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## The speed of leaving the old job: a study on job changes and exit into unemployment during the East German transition process

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The Speed of Leaving the Old Job:  
A Study on Job Changes and Exit into Unemployment during the  
East German Transition Process\*

BY JOACHIM WOLFF AND PARVATI TRÜBSWETTER<sup>†</sup>

June 23, 2003

**Abstract**

The first period of the transition to a market economy was characterised by a high rate of job-change in many transition countries. This was no different for East Germany. This paper analyses the consequences of the transition process for East German workers in their old job. We quantify the speed at which they change their jobs for a new one or enter unemployment by studying a sample of job spells drawn from the German Socio-Economic Panel-East. The study focuses the period from July 1990 to December 1993, thus a period after the introduction of the German Economic, Monetary, and Social Union. We estimate the effects of important covariates on the transition rates from the old job into a new and into unemployment by a standard competing-risks duration model. Our results suggest that the speed of exit into new jobs rises with skills. We also find that old firms managed to keep workers with relatively good job matches. The special short-time allowances, a labour market program that was in force until the end of 1991, slowed down the exit rate into unemployment prior to its end. We find that workers increased their rate of job-change temporarily at around the period in which this program ended.

JEL classification: C41, J63 and P2

Keywords: Job-Changes, Duration Models, Competing Risks, Economies in Transition

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# 1 Introduction

The start of the transition of the socialist economies involved a remarkable reallocation of resources. The reallocation of labour was expected to lead to considerable flows between employment and unemployment and vice versa. Nevertheless, in many transition economies during their first years of transition these flows remained low by Western standards [Boeri (1994)]. This also applies to East Germany [Wolff (1998)]. To a large extent the reallocation of labour from old less productive jobs to new ones took place by direct job changes. According to data from the Labour Market Monitor, East German job-to-job changes made up for roughly 55 % of total hirings from November to November of the years 1991, 1992 and 1993 [German Federal Labour Office (1994)]. This figure is considerably higher than in market economies<sup>1</sup>.

Early in the East German transition process, it became clear that wages would adjust rapidly to the much higher West German wage levels. Already in 1991 some collective wage agreements aimed at raising the gross wages to the corresponding West German levels before the year 1995<sup>2</sup>. For this reason, it was quite likely that a large proportion of the new jobs created in the East German economy would be 'good jobs' with a high productivity and wage level. Hence, firms that created such jobs would chose production technologies that are more capital and human capital intensive than prior to the transition process. Thus, firms that created new jobs had an incentive to attract highly talented applicants to fill their vacancies. Old firms in the restructuring process had an incentive to turn the jobs of talented workers into 'good jobs'. However, for workers in the old jobs, it was likely that their jobs would turn out to be unprofitable in the first years of the transition process. Therefore, they had a high incentive to search for new profitable jobs, which were created by the private firms.

For the reasons above, at the start of the East German transition to a more market-oriented economy, one may expect a high rate of job change. Moreover, the speed of exit from their old to a new one would most likely be higher for highly qualified and talented workers compared with less qualified and talented ones. The opposite should be true for the speed of exit from old jobs into unemployment as the old firms would attempt to dismiss low rather than high-skilled staff.

As many old jobs were likely to become unprofitable, labour market programs

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<sup>1</sup>Pissarides (1994) summarised evidence on job changes in several countries: Estimates by Blanchard and Diamond (1989) suggest for the period from 1968 to 1986, that about 20 % of new hires in the U.S. result from job changes. In West-Germany and France the proportion of new hires that stem from job changes is found to be even lower. For the year 1987 Burda and Wyplosz (1994) estimated this proportion at 17 % for West-Germany and 7 % for France.

<sup>2</sup>E.g., according to the collective agreement in the metal industry, the West German gross wages should have been reached by 1994. The median real monthly consumer wage rose by more than 80 % in the first six years of transition Hunt (2001).

in East Germany partly focused on avoiding high unemployment and high job loss. One such temporary program that will be important to our analysis involved special allowances for short-time work. This program aimed at protecting old jobs, which otherwise would have disappeared more rapidly. It is likely that the hazards to new jobs may be particularly high for a short period just after the special short-time allowances ran out in January 1992. The reason is that being on short-time work was a signal to workers about the lack of profitability of their old job match and hence a high incentive to find a new one. Additionally, at the beginning of the transition process, unions and employer federations reached agreements on temporary protection against dismissal in some sectors. Therefore workers, affected by these agreements may initially have had considerably lower transition rates into unemployment than other workers.

Our analysis is based on retrospectively collected job duration data from the German Socio-economic Panel East (GSOEP-East)<sup>3</sup>. We study a sample of workers who were employed in June 1990 and analyse their exit behaviour over the first three years since the introduction of the German Economic, Monetary, and Social Union (GEMSU) in July 1990. We regard this date as the start of transition process of the East German economy and as the starting date for our old jobs. Our dependent variable is the duration of the old job together with the exit states 'new job' and 'registered unemployment'. Thus, we apply standard econometric duration models to the data to investigate the above hypotheses. The end of our observation period is December 1993, as we are interested in developments in the early phase of the East German transition process.

Section two of the paper summarises some important labour market developments and events over the chosen observation period. Section three discusses previous work on changes in employment status in East Germany and presents our main hypotheses. Section four describes the econometric methods and our sample of old job spells drawn from the GSOEP-East. In this section we present non-parametric estimates of the survivor function and the transition rates into new jobs and into unemployment. Results from the estimation of a logistic competing-risks model are presented in Section five. We discuss the explanatory variables with respect to the magnitude of their impact on the transition rates from old jobs into new jobs and into unemployment. In section six, we draw preliminary conclusions.

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<sup>3</sup>The data used in this study are from the German Socio-Economic Panel Study. These data were provided by the Deutsches Institut für Wirtschaftsforschung.

## 2 The East German Labour Market in the First Years of the Transition Process

In East Germany the impact of the transition to a market economy on the labour market was remarkable. Employment fell from more than 9.7 million people in the first quarter of 1989 to close to 6.2 million people at its (first) trough five years later<sup>4</sup>. More than 90 % of this net job-loss had already occurred by the first quarter of 1992. By that time more than 1.2 million people were registered as unemployed. The unemployment rate had reached more than 15 %. Still, the rise in unemployment made up for only about a third of the net job loss. There are several reasons for this. A considerable number of East Germans migrated to West Germany. However, migration played only a major role in 1989 and 1990 and fell considerably thereafter. Early retirement programs provided an incentive for aged workers to change directly from their old jobs into retirement. A substantial number of people were in training and retraining programs.

Let us discuss some differences between the East and West German labour market in the first three years after the introduction of the GEMSU. Table 1 displays the unemployment rate, the inflow rate into unemployment as well as the outflow rate from unemployment from 1991 and 1992. The figures are shown for East and West Germany. The East German unemployment rate in July 1990, when the GEMSU came into force, was less than four percent. In 1991, however, it exceeded already ten percent. In the following two years it went up to a level of roughly 16 % and was far higher than in West Germany.

Even though the restructuring process lead to a large job loss, East German unemployment dynamics were not extremely high by Western standards in the first years after the introduction of the GEMSU. On average the proportion of people in the labour force that entered registered unemployment each month was 1.5 % between 1991 to 1993. Over the same period the average monthly inflow rate into unemployment in West Germany was between one and 1.2 %. So, East German inflow rates were higher but not strikingly higher than in West Germany.

Migration, entry into special early retirement programs and training and retraining programs may have kept the East German inflow rates at moderate levels. Another reason may have been special short-time allowances that were in force until the end of 1991. They gave workers at risk of loosing their old job time to find a new one without entering unemployment. In West Germany this program only applies to firms affected by temporary economic shocks, while in East Germany until the end of 1991 it applied to any firm with a need to restructure<sup>5</sup>. In 1991 1.8 million

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<sup>4</sup>Source: National Accounts for East Germany of the German Institute for Economic Research

<sup>5</sup>Childless workers on short-time work received 63 % of their net wage loss. For workers with

workers were on this program. This amounts to more than a quarter of the East German employment.

**Table 1: Unemployment Rate and Unemployment Dynamics from 1991 to 1993 (in percent)**

	1991	1992	1993
East Germany			
Unemployment Rate	10.3	14.8	15.8
Gross Inflow Rate into Registered Unemployment <sup>a</sup>	1.4	1.6	1.5
Gross Outflow Rate from Registered Unemployment <sup>b</sup>	9.6	10.8	10.3
West Germany			
Unemployment Rate	6.3	6.6	8.2
Gross Inflow Rate into Registered Unemployment <sup>a</sup>	1.0	1.0	1.2
Gross Outflow Rate from Registered Unemployment <sup>b</sup>	18.3	16.9	14.9

<sup>a</sup>Average monthly inflow into registered unemployment divided by the labour force.

<sup>b</sup>Average monthly outflow from registered unemployment divided by the annual average unemployment stock.

Sources: Federal Labour Office and Microcensus

Agreements between unions and employer federations on temporary protection against dismissal may also have played a high role in explaining the moderate inflow rates. The most important contract was the one of the metal industry and electrical engineering which affected about 1.8 million workers. This agreement was in force until the end of June 1991 [Council of Economic Experts (Annual report 1990/91)]. Both the special short-time allowance and the collective agreements on protection against dismissal may have initially slowed down labour shedding. However, this does not explain, why the inflow rates did not rise after 1991 when the special short-time allowances were no longer in force.

Table 1 also demonstrates that the outflow dynamics were low by Western standards. From 1991 to 1993 the monthly average outflow rate from unemployment in East Germany was close to 10 % while in West Germany it ranged from 14.9 to 18.3 %. The East German outflow rate may reflect that employers preferred to hire workers directly from their old jobs than from the unemployment pool. They may have considered unemployment as a bad signal about the talents of a worker. However, we have to take these numbers with caution. The comparison of the gross average outflow rates of West and East Germany relies on the total outflow from unemployment. Unemployment spells may not only end with regular employment but with an entry in a labour market program or non-participation<sup>6</sup>. Nevertheless,

children the replacement rate was even 68 %.

