

Fehlker, Christian; Purfield, Catriona

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# A Tale of Two Countries: A Comparison of Unemployment Spells in the United Kingdom and Germany\*

By Christian Fehlfker and Catriona Purfield\*\*

## Summary

*This paper reviews how structural change affects unemployment spells in the United Kingdom and Germany. The key hypothesis is that the adjustment to structural change is protracted in a labor market characterized by sector-specific skills, immobile workers and insignificant intersectoral wage flexibility. Unemployment spells in household panels from the United Kingdom and Germany are used to test this hypothesis. The empirical results show that in the United Kingdom individual characteristics have little impact on the length of unemployment spells, while they dominate in Germany. For the United Kingdom, macroeconomic factors impact on unemployment duration.*

## 1. Introduction

Numerous attempts have been made to explain the rise in European unemployment at a macroeconomic level. Currently, some models focus on a long-term shift in demand for skilled labor. Two possible phenomena underlie this shift. The first is globalization, which is argued to have caused a fall in the relative world price of traded goods that are intensive in the use of unskilled labor compared to skill-intensive goods, thus causing the demand for unskilled labor in traded sector goods to decrease in developed countries. The second is technological change that favors skilled over unskilled labor. Blanchard (1997) and Nickell and Bell (1995) argue that the shift in the relative demand for skilled and unskilled workers only partly explains the change in the distribution of unemployment rates.<sup>1</sup> This paper examines the Blanchard (1997) argument by applying a model of structural change to microeconomic data from the United Kingdom and Germany. Section 2 reviews how structural change affects the unemployment spells of skilled and unskilled labor. The key hypothesis is that the adjustment to structural change is protracted in a labor market characterized by sector-specific skills, immobile workers, and insignificant intersectoral wage flexibility. Section 3 describes the construction of variables from household panel data for the United Kingdom and Germany and briefly describes the proportional hazard procedure used to analyze unemployment spells. Section 4 presents the empirical findings for each country. Section 5 concludes.

## 2. Theoretical Model

Structural change shifts the relative demand for labor across sectors, thus increasing the inflows from the un-

favored sector into unemployment. This would have no impact on the level of unemployment if labor could reallocate instantly across sectors. However, due to labor market rigidities, the duration of unemployment spells becomes a critical determinant of the level of unemployment. Unemployment duration, thus, is determined by the characteristics of individuals entering the unemployment pool, and unemployment duration only reveals these characteristics.<sup>2</sup>

To account for the increased inflow into unemployment during a period of structural change, we outline a model developed by Klodt, Maurer, and Schimmelpfennig (1997). The model illustrates that following a period of structural change, the unskilled experience a decline in their exit probability from unemployment. Thus, in the context of the model, we want to examine the effects of the decline of a sector, say sector  $i$ , on unemployment spells of workers from that sector. By extending the original model we can examine more closely how structural change affects different groups in the labor force. Assume two types of labor: skilled workers, denoted  $s$ , and unskilled workers, denoted  $u$ . High-productivity sector  $i$  employs both  $s$  and  $u$  types of workers at relatively high wages, while low-productivity sector  $d_u$  employs unskilled workers at a lower wage, and sector  $d_s$  employs skilled workers at the same wage as in sector  $i$ .

Structural change causes the shrinkage of sector  $i$ , so skilled and unskilled workers are laid off. Sector  $d_u$  demands more unskilled workers, but since the wage paid is below the reservation wage of unskilled workers previously employed in sector  $i$ , the increase in demand is met by new labor force entrants. Meanwhile, sector  $d_s$  demands more  $s$ -workers who relocate from sector  $i$ . Thus, unskilled workers laid off from sector  $i$  enter the unemployment pool.<sup>3</sup> The duration of unemployment will depend on the characteristics of those entering unemployment. With the decline of sector  $i$ , the unskilled face a devaluation in

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\*\* Kiel Institute of World Economics.

<sup>1</sup> Nickell and Bell (1995) conclude that only one-fifth of the increase in unemployment in the United Kingdom is due to the shift in the relative demand for unskilled workers.

<sup>2</sup> Layard, Nickell, and Jackman (1991) view the duration of unemployment spells as the critical determinant of unemployment because of the endogenous depreciation of skill and the decline in search intensity over the duration of the spell.

