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Smooth and Sticky Adjustment: a Comparative Analysis of the US and UK

by

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Abstract

In this paper we adopt the methodology of the micro-econometric labour literature to analyse a common assertion from trade economists that reallocation within sectors is less costly than between sectors. We compare our findings across two countries (the UK and US) which have experienced very different recent aggregate unemployment experiences.

We find that workers previously employed in 'declining' sectors are more mobile in both countries, and that individuals are more likely to switch sector the longer they are unemployed. A plausible explanation for this is that individuals initially attempt to find jobs that complement their general and specific skills in order to accrue the associated rewards, and only move sector as this prospect diminishes. This would seem to accord with the 'smooth adjustment hypothesis' which proposes that intra-industry adjustments are less costly than inter-industry ones.

Outline

1 Introduction

'A purported characteristic of intra-industry trade is its allegedly low adjustment costs in the face of trade liberalisation. It has become an article of faith that the European Community's early liberalisation succeeded because of intra-industry trade.'
Grant et al. (1993)

The proposition that labour market adjustments to intra-industry trade are less costly than adjustments to inter-industry trade is a widely held belief amongst trade economists[1]. If it is the case that there are significant sector-specific skills, then this 'smooth adjustment hypothesis' seems intuitive. Such reasoning has been used to argue that both the 1992 Single Market and further expansion to encompass Eastern Europe can be achieved relatively costlessly. However, direct evidence relating to this issue remains largely anecdotal.

The movement of labour between sectors is also of interest to labour economists. The importance of the sectoral re-allocation of labour as a source of aggregate unemployment is the subject of ongoing debate. Frictional unemployment which occurs as workers move between jobs has long been a focus of research, but with the general increase of unemployment over the last two decades it has reassumed importance. Is it the case that unemployment has increased as a result of individuals becoming less mobile? If so, how mobile is labour and how long does this imply it will take an economy to adjust? These are important questions, since it has been argued (e.g. Haskel and Slaughter 1999 and Slaughter 1999) that a defining contrast between 'trade' and 'labour' economists is how they view the mobility of labour. Trade theorists generally deal with multi-sector general equilibrium models which assume that labour is mobile. Labour economists typically model labour as immobile in the short, and even medium run.

In this paper we adopt the methodology of the micro-econometric labour literature to analyse the assertion by some trade economists that reallocation within sectors is less costly than between sectors. We construct data on unemployment spells for heads of households in both the US and the UK, and use these data to compare unemployment durations for those who find work in the same sector in which they were originally employed, and those who find work in a new sector. We analyse how the personal and economic circumstances

[1] For reviews of the relevant literature see Greenaway and Hine (1991) and Brülhart (1998).

of individuals affect the probability of moving between sectors, and we also examine what factors affect the duration of individual unemployment spells. By comparing the United Kingdom and the United States we compare economies with very different unemployment experiences, and ask whether the 'flexibility' of the US labour market manifests itself in terms of unemployment incidence, unemployment duration or the probability of moving sector.

The paper is organised as follows. Section 2 provides a summary of previous work in this area. Section 3 describes the data used and provides some basic descriptive statistics. Section 4 explains the techniques we use to model unemployment durations with multiple outcomes. Section 5 describes the results, and Section 6 concludes.

2 Some Previous Work

The intra-industry trade literature contains only limited direct evidence on the relative ease of intra- as opposed to inter-sectoral adjustment. Lundberg and Hansson (1986) and Tharakan and Calfat (1994) approach this issue by comparing factor intensities between and within industries. They find that factor intensities are more homogenous within rather than between sectors, though differences are still considerable. By contrast, Finger (1975) and Rayment (1976) found evidence of greater variation within than between sectors. All of these studies do of course only offer indirect evidence, rather than focusing directly on costs of adjustment. The fact that intra-industry adjustment costs may vary considerably depending on the sector being considered is borne out by Adler (1970). He finds that the re-organisation of the steel sector following the formation of the European Coal and Steel Community was relatively painless. In contrast Reker (1994) found that the adjustment processes in the machine tool industry considerably more traumatic, with the industry being highly heterogeneous.