<sup>6</sup>From the official statistics of the Federal Labour Office we could compute an outflow rate into employment, but only if we consider jobs that have been filled by mediation of the labour offices. This figure may be far lower than the true outflow rate into jobs. Moreover, it is far from clear whether the importance of the mediation of the labour offices for filling vacancies is the same in East and West Germany.

consider that exit from unemployment into labour market programs was far higher in East than in West Germany in this period. Therefore, the differences between the outflow rates into employment between West Germany and East Germany should have been rather higher than the difference in the overall outflow rates suggest.

## **3 Previous Work on Changes in Employment Status in East Germany and Main Hypotheses**

### **3.1 Previous Work**

Previous studies did not address the speed of exit from the old jobs into new jobs. One study of Licht and Steiner (1994) used data from the first two waves of the GSOEP-East to study the employment duration for the first nine months since the introduction of the GEMSU in July 1990. They analysed the determinants of exit from employment into short-time work, unemployment and non-participation by estimating a competing-risks discrete time duration model. One of their main results was that the higher the initial wages of the workers in May 1990, the more likely they were to remain employed. This may well reflect the fact, that highly talented workers were those with the highest wages and hence old firms had an incentive to retain these workers, while firms that created new jobs attempted to fill them also with the most talented ones. The authors could not find any considerable and statistically significant effects of schooling or occupational qualifications on the transition rates into any considered exit state. Probably the variation of the wage rates in May 1990 represent to a large extent differences in qualifications.

Schwengler (1997) analysed the determinants of the employment status of East Germans in November 1994 by logistic regressions using data from the Labour Market Monitor. She regarded a sample of people who were employed in November 1989. For the employment status in 1994, she distinguished between being employed, unemployed and long-term unemployed. For those workers who were employed in 1994 she also estimated models that regarded job mobility. She defined upward (downward) mobility as an increase (decrease) of the occupational qualification required for the job .

The main results of this study were that men in contrast to women have a higher probability of being employed. The opposite is true for being unemployed or long-term unemployed. Both for men and women, workers aged 36 to 55 years were found to be considerably more likely to be employed in 1994 than younger workers. As far as results on job mobility are considered, two variables turned out to be very important determinants of upward mobility: a high schooling degree and not surprisingly whether an individual's occupational qualification in 1989 was higher

than the one required for the job held in that year. Both are associated with a very high upward mobility.

## 3.2 Main Hypotheses

The transition from a socialist economy to a market economy implies a large re-allocation of labour. The East German economy has chosen a strategy of a rapid transition. The GEMSU and unification in 1990 implied that East Germany adopted the institutional framework of the West German economy. Rapid restructuring of the old firms was necessary. This was particularly important for firms which produced tradeable goods and so the manufacturing sector. The firms were exposed to international competition and trade with their former socialist trading partners collapsed rapidly. For this reason and due to the fact that production was relatively labour intensive, a destruction of a large number of jobs in the old firms was inevitable.

### **Hypotheses for the speed of job change:**

As workers in the old firms had a high risk of losing their old jobs, incentives for searching a new one at a new employer were quite high. New jobs that were created by new or old privatised firms were more likely to be jobs that would survive the transition process. Moreover, the new jobs were likely to be highly productive, high wage jobs as unions attempted to push wages up to West German levels and capital investment was highly subsidised.

The on-the-job search activity may have been particularly high for several types of workers. Young workers should gain much more by on-the job training in new jobs than in their old jobs, which were less likely to survive the transition process. Moreover, protection against dismissal is more strict for aged workers than for young ones, so that the latter faced a higher risk of losing their old jobs. Workers who had to work short-time in their old job had a precise signal that their jobs are very unlikely to survive. Thus they had a higher incentive to change to a new employer than other workers.

In West Germany unemployment rates of unskilled workers are far higher than those of skilled workers. One reason for this may be that labour demand for unskilled workers is too low, since their wages are too high relative to those of the skilled ones. Wage agreements in East Germany were oriented at the West German wage levels and wage structure. Therefore, existing old jobs of unskilled workers were at a higher risk of being lost than those of skilled ones. Moreover, new jobs created would be to a large extent jobs for skilled workers. So, on the one hand, incentives for searching a new job were high for unskilled workers. On the other hand, the arrival rate of job offers from other employers was likely to be higher for skilled as



opposed to unskilled workers. Therefore, the speed of exit into new jobs should have been higher for skilled than for unskilled workers.

Employers who created new jobs may not only have preferred skilled applicants to unskilled applicants to fill their vacancies. Firms in which new jobs were created were to a large extent firms of West German investors<sup>7</sup>. This may imply that discrimination against women may have emerged. West German employers due to preferences or due to statistical reasons may discriminate against women. They may expect female workers in contrast to male ones interrupt their career temporarily or permanently due to childbearing and -rearing. In the GDR, the combination of work and family life of women had been supported by a number of promotional measures. After unification these promotional measures disappeared, so that it was likely that statistical discrimination against women would emerge. For this reason, we expect the speed of exit into new jobs of women to be lower than for men.

### **Hypotheses for the speed of exit into unemployment:**

The discussion of the speed of exit into new jobs is also relevant for the speed of exit into unemployment. The old jobs at risk to disappear due to the restructuring process may rather have been jobs of unskilled workers. Therefore their transition rates into unemployment should exceed those of skilled workers. Protection against dismissal is more stringent for aged than for young workers. So the latter should be less likely to keep their old job and exit more rapidly into unemployment than elder workers.

Discrimination against female workers in the old firms may have emerged over time, since more and more old firms became privatised. For that reason we should find their likelihood to retain their old jobs to be lower and their transition rate into unemployment to be higher than for men. Discrimination is not the only reason for this difference. Prior to the transition process, child-care facilities were part of many firms. Jobs in these facilities were among the first to be lost in the restructuring process and they were mainly a female domain.

Parts of our hypotheses may contrast predictions of a model that was developed by Boeri (1997) to explain high job-to-job movements in transition economies. His starting point is the following: Under socialism the most educated workers had little incentive to develop their skills on the job, due to the compressed wage structure. For the same reason and due to the fact that dismissing low-productivity workers was almost impossible, managers had little incentive to monitor the productivity of their workers.

For simplicity, Boeri assumed that there were only two types of workers: high-

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<sup>7</sup>In 1995, about 50 % of industrial jobs in East Germany were jobs of firms of West German or foreign owners [German Institute for Economic Research (1999)].

productivity and low-productivity workers. When the transition process started past vocational attainment, wages or occupation of applicants, however, provided little information to new private employers on the applicants' productivity. But new private employers could screen applicants during a probation period and fire them if their productivity were beneath the wage specified in the contract.

Boeri also assumed, that even during the transition process, state firms would continue to pay all their workers the same wage, which would reflect the average productivity of a firm's workforce. Hence, state firm wages remained below the productivity of high-productivity workers. Under these conditions, he supposed that the best hiring strategy for private employers is to offer a wage above the average productivity of the workers in the old firms but below the productivity of high-productivity workers. Then they would attract away only the high-productivity workers from the old firms. The reason is that the low-productivity workers would be sure to lose a new job during the probation period, since they would reveal their low-productivity to the private employer. So, they would have no incentive to apply for a job at a new employer. Moreover, the private employers would only accept applicants who already hold a job. Applicants from the unemployment pool could well be low-productivity workers. For them accepting a new job would be profitable, since at least during the probation period, they receive more than their unemployment benefit.

The model would explain why a high number of new hirings resulted from job changes. The assumption is that past occupation, or vocational attainment during socialism is not signalling the productivity of the workers to the employers who create new jobs. According to Boeri's hypothesis one would not expect, that the speed at which people leave their old jobs for a new one varies considerably with differences in these attributes. This contrasts our views on job changes in the East German economy in transition.

## 4 Methods and Data

### 4.1 Econometric Methods

We analyse the discrete random variable "duration of the old job",  $T$ . The counterpart to this variable is the hazard rate, which measures the probability that a spell ends in some time interval with an exit from the current state "old job". The hazard rate is a conditional probability. As we measure duration in months, it represents the probability of exiting from the old job in month  $t$ , provided that the individual has been in the old job up to the beginning of that month. A hazard rate may additionally be conditioned on a vector of explanatory variables  $\underline{x}(t)$  and may be

written as:

$$P[T = t | T \geq t, \underline{x}(t)] = \theta(t | \underline{x}(t)) \quad (1)$$

The unconditional probability that a spell does not end with an exit up to the month  $T = t$  is called the survival probability and is defined as:

$$S(t | \underline{x}(t)) = \prod_{\tau=1}^t [1 - \theta(\tau | \underline{x}(\tau))] \quad (2)$$

The hazard rate is an exit probability from the current state to any other labour market state. However, our interest is mainly in the exit into a new job and into unemployment. Therefore, we need to model transition rates as the conditional probability to exit to a specific destination state,  $J = j$ . Such a transition rate is then:

$$P[T = t, J = j | T \geq t, \underline{x}(t)] = \theta_j(t | \underline{x}(t)), j = 1, \dots, M \quad (3)$$

If the transition rates to all potential destination states are statistically independent, their sum equals the hazard rate. We assume the logistic specification which is one alternative for modelling the discrete random variable  $T$  [Allison (1982) and Jenkins (1995)]. The transition rates are then specified as

$$\theta_j(t | \underline{x}(t)) = \frac{\exp[\alpha_{tj} + \underline{x}(t)' \cdot \underline{\beta}_j]}{1 + \sum_{m=1}^M \exp[\alpha_{tm} + \underline{x}(t)' \cdot \underline{\beta}_m]}, j = 1, \dots, M, \quad (4)$$

where  $\alpha_{tj}$  represents a parameter for the time effect, which may vary from month to month.  $\underline{\beta}_j$  is the parameter vector of the covariates and may vary for each exit state.

