.3	20.0	14.5	0.9
Average earnings over 1986-1991[c]						
1st quintile	5.5	4.1	44.1	19.4	21.0	5.9
2nd quintile	6.5	5.1	20.4	11.3	22.5	11.0
3rd quintile	5.3	5.1	20.1	15.0	21.2	6.2
4th quintile	6.3	6.2	16.2	19.2	22.5	5.9
5th quintile	11.7	9.4	17.0	25.5	24.6	15.0

.. Data not available.
a) Data for 1984-1989.
b) Quintiles defined for weekly/monthly earnings of all full-time workers in 1986.
c) Quintiles defined for weekly/monthly earnings averaged over 1986-1991 for continuously full-time workers.
Source: See Table 2.A.1.

well as of more educated workers in the United States, illustrate how the rising relative wages of these two groups during the 1980s manifested itself as rapid wage growth for these types of workers. These groups did not have above-average earnings growth in countries in which their relative wages were stable or fell a little [OECD (1993); Freeman and Katz (1995); Gottschalk and Smeeding (1997)].[24]

Certain career events and differences in work patterns are also reflected in real earnings growth. A striking uniformity across all of the countries is that workers changing employers at least once over the period experienced more rapid real earnings growth than workers remaining with the same firm. (This relationship is discussed in more detail below). Earnings growth also differed between persistently full-time, full-year workers and those working fewer or more variable hours. In France and Italy, earnings growth was strongest for individuals with the lowest ''employment intensity'', which is an index of annual hours worked over 1986-1991 (Chart 2.6).[25] By contrast, earnings growth was strongest for American workers with the highest levels of employment intensity.

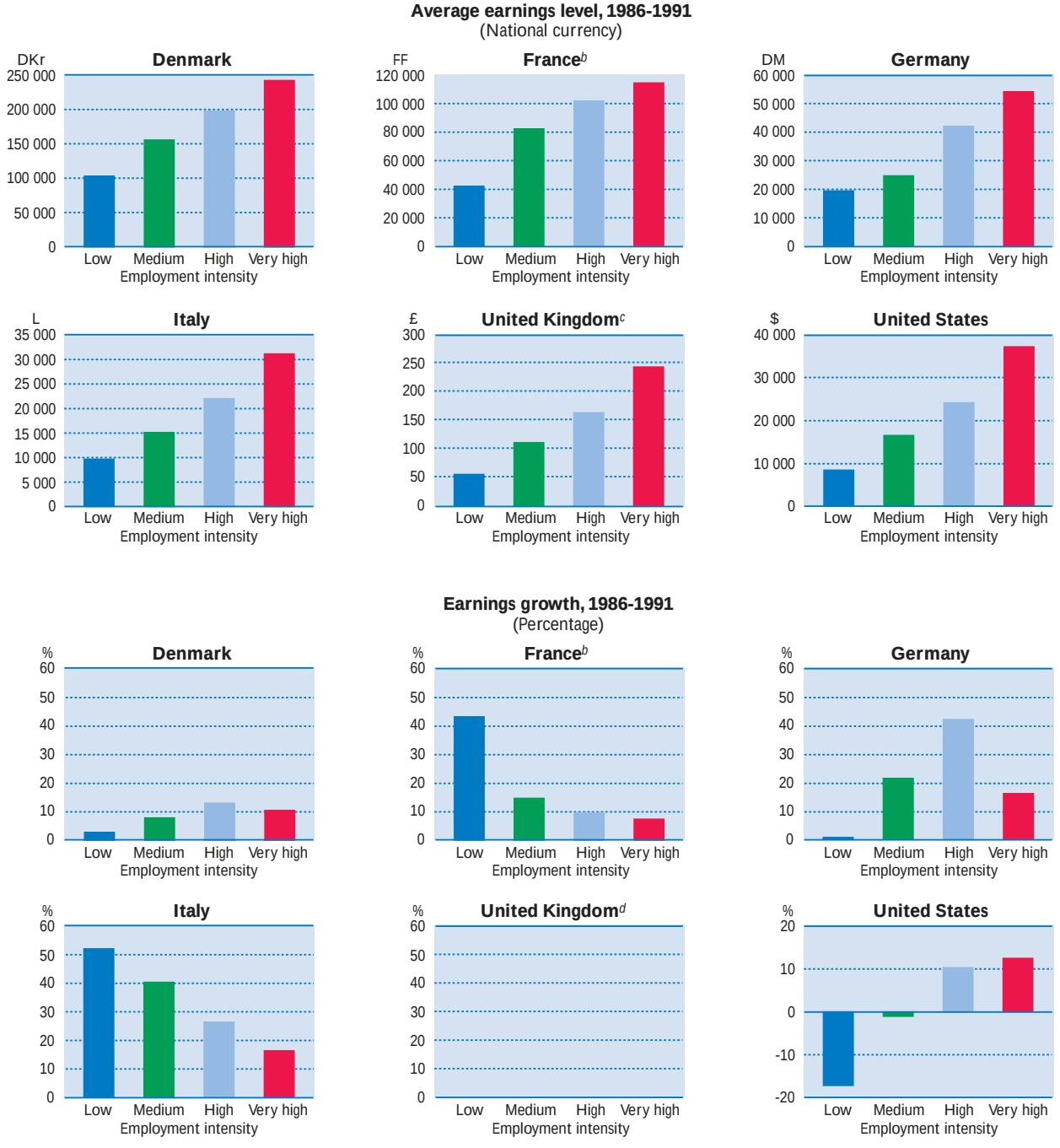
4. Real earnings growth and job change

The positive association noted above, between changing employers and earnings growth, suggests two further questions. First, why do the higher labour turnover rates widely believed to characterise less regulated labour markets, particularly the American labour market, not result in higher earnings mobility? A related and even more difficult question is whether policies to encourage higher labour turnover might provide workers with improved prospects to increase their earnings. Estimates of the proportion of continuously employed workers changing employers, industry or occupation are shown in Table 2.10. These estimates understate labour turnover for the total work force, because

Chart 2.6.