Adopting a political economy approach, Lundberg and Hansson (1986) found that the demand for defensive measures to protect jobs was low in industries subject to inter-industry trade, suggesting the adjustment costs were also relatively small. A similar finding was obtained by Marvel and Ray (1987) for the USA, though these results were contradicted by Ratanayake and Jayasuriya (1991) for Australia. Greenaway and Torstensson (1997) refer to several other industry specific studies.

The labour economics literature, on the other hand, contains far more direct evidence on the cost to individual workers of moving jobs. First, there is aggregate evidence on the relationship between sectoral reallocation of labour and the aggregate unemployment rate. The proposition that sectoral shocks and the subsequent movement of workers between sectors are the main source of fluctuation in the aggregate unemployment rate has been widely investigated in the US, following Lilien (1982) who proxied inter-sectoral shocks by the variance of industry employment growth rates and found that they were positively correlated with US unemployment. This methodology has been questioned: Abraham and 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. 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 and Tave (1990), Brainard and Cutler (1993), Mills, Pelloni and Zervoyianni (1995) — have sought to remedy this shortcoming and generally been supportive of the 'sectoral shift hypothesis', that inter-sectoral shocks are the main source of fluctuations in the unemployment rate.

Second, there is evidence at the individual level on the wage effects of changing or staying within the same sector. It is often assumed that the wage changes are less negative (or more positive) for 'stayers' since, if skills are job specific, then an individual is more likely to able to remain in the same occupation if they stay in the same industry (Kletzer 1996). Evidence to this effect is found by Neal (1996), who finds that workers can transfer skills acquired in one firm to another in the same sector. Workers who change industry on the other hand suffer wage losses, as they are not rewarded for their (now) redundant skills.

Third, there is evidence at the micro level that individuals who change industry ('movers') tend to have longer unemployment durations than those who return to the same industry ('stayers'). The fact that changing industry may entail greater wage losses has led authors such as Murphy and Topel (1987) and Fallick (1993) to argue that individuals may be prepared to stay unemployed for longer periods in order to return to their original sector and avoid losing sector specific skills. Unemployment may then increase because higher skilled workers become increasingly unwilling to move. This hypothesis has been tested on

Canadian data by Thomas (1996*a*), who finds that the link between increased aggregate unemployment and increased immobility of labour is rather weak.

3 The Data and some Basic Statistics

Despite the interest of labour economists in the effects on workers of changing jobs, occupations and industries, the analysis has not been directed towards assessing directly the relative costs of inter- and intra-sectoral adjustment, nor has it attempted to compare different countries using comparable data sets. This is the approach taken here.

This study makes use of two data sets. US data are from waves 21 to 26 of the Panel Study of Income Dynamics (PSID), covering the period 1988 to 1993, described in detail in Hill (1992). The UK data come from waves 1 to 6 of the British Household Panel Survey (BHPS), covering the period 1991 to 1996, described in Taylor *et al.* (1998). From each we construct a complete sequence of labour market spells, recorded to the nearest calendar month. For heads of household who appear in every wave, we select all spells of unemployment and 'out of the labour force'. For each spell of non-employment we record the length of the spell, the previous industry of employment, and the industry of employment following the spell. Industries are defined using the 1980 UK 2-digit SIC classifications.

The use of panel data in the construction of labour market spells allows us to largely avoid the problem of recall bias associated with retrospective data collection (e.g. Elias (1997). The data used is never more than 12 months old, and the overlapping of recall and contemporaneous information has been used to make a variety of consistency checks. The construction of the data is described in detail in a technical appendix (Upward 1999).[2]

Table 1 describes the spells of non-employment. Note that for some individuals employment status is not available either before or after the beginning of the sample period, due to left- or right-censoring. Left-censoring occurs when a spell of unemployment starts before the beginning of the sample period; right-censoring when a spell of unemployment is still in progress at the end of the sample period. We select only those spells of

[2] Available from http://www.nottingham.ac.uk/economics/leverhulme/publications/publications.html.

unemployment preceded by a spell of employment i.e. we exclude left-censored spells[3] (the third row), and those spells of non-employment preceded by another spell of non-employment (the second row).