The logistic specification of the transition rates has a major advantage. The corresponding likelihood function can be transformed into the likelihood function of a standard unordered multinomial logit model [Jenkins (1995)]. For this purpose each month of an individual job spell of length  $t$  is regarded as a separate observation. Each of the first  $t - 1$  of these observations contribute to the likelihood by the probability that no exit occurred in the corresponding month. If the spell is right-censored in month  $t$  also the last observation is modelled in this way. If the spell is completed with an exit to a destination state  $j$  though, then the last observation contributes to the likelihood by its transition rate.

## 4.2 Data

The GSOEP-East is the data source for the analysis of the problems under consideration<sup>8</sup>. It is a representative sample of the East German resident population

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<sup>8</sup>For a general description of the GSOEP-East see Wagner, Burkhauser, and Behringer (1993).

of German nationality on a household basis. The study is longitudinal<sup>9</sup>. The first wave was carried out in June 1990, just before the German Economic Monetary and Social Union (July 1990) came into force. The sample started with 2,179 private households. 4,453 people of at least 16 years of age responded to the interview. The GSOEP-East collects information on the start and end of jobs retrospectively. Respondents provide in each wave the calendar start of their current job if they are employed. Moreover they provide the calendar end of their last job and its complete duration, provided that a previous job ended prior to the current interview.

The information has been used to construct job spells. Our interest is in the speed of job-change and exit into unemployment of individuals from the introduction of the GEMSU onwards. Thus, we selected a sample of workers who held a job in July 1990, which started prior to this date. We regard these jobs as old jobs in the sense that they were created prior to the introduction of the GEMSU. We define as the job start July 1990 as we want to know for how long these workers survived in their old jobs from the start of the transition process. Completed job spells are those that ended prior to the year 1994. Job spells that continued in 1994 are regarded as right-censored. There are other reasons for right-censoring of our spells. A part of these job spells is right-censored due to attrition.

As exit states we regarded first of all a new job, that followed directly the old one. Note that within firm job changes were not considered as such an exit. Moreover, we regarded as exit states unemployment or non-participation. To determine whether a job ended with an exit to one of the latter exit states, we used second piece of information from the GSOEP. Labour force status information on each month of the previous year is collected by a calendarium. The calendarium provides us with up to 12 different states. From this information, we determined whether a job ended with a spell of registered unemployment or some spell of non-participation. As there is extremely little exit from old jobs into non-participation, the analysis that follows treats job spells that terminate by this labour force state as right-censored.

Our sample was limited to workers who are younger than 53 years in 1990. The reason is that special early retirement programs were available at the start of the transition process, so that elder workers were highly likely to enter these programs. Their behaviour with respect to the exit into a new job would certainly differ much from that of workers who could not reach the age of early retirement during the observation period. We dismissed also job spells of women, who reported to be on maternal leave at their first interview in 1990. They did not provide information on a large number of important job-related covariates. This left us with a sample size of more than 2,600 observations.

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<sup>9</sup>People that leave a household are followed and re-interviewed in the successive waves, so long as they do not leave German territory.

**Table 2: Composition of the Sample of Old Job Spells by Destination State**

	Total		Men		Women	
	Number	Proportion (percent)	Number	Proportion (percent)	Number	Proportion (percent)
Sample size	2,645	100	1,381	100	1,264	100
Right-censored	1,535	58.0	805	58.3	730	57.8
Completed	1,110	42.0	576	41.7	534	42.2
Exits by destination state						
Job change	488	44.0	312	54.2	176	33.0
Unemployment	562	50.6	228	39.6	334	62.5
Non-participation	60	5.4	36	6.3	24	4.5

Table 2 displays the composition of our spell sample by destination state and gender. Slightly more than 50 % of the spells represent men. The third row shows that for both sexes more than 40 % of the spells are completed between July 1990 and December 1993. Male spells are much more frequently completed by a job change than female ones. More than half of the completed male spells as opposed to one third of those of females end with a job change. At more than 60 %, the modal female exit state is unemployment. For men and women alike only a small proportion of the sample terminate their old job by an exit into non-participation. The number of exits into this destination state is for both gender too low to allow an analysis of the transition rates into this state.

### 4.3 Kaplan-Meier Estimates

Let us describe our spell data by presenting some Kaplan-Meier estimates of the survivor function and the transition rates into new jobs and unemployment. These estimates give us a preliminary insight on the speed of exit from the old job over these first years of the East German transition process. We also want to focus on variation of the speed of exit for different age and skill groups.

The analysis that follows considers the period from July 1990 to June 1993. We begin with the survival probabilities of men and women. Figure 1 plots the survival probability against the duration of the old job together with Greenwood 95 % confidence bands. There is no considerable and statistically significant difference between the survival probabilities of men and women over the entire period under consideration.

Between July 1990 and July 1991, so during the first 13 months, the survival

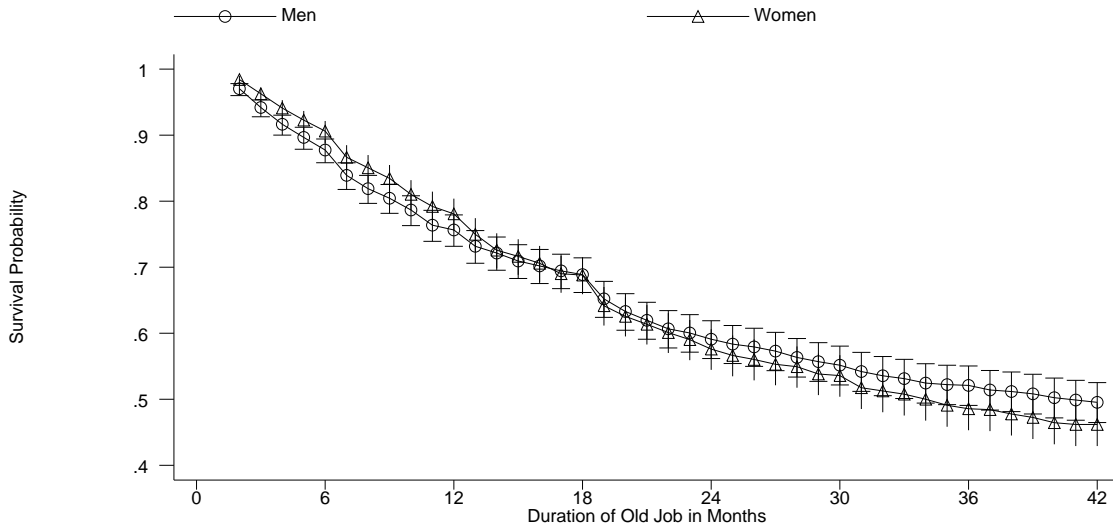


Figure 1: Probability of Survival in the Old Job by Gender from July 1990 to December 1993

probability decreases by more than 2 percentage points per month to about 72 % for both men and women. Over the following four months until the beginning of December 1991 the survival probability falls by less than four percentage points, so it is relatively stable. From December 1991 to January 1992 (month 19), the figure displays the sharpest monthly decrease of the survival probability. It declines by about 3.5 percentage points for men and 4.5 percentage points for women. This sharp decrease reflects the end of the special short-time allowance. For the remaining period until the end of 1993, the survival probability decreases quite slowly. For both sexes it shrinks by less than one percentage point per month.

At the end of 1993 about 49.5 % of men and 46 % of women are still in their old job. We estimated these latter two survival probabilities for a sample of workers in West-Germany who held a job in July 1990 from the GSOEP-West. For them we find that at the end of 1993 about 80 % of men and 75 % of women still held this job. This proportion is a substantially higher than for East Germany. This first set of results did certainly demonstrate that workers left their old jobs rapidly during the transition process.

Let us turn to the question on how rapidly they left their old job for a new one. The transition rates into new jobs are displayed by gender in Figure 2. We used intervals of three months length to estimate these transition rates. The transition rates may be interpreted as an average monthly probability of leaving the old job in such a time interval.

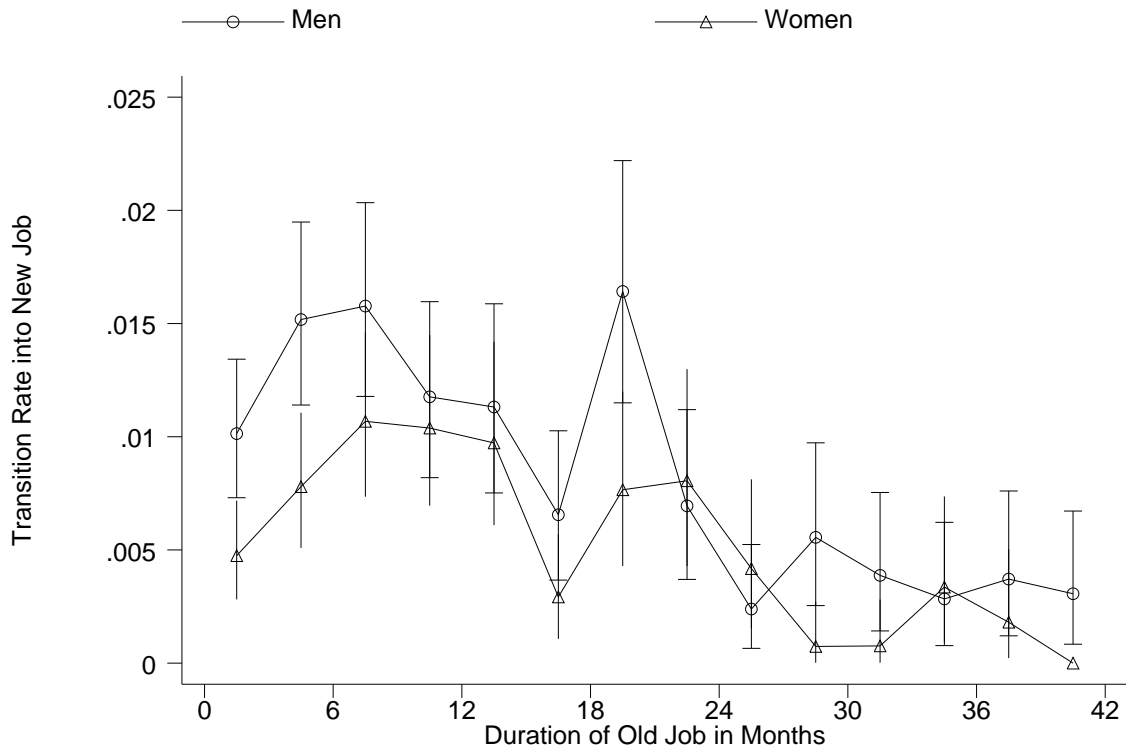


Figure 2: Transition Rates into New Jobs by Gender from July 1990 to December 1993