<sup>3</sup> The availability of unemployment benefits at high replacement ratios, often exceeding the wage rate for unskilled labor in sector  $d_u$ , facilitates queuing by the unskilled unemployed for lower probability sector  $i$  jobs.

their human capital, perhaps due to the lack of appropriate skills, age, physical handicaps, or regional immobility.<sup>4</sup>

The theory presented here suggests that the increase in unemployment, especially among the unskilled, is not merely due to an increase in the unskilled inflow rate, but also to a relative worsening of their labor market prospects, which slows their outflow rate.<sup>5</sup> We aim to determine whether the unemployment spells of these workers are significantly longer than of those who enter unemployment from other sectors.

### 3. Data Description and Procedures

To analyze the impact of structural change on unemployment duration, data are taken from the public use version of the German Socio-Economic Panel (GSOEP) and the British Household Panel Survey (BHPS).<sup>6</sup> Each year respondents complete demographic and personal questionnaires as well as questionnaires relating to the previous year's labor market experience. For our analysis, the German sample considers only individuals who indicate their labor market status as registered unemployed. Thus, the unemployed in our sample correspond to the official German definition of unemployment. The United Kingdom sample considers individuals who report their labor market status as unemployed, whether or not they are claiming unemployment benefits. Those in Germany who commenced their unemployment spells before 1984 (1990 in the United Kingdom) are excluded to overcome the problem of left-censoring, and lack of calendar data. Only individuals who return to the labor force after their unemployment spell are included, thereby excluding all right-censored observations. For Germany, a total of 1,505 unemployment spells are analyzed for the period 1984 to 1995, while for the United Kingdom 904 spells are included over the period 1990 to 1995.<sup>7</sup>

In both surveys, we proxy an individual's skill level using the highest educational qualification reported by respondents. *Uni* represents those who have a university qualification.<sup>8</sup> *Azubi* represents those with an *Abitur* or apprenticeship qualification.<sup>9</sup> *School* represents those with primary level education or no educational qualification. *Other* represents those whose highest education does not fit into any of the above categories.

For each survey we link respondents' unemployment spells to their previous labor force status, occupation, and geographic region. To capture structural change, people moving from employment to unemployment are categorized as coming from the primary, secondary, and tertiary sectors.<sup>10</sup> To keep the German and United Kingdom variables comparable, the International Standard Classification for Occupations (ISCO) was used. People entering unemployment from out of the labor force are also included and identified by variables describing their former labor force status: retired, maternity leave, housekeeping, schooling, government-sponsored training, and military service.

To capture the effect of receiving unemployment *benefits* the variable *benefit* is created. While the information is directly reported in the GSOEP, a proxy is created for the United Kingdom using information on the previous occupation. Due to the very different systems in the two countries the comparability of this variable is limited.

The United Kingdom and Germany are subdivided into 11 and 10 regions, respectively. For Germany, the division by *Laender* is the most detailed available.<sup>11</sup> For the United Kingdom, regional data are aggregated into 11 regions, from 18 in the original dataset. We construct a dummy variable for each region. To proxy the influence of the business cycle and other macroeconomic variables on unemployment spells, we construct annual dummy variables to represent the year in which the unemployment spell started.

In addition to the aforementioned covariates, controls are included to capture personal characteristics such as sex, nationality, marital status, and age. To control for respondent recall problems that cause the overreporting of December as the exit month from unemployment in the German sample, a *December* dummy variable is created. The age variable is defined such that the number indicates

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<sup>4</sup> The unwillingness to acknowledge human capital devaluation in the form of lower wages in sector  $d_i$  hinders workers from relocating from sector  $i$ .

<sup>5</sup> This theory contradicts the argument of Nickell and Bell (1995) who view the rise in OECD unemployment, especially in Canada, Germany, The Netherlands, Spain, and the United Kingdom as predominantly a response to neutral and not structural shocks.

<sup>6</sup> The GSOEP runs from 1984 to 1996; 12,290 individuals were interviewed from 5,921 households in the first wave. The BHPS runs from 1991 to 1995; in the first wave 10,400 individuals were interviewed from 5,000 households.

<sup>7</sup> The mean unemployment spell length for Germany is 7.05 months with a standard deviation of 8.74 while these figures are 4.95 and 5.34 for the United Kingdom, respectively. This divergence is due in part to the different time periods under investigation. The regression results don't change substantially if the same period is taken for both countries. Unemployment spells in the BHPS are reported on a weekly basis, but they are aggregated to form a monthly variable to make them comparable to those reported in the GSOEP. This introduces bias into the United Kingdom results, as reported in Section 4. All variables used in this analysis are constructed with special attention to the comparability of the two panels.