The final sample for the UK consists of a balanced panel of 593 individuals, who experience 785 spells of non-employment between 1991 and 1996. For the US there are 1,345 individuals who experience 2,340 spells of non-employment between 1988 and 1993. Looking at the first row of Table 1, the average duration of unemployment is shortest for those spells ending in a return to the same industry, and longest for those which do not end before the end of the sample period. In both countries the spells which end in a move are slightly longer. However, as we show in Section 4, this is somewhat misleading because each outcome censors the other. For example, an individual who is unemployed for a long time, but who finds a job in a new sector would have taken even longer to find a job in the same sector.

Table 2 describes sample characteristics for those spells in the first row of Table 1. Each individual in the US data experiences 1.74 spells over the five year period (1,839/1,055); in the UK this ratio is 1.32 (744/563). This conforms to our expectations: unemployment incidence is higher in the US, but average durations are shorter. Less obviously, a much smaller proportion of spells in the UK end in a return to the same sector than in the US: 20.4% compared to 46.5%. A correspondingly higher proportion on UK spells therefore end in a movement to a new sector. Note also that the proportion of spells that are censored is higher in the UK. This occurs because the average duration of spells in the UK is longer.

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[3] The sample is therefore a *flow* rather than *stock* sample. As such it avoids the problem of length-biased sampling, which occurs because long spells are more likely to be sampled in a cross-section.

Table 1: Sample sizes and mean unemployment durations[a]

BHPS

		Status at t+1			
		Employed same industry	Employed new industry	Unemployed/ Out of labour force	Censored[b]
	Employed	152 (7.01)	270 (8.34)	125 (11.30)	197 (28.21)
Status at t-1	Unemployed/ Out of labour force		78 (9.46)	112 (13.43)	116 (28.70)
	Censored[c]		109 (19.06)	92 (24.14)	109 (73.35)

PSID

		Status at t+1			
		Employed same industry	Employed new industry	Unemployed/ Out of labour force	Censored
	Employed	855 (4.04)	438 (4.07)	270 (7.43)	276 (14.92)
Status at t-1	Unemployed/ Out of labour force		216 (5.16)	555 (6.71)	210 (17.21)
	Censored		212 (7.38)	162 (13.99)	120 (60.00)

Notes:

[a] Numbers in brackets indicate mean duration in months.

[b] Previous status not known because of left-censoring (occurs before start of sample period).

[c] Following status not known because of right-censoring (occurs after end of sample period).

Table 2 also describes the sample means for the explanatory variables used in the analysis. Where possible we have constructed comparable measures for the two countries. These include the usual covariates in an analysis of unemployment duration (see for example, Narendranathan & Stewart 1993 for the UK and Meyer 1990 for the US). One notable difference in the US data is that 13.6% of spells are coded as ‘temporarily laid off’. This phenomenon is rare in the UK, and is not recognised as an explicit category in the data. We would expect that individuals who report being temporarily laid off are more likely to return to their previous employer, and therefore remain in the same sector.

Table 2: Sample characteristics

	BHPS	PSID
Number of individuals	563	1055
Number of spells of unemployment	744	1839
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
Censored	0.433	0.297
Temporarily laid off	—	0.136
Out of the labour force	0.355	0.298
Female	0.233	0.249
Age	42.585	38.674
Has children	0.406	0.484
Married	0.715	0.516
No qualifications[a]	0.230	0.267
Years of labour market experience since 18[b]	23.408	14.671
Previous job skilled[c]	0.535	0.423
Previous job manual	0.573	0.487
Tenure of previous job (months)	60.108	52.784
Previous job in manufacturing[d]	0.355	0.288
Self-employed in previous job	0.148	0.137
In receipt of unemployment benefit	0.306	0.243
Mean monthly unemployment benefit income	£234.37	$704.94
Local unemployment %[e]	8.708	5.699
Owns own home	0.156	0.160
Buying house (mortgage)	0.535	0.280
Private renter[f]	0.081	

Notes:

[a] Proxied by failure to graduate from high school in PSID data.

[b] Proxied by (age–age left school) in UK data; this is one reason for the disparity between the two means.