The first important fact displayed by Figure 2 is that the speed of exit into new jobs is much higher prior to month 24 than thereafter. In the first subperiod, it ranges most of the time from one to 1.7 % for men and from 0.5 to 1.1 % for women. After month 24, though, transition rates into new jobs are below 0.6% for men and women alike. The small spike in the transition rate for men after month 18 may be related to the end of the special short-time allowance. Presumably, this led temporarily to a more rapid job change. The last important fact to note is that the transition rates of males are nearly always higher than those of women. Up to month 21 they are sometimes about twice as high. So, the early transition process was accompanied by a rapid job change, though the new jobs were much more likely to be filled by men than by women.

The transition rates into unemployment of men and women are shown in Figure 3 and were also computed for time intervals of three months length. They are relatively stable compared with the transition rates into new jobs. Most of the transition rates range from 0.5 to 1.1 % for men and from 0.8 to 1.2 % for women. However, there are some spikes. The most important one occurs after 18 months, where the transition rate of males was 1.5 % and that of females even 2.6 % percent. This spike coincides

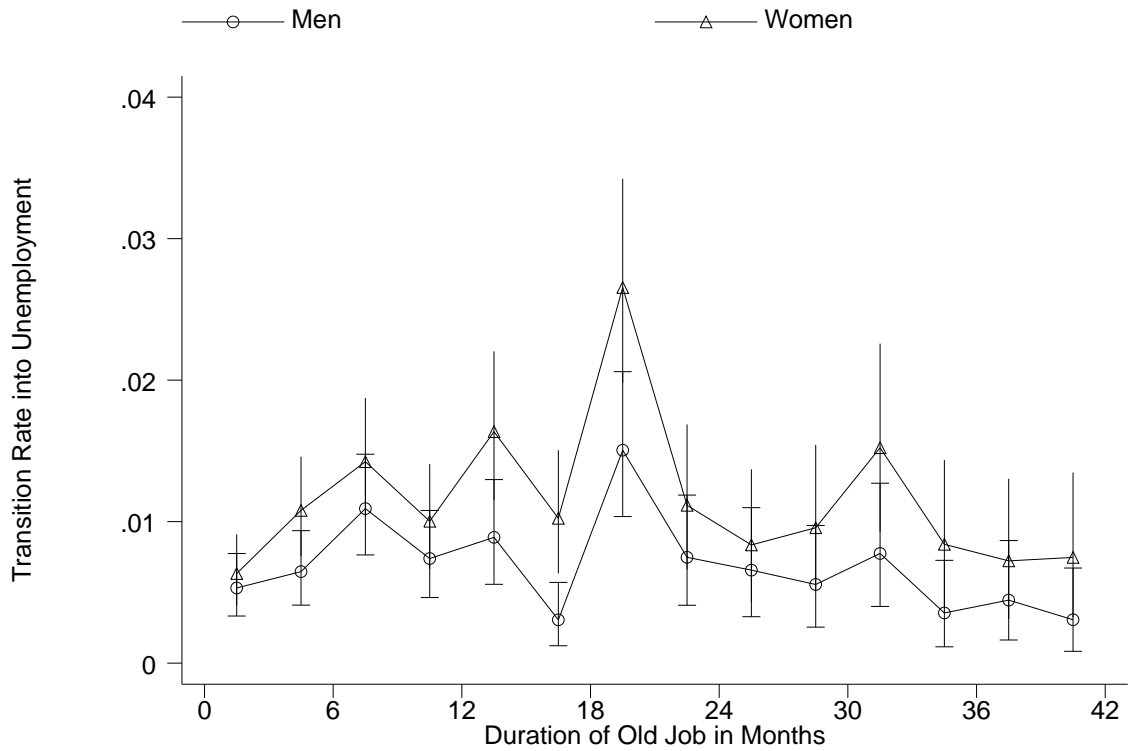


Figure 3: Transition Rates into New Jobs by Gender from July 1990 to December 1993

with the period in which the special short-time allowance ended and reflects that this led to a temporary rise of labour-shedding. Thus, most likely this program has slowed down the speed of exit into unemployment, prior to the year 1992. However, this spike occurs at the beginning of the year 1992, thus labour-shedding may be particularly high for reasons of low seasonal labour demand. The figure also displays that over the entire observation period women had a higher transition rate into unemployment than men. A log-rank test rejected the hypothesis, that the transition rates of men and women are equal at a one percent significance level.

Let us here already discuss two important covariates that may explain variation in the likelihood of keeping the old job. Figure 4 displays the survival probability of men and women by age. We distinguished between workers who are younger than 36 years and workers who are older than 35 years. Figure 4a demonstrates, that the survival probability of young men rapidly became lower than that of men older than 35. Until the end of the first year of the transition process this difference rose



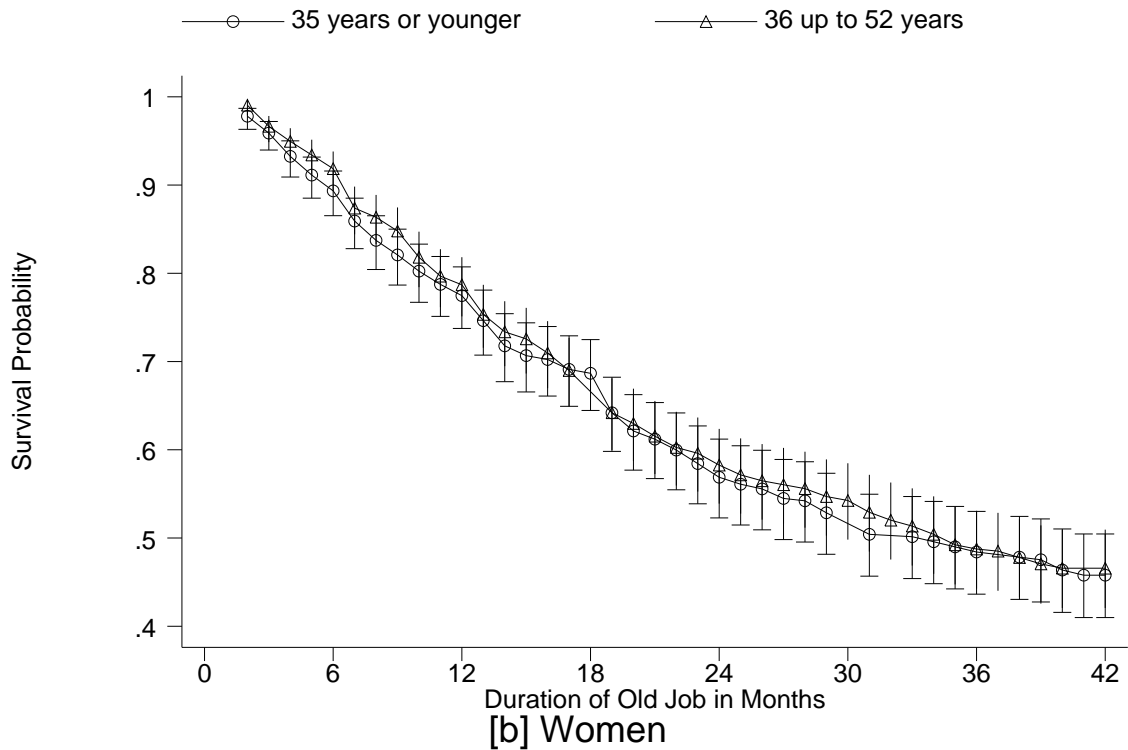
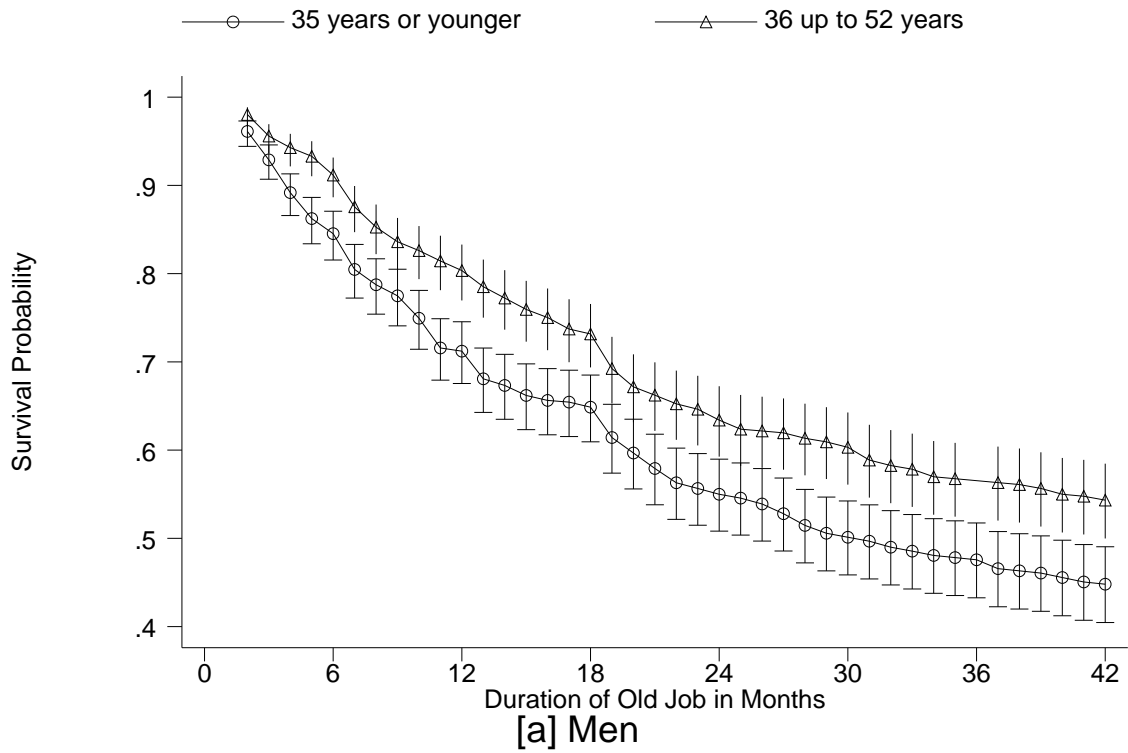