<sup>8</sup> Equivalent to a university degree in the United Kingdom. For a more detailed description of the German education system see Abraham and Houseman (1995).

<sup>9</sup> In the United Kingdom it also represents those with A levels.

<sup>10</sup> These sectors are defined as the agricultural, production, and service sector. The classification was made according to the job description of the three digit ISCO code and contains a judgement of the authors.

<sup>11</sup> Since the sample only includes West Germans, the new eastern states are aggregated into one region to capture people who moved there from the western states after 1989.

Table 1  
Summary Statistics for Individual Variables

Variable	United Kingdom	Germany
foreign	0.05	0.24
male	0.60	0.53
married	0.41	0.51
benefit	0.77	0.77
age25	0.39	0.31
age30	0.16	0.19
age40	0.18	0.27
age55	0.24	0.19
age65	0.02	0.03
uni	0.32	0.07
azubi	0.24	0.60
school	0.43	0.28
other	0.02	0.04
December	—	0.18
Sector1	0.01	0.03
Sector2	0.25	0.28
Sector3	0.50	0.50
retired	0.01	0.02
maternity	0.02	0.03
housekeeping	0.06	0.06
schooling	0.10	0.05
training	0.03	—
military	—	0.02
other	0.03	—
region1	0.11	0.06
region2	0.20	0.11
region3	0.14	0.01
region4	0.03	0.24
region5	0.17	0.02
region6	0.04	0.06
region7	0.03	0.06
region8	0.09	0.13
region9	0.04	0.17
region10	0.06	0.13
region11	0.10	—
Source: Authors' calculations using GSOEP public use version 1984-1995 and BHPS 1990-1995.		

the maximum age of the category into which the individual is placed. Table 1 provides summary statistics for the key variables from the two datasets.

#### Hazard Rate Estimation

To analyze the impact of structural change on the length of unemployment spells, we use hazard rate estimation techniques. The hazard describes the conditional probability of leaving unemployment in  $t + 1$ , given that unemployment has already lasted to month  $t$ . Formally, the discrete-time hazard rate is

$$\lambda(t) = \text{Prob}(T < t + 1 | T < t).$$

Starting from this general description, the hazard is then assumed to be of the proportional form

$$\lambda(t; x) = \lambda(t) \lambda(x),$$

where  $x$  are the time-invariant covariates describing the unemployed individuals and  $\lambda(t)$  is the baseline hazard, which is assumed to be the same for all individuals. Due to the multiplicative connection of the components it is a *proportional hazard rate* model (see Lancaster 1992). Taking the hazard of one characteristic as a benchmark and calculating the relative hazard,  $\lambda(t)$  can be eliminated. This makes the model semiparametric, because the baseline hazard is not specified and the model is estimated without restrictions on the baseline hazard, as in Meyer (1990).<sup>12</sup> The continuous-time hazard is then parameterized in an exponential form for the individual characteristics  $\lambda(x) = \exp[x_i(t)' \beta]$  so that all individual characteristics enter the equation with a positive sign. The vector  $x_i(t)$  contains explanatory variables for individual  $i$  and  $\beta$  is a vector of unknown parameters.<sup>13</sup>

We use the Peto-Breslow approximation to deal with ties when more than one spell ends at the same time. Finally, because unemployment may end with an individual finding employment or leaving the labor force, spells ending with a transition out of the labor force are recorded as censored.

#### 4. Regression Results

While both countries are exposed to globalization and technological change, our results show that displaced workers in Germany remain longer in unemployment, especially among the older, unskilled, and former industrial region categories. In Germany, where unemployment compensation is determined by past earnings and can be unlimited, the unskilled or older unemployed avoid the earnings loss generated by the devaluation of their job-specific human capital by remaining in unemployment. In contrast, older or unskilled workers in the United Kingdom do not experience significantly lower exit probabilities from unemployment when compared to other age and skill categories. Instead, displaced unskilled workers exit unemployment and experience a drop in earnings, as reflected by the increase in aggregate earnings dispersion in the United Kingdom.<sup>14</sup> Thus, it appears that due to varying institutional arrangements, similar shocks generate dif-

<sup>12</sup> The proportional hazard model does not have a constant term. The baseline hazard is an individual specific constant.

<sup>13</sup> These explanatory variables are taken to be spell-invariant. This is not an unrealistic assumption because although some variables such as age change as the unemployment spell progresses, they do so at a sufficiently slow pace that they can be treated as constants.

