

Sectoral Transformation and Labour Market Flows*

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Abstract

This paper examines the pattern of sectoral transformation that has occurred in the United Kingdom in the post-war period and documents the flows of workers that have occurred between industrial sectors and non-employment that have resulted. It then examines what consequences sectoral transformation has had for wages and unemployment, both at the aggregate and the individual level. It concludes by examining the policy implications of its findings.

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1 Introduction

It is frequently assumed that ‘globalisation’ or ‘technological change’ has increased the speed with which economies must adjust. The workforce must be reallocated between sectors, occupations or geographical regions in order to respond to changing patterns of demand. Because of this, it is assumed that the stability of the workplace has declined and ‘jobs for life’ are a thing of the past. Furthermore, the inability of labour markets to react leads to the displacement of a growing numbers of workers from the declining industries. These workers suffer long periods of unemployment and subsequent losses in earnings, should they manage to find alternative employment at all.

But what evidence is there that the speed of reallocation of labour has actually increased, or that job security has fallen? Is it true that workers displaced from declining industries face long periods of unemployment and lower wages when they eventually find work? In this paper we draw together some empirical evidence on the flows of workers between sectors of the labour market in order to shed light on some of these issues.

Section 2 begins by examining the pattern of sectoral transformation that has occurred in the United Kingdom over the last 50 years, and the flows of workers that have resulted. Section 3 attempts to rationalise the movements observed and asks what this implies for previous studies of worker flows that have been conducted. Section 4 then examines the consequences of sectoral transformation for wages and unemployment at both the aggregate and the individual level. Finally, Section 5 examines the policy implications of this study.

2 Sectoral Transformation and Labour Market Flows

What do we mean by sectoral transformation, and what does this imply for the flows of workers in an economy? Consider the diagram below in which there are two aggregate sectors, the declining sector (D) and the expanding sector (E). In addition, workers who cannot find work are unemployed (U).

Crudely, we associate sectoral transformation with the long run decline of one

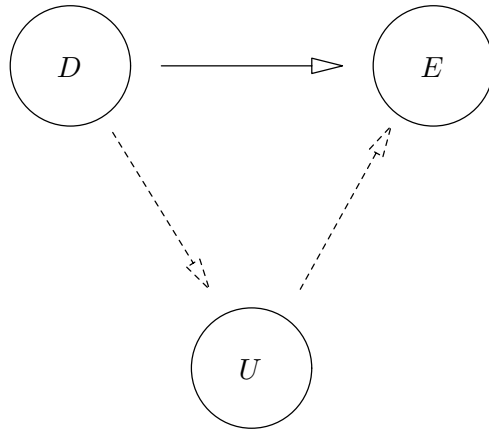


Figure 1: Stylised sectoral transformation

sector (D) and the long run expansion of another sector (E). This will occur if, as a result of exogenous change, there are changes in profitable opportunities between sectors, which manifest themselves in differential rates of job creation and destruction between the two sectors.

This adjustment in the sectoral structure of the economy is potentially important from a policy perspective because it may impact on the welfare of those individuals who are required to change employment status or industry. In the short run they may suffer unemployment if there is friction in the adjustment process and they are unable to move directly from D to E , but rather face a period of unemployment. This will cause an increase in the aggregate level of unemployment, above the cyclical unemployment that occurs because of fluctuations in the rate of job creation and job destruction due to business cycles and other temporary shocks. These individuals may also face changes in their employment conditions when they are re-employed — for instance the wage rates that they receive.

Within this very simple framework two points are apparent. Firstly, if direct movement between sectors becomes more difficult for whatever reason, then the unemployment attributable to sectoral transformation will increase, *ceteris paribus*. Secondly, if the rate of sectoral transformation increases then the unemployment attributable to people being displaced from declining sectors

will increase.

In this section we examine the pattern of sectoral transformation that has occurred in the United Kingdom from 1950 to 2000. In particular we address the question of whether the rate of sectoral transformation has increased or decreased over this period. We then examine the gross and net flows of workers between sectors that these changes have generated and ask what this implies about the ability of the UK economy to adjust to sectoral transformation.

2.1 Employment Change in the UK 1950-2000

The pattern of employment in the United Kingdom has changed markedly since the Second World War. The top panel of Table 1 illustrates the extent to which labour has reallocated across seven broad sectors between 1950 and 2000. As is well known, this reallocation has been considerable. The proportion employed in distribution and services has more than doubled, and now accounts for 70% of the workforce. Manufacturing, by contrast, now provides only 16% of employment compared to nearly 40% in 1950. The bottom panel shows that manufacturing employment declined faster in the 1970s and 1980s than in any other decades, and that the speed of decline has halved in the most recent decade. Similarly, the increase in the size of the service sector accelerated in every decade up to the 1990s.

The rate of restructuring across time may be investigated in more depth by the use of a turbulence index $\frac{1}{2} \sum |\Delta(\frac{N_i}{N})|$, which provides a summary measure of the rate of change of industry employment shares. These are summarised in Table 2 and plotted in Figure 2. Comparisons of this index across time allow an assessment of whether the rate at which the industrial structure of employment is changing over time is increasing. Figure 2 indicates that the 1970s and 1980s witnessed greater sectoral employment reallocation than any decade since the war. Secondly, the rate of restructuring has decelerated rapidly in the 1990s and has returned to levels similar to those that prevailed in the 1960s.¹

There are two important caveats in the calculation of such indices. Firstly,

¹Abraham (1991) notes that since the indices are based on realised rather than desired changes in employment, they might fail to capture the full extent of reallocation shocks. Information on vacancies may be used to assess the extent of desired demand.

Table 1: Changing employment shares in the UK 1950–2000

| <i>(a) % of employees in employment</i> | <i>1950</i> | <i>1960</i> | <i>1970</i> | <i>1980</i> | <i>1990^a</i> | <i>2000^{a,b}</i> |
|----------------------------------------------|-------------|-------------|-------------|-------------|-------------------------|---------------------------|
| Agriculture, forestry and fishing | 5.60 | 4.10 | 1.74 | 1.57 | 1.37 | 1.27 |
| Mining, supply of electricity, gas and water | 5.16 | 4.73 | 3.68 | 3.19 | 1.74 | 0.86 |
| Manufacturing | 38.02 | 37.66 | 38.69 | 30.28 | 20.52 | 16.52 |
| Transport, storage and communication | 8.00 | 6.97 | 6.94 | 6.52 | 6.07 | 6.09 |
| Construction | 6.66 | 6.51 | 5.88 | 5.37 | 5.36 | 4.73 |
| Wholesale and retail distribution | 12.74 | 13.88 | 12.08 | 14.61 | 15.79 | 17.04 |
| Services | 23.82 | 26.16 | 30.98 | 38.47 | 49.15 | 53.50 |

| <i>(b) Change in % over decade</i> | <i>1950s</i> | <i>1960s</i> | <i>1970s</i> | <i>1980s</i> | <i>1990s</i> |
|----------------------------------------------|--------------|--------------|--------------|--------------|--------------|
| Agriculture, forestry and fishing | -1.50 | -2.35 | -0.18 | -0.20 | -0.10 |
| Mining, supply of electricity, gas and water | -0.44 | -1.04 | -0.50 | -1.44 | -0.88 |
| Manufacturing | -0.36 | 1.03 | -8.41 | -9.76 | -4.00 |
| Transport, storage and communication | -1.03 | -0.03 | -0.42 | -0.45 | 0.02 |
| Construction | -0.15 | -0.62 | -0.51 | -0.01 | -0.64 |
| Wholesale and retail distribution | 1.14 | -1.80 | 2.53 | 1.18 | 1.25 |
| Services | 2.34 | 4.82 | 7.48 | 10.68 | 4.35 |

Sources: Ministry of Labour Gazette, Department of Employment Gazette, Employment Gazette, Labour Market Trends (various years).

^aFigures for 1990 and 2000 refer to UK, earlier years refer to GB.

^bDecember 1999.

since they measure absolute changes in employment shares, an expansion of a sector followed by an immediate contraction of the same size will be picked up as two periods of turbulence. Thus the index may pick up the relative expansion and contraction of sectors over the course of the business cycle. Whilst this may be of interest, particularly if it is disruptive in terms of increased unemployment, it is not the focus of this paper. This problem may be ameliorated by extending the time period over which the difference is taken. For instance, by considering a decade turbulence index any temporary relative expansions and contractions which occur within the decade will not be measured.