Figure 4: Probability of Survival in the Old Job by Age-Groups

to roughly ten percent. Since then it remained relatively stable. Presumably the job security of elder men was higher than for younger men. Workers committees

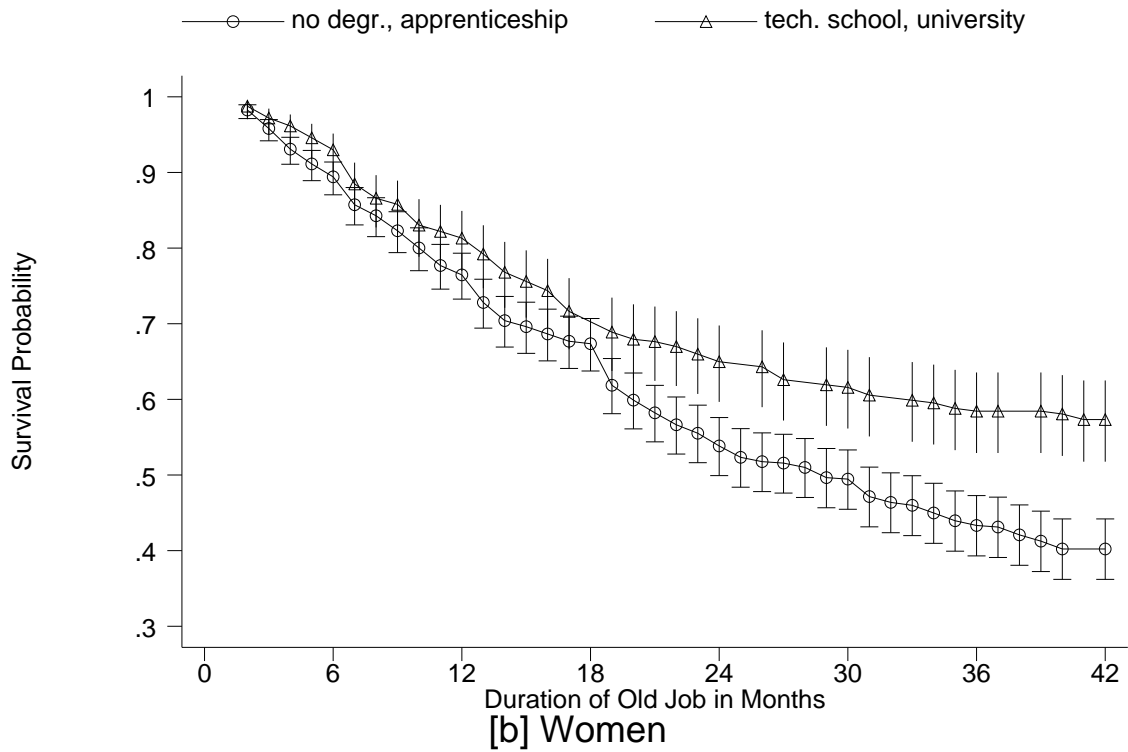
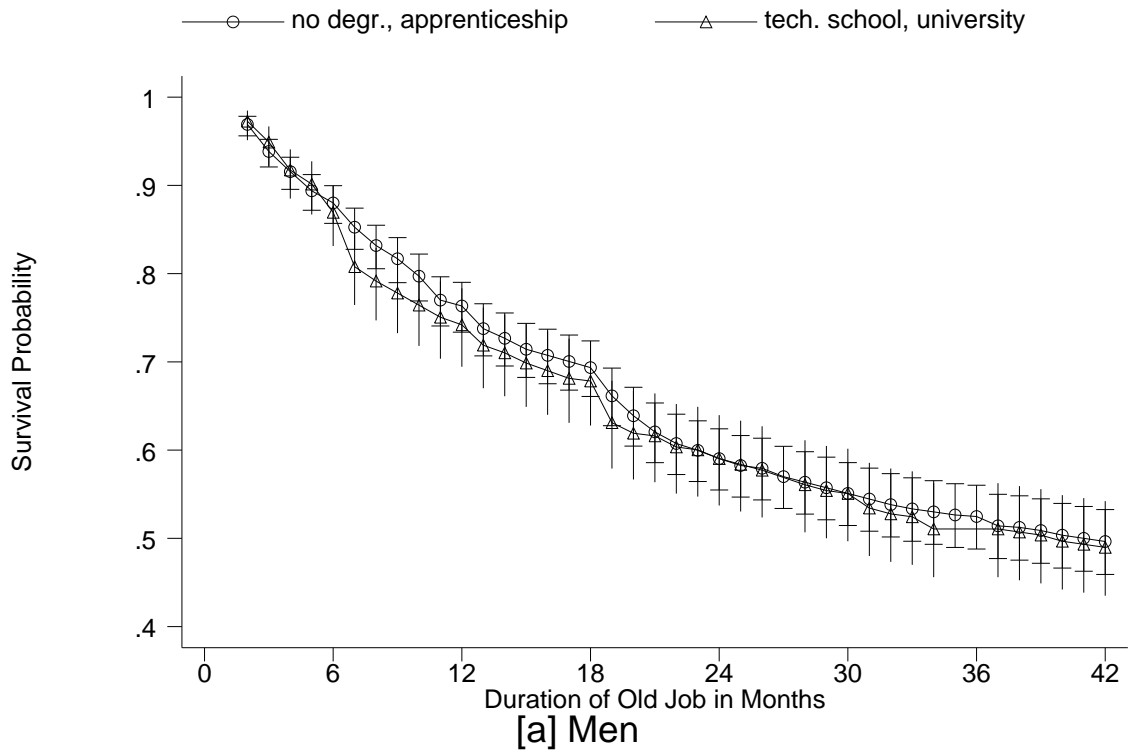


Figure 5: Probability of Survival in the Old Job by Skills

may oppose a dismissal, if jobs in another section of the firm are vacant. They may have a preference for aged workers. Next, the period of notice increases with tenure

and hence it is likely that, at least at the beginning of the transition process, young workers lost their jobs more rapidly than elder workers. However, Figure 4b does not display any substantial difference between the two age-groups' survival probability for women.

Figure 5 shows the survival probabilities by occupational qualification. We distinguished between two groups: workers with no qualification or apprenticeship and workers with a degree of a technical school or a university. The probability of keeping their old job does hardly differ between these two groups as far as we consider men (Figure 5a). In contrast, for women the survival curves of these two skill groups differ substantially. Already prior to the end of the special short-time allowance, it was more likely that high as opposed to low skilled workers kept their old jobs. Thereafter, this difference increased very rapidly. At the end of 1993 about 57 % of the highly skilled still held their old job. For low skilled women this figure is only 40 %. So, skills apparently played a high role for keeping the old job, but only for women.

## 5 The Determinants of the Transition Rates into Old Jobs and Unemployment

### 5.1 Final Sample for the Logistic Model

In the previous section we said very little with respect to the effects of covariates on the transition rates. The time variation displayed by the Kaplan-Meier estimates of the transition rates may well be misleading. They may be a result of sorting if the transition rates vary for individuals with different attributes. In this section, we present the results of our semi-parametric analysis, which controls for such attributes.

Before we turn to this analysis, we first need to present the final sample and descriptive statistics on covariates. The sample size is somewhat smaller than for the sample of old job spells that we used to calculate the Kaplan-Meier estimates. We had to discard spells, if from the beginning of the spell a covariate had a missing value. One may keep such spells in the analysis if the "missing" category of a covariate is represented by a separate dummy variable. However, this makes only sense if a sufficient number of missing values is observed. For most of our covariates this is not the case. Moreover, we did not discard an entire spell if a time-varying covariate is not missing at the start of a spell, but at some other point in time during a spell. In this case, we keep the spell, but treat it as right-censored in the month before the time-varying covariate is missing<sup>10</sup>. Our sample sizes for the econometric

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<sup>10</sup>The time-varying covariates in our analysis are time-intervals, children, equivalent household

analysis that follows are 1,286 male and 1,193 female spells in their old job.