Real earnings and earnings growth by employment intensity, 1986-1991[a]

Annual earnings of all continuously employed workers



a) All earnings are in 1991 currency units. See Annex 2.A for the definition of employment intensity.
b) Data for 1984-1989.
c) Data for weekly earnings.
d) Data not available.
Source: See Table 2.A.1.

Table 2.10. **Average number of years in which workers changed employer, industry or occupation, 1986-1991**

Continuously employed full-time workers

	Denmark	France[a]	Germany	Italy	United Kingdom	United States
Changing[b]						
Employer	1.09	0.6	0.3	0.5	0.6	0.8
Industry	0.30	0.4	0.1	0.2	0.2	0.4
Occupation	0.28	0.6	0.0	0.2	0.4	0.4
Ratio of changes						
Industry/employer	0.28	0.6	0.2	0.3	0.4	0.5
Occupation/employer	0.26	0.9	0.1	0.3	0.7	0.5

a) Data for 1984-1989.
b) Changes defined in terms of workers' main job in each year. Industry and occupation are classified into broad groupings (approximately one-digit).
Source: See Table 2.A.1.

they are calculated using samples of continuously employed full-time workers and, hence, tend to exclude many of the workers who change employers or the type of work that they do (see Annex 2.A).

Labour turnover rates are not uniformly higher in the United States than in Europe. American workers most frequently change broad industrial sector, but change employers less frequently than Danish workers and change occupation less frequently than British and French workers. Germany stands out in this sample of countries for having the lowest turnover rates. German workers are particularly unlikely to change industry and occupation, probably due to the greater investment in and formalisation of specific vocational skills that is associated with the dual system of secondary education.

Although workers changing employers have higher average real earnings growth, it cannot be concluded that greater turnover would also increase upward mobility. The pay-off to turnover among continuously employed workers may greatly overstate the earnings gains from turnover for the entire work force, because many workers for whom changing jobs is most disruptive are omitted from the analysis. For example, displaced workers who experience long spells of unemployment leave, or the labour force, are not accounted for in these estimates.[26] Furthermore, the association of more rapid wage gains with turnover does not, of itself, imply a casual relationship between more job changes and higher earnings growth.

Table 2.11 shows that the propensity of workers to change employers varies quite strongly across groups, in ways that suggest that only certain forms of turnover are likely to result in earnings gains. In all countries, young workers change employers frequently. Less-educated workers also change employers more often than university graduates. With the exception of the United Kingdom, there is a *negative* association between the number of times a worker changed employers between 1986 and 1991 and their average earnings for the entire period (Chart 2.7). This pattern is particularly strong in Italy and the United States and probably reflects, in part, the typically low earnings of youthful and low-education job changers. Overall, these associations suggest caution in concluding that increased turnover should be encouraged on the grounds that it is likely to lead to higher earnings, particularly for adults or highly educated workers. Much of the association between changing employers and more rapid earnings growth appears to be due to youths, who rate high on both measures. This coincidence suggests that moving between employers plays an important role during the initial stages of many careers, but is not a reliable guide to when additional turnover would improve the earnings prospects of more experienced workers. It probably matters a great deal which workers change jobs and under what conditions.

E. CONCLUSIONS

The analysis in this chapter confirms that earnings mobility is one of the defining characteristics of labour markets in OECD countries. When assessing the distribution of the gains from work and their possible implications for policy, a longer run view that incorporates mobility is essential. The analysis presented here highlights several different aspects of mobility, including: the extent to which workers change places in the earnings distribution, thereby lowering long-run inequality below cross-sectional inequality; the dynamics of low-paid employment; and the shape of the real earnings paths traced out by individual workers. These different facets of mobility cannot be reduced to a single measure. Furthermore, international comparisons of earnings mobility vary, depending on which aspect is being emphasised and the details of how it is measured.

Table 2.11. **Relative number of annual changes of employer by workers' characteristics, 1986-1991**

Ratio of average annual changes for the specified group to the average for all continuously employed full-time workers

	Denmark	France[a]	Germany	Italy	United Kingdom	United States
Total	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**
Sex						
Men	1.06	1.06	0.99	1.00	0.95	0.92
Women	0.92	0.89	1.02	0.99	1.08	1.08
Age						
Under 25	2.78	1.55	2.28	1.76	1.72	1.98
25-34	0.98	1.00	1.30	1.04	1.20	1.13
35-49	0.68	0.87	0.49	0.69	0.79	0.79
50-64	0.58	0.82	0.26	0.56	0.56	0.42
Education						
Less than upper secondary	1.17	..	1.19	..	..	0.97
Upper secondary	1.03	..	1.03	..	..	1.01
Non-university tertiary	0.61	..	0.56	..	..	1.19
University degree	0.67	..		..	..	0.81
By earnings level (average over 1986-1991)[b]						
1st quintile	1.54	1.72	1.43	1.99	1.02	1.56
2nd quintile	1.13	0.86	1.33	1.09	1.05	1.32
3rd quintile	0.87	0.68	0.81	0.80	0.89	0.97
4th quintile	0.75	0.69	0.82	0.61	0.94	0.62
5th quintile	0.71	1.06	0.61	0.52	1.06	0.53

.. Data not available.
a) Data for 1984-1989.
b) Quintiles defined for weekly/monthly earnings averaged over 1986-1991 for continuously full-time workers.
Source: See Table 2.A.1.