Secondly, the level of industrial aggregation matters. At higher levels of aggregation movements of employment within an industrial sector will not affect the index. At lower levels of aggregation, these will be picked up as movements between the more disaggregated sectors. Clearly a judgement needs to

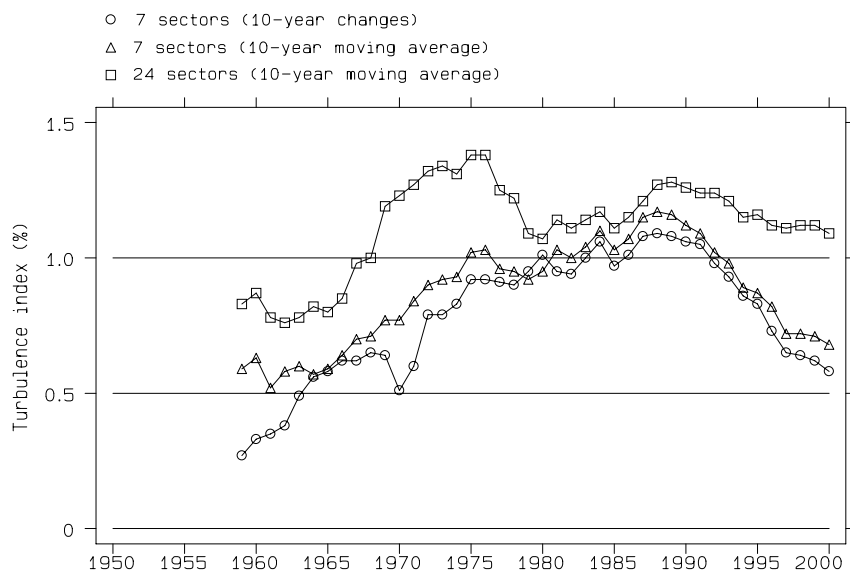


Figure 2: Decade Turbulence indices for the United Kingdom

be made about the appropriate level of aggregation with all movement which might be viewed as potentially disruptive (in terms of unemployment) being captured by the index.²

Table 2: Decade turbulence indices for the UK (%)

| | <i>24 sectors</i> | <i>7 sectors</i> | <i>7 sectors</i> |
|-------|---------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------|
| | <i>Decade average</i> | <i>Decade average</i> | <i>10 year difference</i> |
| | $\frac{1}{2} \sum_{i=1}^{24} \Delta_1(\frac{N_i}{N}) $ | $\frac{1}{2} \sum_{i=1}^7 \Delta_1(\frac{N_i}{N}) $ | $\frac{1}{2} \sum_{i=1}^7 \Delta_{10}(\frac{N_i}{N}) $ |
| 1950s | 0.83 | 0.59 | 0.27 |
| 1960s | 1.19 | 0.77 | 0.64 |
| 1970s | 1.09 | 0.92 | 0.95 |
| 1980s | 1.28 | 1.16 | 1.08 |
| 1990s | 1.12 | 0.71 | 0.62 |

The influence of these elements can clearly be seen in Figure 2. The turbulence index based on 24 sectors is always higher than that based on 7 sectors as it

²Abraham (1991) also notes that changes in the skill mix of workers required within an industry may occur without affecting the industry's share of employment and hence the index.

is picking up more movements between the sub-sectors. The finer level of disaggregation is achieved mainly by a more detailed division of manufacturing. The divergence of the two lines in the earlier periods is therefore caused by the fact that in the 1950s and 1960s most of the adjustment that was occurring was between manufacturing sectors, which the 24-sector index is picking up but the 7-sector index misses. In the 1970s and 1980s on the other hand, most of the adjustment is directly from manufacturing to services, which both indices pick up. Hence they are much closer together over this period. If it is the case that adjustments within manufacturing are easier than adjustments between manufacturing and services, then the problems associated with increasing sectoral transformation may be more accurately reflected by changes in the 7 sector index. We return to this question later in the paper.

A comparison of a decade based turbulence index with a 10-year moving average of the annual turbulence indices also indicates the relative importance of short run and long run factors. From 1950 to 1980 these indices diverge periodically since temporary shocks are an important cause of sectoral employment change. From 1980 to 2000 the indices move more closely together since, over this period, employment is consistently moving from manufacturing to services and reverse flows are rare.

2.2 Gross Worker Flows and Sectoral Transformation

Although the mechanism for sectoral transformation is differential job creation and job destruction, the consequence of this change is to generate flows of workers from one sector to another. Intuitively, one might imagine that movements of labour occur directly from the declining (D) to the expanding sectors (E). That is, declining sectors have high outflow rates of labour, and expanding sectors have high inflow rates. Further, if there is some frictional unemployment, some of these flows might occur with an intervening spell of unemployment (U). How well does this characterisation square with the facts in terms of measured employment flows?

Figure 3 plots the gross flows between the declining and expanding sectors.³

³The data source used in this study is the UK Labour Force Survey (LFS) from 1975 to 1995. This is an annual (biennial from 1975 to 1983; quarterly from 1992 onwards) survey of

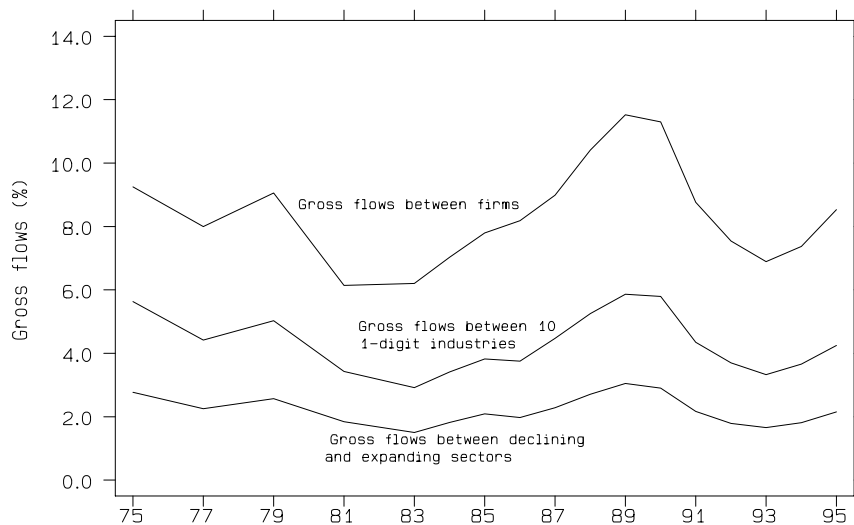


Figure 3: Gross Flows between sectors 1975–1995

It is apparent that such flows are procyclical and are highest during booms. This suggests that sector to sector flows are dominated by voluntary moves (quits rather than layoffs), with individuals moving when times are good rather than when they are bad.⁴ Another interesting feature is that many of these flows are not occurring from the declining to the expanding sectors. Whilst between 6% and 11% of individuals change firms each year, only 2%–3% switch from the declining to the expanding sector or *vice versa*.⁵ There is therefore considerable intra-sectoral movement of labour. This is consistent with the observation on US firm-level data that much job creation and destruction occurs within narrowly defined industries (Davis & Haltiwanger 1992).

A number of studies have argued that, for the US, such gross flows of workers

60,000 households comprising about 120,000 adults. In every year of the survey, individuals are asked about their current labour force status (working, unemployed, out of the labour force) and their current industry, if employed. Individuals are also asked about their status and industry 12 months previously.

⁴It is well known from the literature of flows of workers between employment status that quits are procyclical (Blanchard & Diamond 1990, Burda & Wyploz 1994).

⁵Clearly, the size of gross flows depends partly on the level of aggregation: flows are greater if there are more industries. Sectors are classified as expanding or declining dependent on whether they experienced increases or decreases in employment shares over the period 1975–1995.

have declined secularly over the 1970s and 1980s as workers have become less mobile (Murphy & Topel 1987, Jovanovic & Moffitt 1990) and that this has coincided with an increase in the unemployment rate. Indeed, Jacoby (1983) argues that job mobility has been declining throughout the 20th Century with the development of more sophisticated internal labour markets. One explanation for this is that workers with high levels of sector-specific human capital are unwilling to change sector, even at the expense of longer periods of unemployment (Thomas 1996). However, we argue that this is too simplistic a characterisation. Firstly, as is evident from Figure 3, the apparent decline in the 1970s and 1980s was strongly reversed in the 1980s as the UK Economy boomed. Secondly, the link between changes in gross flow rates and the level of unemployment is far from direct, and more subtle than the above characterisation suggests. It is particularly important to realise, for instance that worker flows other than those indicated on Figure 1 are important. We have already noted that intra-sectoral flows are important. However, so are reverse flows from unemployment and the expanding sector to the declining sector.