[c] Skilled job defined as (BHPS) managers & administrators; professional; associate professional; craft and related and (PSID) professional and technical; managers and administrators; craftsmen.

[d] Manufacturing industries defined according to UK 1980 SIC divisions 0-4.

[e] Local unemployment % at UK Standard Region and US County level.

[f] Missing category for UK is public renters; for US missing category is any renter.

We have included spells of 'out of the labour force' in the sample. This is because, despite reporting themselves as out of the labour force, these respondents often return to employment. As can be seen, they constitute a significant proportion of the sample.

4 Modelling Unemployment Durations with Multiple Outcomes

The modelling framework that will be adopted in this paper is a competing risk model, which is commonly used in the estimation of unemployment durations with multiple outcomes (e.g. Katz & Meyer 1990, Narendranathan & Stewart 1993, Thomas 1996*a*).

This allows a comparison of the length of unemployment of those who change sector with those that do not, as well as an assessment of those factors which affect choice of sector. 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 $f_A(t_A)$, whilst the duration of unemployment spells of those returning to a different industry (t_B) is given by $f_B(t_B)$. 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, t_B will be unknown. The probability of observing a spell with duration t^* which ends with a return to the same industry is given by the joint probability:

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

The probability of a duration t^* which ends in an exit into a new industry will similarly be given by:

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

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

In order to simplify the log-likelihood function, note that the *hazard rate* is the probability of exiting unemployment in the period of time between *t* and *t*+*dt* as *dt*→0, conditional on having reached t:

$$h(t) = \frac{f(t)}{1 - F(t)} = \frac{f(t)}{S(t)}$$

We can now partition the log-likelihood into two separate terms, according to the exit industry of the individual if it is assumed that $f_A(t_A)$ $f_B(t_B)$ are independent. Right-censoring (failing to find a job before the end of the sample period) is treated as another outcome.

Hence the likelihood can be written in terms of the hazard as:

$$\log L = \sum_{i=1}^{N} d_i \log h_A(t_i^*) + \sum_{i=1}^{N} \log S_A(t_i^*) + \sum_{i=1}^{N} (1-d_i) \log h_B(t_i^*) + \sum_{i=1}^{N} \log S_B(t_i^*)$$

where d=1 if the individual returns to the same industry and d=0 if they return to a different industry. The hazard for each outcome $j=A,B$ can be factored as $h_j(t) = \phi(x, \beta_j)\lambda_j(t)$, where x are covariates and β are parameters to be estimated. $\lambda_j(t)$ is the baseline hazard. In this paper we estimate $\lambda_j(t)$ assuming a Weibull distribution, as well as non-parametrically.[4] The non-parametric estimates allow for an unrestricted estimate of the baseline hazard at each point in time.

The Weibull distribution is $\alpha_j t^{\alpha_j - 1}$, where α_j is a parameter determining whether the hazard increases or decreases over the duration of a spell. If $\alpha_A < 1$, for example, then the conditional probability of exiting unemployment into the same industry is declining as the spell continues. Further, if $\alpha_A < \alpha_B$, then the probability of exiting a spell into a new industry is increasing relative to the probability of exiting into the same industry over the course of a spell. Thus, although the non-parametric form is more flexible, the Weibull distribution gives us some intuition about the relative ease with which individuals who are unemployed remain in the same sector or move to new sectors. If the hazard to returning to the same industry is initially higher than the hazard to moving industry, this provides some support for the idea that individuals find employment more easily in the sector from which they came, and hence supports the smooth adjustment hypothesis.

Table 3 gives guidance on interpreting competing risk models (Thomas 1996*b*). In a proportional hazard model of the type estimated, covariates serve to shift up or down the baseline hazard. Thus, in the table, a negative sign indicates that the variable shifts the hazard down and hence decreases the likelihood of a transition.

[4] We also estimated the model using a more flexible parametric form (log-normal) which allows the baseline hazard to be non-monotonic. There was no evidence that the baseline hazard was initially increasing.