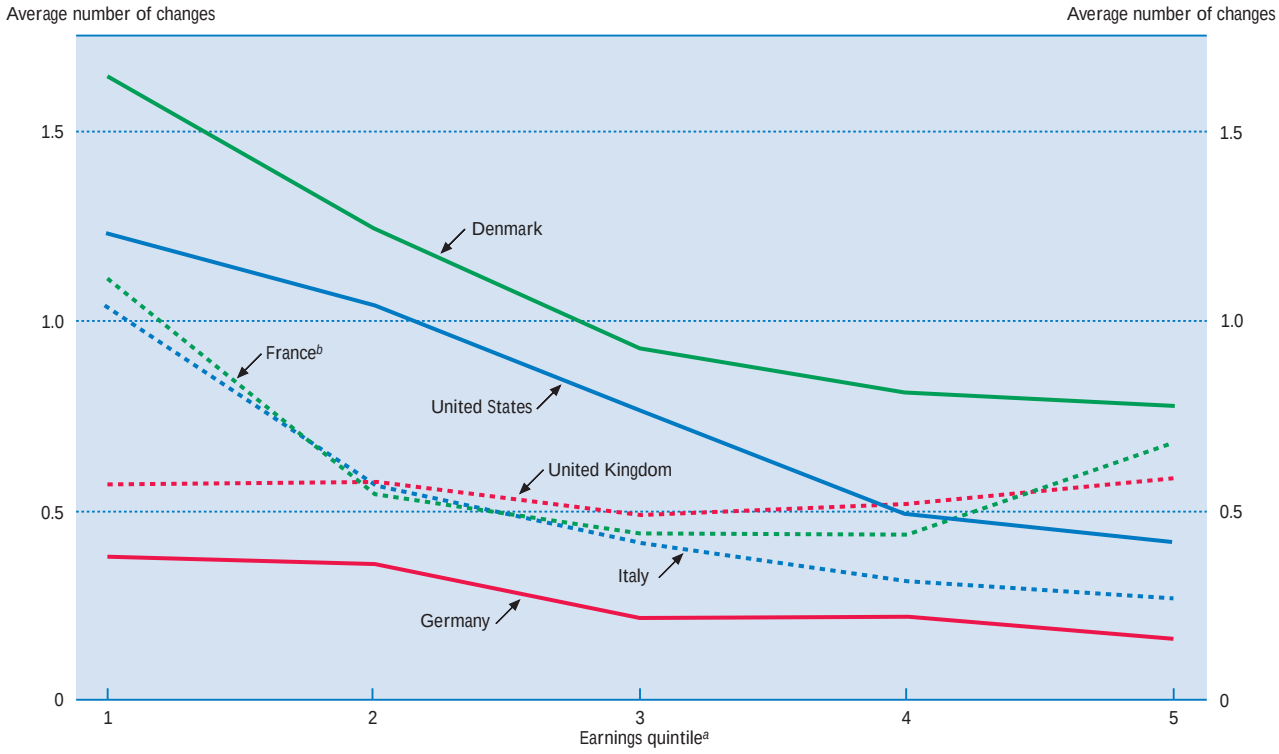
Several cross-cutting themes emerge from this diverse analysis. First, labour market policies need to take account of earnings mobility. For example, measures of the persistence and recurrence of low-paid employment imply that programmes to assist chronically low-paid workers should target women, older and less-educated workers more strongly than programmes intended to help workers experiencing temporarily low earnings. Second, countries with more deregulated labour and product markets do not appear to have higher relative mobility, nor do low-paid workers in these economies experience more upward mobility. Equity concerns about increased earnings inequality, which several continental European governments have identified as an important barrier to implementing some of the policy recommendations of the OECD *Jobs Strategy* [OECD (1997)], cannot be dismissed simply with an appeal to increased labour mobility. Supplementary policies to ameliorate the potential negative effects of any expansion in low-paid employment (*e.g.* employment-conditional benefits) or alternative strategies for reducing unemployment (*e.g.* targeted wage subsidies or payroll tax reductions) merit additional attention. Finally, mobility is a double-edged sword. Some of the earnings inequality in a single year is equalised over a longer time horizon and, hence, may not be a source of important differences in living standards. However, mobility sometimes takes the form of large fluctuations in real earnings that could result in economic insecurity.

The equalising effect of mobility is important, but should not be exaggerated. Perhaps of greatest importance for policy, the substantial rates of upward mobility among low-paid workers do not, by themselves, vitiate most of the concerns associated with low-paid employment. The large flows in and out of low pay do mean, however, that low-paid workers in a given year have very different prospects and, hence, differ greatly in whether they require public assistance and, if so, what sort of assistance would be most appropriate. Further study of the individual characteristics, career events and policy interventions that most improve the odds of making a *sustained* escape from low pay would be especially useful.

Further analysis of earnings volatility, and the extent to which it imperils family living standards, would also be useful. Significant shares of workers experience absolute declines or large increases in

Chart 2.7.

Average number of years in which workers changed main employer by level of earnings, 1986-1991
All continuously employed workers



a) Earnings averaged over the period.
b) Data for 1984-1989.
Source: See Table 2.A.1.

real earnings, suggesting considerable earnings insecurity, as does the finding that much earnings mobility occurs *among* similar workers (according to sex, age and education). However, the analysis presented here is descriptive and additional research will be required to better delineate the determinants of individual earnings fluctuations and their implications for welfare and policy.