**Table 3: Characteristics of the Male and Female Spell Samples: Part 1**

	Male sample		Female sample	
	Mean	Std. Dev.	Mean	Std. Dev.
Destination states				
New Job	0.208		0.136	
Unemployment	0.162		0.238	
Covariates				
Calendar time:				
July 90 - Aug. 90	0.090		0.093	
Sept. 90 - Nov. 90	0.120		0.127	
Dec. 90 - Feb. 91	0.108		0.114	
Mar. 91 - May 91	0.095		0.099	
June 91 - July 91	0.055		0.056	
Aug. 91 - Nov. 91	0.103		0.103	
Dec. 91 - Feb. 92	0.069		0.068	
Mar. 92 - July 92	0.096		0.092	
Aug. 92 - Dec. 93	0.264		0.247	
Personal and household characteristics:				
Age				
< 26	0.183		0.158	
26 to 35	0.334		0.346	
36 to 45	0.278		0.298	
> 45	0.205		0.199	
Number of own children				
No children < 17 years	0.443		0.411	
1 child	0.260		0.289	
more than 1 child	0.297		0.300	
ln(equivalent household income) <sup>a</sup>	6.989	0.316	6.995	0.332
Occupational qualification				
No degree or apprenticeship	0.707		0.676	
Technical school	0.190		0.245	
University or technical college	0.103		0.079	
Sample size (expanded sample)	27044		24402	
Number of spells	1286		1193	

<sup>a</sup>The household income was deflated with the consumer price index. We computed the equivalent real household income by using the new OECD equivalence scale. I.e., we calculated the equivalent number of household members in the following way: the first adult contributes as 1 household member, each additional household member that is older than 14 years contributes as 0.5 household members, each child that is 14 years old or younger contributes as 0.3 household members. The real household income divided by this household size is the real equivalent household income.

Table 3 and 4 display descriptive statistics of the covariates of the male and female spell samples. They display the proportion of a category in case of dummy covariates and the mean and standard deviation for continuous covariates. The first set of covariates displayed in Table 3 represent intervals of calendar time. The time

income, company has been taken over, working short-time and the logarithm of the regional vacancy-unemployment rate.

intervals are not of equal length for various reasons. E.g., we chose a relatively short interval of three months length for the period December 1991 to February 1992, so that we may quantify in how far the end of the special short-time allowance led to a temporary rise of the exit rates into new jobs and unemployment. The last time interval in contrast is longer than one year. The reason is that the number of spells that reach this time interval is relatively small, so that we observe only a very small number of exits for this last period.

The next set of covariates represent personal and household characteristics of our workers. We considered age and the number of own children who are younger than 16 years as well as household income. The proportions of males in the four age-groups in Table 3 clearly demonstrate, that the share of young male workers is higher than the share of young female workers. This is not surprising as young mothers are more likely to be non-participants than young fathers. As far as children are considered the distribution is relatively similar for both sexes. More than 41 % have no children, 26 % of men and 29 % of women are parents of one child. Finally, there are about 30 % of men and women who have more than one child. The real equivalent household income is the only household variable used in the analysis. It could influence the speed of exit into jobs for various reasons. The lower the household income, the larger may be the need for household members to change the old job for a better paid one. However, household income may also be related positively to the talents of the household members. The higher their household income and hence their talents, the higher should then be rate of job change.

Table 3 also presents descriptive statistics of individual skills. We divided the workers also into three groups of occupational qualification. The modal group is no degree or apprenticeship. About 71 % of men and 67.6 % of women belong to this category. 19 % of men and 24.5% of women went to technical school. More than 10 % of the male sample and about 8 % of the female sample hold a university degree or a degree from a technical college.

Table 4 displays descriptive statistics for two further sets of covariates: attributes of the old job in 1990<sup>11</sup> and other covariates. The speed of exit into new jobs and unemployment is certainly related to characteristics of the old job of the workers. Let us start the discussion with the industry. Many sectors in the East German economy were likely to shrink and did so at the beginning of the transition process. Agriculture, forestry and fishing was certainly one of these. Its share of GDP in East Germany was more than twice its West German level in the second half of 1990<sup>12</sup>. Moreover, the start of the transition process implied that manufacturing

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<sup>11</sup>More than 95 % of the interviews of the first wave of the GSOEP-East took place in June 1990. About 3.5 % of the interviews were carried out in May or July

<sup>12</sup>Comparable National Accounts Data for the two German regions are only available since the second half of the year 1990

**Table 4: Characteristics of the Male and Female Spell Samples: Part 2**

	Male sample		Female sample	
	Mean	Std. Dev.	Mean	Std. Dev.
Covariates				
Characteristics of old job in 1990:				
Industry				
Agriculture, forestry, fishing	0.151		0.080	
Energy, mining, manufacturing	0.444		0.318	
Construction	0.114		0.031	
Trade, transport, communication	0.142		0.194	
Other services	0.149		0.376	
Occupation				
Missing, self-employed, trainee	0.082		0.057	
Blue-collar worker	0.624		0.295	
Foremen, un- or semi-skilled white collar workers	0.130		0.467	
Professional or managerial position	0.165		0.181	
Tenure in June 1990				
$\leq 2$ years	0.163		0.159	
3-4 years	0.126		0.135	
5-7 years	0.121		0.135	
8-10 years	0.103		0.111	
11-15 years	0.164		0.175	
$> 15$ years	0.323		0.285	
Other				
Not working in job trained for	0.400		0.398	
Public sector employee	0.232		0.422	
ln(wage)	1.781	0.734	1.726	0.647
Wage information missing	0.119		0.095	
Other Covariates:				
Company has been taken over	0.042		0.050	
Working short-time	0.306		0.287	
ln(regional vacancy-unemployment-ratio)	-3.349	0.365	-3.342	0.367
Sample size (expanded sample)	27044		24402	
Number of spells	1286		1193	

was exposed to international competition. This led to a sharp downturn in this industry. For workers in both sectors a high transition rate into unemployment may be expected. In contrast, at the start of the transition process, construction workers could expect that their old jobs would survive. Investment in East Germany grew rapidly and the state invested large amounts into the renewal of the East German infrastructure. Similarly, the speed of exit into unemployment should have been low for service sector workers. The service sector had been neglected under socialism and the service sector expanded in the first years of the East German transition process. So, the industry may be an important control variable in our analysis.

Another job related set of covariates are occupational categories. We distinguish between four occupational categories: For the first, the occupation is either missing, self-employment or trainee. They make up for a very small percentage of both

samples. The second group are blue collar workers. It is the modal group for men. The third group are foremen, un- or semi-skilled white collar workers. At more than 46 % this group represents the largest proportion of the female observations. The last group are professional or managerial white-collar workers.

Additionally we will control for covariates that characterise the length people already were in their old job prior to July 1990. This job tenure was divided into 6 groups that represent 2 or less years, 3-4 years, 5-7 years, 8-10 years, 11-15 years, and more than 15 years of tenure. The other characteristics in the old job are not working in the job trained for, public sector employee and the log of the hourly wage rate in 1990. There is certainly reason to distinguish the category public sector employee from working for a firm which is still a state firm. Respondents to the GSOEP are asked whether they work for a company that is part of a government or state administration. This is what we consider as a public sector worker. For this type of worker we expect a higher job security and hence lower transition rates into new jobs and unemployment, compared with other workers.

The final set of variables is labelled as “Other”. Company has been taken over and working short-time are time-varying covariates are both binary covariates, for which monthly information is available. For both covariates Table 4 displays the proportion of workers for which these two events ever took place during their spell. Between four and five percent of the sample members reported that their company had been taken over. Roughly 30 % have been for at least for one month on short-time work, which demonstrates how important this labour market program was. Finally, we will control for the regional labour market situation by variables that characterise the federal state and by the logarithm of the regional vacancy-unemployment ratio. This variable does not stem from the GSOEP. It is computed from statistics on vacancies and registered unemployment that are published by the Federal Labour Office for the East German federal states Brandenburg, Berlin-East, Mecklenburg-West-Pomerania, Thuringia, Saxony and Saxony-Anhalt.

## **5.2 Estimation Results for the Logistic Competing-Risks Model**

We estimated the coefficients of the covariates by maximising the likelihood of a logistic competing-risks model for the transition rates from old jobs into new jobs and into unemployment. Calendar time effects were not modelled by a specific time function. Instead, we estimated parameters of a set of dummy variables for different time intervals. They measure in how far a transition rate is distinct from the transition rate in the reference period July 1990 to August 1990. The estimation was carried out for men and women separately.

The reference individual 26 to 35 years old and is childless. He/she holds an occupational qualification no higher than an apprenticeship. This reference person works in the primary sector as a blue collar worker, while his/her tenure is 2 years or less. The person is working in the job trained for but not as a public sector employee and wage information is available for this person. Neither was his/her company taken over nor is the individual working short-time. We present only one specification for each gender<sup>13</sup>.

The coefficients together with their t-statistics are presented in Table 5 for men and Table 6 for women. Likelihood ratio tests did not reject the hypothesis that parameters of the “logarithmic equivalent household income”, “not working in the job trained for” and “short-time employment” are zero for the new job transition rate. So, they were constrained to be zero. Let us first discuss the statistical significance of the coefficients. We then turn to some predicted probabilities that result from these estimates in order to discuss the magnitude of the impact of the covariates on the two transition rates.

### **Estimation Results for Men**

Table 5 presents the coefficients for the new job transition rates of men in the first column. The corresponding t-values are displayed in the second column. The third and fourth column display these statistics for the transition rates into unemployment. The coefficients of the first set of covariates, calendar time, suggest that both transition rates vary over the period with calendar time. They imply a spike for the interval December 1991 to February 1992 both in the transition into a new job and the transition rate into unemployment and hence for the period in which the special short-time allowance terminated. They also imply another spike for the transition rate into unemployment during the interval June 1991 to July 1991. It is prior to this period that some special agreements of protection against dismissal were in force. However, the coefficient for this interval is not statistically significant.

The personal characteristics and household characteristics are significant determinants of the transition rates. Age significantly determines the variation of the transition rates into new jobs. The coefficients of some children dummies are significant. The logarithmic equivalent household income has no effect on the new job transition but plays a role for explaining the variation in transitions into unemployment.