Figure 4 shows job-to-job inflow and outflow rates between 10 sectors of economic activity in the UK for each year from 1975 to 1995. The 45-degree line equates inflow and outflow rates. Two features stand out. First, inflows and outflows between sectors are of similar size. Second, they are positively correlated.⁶ That is, although a considerable number of people who have left the declining sectors enter the expanding sectors each year, an almost equal number of people have moved in the opposite direction

2.3 Net Flows of Workers

The fact that inflows and outflows are of a similar size implies that gross flows between sectors are larger than net flows between sectors. To see this consider the gross flow matrix \mathbf{G} of workers between the declining and expanding sectors in the UK for 1993–94 given in Table 3. Total gross flows are the sum of the

⁶This relationship might occur if some sectors have high turnover whilst others have low turnover, and not because inflows and outflows are positively correlated. Although some sectors do have higher turnover than others, OLS regressions of inflows on outflows separately for each sector reveal a significant positive correlation within sectors for nine of the ten sectors.

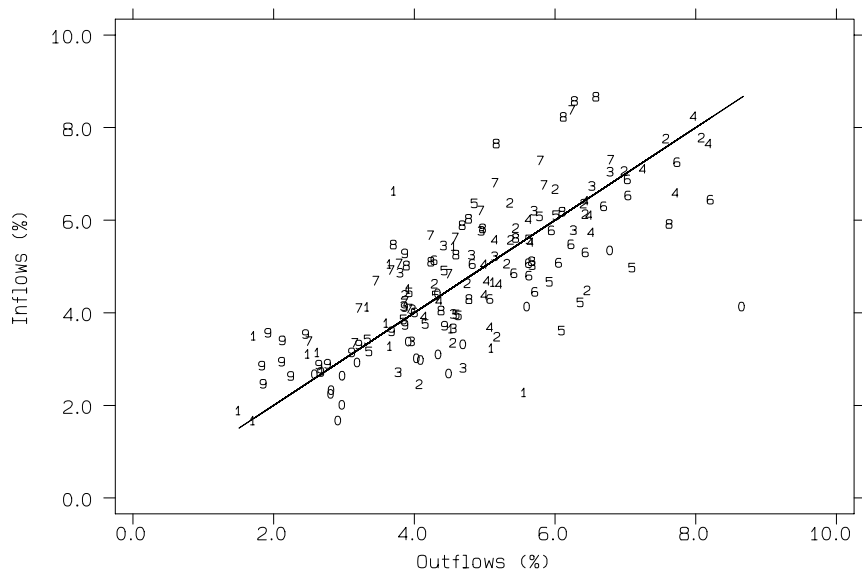


Figure 4: Inflow and Outflow rates by 1-digit SIC 1975–1995

off-diagonal elements of \mathbf{G} .⁷ Total net flows are the sum of flows that are not cancelled out by return flows. For example, net flows between the expanding and the declining sector can most easily be calculated as $|212538 - 203213|$.⁸

The gross flow matrix \mathbf{G} may be defined for any dimension. If an individual is in any of $s = 1, \dots, S$ sectors at time t , then \mathbf{G} has dimension $S + 1 \times S + 1$, since flows between employment and non-employment must also be included. Figure 5 plots net flows between sectors over time for a number of aggregations.⁹

Several points are noteworthy from this figure. First, note that gross flows are approximately 10 times greater than net flows. Only about one-fifth of one percent of the labour force moves between the declining and expanding sectors in a way that contributes to sectoral adjustment. However, the changes in sectoral employment during this period, shown in Table 1, would require net flows of the order of 1% per year. It is clear, therefore, that direct job-to-job

⁷Proportionate gross flows are calculated by standardising on the total number in the sample at $t - 1$.

⁸This is equivalent to the sum of the elements of $\mathbf{N} = |\mathbf{G} - \mathbf{G}'|$, divided by two to avoid double counting.

⁹As with gross flows, net job-to-job flows increase with the number of sectors.

Table 3: Gross flow matrix, UK 1993–94

| | | <i>Aggregate sector at t</i> | | | Total |
|----------------------------------|----------------|------------------------------|------------|--------------------|------------|
| | | Declining | Expanding | Non- Employment | |
| <i>Aggregate sector at t – 1</i> | Declining | 7,665,379 | 212,538 | 571,264 | 8,449,181 |
| | Row % | 90.72 | 2.52 | 6.76 | 100.00 |
| | Column % | 90.94 | 1.52 | 6.54 | 27.15 |
| | Expanding | 203,213 | 12,596,283 | 857,604 | 13,657,100 |
| | Row % | 1.49 | 92.23 | 6.28 | 100.00 |
| | Column % | 2.41 | 90.28 | 9.82 | 43.89 |
| | Non-employment | 560,208 | 1,143,281 | 7,307,549 | 9,011,038 |
| | Row % | 6.22 | 12.69 | 81.10 | 100.00 |
| | Column % | 6.65 | 8.19 | 83.64 | 28.96 |
| | Total | 8,428,800 | 13,952,102 | 8,736,417 | 31,117,319 |
| | Row % | 27.09 | 44.84 | 28.08 | 100.00 |
| | Column % | 100.00 | 100.00 | 100.00 | 100.00 |

sectoral flows cannot account for this adjustment. Secondly, the pattern of net flows is less obviously cyclical than are gross flows. Indeed the peak in net flows occur in recession years when lay-offs are prominent. This suggests that involuntary moves may have a significant influence over net flow rates.

To examine gross and net flow worker flows in more detail, Figure 6 plots gross and net flows between employment and non-employment.¹⁰ Note that net flows between employment and non-employment are much larger than net flows between sectors, and nearly half as big as gross flows. This is because flows from employment to non-employment are counter-cyclical (highest in slumps), while flows in the reverse direction to employment are pro-cyclical (highest in booms). There is therefore less of a tendency for these flows to cancel each other out.

¹⁰Non-employment is defined to include both unemployment and ‘not in the labour force’ (NILF). This grouping is necessary because a proportion of individuals who classify themselves as NILF do in fact move into and out of employment.

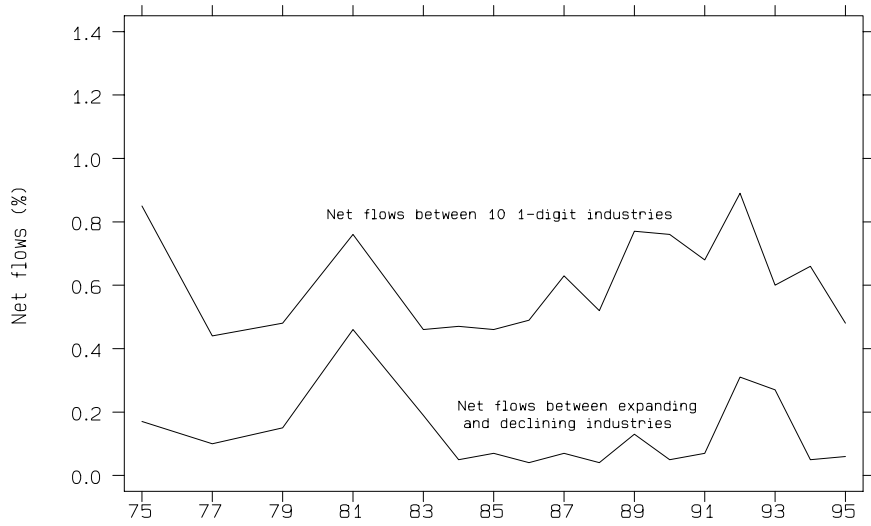


Figure 5: Net flow rates between sectors

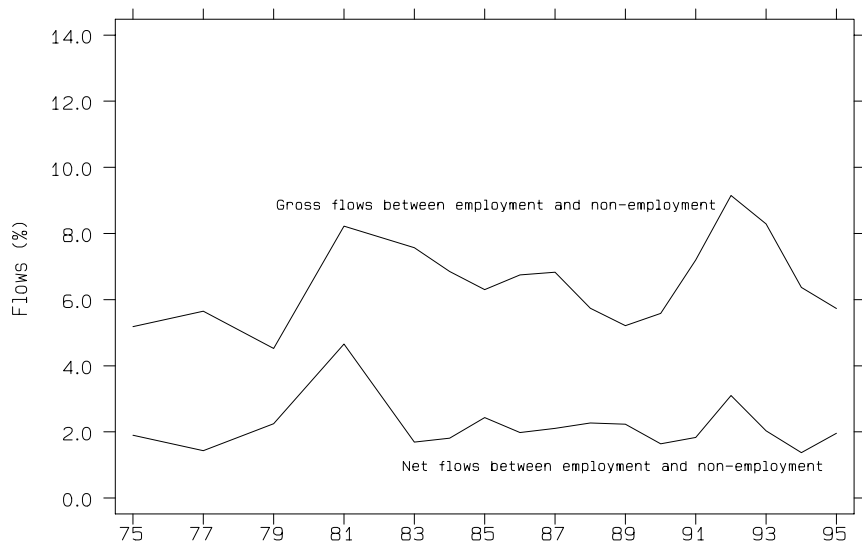


Figure 6: Gross and Net flow rates between employment and non-employment

2.4 Implications for the measurement of sectoral transformation

What does the above discussion imply about appropriate measures for assessing sectoral transformation? That is examining *differential* job creation and destruction between sectors. Consider a very simple example. Suppose that the rate of sectoral transformation that occurred between 1994 and 1995 had been higher. That is, an additional 100,000 jobs had been destroyed in the declining sector and created in the expanding sector.