<sup>14</sup> See OECD Employment Outlook (1996), Table 3.1.

ferent responses in unemployment durations in Germany and the United Kingdom.<sup>15</sup> Table 2 presents our regression results for the two countries.

### United Kingdom

The last two columns of Table 2 show that of the various dummy variables included to capture the influence of personal characteristics on the hazard from unemployment to

employment in the United Kingdom, only three are significant.<sup>16</sup> Married individuals face a slightly higher hazard

<sup>15</sup> Our results augment the findings of Ljungqvist and Sargent (1998). In their general equilibrium search model, workers accumulate skills on the job and lose skills on entering unemployment. In a welfare state with generous unemployment compensation, displaced workers end up in long-term unemployment. In a laissez-faire economy, displaced workers experience large and enduring earning losses.

Table 2

### Hazard Rate Analysis of Exits from Unemployment to Employment

Variable	Germany		United Kingdom	
	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
foreigner	-0.35	0.07*	-0.04	0.16
male	0.03	0.05	-0.13	0.07*
married	0.06	0.06	0.18	0.09*
benefit	0.63	0.16*	-1.18	0.73
age30	-0.19	0.08*	-0.02	0.11
age40	-0.22	0.07*	-0.15	0.11
age55	-0.35	0.08*	-0.18	0.11
age65	-0.39	0.15*	-0.19	0.27
azubi	-0.16	0.11	0.07	0.09
school	-0.28	0.12*	-0.09	0.08
other	0.13	0.16	-2.52	0.92*
December	-0.11	0.07	—	—
sector1	-0.11	0.23	0.01	0.31
sector2	0.01	0.07	0.07	0.09
training	0.31	0.18	-2.19	0.75*
retired	0.24	0.48	-2.33	0.84*
maternity	-0.05	0.27	-2.69	0.79*
schooling	0.43	0.22*	-2.08	0.74*
military	0.71	0.31*	—	—
housekeeping	0.04	0.22	-2.42	0.75
region1	-0.34	0.15*	0.11	0.13
region2	-0.21	0.18	0.35	0.14*
region3	-0.73	0.32*	-0.11	0.22
region4	-0.28	0.09*	-0.02	0.14
region5	-0.57	0.23*	-0.11	0.21
region6	-0.22	0.08*	-0.03	0.23
region7	-0.11	0.12	0.03	0.16
region8	-0.13	0.12	0.02	0.21
region9	-0.14	0.09	0.04	0.19
region10	-0.11	0.19	0.01	0.15
year89	0.28	0.13*	—	—
year90	0.14	0.12	-0.74	0.23*
year91	0.22	0.11*	-0.22	0.15
year92	0.01	0.11	-0.08	0.08
year94	0.31	0.09*	0.21	0.09*
year95	0.81	0.11*	0.83	0.13*

\* Indicates significant at 5 percent level.

Source: Authors' calculations using GSOEP public use version 1984-1995 and BHPS 1990-1995.

and therefore a shorter expected unemployment spell than single individuals. This may reflect increased job search efforts on the part of individuals with family dependents.

In accordance with the finding of Holden, Matthews, and Thompson (1995) that female unemployment rates and spells are lower than those for males, males experience significantly a lower hazard rate than females. This may be because females who reenter the labor force after raising a family are not eligible for unemployment assistance, or because females may choose to exit unemployment to engage in household and caring activities, rather than market employment.

Age, education, and previous occupation appear to have no significant impact on duration of unemployment.<sup>17</sup> However, those who enter unemployment from out of the labor force, i.e., training, retirement, maternity leave, or school, experience significantly longer unemployment spells than those who enter unemployment from employment (the omitted category). Thus, individuals with more recent employment experience face a decisive advantage in exiting unemployment.

In the United Kingdom, region of residence has no significant impact on unemployment duration overall. Thus, it appears that the increasing regional wage inequality and the active labor market policies pursued by various governments in the United Kingdom have made the length of unemployment spells broadly similar across the country.

Three of five dummy variables used to capture the impact of the business cycle on unemployment spells are significant. The negative coefficient on the *year90* variable indicates that those who entered unemployment in 1990 experienced significantly longer unemployment spells than those who entered in 1993. The decline in unemployment duration in 1993 was prompted by the beginning of the recovery spurred by the pound's 1992 devaluation when the United Kingdom left the European Monetary System. The positive coefficients on the variables *year94* and *year95* indicate that the trend of declining unemployment spells continued.<sup>18</sup> These findings support Meager's (1997) claim that supply-side reform appears to have made the United Kingdom labor market more responsive to the business cycle.