Both for the new job and unemployment transition rate, the qualification of workers is a significant determinant. Also many of the control variables for char-

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<sup>13</sup>Other specifications considered additionally a number of covariates that according to likelihood-ratio tests turned out to be statistically insignificant for both gender. These were marital status, relationship to household head, number of adult household members and the size of the firm as well as dummy variables for the federal states.



**Table 5: Maximum-Likelihood Estimates of the Parameters: Men**

		New Job		Unemployment	
		Coef.	t	Coef.	t
Constant		-2.951	3.14 **	2.092	1.07
Calendar Time:	Sept. 90 - Nov. 90	0.371	1.37	-0.181	0.50
	Dec. 90 - Feb. 91	0.538	1.48	0.177	0.40
	Mar. 91 - May 91	0.440	1.10	0.042	0.09
	June 91 - July 91	0.238	0.63	0.633	1.50
	Aug. 91 - Nov. 91	-0.084	0.24	-0.631	1.32
	Dec. 91 - Feb. 92	0.943	2.50 **	1.138	2.52 **
	Mar. 92 - July 92	-0.522	1.09	0.489	0.98
	Aug. 92 - Dec. 93	-0.361	0.97	0.144	0.32
Personal and household characteristics:					
Age	< 26	-0.103	0.41	0.133	0.49
	36 to 45	-0.325	1.99 **	0.056	0.28
	> 45	-0.348	1.57	0.177	0.73
Number of own children:	1 child	0.409	2.35 **	-0.245	1.24
	> 1 child	0.321	1.76 *	-0.437	2.04 **
	ln(equivalent household income)	.	.	-0.649	2.67 **
Occupational Qualification:					
Technical school		0.470	2.36 **	-0.476	1.76 *
University or technical college		0.503	1.69 *	0.165	0.46
Characteristics of old job in 1990:					
Industry:	Energy, mining, manufacturing	-0.371	1.92 *	-0.882	4.53 **
	Construction	-0.138	0.57	-0.537	2.01 **
	Trade, transport, communication	-0.184	0.68	-0.914	2.99 **
	Other services	0.258	0.87	-1.024	2.81 **
Occupation:	Missing, self-employed, trainee	-0.886	2.17 **	-0.586	1.45
	Foremen, un- or semi-skilled white collar	-0.126	0.57	0.475	1.90 *
	Professional or managerial position	-0.040	0.16	0.652	1.98 **
Tenure in June 1990	3-4 years	0.047	0.20	-0.164	0.65
	5-7 years	-0.445	1.82 *	-0.322	1.26
	8-10 years	-0.115	0.48	-0.384	1.33
	11-15 years	-0.307	1.41	-0.544	2.04 **
	> 15 years	-0.430	2.03 **	-0.790	3.20 **
Other: characteristics:	Not working in job trained for	.	.	0.159	1.05
	Public sector employee	-0.887	3.81 **	-0.266	0.95
	ln(wage)	0.309	1.06	-0.533	1.62
	Wage information missing	0.338	0.54	-1.201	1.84 *
Other Covariates:					
Company has been taken over		-1.281	2.19 **	-0.372	0.94
Working short-time		.	.	1.107	5.91 **
ln(reg. vacancy-unemployment-ratio)		0.577	2.03 **	0.153	0.45
Sample size (expanded sample)		27044			
Log-likelihood				-2563.4	
McFadden's $R^2$				0.0563	

“\*” one asterisk implies a ten percent significance level.

“\*\*” two asterisks imply a five percent significance level.

acteristics in the old job and the “Other Covariates” are important in determining both transition rates. We will discuss these results together with the predicted probabilities in the following section.

**Table 6: Maximum-Likelihood Estimates of the Parameters: Women**

		New Job		Unemployment	
		Coef.	t	Coef.	t
Constant		-4.229	3.47 **	1.404	0.81
Calendar Time:	Sept. 90 - Nov. 90	0.199	0.53	0.446	1.33
	Dec. 90 - Feb. 91	0.738	1.55	0.908	2.22 **
	Mar. 91 - May 91	0.840	1.64	0.570	1.25
	June 91 - July 91	0.859	1.91 *	1.458	3.83 **
	Aug. 91 - Nov. 91	-0.279	0.58	0.729	1.91 *
	Dec. 91 - Feb. 92	0.681	1.33	1.973	4.80 **
	Mar. 92 - July 92	0.424	0.78	1.239	2.70 **
	Aug. 92 - Dec. 93	-1.506	2.51 **	1.078	2.64 **
Personal and household characteristics:					
Age	< 26	-0.567	1.61	-0.173	0.64
	36 to 45	-0.241	1.13	0.227	1.44
	> 45	-0.569	2.00 **	-0.272	1.21
Number of own children:	1 child	-0.276	1.28	-0.307	1.72 *
	> 1 child	-0.750	2.93 **	-0.204	1.02
ln(equivalent household income)		.	.	-0.322	1.51
Occupational Qualification:					
Technical school		-0.063	0.28	-0.132	0.63
University or technical college		0.575	1.61	0.076	0.22
Characteristics of old job in 1990:					
Industry:	Energy, mining, manufacturing	-0.849	2.77 **	-0.279	1.34
	Construction	-0.496	1.00	0.285	0.74
	Trade, transport, communication	-0.626	1.87 *	-0.125	0.51
	Other services	-0.614	1.66 *	-0.243	0.90
Occupation:	Missing, self-employed, trainee	1.340	2.79 **	-2.033	4.24 **
	Foremen, un- or semi-skilled white collar	0.647	2.73 **	-0.276	1.83 *
	Professional or managerial position	0.171	0.50	-0.197	0.69
Tenure in June 1990	3-4 years	0.104	0.36	-0.211	0.95
	5-7 years	-0.273	0.85	-0.742	3.24 **
	8-10 years	0.016	0.05	-0.415	1.76 *
	11-15 years	-0.540	1.64	-0.416	1.99 **
	> 15 years	-0.314	1.02	-0.759	3.38 **
Other characteristics:	Not working in job trained for	.	.	0.390	2.88 **
	Public sector employee	-0.500	2.00 **	-0.615	3.27 **
	ln(wage)	0.804	2.28 **	-0.836	2.74 **
	Wage information missing	0.431	0.60	-1.585	2.61 **
Other Covariates:					
Company has been taken over		-1.345	1.86 *	-1.021	2.23 **
Working short-time		.	.	0.567	3.46 **
ln(reg. vacancy-unemployment-ratio)		0.399	1.05	0.563	1.89 *
Sample size (expanded sample)		24402			
Log-likelihood				-2346.2	
McFadden's $R^2$				0.0685	

Note “\*” one asterisk implies a ten percent significance level.  
 “\*\*” two asterisks imply a five percent significance level.

### Estimation Results for Women

The coefficients of the covariates for the female sample are displayed in Table

6. It has the same structure as Table 5. According to the coefficients for the time intervals, transition rates varied considerably with calendar time and many coefficients are significantly different from zero. This is particularly true for the unemployment hazard. The results indicate two spikes in the intervals June 1991 to July 1991 and December 1991 to February 1991. They also imply that from March 1991 to December 1993 the transition rates into unemployment are relatively high compared to most of the previous time intervals.

The estimated coefficients for age suggest that the unemployment transition rate does not vary significantly with age, but the new job transition rate does. Children instead are a significant determinant of both transition rates, while the effect of household is well determined only for the unemployment hazard. Let us turn to the covariates that indicate the qualification of the worker. We cannot find any statistically significant impact of occupational qualification categories on both transition rates.

Characteristics of the old job explain some of the variation of both transition rates of female workers. The industry plays a significant role for explaining the speed of exit into new jobs but not for explaining the speed of exit into unemployment. For the exit rate into new jobs, all the coefficients of the industry dummies are negative, which implies that the rate of job change was highest for the reference worker, who is employed in the primary sector. The occupation is an important determinant of both transition rates. Some of the tenure coefficients instead are only well determined for transitions into unemployment.

The covariates “not working in the job trained for” and “public sector employee” as well as the logarithm of the hourly wage rate in 1990 turned out to be significant determinants of the transition rates. Working short-time and the logarithm of the vacancy unemployment ratio have considerable role in determining the unemployment hazards of women.

### **5.3 Magnitudes of the Effects of Covariates on the Transition Rates**

Table 7 presents estimates of transition rates for both gender and several types of individuals. The transition rates of the reference individual are for the period July 1990 to August 1990. They belong to an individual who is 26 to 35 years old, childless with a logarithmic household income that is set to the corresponding sample mean for the entire period. This person is low skilled: He/She has either no occupational qualification or an apprenticeship. The reference individual works in the primary sector as a blue collar worker with a tenure of two years or less. He/she is neither working in the job trained for nor as a public employee. The logarithmic hourly

wage in 1990 is set for both the reference male and female at the corresponding sample mean. The reference person is not working short-time neither has his/her company been taken over. The logarithmic vacancy-unemployment ratio is set at the economy-wide mean over the observation period.

We judge the magnitudes of the effect of a covariate in the following way: We compare the transition rate of a reference worker with those of a worker who differs from this worker with respect to one characteristic. Table 7 displays the transition rates in percent. The transition rates of the reference individual are displayed in the first row of Table 7. In column one and two we see that the reference male has a transition rate into jobs of 1.3 % and into unemployment of 1.7 %. Column three and four display these values for the reference woman. Her transition rate into jobs is about 1.7 % and into unemployment it is 1.2 %. These probabilities appear to be quite low at first sight. However, this is not surprising if we recall that they represent a probability of exit in a time interval of one month. Note that in the following discussion we focus only the impacts of those covariates, we are most interested in.

### **The Impact of Calendar Time**

Let us start the discussion of magnitudes of the transition rates and in how far they are in line with our hypotheses. The first set of predicted transition rates in Table 7 represent their variation with calendar time. As mentioned before, two economic events may have had a substantial impact on the transition rates. The first was the end of collective agreements against dismissal, which were in force in some sectors of the economy until June 1991. The second is the end of the special short-time allowance in December 1991.