Such an increase in net job creation would cause increases in net worker flows and in net employment changes. Net worker flows are not identical to net employment changes because net worker flows are greater if adjustment comes about via unemployment U . However, net worker flows are useful because they allow us to decompose adjustment into job-to-job and job-to-unemployment flows.

What is surprising at first sight however is that gross worker flows might actually decrease in response to the sectoral transformation. A given rate of job creation and destruction may be accommodated by widely varying gross flow rates. This is because the balanced flows may increase or decrease with no impact on the flows that lead to adjustment. This leads us to the conclusion that gross flows of workers are not particularly informative if we want to assess the amount of sectoral transformation. Thus the argument that decreasing engagements and separations in manufacturing (turnover) imply a decreasing rate of sectoral transformation is fallacious. Because workers may move between pre-existing jobs, and because workers may move in equal and opposite directions there is no relationship between gross flows and sectoral transformation.

Similarly, increased job instability (declining rates of average job tenure) does not necessarily indicate increased rates of sectoral transformation. Rather it indicates an increase in gross flow rates. Of course, sectoral transformation does imply declining average tenure in the declining sector, but it is important to note the direction of causality is reversed.

So what then are gross flows a useful measure of? They are measure of the

average ease with which people can move (or are forced to move) between jobs. It does not however indicate whether the relative ease with which individuals can move to new or between existing jobs. They also do not indicate whether the jobs left are destroyed.

2.5 Changes in Occupational Structure

A major focus of the recent labour economics literature in the United Kingdom has focused on the changing occupational structure of the United Kingdom (e.g. Machin & Van Reenen 1998). If the expanding sectors are more skill intensive than the declining sectors then this process may be driving this skill upgrading. Evidence would seem to suggest that this is only partially true. In general the process of skill upgrading appears to be a more general phenomenon in the economy. Authors such as Machin & Van Reenen argue that skill biased technological change is causing skill upgrading to occur even within narrowly defined sectors of the economy. Hence we would expect to observe this process even within the declining sectors.

To summarise, the rate of sectoral transformation accelerated through the 1970s and the 1980s and became increasingly dominated by movements of employment from manufacturing to services. Further, flows of workers between sectors do not correspond to a simple characterisation that individuals move from the declining to the expanding sector. Intra- sectoral movements are common and many individuals actually move from the expanding to the declining sector. Thus gross flows dominate net flows.

Whilst there have been large shifts in employment between sectors, only a small proportion of the adjustment flows is made up of individuals moving directly from a job in one sector to a job in another. Instead, flows into and out of non-employment appear to play a large part of the adjustment process.

3 Why do individuals move sector?

Why do we observe patterns of worker flows of this sort? Intra-sectoral worker flows are consistent with the models of job creation and job destruction for-

mulated by Mortensen & Pissarides (1994). In their model, firms experience persistent idiosyncratic shocks and hence what is profitable for one firm may not be profitable to another. This leads to simultaneous job creation and destruction even within narrowly defined industries as evidenced by Davis & Haltiwanger (1992). A model of this sort would also imply that shocks may have idiosyncratic effects on firms within the same sector.

Given this pattern of job creation and job destruction how do we rationalise the patterns of gross and net worker flows that we have observed? Matching models such as Jovanovic (1979) suggest that the vast majority of worker movements can be explained within a framework where firms and workers are searching for their most suitable job match.¹¹ In models of this kind, the wage of worker i , w_{ist} , is given by

$$w_{ist} = mp_{st}f'_{st}(x, z_{st}) = mw_{st}.$$

That is, the wage that an individual receives depends on: the marginal product of labour in sector s at time t (measured in efficiency units x); the output price in sector s at time t (p_{st}); sectoral specific factors (z_{st}); and the quality of the match between the worker and the employer (m). In this framework, it is assumed that the quality of the match is not known prior to hiring. Following its realisation, poorly suited individuals will obtain a low wage and well-suited individuals will obtain a high wage.

It is important to realise that the wage that an individual receives will determine their attitude to their job, and poorly suited individuals will seek more profitable alternatives. Note that an individual may well move to a declining sector if their anticipated match quality within that sector is high, since the high match quality may more than outweigh a lower wage per efficiency unit. Hence we will observe gross flows both into and out of the declining sector even in equilibrium.

Within this framework, the total number of gross flows depends on the cost of moving sector and on the spread of matching returns. This is because the lower the cost of movement the greater the incentive to seek the highest

¹¹In addition, people may move within industries as part of the process of career development (Sicherman & Galor 1990, Booth 1997).

possible match, and the greater the spread the greater the likelihood of an individual receiving a poor match.

Notice that net flows between the sectors will occur as long as there is a difference in the expected net returns. This may occur because of differences in the wages paid per efficiency unit, or if unemployment queues are present, in the expected probability of a job differs.

What happens if there is a shock that impacts on sectors differentially? Suppose that there is a decline in the output price (p_{st}) or an unfavourable movement in z_{st} for the declining sector. This will cause a decrease in the wage that the firm is willing to pay per efficiency unit which can have a number of consequences. Firstly, a number of workers who were previously happy with their match in the declining sector will now seek jobs in the expanding sector. Likewise people who would have otherwise moved in the opposite direction now find this unattractive; Secondly, if there is some institutional limit on how far the wage per efficiency unit can fall, firms may seek to lay off workers. Hence there will be an increase in net flows from the declining to the expanding sectors of the economy and possibly also into non-employment.

These models imply that authors such as Lilien (1982) may be misinterpreting the impact of that demand shifts have on worker flows, since many observed job changes may be occurring for matching reasons, rather than because the sector in which an individual is employed has been subject to an external shock. This difficulty also bedevils empirical work which focuses on individual ‘displaced workers’ (e.g. Mincer 1986, Kletzer 1996), where identifying those individuals whose job moves are enforced by sectoral shocks is similarly problematic.

4 The Consequences of Adjustment

4.1 Sectoral adjustment and wages

Aggregate Wages

From a labour market perspective, an important consequence of sectoral change is that there is likely to be a change in the structure of wages. Nickell (1996)

argues that the movement of employment from the production to service sectors was not accompanied by dramatic changes in the average real wage set in each sector: expanding sectors did not have higher average real wage growth. On the other hand, the real wage growth of non-manual workers was 80% higher than that of manual workers. Nickell uses this to argue that it is not changes in the industrial structure of the economy which have primarily led to observed changes in employment and unemployment, but rather changes in the occupational demand for labour which have necessitated skill upgrading in all sectors.

However, the simple model presented in Section 3 would suggest that examining average wages within sectors is potentially misleading. Favourable shocks will lead to expanding sectors paying higher wages per efficiency unit than declining sectors. This will encourage net movement to the expanding sector since the number of individuals who anticipate higher wages from such a move will increase. The average wage of movers will therefore be higher than the wage that they received previously. However, those with good quality matches in their existing job will be the least likely to move. Therefore the average quality of match in the declining sector will increase. As Jovanovic & Moffitt (1990, p.838) argue “a contracting sector . . . will therefore have higher wages than an expanding sector. The scenario above more or less describes U.S experience over the past 15 years or so: The manufacturing sector has shrunk while services have expanded, but manufacturing wages have tended to exceed those in the service sector.”

Individual Wages

Turning to the impact on individuals, a key impact of sectoral transformation is that workers who are involuntarily displaced from their jobs are likely to suffer wage losses, and these losses will tend to be higher for more senior workers.¹² Such wage losses are a key component of the cost to individuals of sectoral transformation. But why should workers suffer wage losses when displaced?