Notes

1. In this chapter, Germany always refers to the former West Germany.
2. Changes in annual earnings are interesting in their own right, but they may not provide as good an indication of changes in workers' potential earnings if – as seems likely – the lower earnings associated with part-time employment are due in substantial degree to voluntary labour supply choices.
3. It is very difficult to differentiate between earnings fluctuations that can be "smoothed" and have little or no adverse impact on consumption from those causing economic insecurity. No doubt, some of the within-group mobility, which appears as idiosyncratic variations in the decomposition, reflects either predictable or insurable earnings variations.
4. Even though all of the workers in the sample gain six years of work experience over 1986-1991, some of the cross-sectional earnings inequality due to age differences in earnings is equalised, because wages rise much more quickly for the youngest age group than for the older groups, particular those aged 50 to 64 in 1986. Much longer panels of data would be required to account fully for ageing. However, some earnings differences associated with age in a cross-section might persist over entire working lives, since different age cohorts may fare differently.
5. The considerable empirical success of the permanent-income model of consumption indicates that families are able to smooth their incomes to a considerable degree. However, the "over-responsiveness" of consumption to changes in income, relative to the basic model's predictions, indicates that smoothing is incomplete, perhaps due to the difficulty of predicting future incomes or liquidity constraints that make it difficult to tap future income growth before it is actually received [Hall (1978); Flavin (1981)].
6. The single exception is Germany using the Theil I_2 inequality index, where the full equalising effect is reached in three years. More detailed analysis indicates that the "smoothing" effect of averaging earnings over more years was off-set by rising cross-sectional inequality as a small number of men, initially aged 25 to 34, achieved high earnings levels. This probably reflects an idiosyncrasy of this particular sample, rather than a general characteristic of the German labour market. Studies using longer panels typically find that most of the equalisation occurs in the first four to six years [Buchinsky and Hunt (1996); Finnie (1997)]. However, they also understate the full effect of age, since they only examine earnings mobility during years in which the careers of workers from different age cohorts overlap.
7. In a comparison of Germany and the United States, Burkhauser and Poupore (1997) also find lower mobility using the Gini, rather than alternative indices, but do not find that national rankings are affected by the choice of inequality index. Some of the apparently higher earnings mobility near the top and the bottom of the distribution could reflect measurement errors. Large and transitory errors would place an individual at one or the other extreme in the year in which of the error was recorded. In several of the datasets, a small number of outlier observations, which appeared to reflect large measurement errors, were omitted from the sample.
8. An example of the former is provided by the strong upward mobility at the bottom of the German earnings distribution. This is due to the importance of the low wages (and subsequent strong wage growth) received by apprentices when they first enter the labour market. When the sample is confined to prime-aged workers (Table 2.1, Panel B), Germany has the lowest equalisation from mobility measured by the mean log deviation index. Although no direct evidence is available, the relatively high mobility at the top of the French earnings distribution may reflect measurement error in the data, rather than true mobility. The French annual earnings data appear to be quite accurate, but their conversion into a monthly wage rate is somewhat imprecise for workers with multiple jobs. Measurement errors introduced by this calculation may account for the apparently high level of equalisation at the top of the French wage rate distribution. French mobility estimates for the Theil I_2 indices drop sharply when annual earnings are used (Table 2.1, Panel C).
9. Little is known about whether mobility in recent years is higher or lower than previously, but some limited evidence suggests considerable stability. This question is particularly pertinent for countries that have experienced a recent increase in cross-sectional earnings inequality. Several studies for Canada, Finland, the United Kingdom and the United States have concluded that the recent rise in earnings dispersion within a single year has not been offset by greater relative mobility [Gottschalk and Moffitt (1994); Gittleman and Joyce (1995, 1996); Buchinsky and Hunt (1996); Morrissette (1996); Dickens (1997); Finnie (1997); Eriksson (1997)].
10. This within-group youth effect is distinct from the better known between-group age effect, *i.e.* the tendency for young workers to gain ground on older workers, due to their typically more rapid earnings growth.
11. This decomposition can only be computed for the mean log deviation inequality index. Results are reported for the weekly/monthly earnings of continuously full-time employed workers, but qualitatively

similar results were obtained using annual earnings of full- and part-time workers.

12. From a policy perspective, the definition of low pay as below 0.65 times median earnings is probably more salient than the bottom quintile, but this definition produces quite small samples of low-paid workers in several countries, which may not yield as precise estimates of mobility patterns. A third approach to defining a low-pay threshold would be to set a common absolute (*e.g.* fixed purchasing power) threshold for all countries. The construction of comparable absolute thresholds is complex and is not attempted here. See Keese and Swaim (1997) for a comparison of absolute and relative thresholds.
13. Intermittent workers are difficult or impossible to track in the longitudinal datasets used for most of the countries studied in this chapter.
14. As was explained above, the exclusion of intermittent workers from the sample explains why less than 20 per cent of the workers fall in the first quintile of the earnings distribution in 1986, in Chart 2.2.
15. Chart 2.3 reports escape rates from low weekly/monthly earnings of continuously employed full-time workers. Results are similar when annual earnings of all continuously employed workers are used instead.
16. The United Kingdom has also had strong gains in average earnings, but weak employment growth. The situation was reversed in the United States.
17. Qualitatively similar results obtain for the other countries and for the annual earnings of all workers.
18. This finding is very similar to that found in an earlier literature about the distribution of time spent unemployed [Clark and Summers (1979)].
19. In the statistical literature, this is referred to as "the hazard rate". It is calculated as the conditional probability of exiting low pay in year *t*, given that the worker was low paid continuously from 1986 to year t-1.
20. Cross-country differences in the average accumulation of repeat spells are greater when low pay is defined as less than 0.65 times median earnings, ranging 0.3 years in Denmark and Italy to 0.9 in the United States.
21. That is, the average of earnings over 1985-1987 was used as the starting wage and the average over 1990-1992 as the ending wage.
22. Westergard-Nielsen (1989), Hill (1992), Atkinson, Bourguignon and Morrison (1992) and Bound, Brown, Duncan and Rodgers (1994) discuss measurement error in longitudinal datasets.
23. For evidence that the dispersion of individual growth rates and the risk of significant declines in real earnings was higher during the 1980s than the 1970s in Canada and the United States, see Morrisette (1996), Gottschalk and Moffitt (1994) and Rose (1994, 1995).
24. Whether there was an overall trend toward higher or low earnings inequality is reflected in the association between individual earnings growth rates and their earnings averaged over the full 1986-1991 period. In Germany, cross-sectional inequality fell a little during this period, consistent with earnings growth being higher for workers whose time-averaged earnings were lowest (*i.e.* the lowest growth trajectories tended to slope more steeply upwards). The association between earnings averaged over this period and earnings growth is somewhat erratic in other countries, but there is some indication that gains were strongest at the top of the distribution.
25. Everywhere, and virtually by definition, the level of annual earnings rises with employment intensity. See Annex 2.A for a fuller description of the employment intensity index.
26. Among displaced workers, those experiencing protracted unemployment also have the largest earnings losses once re-employed [Podgursky and Swaim (1987)].