Table 3: Interpreting competing risk estimates

Coefficient (stayers) β_A	*Coefficient (movers)* β_B	*Predicted probability of moving sector*	*Predicted unemployment duration*
<0 Takes longer to find a job in the same sector	>0 Takes less time to find a job in a new sector	<0 Probability of moving sector is increased	? Ambiguous effect on predicted unemployment duration
>0 Takes less time to find a job in the same sector	<0 Takes longer to find a job in a new sector	>0 Probability of moving sector is decreased	? Ambiguous effect on predicted unemployment duration
<0 Takes longer to find a job in the same sector	<0 Takes longer to find a job in a new sector	? Ambiguous effect on probability of moving sector	>0 Unemployment durations increased
>0 Takes less time to find a job in the same sector	>0 Takes less time to find a job in a new sector	? Ambiguous effect on probability of moving sector	<0 Unemployment durations decreased

Table 3 shows that if both β_A and β_B are negative, then the influence of that covariate is to unambiguously increase the unemployment durations, since the hazard to both outcomes is reduced. However, the effect on the probability of changing sector depends on the relative size of the coefficients. For example, if $\beta_A < \beta_B$ then the effect of that covariate is to increase the probability of moving sector. Conversely, if β_A and β_B have opposite signs, the effect of moving sector is unambiguous, whereas the impact on unemployment duration depends on relative magnitudes. This is because the hazard to one outcome is reduced (increasing durations), but the hazard to the other outcome is increased (reducing durations).

5 Results

Figures 1 and 2 plot the estimated baseline hazards that result from the Weibull and non-parametric models,[5] with the full estimates from the Weibull model reported in Table 4.

In both the UK and the US, and for both outcomes, the Weibull parameter is less than one, which indicates that the baseline hazard is declining and hence individuals are less likely to exit unemployment as the spell proceeds. The piecewise constant baseline hazards are far more variable than suggested by the two parameters of the Weibull distribution. In the UK, in particular, a spike in the hazard is observed at 12 months. However, the estimates of β_A and β_B are almost exactly the same for the two specifications.

Figure 1: Predicted baseline hazards: BHPS

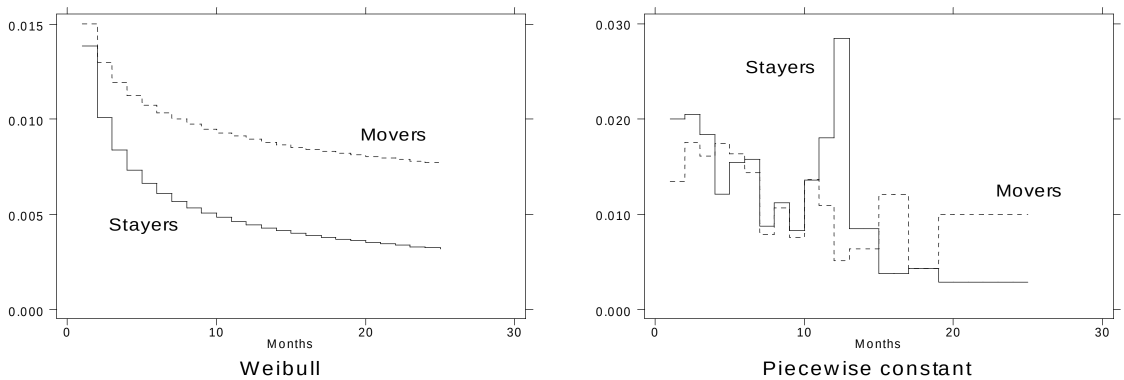
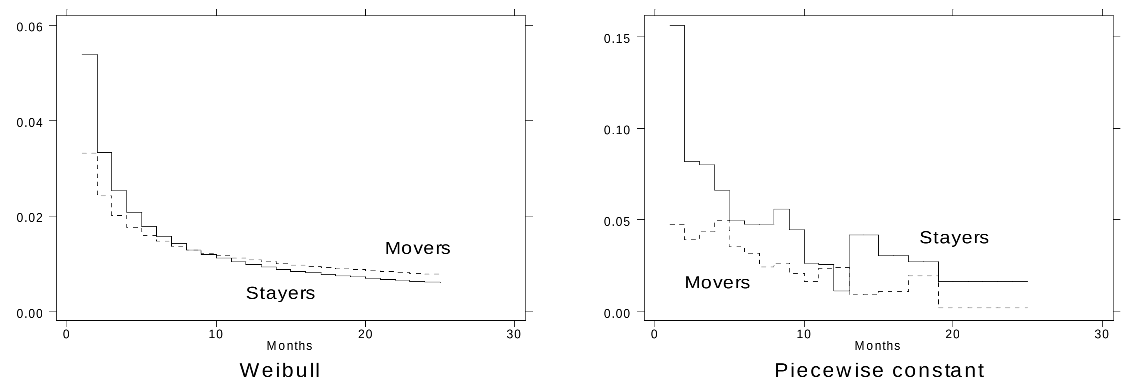