¹²Evidence for this comes from the large (mainly US) literature on displacement. Kletzer (1998) provides a summary.

A large body of evidence exists to suggest that workers accumulate firm specific human capital. In empirical wage equations this manifests itself in terms of returns to tenure within a firm, as well as the wage falls that workers experience when they are displaced from jobs.¹³ General human capital that is not specific to a particular job also accumulates, and this explains the positive relationship between wages and total labour market experience. It also seems likely that some element of human capital may be occupation specific and industry specific.

Clearly this has implications if workers are forced to move as a result of sectoral transformation since workers will lose returns to current industry and maybe also occupational status. As well as being of importance to the individual, the extent to which skills are industry specific is clearly of great interest in determining the cost of aggregate adjustment since this will determine the ease with which workers will move from one industry to another. Indeed the view that these costs may be substantial underpins the commonly held proposition that labour market adjustments to intra-industry trade are less costly than adjustments to inter- industry trade. However, as Brülhart, Murphy & Strobl (1998, p.1) notes, “empirical tests of [this hypothesis] have been crude and rather indirect.”

For the US, Neal (1995) finds that workers can transfer skills acquired in one firm to another in the same sector suggesting that industry level skills are important. Workers who change industry on the other hand suffer wage losses, as they are not rewarded for their (now) redundant skills. For the UK, this issue is investigated by Haynes, Upward & Wright (2000a), using the New Earnings Survey Panel Dataset. They estimate an equation of the form:

$$w_{ijt} = X_{it}\gamma_1 + T_{ijt}\gamma_2 + I_{ikt}\gamma_3 + O_{ilt}\gamma_4 + \mathbf{x}'_{ijt}\boldsymbol{\beta} + \varepsilon_{ijt},$$

where w_{ijt} is the log wage for individual i on job j at time t , X_{it} is total labour market experience, T_{ijt} is firm tenure, I_{ikt} is industry tenure and O_{ilt} is occupational tenure. The parameters γ_2 , γ_3 and γ_4 provide estimates of the relative returns to firm, industry and occupational tenure. If skills are firm specific only, then $\gamma_2 > 0$ and $\gamma_3 = \gamma_4 = 0$. Hence there will be is no cost to

¹³Returns to tenure are also consistent with a number of other theories of worker compensation, such as screening or signalling theories (Weiss 1995).

moving between industries or occupations, above that which would otherwise occur when workers move job.

The modelling framework suggested in Section 3 suggests that a number of problems may occur in the estimation of the parameters on X_{it} , T_{ijt} , I_{ikt} and O_{ilt} . If the quality of the worker-firm match is not measurable but is correlated with the included measures of tenure, then biases will arise in the estimates of γ_2 , γ_3 and γ_4 . The unmeasured component of the relationship ε_{ijt} , which reflects the quality of the match, may be decomposed into three separate terms:

$$\varepsilon_{ijt} = \mu_i + \phi_{ij} + \nu_{ijt}.$$

Where μ_i is the unobserved person-specific component of wages, ϕ_{ij} is the unobserved worker-firm component and ν_{ijt} accounts for other unobserved component of wages.

There are indeed good reasons to expect correlations between the unobserved match quality and the measures of tenure. If workers with higher unobserved ability have a higher average quality of match and they will have a lower turnover. The unobserved person-specific effects μ_i will be correlated with experience. Similar arguments apply to the correlation of μ_i with I_{ikt} and O_{ilt} . A correlation between μ_i and total experience may occur if workers with low ability (low μ_i) are more likely to experience unemployment.

Second, since workers with good matches (high values of ϕ_{ij}) are less likely to quit they will have high values of tenure (T_{ijt}). However, as Topel (1991) notes, since individuals move jobs in order to obtain higher values of ϕ_{ij} , movers will have lower values of tenure. Finally, individuals who have been in the labour market for longer are more likely to have received a job offer with a high match quality (high ϕ_{ij}). Therefore ϕ_{ij} and X_{it} will be positively correlated.

Haynes *et al.* show that crude returns to industry tenure appear to be large. However once the correlations between the measures of tenure and the unobserved match-specific components of the wage are controlled for, returns to industry tenure are much smaller than are returns to occupational tenure. This implies that workers moving between industries suffer no greater wage losses than workers moving within industries, provided that they remain in

the same occupation. Of course, as Table 4 shows, workers moving between industries are more likely to move occupation as well.

Table 4: The Probability of Job, Industry and Occupational Change

| | <i>Annual Probability</i> |
|------------------------------------------|---------------------------|
| New job | 0.176 |
| New industry | 0.111 |
| New occupation | 0.110 |
| Same job, same industry, same occupation | 0.775 |
| Same job, same industry, new occupation | 0.017 |
| Same job, new industry, same occupation | 0.029 |
| Same job, new industry, new occupation | 0.004 |
| New job, same industry, same occupation | 0.058 |
| New job, same industry, new occupation | 0.039 |
| New job, new industry, same occupation | 0.027 |
| New job, new industry, new occupation | 0.051 |

Further they also find that returns to job tenure are much smaller than returns to firm tenure, which is the usual measure in the literature. This is unsurprising, since a ‘job’ may be associated with a particular nominal wage, and so longer tenure in a particular job may lead to a declining real wage if individuals get stuck in a job. In a recent comprehensive study of returns to tenure, Altonji & Williams (1997) suggest that the best estimate for returns to 10 years firm tenure is about 0.11. The results of Haynes *et al.* suggest that it is not firm tenure itself which causes this increase, but occupational, and to a lesser extent, industry tenure.

4.2 Sectoral Adjustment and Unemployment

Aggregate Unemployment

What will be the impact of sectoral transformation on the aggregate unemployment rate? As was documented in Section 2, an important consequence of sectoral transformation is that a substantial proportion of those displaced are unable to move directly from the contracting sector to the expanding sectors. Hence sectoral transformation and the sectoral reallocation that it implies

may be an important source of aggregate unemployment. Indeed, aggregate unemployment may increase if the rate of change of sectoral transformation has risen or if individuals have become less mobile between sectors for a given level of adjustment. Lilien (1982) examines this issue for the US and finds that inter-sectoral shocks (proxied by the variance of industry employment growth rates) were positively correlated with US unemployment. This methodology has been questioned: Abraham & Katz (1986) point out that, if manufacturing employment is more cyclical than that of services, then the dispersion of employment growth rates may increase anyway during slumps, even without any permanent reallocation of labour.¹⁴ Hence, a positive correlation between the variance of employment growth and unemployment is not necessarily evidence for the impact of re-structuring. A number of more recent studies — Loungani, Rush & Tave (1990), Brainard & Cutler (1993), Mills, Pelloni & Zervoyianni (1995) — have sought to remedy this shortcoming and have generally been supportive of the ‘sectoral shift hypothesis’ that inter-sectoral shocks are an important source of fluctuations in the unemployment rate.

Impact on Individuals

Unemployment spells also represent an important cost of sectoral transformation to individuals. An examination of the movement of workers into and out of unemployment can also shed light on the proposition that labour market adjustments to intra-industry trade are less costly in terms of dislocation than adjustments to inter-industry trade.

Previous literature on this subject is rare, though Murphy & Topel (1987) and Fallick (1993) provide evidence that individuals who change industry (‘movers’) tend to have longer unemployment durations than those who return to the same industry (‘stayers’). They suggest that the greater wage losses that may occur when changing industry mean that individuals are prepared to stay unemployed for longer in order that they may return to their original sector and avoid losing returns to sector specific skills. The more skills are sector specific, the more persistent will be the unemployment associated

¹⁴As discussed earlier, this methodology picks up unemployment due to cyclical impacts as well as structural impacts because of its use of an annual turbulence index.

with adjustment as workers will become increasingly unwilling to move. This hypothesis has been tested on Canadian data by Thomas (1996), who finds that the link between increased aggregate unemployment and the increased immobility of labour is relatively weak.

Haynes, Upward & Wright (2000*b*) provide additional evidence for both the US and UK. They compare the unemployment durations of those who find work in the sector in which they were originally employed, and those who find work in a new sector. They also examine what personal circumstances affect the probability of individual movement and the duration of unemployment spells.

Table 5 shows that individuals in the US experience a higher incidence of unemployment than those in the UK. Further a larger proportion of spells in the US end in a return to the same sector: 46.5% compared to 20.4%. A correspondingly higher proportion on UK spells therefore end in a movement to a new sector.¹⁵ One notable difference in the US data is that 13.6% of spells are coded as 'temporarily laid off' and it would be expected that such individuals are more likely to return to their previous employer, and therefore remain in the same sector. This phenomenon is rare in the UK, and indeed is not recognised as an explicit category in the data.