ANNEX 2.A

Data sources, sample construction and data definitions for the longitudinal analysis

1. Sources and representativeness of data on earnings histories

An overview of the data sources used in this chapter is provided in Table 2.A.1. Earnings mobility is analysed over the period 1986-1991, with the sole exception of France, where the data refer to 1984-1989. Business-cycle conditions, which affect earnings mobility, were broadly similar for these countries and years.

The use of longitudinal data raises a number of special data quality concerns that were discussed in the 1996 *Employment Outlook*. In one important respect, these concerns are heightened in the analysis presented in this chapter. Last year, the analysis emphasised comparisons of earnings in 1986 with earnings in 1991. Because many details of an earnings history are lost if only the start and end points are examined, this year the focus has shifted to tracking earnings over the full 1986-1991 period. This provides a more detailed view of earnings histories, but also requires that attention be largely restricted to individuals for whom a continuous earnings history is available, raising the issue of the extent to which such a sample is representative of the overall work force.

For a variety of reasons, some of the individuals in a panel dataset in one year will be lost from the sample over the succeeding year. Such sample attrition can introduce biases if no correction is made for any resulting change in the representativeness of the remaining sample. However, sample attrition is probably only slightly more severe for the analysis in this chapter than for the snapshot measures reported in the 1996 chapter. Only a small number of individuals included in both the 1986 and 1991 samples are missing in one or more of the intervening years and, hence, fall out of the new analysis. The collectors of the German and United States data provide sophisticated probability weights to correct for sample attrition bias that are used in all of the calculations reported here. The other datasets lack such weights, but are probably less vulnerable to this problem since they are collected from administrative records rather than household interviews.

A second form of sample restriction, which is economic rather than statistical, is much more strongly affected by following workers over a successive six-year period. This generally requires that analysis be restricted to individuals employed in *every* year. The exclusion of "intermittent" workers means that great care must be taken in interpreting the results. Intermittent workers may be particularly salient for some of the policy questions related to earnings mobility, especially those relating to low-paid employment. For this reason, the core analysis of time spent in low pay among continuous workers is supplemented by a parallel analysis incorporating data on intermittent workers. However, this supplementary analysis is restricted to Germany and the United States.

Table 2.A.2 provides several measures of the extent and implications of sample attrition and the exclusion of intermittent workers from the sample. Sample sizes fall quite dramatically. The number of workers observed to be continuously employed over 1986-1991 was between 52 and 68 per cent of the number observed in employment in any single year. Attrition was moderately higher for full-time employment, since some workers move between full- and part-time jobs. Continuous workers also earn more than intermittent workers. The differences in earnings between continuous and intermittent workers are largest at the bottom of the earnings distribution and for the annual measure of earnings, which reflects differences in hours worked as well as wage rates. Chart 2.A.1 indicates that, in all countries, half or more of the workers in the continuously employed sample worked full-time and full-year schedules throughout 1986-1991 ("very high" employment intensity). However, even in this sample significant shares of women, low-educated and low-earning workers had lower levels of employment intensity, particularly in Denmark (Table 2.A.3).

2. Data definitions

Mobility is examined in terms of two measures of earnings. As in the 1996 chapter, the emphasis is on a wage-rate estimate, namely, the weekly or monthly earnings of full-time workers. This measure is intended to control for differences in working hours and to provide an indication of earnings potential and how it varies over a career. An important limitation of this measure is that it restricts attention to full-time workers. The exclusion of part-time workers is particularly troublesome when low-paid employment is analysed, but in many of the data sources it is not possible to calculate an accurate wage rate for them. Accordingly, a second earnings measure, the *annual* earnings of both full-and part-time workers, is also examined. Differences in annual earnings, whether across individuals or across time for a given worker, reflect both changes in wage rates and in hours worked. The inclusion of differences in hours worked is of interest, but

Table 2.A.1. **Overview of longitudinal datasets used in earnings mobility analysis**

	Source of data	Type of data	Main groups of wage and salary workers excluded	Data on the non-employed	Earnings concept[a]
Denmark	Data from the Danish Longitudinal Database (DLD), supplied by Niels Westergard-Nielsen and Paul Bingley, Centre for Labour Market and Social Research, Aarhus Business School.	Administrative	–	Yes	Gross weekly earnings
France	Data from Déclarations Annuelles des Données Sociales (DADS), supplied by Yves Guillotin and Alain Bigard, Groupe d'Analyse des Itinéraires et Niveaux Salariaux (GAINS), Université du Maine.	Administrative	General government	No	Net monthly earnings
Germany	Secretariat calculations based on data from the German Socio-Economic Panel (GSOEP).	Household survey	–	Yes	Gross monthly earnings
Italy	Data from the Instituto Nazionale de Previdenza Sociale Dataset (INPSD), supplied by Marco Novarese, Riccardo Revelli and Claudia Villosio, Ricerche e Progetti, Torino.	Administrative	General government	No	Gross monthly earnings
United Kingdom	Data from the New Earnings Survey Panel Dataset (NESPD), supplied by Peter Elias and Abigail McKnight, Warwick University.	Establishment survey (sampled from administrative data)	Very low earners	No	Gross weekly earnings
United States	Secretariat calculations based on data from the Panel Study of Income Dynamics (PSID).	Household survey	–	Yes	Gross weekly earnings

a) This column reports the earnings measure used for samples of full-time workers as a proxy for a wage rate. For all countries except for the United Kingdom, gross annual earnings are also analysed for full-time and part-time workers.