Figure 2: Predicted baseline hazards: PSID



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[5] In both cases the baseline hazard is calculated at the mean value of the covariates.

The Weibull parameter is greater for movers than for stayers in both the US and the UK. This implies that the likelihood of an individual moving sector increases the longer they remain unemployed. Column 3 in Table 4 indicates that this effect is statistically significant at conventional levels. The shorter unemployment durations observed in the US are *not* therefore a result of a less sharply declining unemployment hazard. Instead, the difference in mean durations is explained by a much higher hazard in the US, picked up by the value of the constant. The constant also shows that, for the UK, the hazard to staying in the same sector is much lower than the hazard to moving, while in the US this difference is insignificant.

The fact that $\alpha_A < \alpha_B$ in both countries is supportive of the hypothesis that individuals initially concentrate their search for re-employment in the sector in which they were originally employed. This in turn suggests that adjustment for individuals is less 'costly' within than between sectors. It is also interesting to note that the UK has a much higher proportion of sectoral movers amongst the unemployed, and also has lower re-employment hazards.

We now turn to the estimates of β_A and β_B, shown in Table 4. The results are generally consistent across the two countries. Of the 46 estimated parameters, 35 have the same sign in both countries. Of those 11 covariates where the estimates differ in sign, only five are significantly different from zero in either country.

The variable that relates most directly to the 'sectoral shifts hypothesis' is whether or not the individual was previously employed in the declining sector (manufacturing). It would be expected that such individuals would both have longer unemployment durations and be more likely to move. This is exactly what is observed, although the results are not always significant. In the UK, those in manufacturing industry have lower hazards to finding a job in the same sector, and higher hazards to moving. The net effect is that those who were employed in manufacturing are significantly more likely to move sector. We observe the same effect for the US.

Table 4: Weibull proportional hazard competing risk estimates[a,b]

	BHPS			PSID		
	Stayers	*Movers*	*Difference*	*Stayers*	*Movers*	*Difference*
Weibull parameter (α)	0.542**	0.791**	-0.249**	0.311**	0.542**	-0.231**
Constant	-4.431**	-1.911**	-2.520**	-1.281**	-1.155**	-0.126
Temporarily laid off				-0.417**	-0.895**	0.477*
Out of the labour force	-0.955**	-2.258**	1.303**	-0.540**	-0.594**	0.054
Female	0.729**	0.391*	0.338	0.041	-0.232	0.273
Age 26–35	0.538	-0.033	0.571	0.017	-0.442**	0.458**
Age 36–45	0.513	-0.191	0.704	-0.125	-0.611**	0.486*
Age 46–55	0.313	-0.473*	0.786	-0.193	-1.064**	0.871**
Age 56+	0.161	-1.192**	1.354**	-0.168	-1.166**	0.999**
Has children	0.287	-0.467**	0.754**	-0.105	0.020	-0.126
Married	0.017	0.648**	-0.631**	0.126	-0.100	0.226
No qualifications	-0.188	-0.296	0.107	-0.066	-0.290**	0.224
>10 years in labour market	-0.273	0.009	-0.282	0.190*	0.186	0.004
Previous job skilled	0.245	0.000	0.244	0.053	0.091	-0.039
Previous job manual	-0.083	0.090	-0.173	0.169**	-0.137	0.306**
Tenure of previous job 1-5 years	-0.433**	-0.014	-0.419*	-0.040	-0.027	-0.013
Tenure of previous job > 5 years	-0.495**	-0.318*	-0.177	-0.295**	-0.245*	-0.050
Previous job in manufacturing	-0.293	0.128	-0.421*	-0.239**	0.175	-0.414**
Self-employed in previous job	0.451**	-0.090	0.541*	0.344**	-0.187	0.530**
In receipt of unemp. Benefit	-0.908**	-1.795**	0.887**	-1.268**	-1.611**	0.343
Monthly UB income	0.071*	0.085**	-0.014	0.194**	0.237**	-0.043
Local unemployment %	0.281	-0.208	0.489	-0.151	-0.285**	0.134
Owns own home	0.730**	0.518**	0.212	0.122	0.058	0.064
Buying house (mortgage)	0.848**	0.387**	0.461	0.093	0.138	-0.045
Private renter	0.827**	-0.056	0.884*			