#### Germany

In Germany, the picture is quite different.<sup>19</sup> There is a significant divergence in hazard rate by various personal characteristics and region of residence. Foreigners, older individuals, and those with low levels of education face longer spells in unemployment. In contrast to the United Kingdom, there is considerable regional dispersion in the hazard rate. Those living in Berlin, Bremen, Hamburg, Niedersachsen, and Nordrhein-Westfalen experience longer spells of unemployment. This may indicate that those living in these regions do not move to find employment. Again, in contrast to the United Kingdom, those entering unemployment from full-time education ex-

perience shorter unemployment spells. This points to the positive influence of the German education system on labor market skills.<sup>20</sup> Entitlement to unemployment benefit shortens the expected duration of unemployment. This result may be due to the fact that entitlement proxies for recent labor market experience. Nevertheless, since almost 80 percent of the sample receive this benefit and the income replacement ratio is not included in the specification, this result should be interpreted with caution.

Only three of the dummy variables constructed to control for the impact of the business cycle on unemployment spells are significant. Thus, in contrast to the United Kingdom, unemployment spells in Germany appear to be unresponsive to business cycle fluctuations. Those entering unemployment in 1994 and 1995 experienced significantly shorter unemployment spells but this is most probably attributable to bias against long unemployment spells in 1994-1995 due to deleting right-censored spells.

#### 5. Conclusion

As a consequence of globalization or technologically induced structural change, a worker laid off from a job in which his human capital was complementary to physical capital experiences a significant decline in his human capital and future earnings potential. Our model predicts that such workers are more prone to find themselves in long-term unemployment. However, our findings from an empirical investigation of the hazard of leaving unemployment in Germany and the United Kingdom indicate that both countries exhibit significantly different responses to the pressures of globalization and technological change. In the United Kingdom, older, less skilled, and displaced workers from former industrial regions do not experience a significantly lower hazard rate from unemployment when compared to other groups. One interpretation of these findings is that the institutional reforms implemented under the Thatcher and Major governments that resulted in flexi-

<sup>16</sup> Our regression for the United Kingdom explains the variation in the hazard rate from unemployment to employment quite well: the likelihood-ratio  $\chi^2(21)$ , is 674.8, while the Wald chi-square statistic of 648.4 is significant at the 1 percent level.

<sup>17</sup> The variable *other* is significant but must be interpreted with caution because it represents only 1.6 percent of the sample, or 14 persons.

<sup>18</sup> These results suffer from a bias due to the exclusion of the right censored spells, which increases the significance of the *year94* and *year95* variables.

<sup>19</sup> The regression for Germany explains the variation in the hazard rate from unemployment to employment well: the likelihood-ratio test  $\chi^2(28)$ , for the German regression gives 611.9, while the Wald chi-square statistic of 618.2 is significant at the 1 percent level.

<sup>20</sup> The positive impact of military employment most probably reflects the fact that those who complete military service return to their previous job.

ble relative wage rates and limited unemployment compensation has meant that workers displaced by the process of structural change do not experience a relative decline in their hazard rate. Consequently, when the United Kingdom emerged from recession of the 1990s, unemployment duration and rates fell to record lows perhaps because relative wage flexibility allowed the economy to move closer to full employment. In a flexible labor market, negative individual characteristics, such as age and low skill level, matter little; instead, the overall macroeconomic situation may influence unemployment duration.

We find in Germany, unemployment spells are longer for those with negative individual characteristics such as older age, low skill level, and industrial region of residence. It may be the case that institutional arrangements, such as the wage bargaining system, which has held relative wages constant, and the generous unemployment compensation system, which links payments to past earnings, hinder the process of restructuring. In such an institutional setting, older and less skilled workers may lack the incen-

tive and ability to make the transition to expanding sectors and, therefore, may choose lower search intensities and remain longer in unemployment.

Our findings support those of Ljungqvist and Sargent (1998) who find that a welfare state is more vulnerable to economic shocks. Shocks, such as skilled-biased technical change, induce a drawn out response in the unemployment rate that is associated with longer unemployment spells because displaced workers with their depreciated skills have difficulty finding jobs. The contrast between the experience of the older and less skilled unemployed in the United Kingdom and Germany highlights the need for the restructuring of institutional arrangements in Germany. Reforms that increase wage flexibility, sharpen the incentive to work, especially for older and unskilled workers, and education/training that provides the necessary skills to allow workers to move from declining to emerging sectors could improve the capability of the German economy to adjust to structural change.

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