Table 2.A.2. **Earnings levels and sample sizes for the mobility analysis, 1986-1991**

A. Weekly/monthly earnings of full-time workers[a] (1991 prices in national currency)

	Average of single-year values, 1986-1991				Earnings averaged over 1986-1991 for continuously full-time subsample			
	D1	D5	D9	Sample size	D1	D5	D9	Sample size
Denmark	3 041	4 043	6 195	5 273	3 331	4 233	6 449	3 023
France[b]	4 652	7 259	14 274	92 365	5 491	8 022	15 234	45 779
Germany	1 860	3 643	6 225	3 796	2 733	3 995	6 564	1 666
Italy	1 445	2 118	3 428	111 852	1 677	2 290	3 622	56 605
United Kingdom	131	236	431	125 326	162	272	453	42 536
United States	223	549	1 168	5 867	310	634	1 206	3 179

B. Annual earnings of full-time and part-time workers[a] (1991 prices in national currency)

	Average of single-year values, 1986-1991				Earnings averaged over 1986-1991 for continuously employed subsample			
	D1	D5	D9	Sample size	D1	D5	D9	Sample size
Denmark	79 101	174 012	281 267	8 242	116 650	186 823	294 716	5 639
France[b]	16 866	75 873	153 979	117 467	52 288	88 688	171 861	66 349
Germany	9 528	38 851	70 253	4 842	22 807	43 666	72 801	2 670
Italy	4 997	21 866	38 607	115 697	14 636	25 182	41 818	59 989
United Kingdom	..	..	..	..	..	..	..	..
United States	4 374	21 683	51 118	7 114	9 269	25 046	53 507	4 483

.. Data not available.
a) D1, D5 and D9 denote the 10th, 50th (median) and 90th percentiles of the earnings distribution, respectively.
b) Data for 1984-1989.
Source: See Table 2.A.1.

complicates interpretation of the results. Differences in earnings opportunities may now be confounded with choices to work fewer weekly hours than the national standard for full-time employment or to work only part of the year.

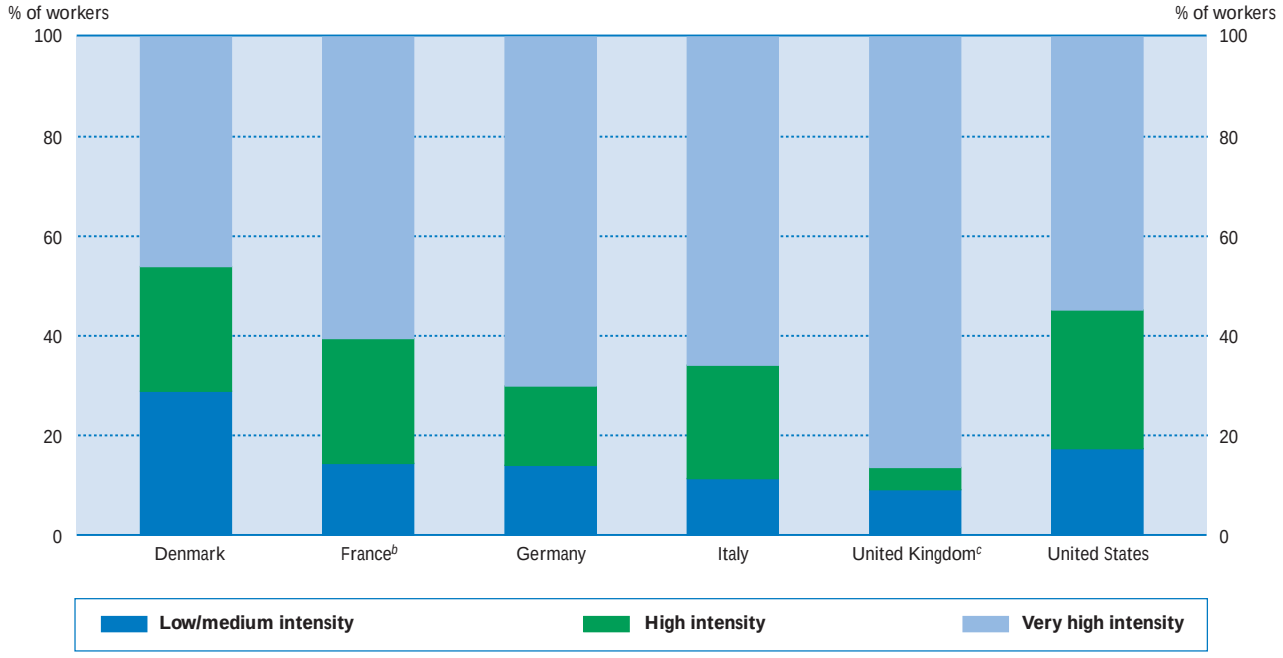
Two additional limitations of the mobility analysis are related to the definition of earnings adopted. First, the analysis of earnings mobility is restricted to dependent employees. Earnings from self-employment may play an important role in the earnings histories of a significant number of workers, but these earnings are measured either imprecisely or not at all in the data sources used for this analysis. National differences in the overall level of self-employment and the extent to which dependent employment and self-employment are combined into single careers may thus affect the comparisons made in this chapter. Second, the earnings measures refer to *gross* cash earnings. Accordingly, they may not provide a completely accurate indication of how total compensation or take-home pay evolves over time.