Notes:

[a] Estimates are Maximum Likelihood using the sequential binary response form to take account of the discrete measurement of duration, which is measured to the nearest month (Jenkins 1995).

[b] Estimates were also made using a less restrictive flexible baseline hazard, but this made virtually no difference to the parameter estimates, and removes the intuition available from a single estimate of α. All other estimates available on request from the Authors.

[c] Two asterisks denote 95% significance level; one denotes 90% significance level.

In the US, temporary lay-offs may help to explain why a large proportion of the sample return to the same industry. As would be expected, those who report that their spell of unemployment is a temporary lay-off are more likely to stay in the same sector than otherwise, presumably because a significant number return to their previous employer. Perhaps more surprising is that such individuals also have unambiguously longer unemployment durations, as the estimate of β_A as well as β_B is negative. It seems that individuals who are temporarily laid off are willing to wait longer to reap the rewards of a recall.

Local labour market conditions also appear to play a significant role in the US, as would be expected. High local rates of unemployment reduce the hazard to finding a job in either the old or a new sector, and hence unambiguously increase unemployment durations. The effect on the hazard to moving is greater (more negative), indicating that higher local unemployment rates reduce the probability of moving sectors, presumably because queues of more suitable workers already exist. In the UK, however, local labour market conditions have no significant effect either on the hazards to re-employment or the probability of moving sector.[6]

The impact of the unemployment benefit system is rather more complicated. In both countries, the dummy indicating receipt of unemployment benefit is significant and negative on both outcomes, indicating that those in receipt of benefits have unambiguously longer unemployment durations, as would be predicted by standard search theory. In both countries the effect is smaller (more negative) for exits into a new sector, indicating that those receiving benefits are less likely to switch sectors. This too is intuitive if benefits act as a subsidy to 'wait' for a suitable job in the same sector. This effect is, however, insignificant in the US.

The effect of the *level* of benefits (conditional on receipt), is however, positive, which is less intuitive. In fact, only 47.4% of the UK sample and 34.6% of the US sample report themselves as receiving unemployment benefit (see Table 2). This seems low, and suggests that individuals are reporting a particularly narrow definition of benefit. It may be that

[6] This may be reflect the fact that, due to data availability, different levels of aggregation for the local unemployment rate have been used in the two countries.

those in our sample who report high levels of unemployment benefit receive low levels of other out-of-work benefits, and *vice versa*. This seems plausible if other out-of-work benefits are means-tested. It should be noted that the predicted mean effect of benefit is still negative for the great majority, since the coefficient on receipt of benefits is much smaller than that on the level of benefits.

One of the largest and most consistent effects on unemployment durations is if the individual reports being 'out of the labour force' rather than unemployed. As noted earlier, these spells are included because they are preceded and often followed by a spell of employment. These individuals presumably regard themselves as being less attached to the labour force, and this is reflected in the significantly lower re-employment hazards. Spells of out of the labour force are on average longer than spells of unemployment. Less obviously, spells out of the labour force in the UK are *less* likely to result in a move to a new sector. This effect is insignificant in the US.