Table 5: Unemployment in the UK and US

| | <i>UK</i> | <i>US</i> |
|------------------------------------------------|-----------|-----------|
| Annual incidence of unemployment (spells/year) | 0.264 | 0.348 |
| Exit into job, of which | 0.567 | 0.703 |
| (a) Exit into same industry | 0.204 | 0.465 |
| (b) Exit into new industry | 0.363 | 0.238 |
| Temporarily laid off | — | 0.136 |

Source: Haynes *et al.* (2000*b*)

Table 6 shows the probability of exiting into particular states from unemployment in the UK and US. The average duration of spells in the US is shorter with, for both countries, the duration being shortest for those spells ending in a return to the same industry.¹⁶ Spells which end in a move are slightly

¹⁵Note also that the proportion of spells that are censored is higher in the UK (0.433 as opposed to 0.297). This occurs because the average duration of spells in the UK is longer.

¹⁶It is longest for those which do not end before the end of the sample period.

longer.

Table 6: Flows from unemployment in the UK and US

| | <i>Exit state from unemployment</i> | | | | | | | |
|-----------|-------------------------------------|-----------------------|------------------------------------|----------|-------------------|----------|-----------------------------|----------|
| | <i>Employed (Same industry)</i> | | <i>Employed (New industry)</i> | | <i>Unemployed</i> | | <i>Censored^a</i> | |
| | Prob. | Duration ^b | Prob. | Duration | Prob. | Duration | Prob. | Duration |
| <i>UK</i> | 0.20 | 7.01 | 0.36 | 8.34 | 0.17 | 11.30 | 0.26 | 28.21 |
| <i>US</i> | 0.46 | 4.04 | 0.24 | 4.07 | 0.15 | 7.43 | 0.15 | 14.92 |

Source: Haynes *et al.* (2000b)

^aFollowing status not known because of right-censoring

^bMean duration of unemployment spell in months

It is important to note that the use of raw data is potentially misleading however since an individual who is unemployed for a long time, but who finds a job in a new sector could have taken even longer to find a job in the same sector. That is, one outcome ‘censors’ the other. To allow for this Haynes *et al.* adopt a competing risk model to allow for the possibility of multiple exit states from unemployment. In such models, the duration of unemployment spells of those individuals returning to the same industry (t_A) is assumed to be distributed with density f_A , whilst the duration of unemployment spells of those returning to a different industry (t_B) is given by f_B . For a given individual, the industry into which they exit will depend on their drawings of t_A and t_B . If $t_A < t_B$ then the individual will exit into the same industry, whilst if $t_A > t_B$ they will exit into a different industry. The observed duration (t^*) will therefore be the minimum of these two underlying factors:

$$t^* = \min(t_A, t_B).$$

For a given individual in the sample the drawings of t_A and t_B will be unknown. The probability of observing a spell with duration t^* that ends with a return to the same industry will however be given by the joint probability:

$$\Pr(T_A = t^*) \cdot \Pr(T_B \geq t^*) = f_A(t^*)(1 - F_B(t^*))$$

Similarly, for someone that exits into a new industry:

$$\Pr(T_B = t^*) \cdot \Pr(T_A \geq t^*) = f_B(t^*)(1 - F_A(t^*))$$

These probabilities may be estimated using maximum likelihood and the dependence of the transition probabilities on the characteristics of the individuals may be assessed.

Figure 7 and 8 plot the baseline hazards for the different exit states for the US and UK, that is the probability of exiting unemployment in the next period conditional on not having previously exited. This suggests that the longer mean duration observed in the UK is not the result of a less sharply declining unemployment hazard (which means the unemployed find it increasingly hard to find a job), so much as a much lower overall hazard in the UK (which means that they are always less likely to exit unemployment). This is picked up by differences in the constant terms.

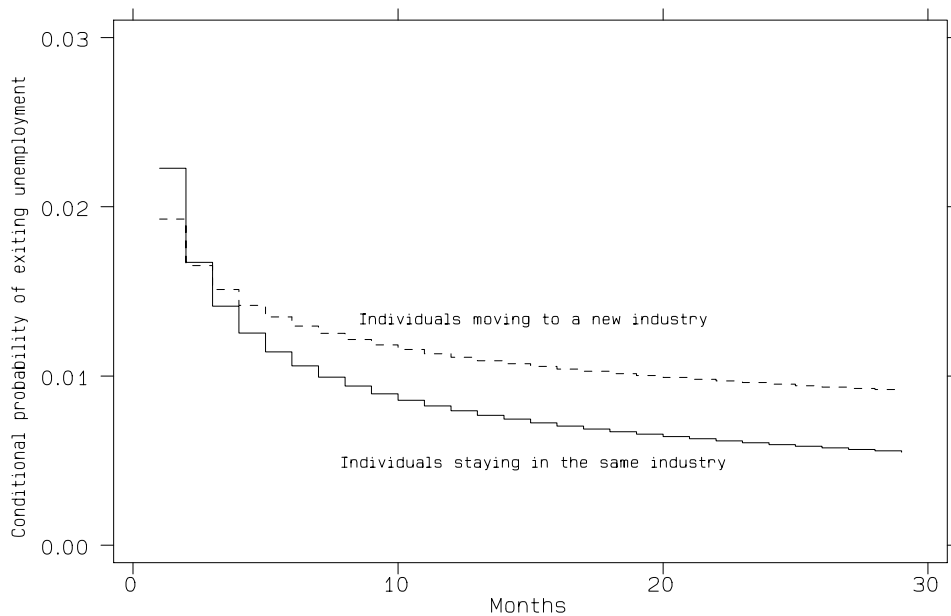


Figure 7: Weibull baseline hazard for the UK

Haynes *et al.* find that the hazard to staying in the same sector declines faster than the hazard to finding a job in a new sector in both countries. This suggests that individuals are more likely to switch sector the longer they are unemployed in both countries. A plausible explanation for this is that

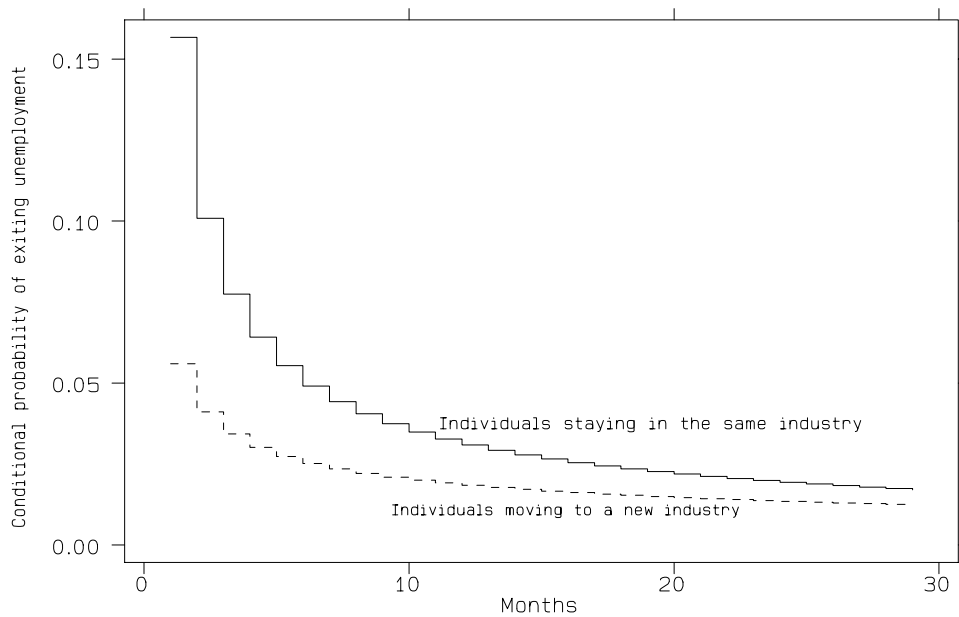


Figure 8: Weibull baseline hazard for the US

individuals initially attempt to find jobs that complement their general and specific skills in order to accrue the associated rewards, but move sector as this prospect diminishes. This is particularly the case for workers who would be expected to have higher levels of sector-specific skills (older workers, for example). This finding is consistent with the hypothesis that finding a job in the original sector is less costly than finding a job in a new sector, at least for shorter unemployment durations. Indeed, even if it were the case that rewards in the new sector were in fact higher, their results suggest that other costs of moving are sufficiently large to encourage search in the original sector.¹⁷

A further interesting result is that workers in both countries who enter unemployment from the manufacturing sector are more likely to change sectors. If, as is thought to be the case, the manufacturing sector has experienced long term decline, this provides some evidence of a relationship between sectoral

¹⁷This interpretation does not necessarily imply that potential wages in the original sector are greater than in any other sector.

transformation and factor mobility, as might be expected.