A multi-year *employment intensity* index was computed so that the implications of part-time and part-year employment for earnings mobility could be examined. The index is computed in two steps. First, individuals are assigned a single-year employment intensity score for each of the six years, 1986-1991. Individuals working full-time during the entire year received the score 3; those working less than, but at least one-half of, full-time and full-year 2; and other workers 1. The six-year employment intensity index is then simply the sum of these annual scores. For purposes of tabulation, workers were sometimes grouped by ranges of this index. Workers with a combined score of 18 (continuously full-time and year-round workers) are labelled as having "very high" employment intensity. Workers with six-year indices in the ranges 15 to 17, 12 to 14 and under 12 are labelled as having, respectively, "high", "medium" and "low" employment intensity. These are intended to provide a useful comparison of relative employment intensities among continuous workers and indicate that women and the youngest, oldest and the least educated workers have below-average employment intensities (Table 2.A.3). By comparison to the full working-age population, virtually all of these workers have high levels of employment intensity.

Chart 2.A.1.

Distribution of workers by employment intensity, 1986-1991[a]

All continuously employed workers



a) See Annex 2.A for an explanation of employment intensity levels.
b) Data for 1984-1989.
c) Employment intensity measure does not incorporate variations in weeks worked per year.
Source: See Table 2.A.1.

Table 2.A.3. **Distribution of employees by employment intensity, 1986-1991**[a]

All continuously employed workers

	Denmark			France[b]			Germany			Italy			United Kingdom[c]			United States		
	Low/ Medium	High	Very high	Low/ Medium	High	Very high	Low/ Medium	High	Very high	Low/ Medium	High	Very high	Low/ Medium	High	Very high	Low/ Medium	High	Very high
Total	**29.1**	**25.3**	**45.6**	**14.4**	**25.1**	**60.5**	**14.0**	**15.9**	**70.0**	**11.4**	**22.8**	**65.9**	**9.1**	**4.5**	**86.4**	**17.4**	**27.9**	**54.8**
Sex																		
Men	20.5	25.4	54.2	10.5	26.3	63.2	2.6	15.5	81.9	8.6	20.3	71.1	0.8	1.4	97.8	5.3	24.2	70.4
Women	39.3	25.2	35.5	21.7	22.7	55.5	36.6	16.9	46.5	17.2	27.9	54.9	22.9	9.6	67.5	29.0	31.3	39.7
Age																		
Under 25	36.3	36.9	26.8	19.6	35.9	44.4	10.0	36.9	53.0	20.9	39.2	39.9	1.4	4.5	94.1	21.4	36.4	42.2
25-34	28.6	31.0	40.5	13.3	25.5	61.2	13.8	16.3	69.9	11.0	21.7	67.4	6.1	3.6	90.3	14.6	26.4	59.0
35-49	26.9	20.1	53.0	13.1	21.6	65.3	14.3	9.4	76.3	7.4	15.0	77.6	12.1	5.1	82.8	15.9	25.8	58.3
50-64	31.1	20.2	48.7	16.4	23.3	60.3	17.6	15.4	67.0	8.9	25.4	65.7	14.4	4.1	81.5	24.3	29.2	46.4
Education																		
Less than upper secondary	39.5	25.9	34.6	..	..	..	18.6	18.7	62.7	..	..	..	..	..	..	20.7	30.3	49.0
Upper secondary	27.8	26.2	46.1	..	..	..	14.1	16.3	69.6	..	..	..	..	..	..	17.5	27.8	54.7
Non-university tertiary	23.7	25.8	50.6	..	..	..	6.6	10.6	82.7	..	..	..	..	..	..	15.7	30.4	53.9
University degree	9.1	20.5	70.3	..	..	..				..	..	..	..	..	..	17.7	23.3	59.0
Average earnings over 1986-1991[d]																		
1st quintile	80.1	15.1	4.9	45.4	30.7	23.8	68.1	18.2	13.6	48.7	37.6	13.7	20.2	7.6	72.1	54.7	33.4	11.9
2nd quintile	31.9	37.9	30.2	8.8	29.5	61.7	8.3	25.4	66.4	5.8	37.9	56.3	1.0	2.5	96.5	15.3	37.3	47.5
3rd quintile	17.5	30.6	52.0	5.3	22.7	71.9	4.7	18.5	76.8	1.3	19.9	78.8	1.8	2.6	95.5	9.3	27.0	63.7
4th quintile	12.7	25.1	62.2	4.7	20.2	75.1	1.7	10.7	87.6	0.6	11.9	87.6	1.4	2.3	96.3	5.0	27.2	67.7
5th quintile	3.3	17.9	78.8	7.8	22.3	70.0	0.2	8.1	91.6	0.2	6.8	93.0	0.4	0.7	98.8	2.6	14.4	83.1

.. Data not available.

a) See Annex 2.A for an explanation of employment intensity levels.

b) Data for 1984-1989.

c) Employment intensity measure does not incorporate variations in weeks worked per year.

d) Quintiles defined for annual earnings (weekly for the United Kingdom) averaged over 1986-1991 for continuously employed workers.

Source: See Table 2.A.1.

ANNEX 2.B

Quantifying how much mobility reduces earnings inequality

Shorrocks (1978) proposed an answer to the question, "How much does mobility reduce inequality?". He argued that a precise answer can be obtained by examining how much more equal the distribution of earnings is when individual earnings are averaged over multiple years, as compared with the distribution in a single year. If a decomposable index is used to measure inequality, the reduction in earnings inequality due to mobility can be split into the share due to mobility among groups of similar workers (within-group mobility) and relative changes in the average earnings of these groups (between-group mobility).