Turning to the impact of the other covariates, there is a consistent monotonic age effect on hazards to changing sector: older workers have lower hazards, which is consistent with the idea that older workers have a greater value of industry-specific human capital accumulated with experience. As a result, older workers are also less likely to switch sector, as shown by the increasingly positive coefficients in the third column.

The effect of tenure with previous employer is also consistent across the two countries. Tenure also ought to relate to skill specificity. Presumably, a high tenure signals that the quality of the pre-unemployment match was high and that job specific skills will have been accumulated. This may serve to hinder mobility. In fact, in the UK there appears to be a strong negative effect of tenure on unemployment hazards to both moving and staying: those with longer tenure take significantly longer to find a job in the same sector, as well as in a new sector. A similar result is found in the US: those with the longest tenures have longer unemployment durations. This result is consistent with the hypothesis that high tenure workers spend longer searching for re-employment in the same sector, because the relative value of the sector-specific skills is higher. After controlling for age and tenure, general labour market experience is generally insignificant.

Turning to qualifications, the estimates have the expected signs but are generally insignificant. Individuals with no qualifications have lower hazards to moving and staying in both the US and the UK and thus have longer unemployment durations. They also appear to be less flexible in that they are increasingly likely to stay in the same sector the longer they are out of work. This gives weak support to the view that high general levels of education aid mobility.

In order to assess the impact of specific skills on mobility, we also considered whether the previous job was skilled and whether it was manual. We would expect that skilled workers would be in relatively high demand, and hence have shorter spells of unemployment. However, because of the specific nature of many skills, their mobility between sectors might be reduced. The effect of skill was however insignificant, whilst for the US it was found that manual workers have a significantly higher hazard to staying in the same industry, with the net result that manual workers are less likely to switch sectors.

Finally, we also investigated the role of the housing market on sectoral mobility and unemployment durations. It has been suggested that owner-occupiers (Oswald 1997) and public-sector renters (Hughes & McCormick 1981) may be unable to move between geographical regions, and are therefore less mobile between sectors. In the context of a comparison between the UK and the US, this hypothesis is particularly interesting because the structure of the housing market is so different: Table 2 shows that over 69% of the UK sample are buying or own their home, compared to 42% in the US.

In the UK, the housing variables do have a significant impact on unemployment durations. However, we find no evidence to support the hypothesis that owner-occupiers are less mobile in terms of sectors.[7] Public-sector renters (the base group) have significantly longer unemployment durations. Those who own their own home and those with mortgages appear to be more mobile both within and between sectors though they are not more likely to change sector. Private renters have an increased probability of staying in the same sector, presumably to retain the rewards that accrue to specific skills. Interestingly, we find no significant housing effects in the US data: although owner-occupiers have higher hazards, the effect is insignificantly different from zero.

[7] Of course, sectoral mobility is not synonymous with geographical mobility, since workers may move regions in order to stay in the same sector.

6 Summary and Conclusions

This paper has examined the intra- and inter-sectoral mobility of labour. It provides evidence on what factors determine how long an individual remains unemployed, and what factors affect whether an individual moves sector following a period of unemployment. In doing so we examine the hypothesis that adjustment within industries is less costly, in terms of unemployment duration, than adjustment between industries.

The raw data confirm the stylised facts that although US workers experience higher incidence of unemployment, the spells have shorter duration. A further key difference between the two countries is that unemployment spells in the US are less likely to end in a move to another sector than they are in the UK. This may suggest one reason for the superior labour market performance of the US economy in the last two decades.

We also find that individuals are more likely to switch sector the longer they are unemployed in both countries. A plausible explanation for this is that 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 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.

The use of individual-level data enables us to say more about which types of worker are more or less likely to change sector. It is clear that although the average effect (as measured by the difference between the baseline hazards) suggests that workers initially search in the sector in which they were previously employed, there is great variation in the probability of moving sector. As suggested in some of the previous work in Section 2, the smooth adjustment hypothesis is perhaps too simple a view, since some industries contain heterogeneous workers, some of whom find it more difficult to change sectors than others. For example, we find that workers who would be expected to have higher levels of sector-specific skills (older workers, for example) are less mobile between sectors. A further interesting result is that workers in both countries who enter unemployment from the manufacturing sector are more likely to change sectors.

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