Whilst these results would seem to be supportive of the smooth adjustment hypothesis the real world is more complicated than this characterisation suggests. It should be noted that in the UK, the conditional probability of staying in the same sector is generally lower than that of moving. This may be true for a number of reasons that await further research: firstly, the rate of turbulence in the US may be lower, and workers that are displaced can return to the same industries; secondly the costs of moving sector in the US may be higher, discouraging movement. This might be the case if there is a higher level of industry skill specificity in the US. However this seems not to be supported by the evidence which suggests that exits from unemployment to a new sector seem easier in the US; thirdly, institutional arrangements in the US may facilitate the return of a worker to the same sector, for example via temporary layoffs.

4.3 Job Tenure

An alternative way to look at changing patterns of employment that has received a lot of attention is that of job stability. If job reallocation has increased in response to the greater requirements of restructuring, then we might expect to find that average job tenure has declined. There are a number of reasons why this is not straightforward however. As we have seen increasing turbulence has ambiguous impacts on gross flows and therefore on tenure. Further, increased job instability may be caused by increased reallocation within sectors rather than between sectors. Finally, increased movement may be voluntary-observing higher turnover tells you nothing about its cause.

Recent evidence from the UK comes from Gregg & Wadsworth (1995) and Burgess & Rees (1996) who find that, contrary to popular conceptions, there is no evidence that the average length of jobs declined dramatically over the 1970s and 1980s. Second, in contrast, it does appear that jobs for older workers and less-skilled men have become less stable. This would suggest that it is the peripheral workers who have found it increasingly difficult to move and it is not a general phenomenon.

4.4 Regional Adjustment

In the UK, much of the focus on worker mobility has been on regional rather than sectoral mobility¹⁸ (e.g. Creedy 1974, Pissarides & Wadsworth 1989, Jackman & Savouri 1992, McCormick 1997). A particular issue, which has attracted attention in the UK, is the relationship between housing tenure and mobility with several authors arguing that rigidities in the UK housing market have hindered the mobility of labour. Hughes & McCormick (1981) point to rigidities in the public rented sector, and Oswald (1996) points to the expansion of home ownership at the expense of the private rented sector. However, the links between regional and sectoral mobility have not been made explicit. If rigidities in the housing market do cause workers to be less mobile between regions, does this have an effect on their mobility between sectors? If sectors are geographically evenly spread, then one would expect the relationship to be rather unimportant, since individuals will be able to switch sectors without moving region. If, as seems more plausible, sectors are unevenly distributed across regions, the relationship will be stronger.

Table 7 summarises the average probability of moving between and within sectors and regions, split by employment status at $t - 1$. The first number in each cell gives the row proportion, and the second number the column proportion. The probability of moving firm and moving sector is much higher for those who change address, and higher still for those who move region. For example, only 44% of those in the declining sector at $t - 1$ who move region stay with the same firm, compared to 76% for those who move within regions and 87% for those who remain at the same address. Similar patterns can be observed in panel (b), for those in the expanding sector at $t - 1$. However, note that the proportion who move region is extremely small (about 1%), and also that the probability of moving into unemployment is also substantially higher for this group. 17.5% of individuals in the declining sector at $t - 1$ who move region leave employment, compared to just 5.9% of those who stay at the same address.

Panel (c) in Table 7 shows that there is a much higher probability of leaving non-employment for those who move region. Only 59% of those who move re-

¹⁸Pissarides (1978) is an exception

Table 7: Average gross flow rates by geographical mobility 1975–1995

| | <i>Same firm</i> | <i>Declining Sector</i> | <i>Expanding Sector</i> | <i>Not Employed</i> | <i>Total</i> |
|---------------------------------------------------------------|------------------|-----------------------------|-----------------------------|-------------------------|--------------|
| (a) Employed at $t - 1$ in declining sector | | | | | |
| <i>Same address</i> | 0.869 | 0.050 | 0.022 | 0.059 | |
| | 0.932 | 0.844 | 0.813 | 0.862 | 0.920 |
| <i>Same region (new address)</i> | 0.758 | 0.093 | 0.049 | 0.100 | |
| | 0.064 | 0.123 | 0.142 | 0.117 | 0.073 |
| <i>New region</i> | 0.444 | 0.233 | 0.148 | 0.175 | |
| | 0.004 | 0.033 | 0.045 | 0.021 | 0.008 |
| <i>Total</i> | 0.858 | 0.055 | 0.025 | 0.063 | |
| (b) Employed at $t - 1$ in expanding sector | | | | | |
| <i>Same address</i> | 0.867 | 0.018 | 0.058 | 0.057 | |
| | 0.922 | 0.810 | 0.781 | 0.819 | 0.903 |
| <i>Same region (new address)</i> | 0.734 | 0.035 | 0.126 | 0.105 | |
| | 0.072 | 0.148 | 0.156 | 0.140 | 0.083 |
| <i>New region</i> | 0.420 | 0.064 | 0.322 | 0.195 | |
| | 0.007 | 0.043 | 0.063 | 0.041 | 0.013 |
| <i>Total</i> | 0.850 | 0.068 | 0.020 | 0.063 | |
| (c) Not employed at $t - 1$ | | | | | |
| <i>Same address</i> | | 0.060 | 0.111 | 0.083 | |
| | | 0.873 | 0.848 | 0.910 | 0.900 |
| <i>Same region (new address)</i> | | 0.073 | 0.159 | 0.769 | |
| | | 0.099 | 0.113 | 0.079 | 0.084 |
| <i>New region</i> | | 0.115 | 0.297 | 0.588 | |
| | | 0.029 | 0.039 | 0.011 | 0.016 |
| <i>Total</i> | | 0.062 | 0.012 | 0.820 | |

gion remain in non-employment, compared to 77% for those who move address within regions and 83% for those who remain at the same address. However, the proportion changing address and moving region amongst those who are not employed at $t - 1$ is only slightly higher than for the employed sample. Thus, while there is clearly a relationship between ‘flexibility’ in terms of regional mobility, sectoral mobility and non-employment, the number of individuals is so small that it is not necessarily important in terms of its overall contribution to the sectoral transformation of the economy.

Figures 9 and 10 plot gross and net flows between regions in the United Kingdom. These share similar characteristics to those of flows of workers between

sectors. Although a large number of people move from the declining region (North) to the expanding region (South), an almost equal number of people move in the opposite direction. Thus gross flows greatly exceed net flows. This suggests that net flows between regions are insufficient to balance the disparities that may exist between the labour market in the North and in the South. Adjustment must come from elsewhere.

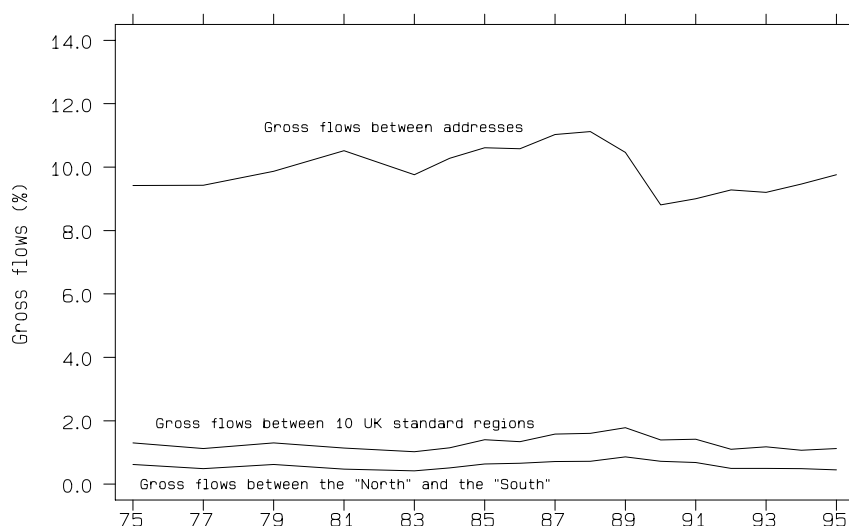


Figure 9: Gross flows between regions in the UK 1975–1995

4.5 Summary

Before we continue, it is useful to summarise the results of this section. First, we argue that changes in relative aggregate wages between the expanding and declining sectors are not particularly informative about whether or not bottlenecks are occurring as a result of adjustment. The wages of the expanding sector may not rise relatively in this instance because of sample selection. This is because the declining sector may be losing its least suited and lowest-paid workers and hence also experience increases in average wages.