1. Shorrocks' method

It is first necessary to select a measure of inequality. Let $I(\omega)$ denote the chosen inequality index, such as the Gini index or the mean log deviation, where ω denotes the (N x 1) vector of the earnings of the N workers in the sample being analysed. Shorrocks suggests estimating mobility by the extent to which the index $I(\bullet)$ is lower for earnings averaged over $T > 1$ years compared with earnings in a single year. A useful way to make this comparison is to express the inequality of "smoothed" earnings as a proportion of single-year inequality, where the latter is averaged over the time period being investigated. Formally, Shorrocks' ratio is calculated as:

$$R(\mathbf{W}_T) = I(\omega^{mT}) / [\Sigma_{t = 1 \text{ to } T}(\eta_{t,T} * I(\omega_t))], \text{ where}$$

$\mathbf{W}_T$ is the (N x T) matrix of the N workers' earnings in years 1 to T, ω^{mT} denotes the (N x 1) vector of individual earnings averaged over years 1 to T (*i.e.*, $w^{mT} = (1/T)\,\Sigma_{t = 1 \text{ to } T}\, w_t$), ω_t denotes the (N x 1) vector of individual earnings in year t and $\eta_{t,T} = (\Sigma_{j = 1 \text{ to } N}\, w_{j,t}) / (\Sigma_{\tau = 1 \text{ to } T}\, \Sigma_{j = 1 \text{ to } N}\, w_{j,\tau})$ is the share of total earnings (over the years $t = 1$ to T) that accrued in year t.[1] The associated mobility index is simply:

$$M(\mathbf{W}_T) = 1 - R(\mathbf{W}_T)$$

M ranges from 0 (no equalising mobility) to 1 (fully equalising mobility).

If a decomposable inequality index is adopted, the Shorrocks method can be extended to examine the relative importance of within-group mobility and between-group mobility. Suppose the total sample has been divided into G groups (for example age groups). Letting $I^W(\omega)$ denote within-group inequality, $I^B(\omega)$ between-group inequality, and $I^{total}(\omega)$ total inequality for all workers:

$$I^{total}(\omega) = I^W(\omega) + I^B(\omega), \text{ where}$$

$I^W(\omega) = \Sigma_{g = 1 \text{ to } G}\, [\nu_g * I_g(\omega)]$, is simply a weighted average of inequality within each group I_g, the weights $\nu_g = n_g/N$ being the population shares of each group, and

$I^B(\omega) = \Sigma_{g = 1 \text{ to } G}\, [\nu_g * \log(w^{mN}/w^{mN}{}_g)]$, an index of the deviations between the overall mean earnings for the total sample (w^{mN}) and the means for the G groups ($w^{mN}{}_g$).

Analogously, the mobility index for a T-year period can be decomposed into within-group and between-group mobility:

$$M^{total}{}_T(\mathbf{W}) = \sigma^W M^W{}_T(\mathbf{W}) + \sigma^B M^B{}_T(\mathbf{W})$$

Total mobility is a weighted average of the within-group and between-group mobility indexes, which are defined analogously to the total mobility index:

$$M^W{}_T(\mathbf{W}) = 1 - [I^W(\omega^{mT}) / (\Sigma_{t = 1 \text{ to } T}\, (\eta_{t,T} * I^W(\omega_t))] \text{ and}$$

$$M^B{}_T(\mathbf{W}) = 1 - [I^B(\omega^{mT}) / (\Sigma_{t = 1 \text{ to } T}\, (\eta_{t,T} * I^B(\omega_t))].$$

The σ^W and σ^B weights reflect the relative importance of within-group and between-group inequality in total inequality and are defined as:

$$\sigma^W = [\Sigma_{t = 1 \text{ to } T}\, (\eta_{t,T} * I^W(\omega_t)] / [\Sigma_{t = 1 \text{ to } T}\, (\eta_{t,T} * I^{total}(\omega_t)] \text{ and}$$

$$\sigma^B = [\Sigma_{t = 1 \text{ to } T}\, (\eta_{t,T} * I^B(\omega_t)] / [\Sigma_{t = 1 \text{ to } T}\, (\eta_{t,T} * I^{total}(\omega_t)]$$

2. Implementation of Shorrocks' method in this chapter

Four different measures of the inequality index function $I(\bullet)$ are used. In the formulas defining these four indices, $\log(\bullet)$ always denotes the natural logarithm (base e) and w^{mN} denotes the mean of earnings over the N individuals in the specified sample [*i.e.*, $w^{mN} = (1/N)\Sigma_{j = 1 \text{ to } N} w_j$]. The four measures are:

Mean log deviation:

$$I^{mld}(\omega) = (1/N)\, \Sigma_{j = 1 \text{ to } N}\, [\log(w^{mN} / w_j)]$$

Gini:

$$I^{gini}(\omega) = [1/(2N^2\, w^{mN})] * \Sigma_{j = 1 \text{ to } N} \Sigma_{k = 1 \text{ to } N}]w_j - w_k]$$

Theil I_1: $I^1(\omega) = (1/N)\Sigma_{j = 1 \text{ to } N}[(w_j/w^{mN}) * \log(w_j/w^{mN})]$

Theil I_2: $I^2(\omega) = (1/2N)\Sigma_{j = 1 \text{ to } N}[(w_j/w^{mN})^2 - 1]$

All four indices are used to assess how rapidly mobility caused inequality to diminish.[2] Multiple indices are used because no one index fully captures all the relevant aspects of inequality, as each are more sensitive to different aspects of inequality.[3] However, when differentiating within- and between-group mobility, only the mean log deviation index is used, because it alone allows exact decompositions into the shares due to each effect.

Notes

1. Under quite general conditions, Shorrocks shows that the $\eta_{t,\,T}$ are the best weights to use to calculate an "average" inequality level over a multi-year period, which can then be compared with the level of inequality when earnings are first averaged over the same period.
2. The mean log deviation is sometimes referred to as the Theil I_0 index. The Theil I_2 index is one-half of the square of the coefficient of variation.
3. Atkinson (1970) has pointed out that all inequality indices weight different portions of the distribution differently. Among the four indices used, the mean log deviation index is most sensitive to inequality near the bottom of the distribution, the Gini is most sensitive in the middle, the Theil I_2 at the top, and the Theil I_1 at both extremes.

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