Second, some evidence was provided on the impact of switching industry on

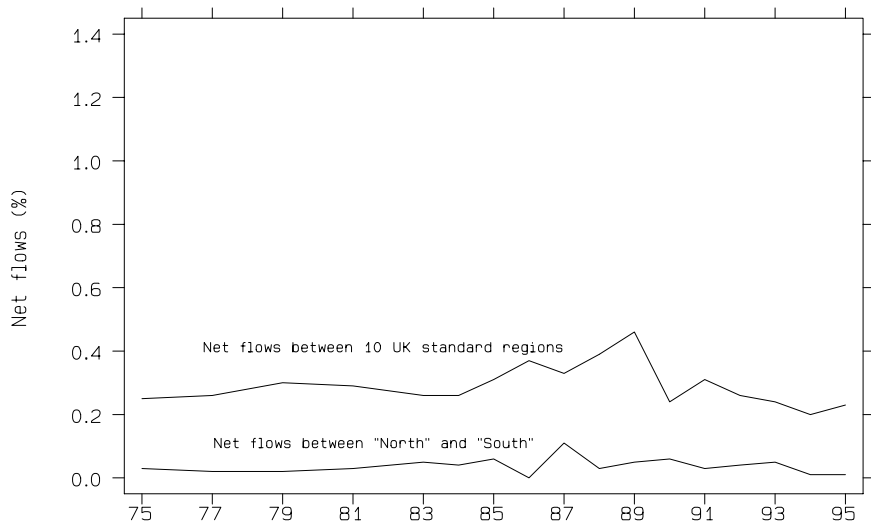


Figure 10: Net flows between regions in the UK 1975–1995

individual wages. We find that the costs of moving industry are less important than the costs of moving occupation. This suggests, unsurprisingly, that some portion of human capital is specific to skills or occupations. However, it is important to realise that sectoral transformation may be causing the occupational changes. Evidence from Machin & Van Reenen (1998), amongst others, shows that skill-upgrading has been occurring predominantly within rather than between industries. But again, this may be because those jobs lost in the declining sector are the least skill-intensive, raising the average in this sector as well.

Third, recent evidence is supportive of the idea that the amount of sectoral transformation is an important component of the aggregate unemployment rate, consistent with Lilien’s sectoral shifts hypothesis. Nickell (1996) has argued that this is an unconvincing explanation of the European unemployment experience because indices of industrial turbulence were not rising over the 1970s and 1980s. But as we have seen, the turbulence index (in the UK at least) is sensitive to the level of aggregation across time and across sectors.

Using changes in sectoral employment shares over a longer time period yields a turbulence index which was much higher in the 1970s and 80s than in other post-war decades.

Fourth, our evidence on unemployment durations suggests that switching sector is associated with longer unemployment spells. This too is consistent with the notion of sector-specific skills.

Fifth, although there is little evidence that average tenure has declined, we have shown that tenure itself is not a useful measure of sectoral transformation. Average tenure may or may not decline in the face of increasing shifts of labour between sectors.

Finally, we have shown that the probable contribution of regional mobility to sectoral transformation is extremely small, simply because net flows of labour between regions are so tiny.

5 Conclusions and Policy responses

Fundamental to many models of an economy's response to external shocks is the reallocation of factors of production between sectors. These models often make extreme assumptions either that the reallocation of factors is entirely frictionless, or completely impossible.¹⁹ In this paper we have drawn together a diverse set of evidence on two important questions. First, has the rate of sectoral transformation increased, for whatever reason? Second, how difficult is it for labour to move between sectors, and has it become more difficult?

There is some evidence that the rate of sectoral transformation was greater in the UK in the 1970s and 80s than in any other post-war decades. However, this conclusion is partly dependent on the measure of reallocation used. Year-on-year changes in industrial employment show a less dramatic increase than decade changes because the former measure includes cyclical variation in employment between sectors with long-run transformation.

Although there has been a dramatic process of sectoral transformation in the

¹⁹In contrast, the labour economics literature has primarily been concerned with the movement of labour between labour market states rather than between sectors.

UK during the post-war period, gross flows of workers are far greater than net flows. That is, changes in employment shares across time disguise massive flows from the declining to the expanding sector and in the reverse direction. They also disguise enormous flows within sectors, although of course the proportion of flows within and between sectors depends on the level of aggregation used. Although there is some evidence for the US that gross flows declined during the 1970s and 1980s, we find that gross flows in the UK are basically procyclical with no secular trend. Further, we argue that gross flows are not in themselves indicative of the amount of sectoral reallocation occurring in the economy, because a sectoral shock can be accommodated by any amount of gross flows. Instead, gross flows are useful as a measure of the costs of moving between sectors. In Section 4 a number of pieces of evidence were surveyed that suggest that sectoral reallocation is costly, particularly in terms of aggregate unemployment and unemployment duration.

Policy responses

If the process of adjustment between sectors is costly and unevenly distributed, then there may be a case for some kind of policy intervention. Policies can broadly be described as having one of two objectives: either to reduce the costs of adjustment, or to compensate the ‘losers’ from the adjustment process.

The first objective is based on an efficiency argument. For a given amount of reallocation, there will be a smaller loss of output if the transition process involves less frictional unemployment. “An obvious policy to deal with this type of unemployment [i.e. mismatch] is to speed up the process of adjustment by reducing the impediments to intersectoral labour mobility.” (Nickell 1991). However, this begs the question as to why the market fails to reduce adjustment costs. For example, why do individuals fail to retrain in order to find jobs in the expanding sector or in more skilled occupations?

The second objective is based directly on an equity argument and indirectly on an efficiency argument. “Government programmes are often justified on the grounds that society should compensate the losers for structural changes that benefit us in the aggregate.” (Fallick 1996). There might also be an efficiency argument if potential losers from adjustment have an incentive to lobby against

adjustment. It seems plausible, for example, that trade adjustment assistance programmes in the US are implemented in order to compensate high tenure organised labour who might have the political power to lobby against increased adjustment.

In the US, various programmes targeted specifically at displaced workers have offered income replacement, reemployment and retraining services for some limited period. More recently, support for displacement has also included the requirement of advance notification for plant closures or mass-layoffs. However, empirical evidence on the efficacy of these programs is, at best, mixed. Given the fact that income losses following displacement are often long-lived (e.g. Jacobson, LaLonde & Sullivan 1993), it seems unlikely that temporary income replacement will fully compensate for this loss. The impact of retraining programmes has been subject to widespread empirical study (see Heckman, LaLonde & Smith (1999) for a recent survey). The consensus view tends towards the idea that the expenditure on these programmes often outweighs the benefits in terms of increased employment probabilities or earnings. Evidence is also emerging that the benefits of receiving advance notice are “modest at best” (Kletzer 1998).

Policies which are intended to compensate displaced workers specifically are less common in Europe than in the US. This is in part a reflection of a more general social safety net in Europe. Unemployment insurance and unemployment assistance, for example, are not targeted specifically at displaced workers. Sapir (2000) suggests that the adjustment costs of globalisation have tended not to fall on the median voter in Europe, and that organised labour has therefore voiced less opposition to the adjustment and reallocation of labour.

In the UK, attention has also focussed on the regional mobility of labour. Compensation has often taken the form of regional assistance programmes rather than payments to displaced individuals. Several authors have argued that rigidities in the housing market contribute to the immobility of labour, although for various different reasons. Hughes & McCormick (1981) argued that social housing may prevent individuals moving between regions, while Oswald (1996) has suggested that the high levels of home ownership has contributed to aggregate unemployment because of the high costs of moving house. An

attempt to revive the private rented sector may therefore suggest itself as a remedy.

Many authors have looked to the education system and human capital formation as an explanation for the inability of workers to adjust to changing patterns of demand. For example, Nickell & Bell (1996) suggest that “The very high level of education and training embodied in the vast bulk of the German labour force enables them to respond in a flexible manner to demand shifts”.

Some authors have dismissed sectoral reallocation as a suspect in the search for the causes of the high levels of unemployment and the increasing skilled-unskilled wage differentials observed in some OECD countries over the last 30 years. We feel that this may be premature, for three reasons. First, industrial turbulence in the UK peaked in the 1970s and 80s, and has subsequently returned to post-war levels. Second, net flows of labour between sectors have been largely facilitated by movements in and out of the labour force rather than directly from job to job. Third, micro-econometric evidence suggests that movements between sectors are associated with longer unemployment spells than movements within sectors.

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