First consider the transition rates into new jobs of men during the three time intervals from September 1990 to May 1991. They are between 1.9 and 2.2 % and thus somewhat higher than for the reference period of July 1990 to August 1990 at 1.3 %. However, their coefficients were badly determined. The same is true for the next two time intervals from June 1991 to November 1990, were the implied transition rates into jobs are relatively close to that of the reference period. The job transition rate peaks in the following interval from December 1991 to February 1992 at about 3.2 %. Thus, the rate of job change rose considerably just when the special short-time allowance came to an end. Immediately thereafter the transition rates fall back to a very low level of less than 1 %. The speed of job change was relatively high in the very early stage of the transition process before March 1992, but not thereafter. However, only for the rate of job change from December 1991 to February 1992 can we find any significant differences.

The second column of Table 7 displays how the male transition rates into unemployment varied with calendar time. From July 1990 to May 1991 they range

**Table 7: Predicted Transition Rates for Men and Women in Percent**

	Men		Women	
	New Job	Unempl.	New Job	Unempl.
Transition rate of reference individual:	1.306	1.692	1.666	1.222
Calendar Time:				
Sept. 90 - Nov. 90	1.887	1.407	2.012	1.889
Dec. 90 - Feb. 91	2.208	1.995	3.361	2.923
Mar. 91 - May 91	2.011	1.751	3.743	2.096
June 91 - July 91	1.626	3.129	3.699	4.940
Aug. 91 - Nov. 91	1.211	0.909	1.250	2.511
Dec. 91 - Feb. 92	3.174	4.998	3.015	8.046
Mar. 92 - July 92	0.770	2.744	2.450	4.062
Aug. 92 - Dec. 93	0.911	1.957	0.365	3.554
Personal characteristics:				
Age				
< 26	1.176	1.930	0.954	1.037
36 to 45	0.946	1.794	1.310	1.535
> 45	0.922	2.020	0.953	0.941
Number of own children				
1 child	1.960	1.320	1.273	0.905
> 1 child	1.801	1.093	0.795	1.007
Occupational qualification				
Technical school	2.086	1.050	1.568	1.074
University or technical college	2.134	1.973	2.920	1.301
Selected characteristics of old job in 1990:				
Occupation				
Missing, self-employed, trainee	0.547	0.956	6.137	0.154
Foremen, un- or semi-sk. white col.	1.141	2.698	3.143	0.916
Professional or managerial position	1.235	3.200	1.975	1.003
Tenure in June 1990				
3-4 years	1.371	1.439	1.850	0.990
5-7 years	0.845	1.238	1.281	0.588
8-10 years	1.172	1.161	1.700	0.810
11-15 years	0.971	0.993	0.982	0.815
> 15 years	0.861	0.779	1.231	0.578
Other				
Not working in job trained for	1.302	1.978	1.656	1.794
Public sector employee	0.544	1.312	1.023	0.669
Other covariates:				
Company has been taken over	0.368	1.183	0.443	0.449
Working short-time	1.262	4.949	1.651	2.133

<sup>a</sup> The characteristics of the reference person are: time period - July to August 1990, age of 26 to 35 years, childless, has an average logarithmic household income and as an occupational qualification no degree or an apprenticeship. Further characteristics are working in the primary sector as blue collar worker with a tenure of 2 years or less, working in the job trained for but not as a public sector employee. His/her company has not been taken over nor is the person working short-time. The wage in 1990 is set at its sample mean for each gender in 1990. The logarithm of the vacancy-unemployment ratio is  $-3.4318$ , its mean for the East German economy over the observation period.

between 1.4 and 2 %. At more than 3 % a first spike is reached in June 1991 to July 1991. In August 1991 to November 1991 the speed of exit into unemployment

of males was particularly low at 0.9 %. But in the following months from December 1991 to February 1992 transition rates into unemployment peaks at 5 %. This certainly reflects that many jobs were lost, once the special short-time allowance was no longer in force. Still from March 1992 to July 1992 the speed of exit into unemployment at 2.7 % remained high. It decreased somewhat to slightly less than 2 % for the remaining period from August 1992 to December 1993.

The transition rates of women are displayed in the third and fourth column of Table 7. Their rate of job change increased very early in the transition process. For the reference individual in the period July 1990 to August 1990 the transition rate into new jobs was approximately 1.7 %. However, from December 1990 to July 1991 it was already substantially higher and ranged from 3.3 to 3.8 %. For the following two months it fell to about 1.2 % but rose again to a relatively high level of 3 % in the interval from December 1991 to February 1992, when the short-time allowance ended. From August 1992 to December 1993, it was particularly low at less than 0.4 % and hence less than a quarter of its initial level.

The variation of the female transition rate into unemployment with calendar time is similar to that of males. From September 1990 to February 1991, at 1.9 % it was already 50 % higher than in the reference period. It was particularly high when the agreements on protection against dismissal were no longer in force: From June 1991 to July 1991, it reached a value of 3.8 %. This is more than four times as high as in the reference period July 1990 to August 1991. In the following two months though the transition rate fell by 50 %. Then followed its peak at more than 8 % in the interval from December 1991 to February 1992. This demonstrates that women were much more affected by the end of the short-time allowance than men. After February 1992 the speed of exit into unemployment though fell again to a much lower level. Still it remained higher than prior to June 1991.

These results suggest the following. The special short-time allowance and collective agreements for protection against dismissal apparently slowed down the transition rates into unemployment as long as they were in force. The end of the special short-time allowance also lead to a temporary increased rate of job changes for both men and women. This is in line with the hypothesis that the growing threat of dismissal raised the willingness of workers to change their job and/or their intensity to search for another job.

These results have to be partly viewed with caution. There may be seasonal effects that are particularly relevant for the peaks in the transition rates in the period of December 1991 to February 1992. We estimated also various specifications that control for seasonality. Controlling additionally for quarterly dummies for example implied that the spike in the above interval changes little for the transition rate into

jobs, but is somewhat reduced for the transition rates into unemployment<sup>14</sup>. Still, one may argue that seasonal effects are not stable, and so the spike in December 1991 to February 1992 is presumably by and large a seasonal phenomenon.

Our results also suggest that changes from the old job to a new one tend to be relatively high at the beginning of the transition process and extremely low after July 1992. For women, this difference is substantial. We cannot be very confident about this result for men given the lack of statistical significance of many of the period coefficients.

### **The Impact of Personal Characteristics**

The second set of predicted transition rates in Table 7 describe their variation with age and the number of own children. The male transition rates into new jobs at 1.2 to 1.3 are relatively high for workers who are younger than 36 years. Workers who are older than 35 instead exit at a rate that is slightly lower than 1 % into new jobs. With respect to the destination state unemployment, we find workers who are younger than 26 and older than 45 to have the highest speed of exit. However, the corresponding coefficients were extremely badly determined. The job change rate of women at 1.7 % is highest for the reference category. Women who are younger than 26 years or older instead leave their old job for a new one at a far lower rate of about 0.95 %. Similar to men the coefficients of age for the unemployment transition rate were not statistically significant. The predicted probabilities do not imply that this rate would generally decline with age.

The age variation of the new job transition rates for men are in line with the hypothesis that young workers as opposed to elder have a higher incentive to change to a new job, as they have still more time to reap the benefits of new on-the-job training than older workers. For the transition rates into unemployment we expected a decline with age. Work councils as well as courts have the possibility to protect workers against dismissal due to social consideration about age or family status. But we find neither a clear age pattern nor a significant variation of the transition rates into unemployment with age. Therefore, the results do not confirm that in the first period of the transition of the East Germany economy such a protection against dismissal was very stringent due to considerations of the age of workers.

Let us turn to the effects of children. The childless reference man has a transition rate into a new job of only 1.3 %; it is about 2 % for a father of one child and 1.8 % for a father of more than one child. The presence of children implies an increase in the male transition rate but a decrease for women as displayed in the third column of Table 7. One reason may be that potential new employers were reluctant to fill vacancies with women but not with men who have children. The results of men and women also differ with respect to the transition rates into unemployment. For

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<sup>14</sup>These estimation results are available on request

men the speed of exit into unemployment declines considerably with the presence of children. Hence, the above mentioned protection against dismissal may be rather stringent with respect to family status considerations. But this conclusion would not apply to women, as their transition rates into unemployment vary only very little with the children.

### **The Impact of Qualification**

There is some variation of the male transition rates into new jobs with the occupational qualification. The rate of exit into new jobs of men increases considerably with qualification. While the predicted probability for the reference category of apprenticeship or no occupational degree is only 1.3 %, it is about 2 % for technical school or university degree/technical college. With respect to the unemployment transition rates, the results are less clear. Compared with the reference group a man with a degree from a technical school exits at a 70 % lower rate into unemployment. However, a university degree implies a somewhat higher transition rate into unemployment than apprenticeship.

For women the occupational qualification is important in explaining variation of the rate of job change but not the rate of exit into unemployment. Both female workers who went to a technical school or have a lower qualification exit at a rate of about 1.6 % into new jobs. Only a university degree is associated with a substantially higher speed of exit into new jobs of about 2.9 %. However, Table 6 showed, that all coefficient for the occupational dummies were not statistically significant at conventional levels and the implied variation of the unemployment hazard with occupational qualification is relatively low.

We would have expected that the job transition rate increases with skills. The results are in line with this hypothesis. By and large there is some evidence that employers filled new jobs by hiring highly skilled workers rather than workers with low skills directly from their old job. But the evidence not always in line with our hypothesis that high skilled workers exit less rapidly into unemployment than low skilled workers and hence that the old firms attempted to keep the highly skilled workers.

### **The Impact of Selected Characteristics of the Old Job**

Again we start the discussion of the magnitudes with men. The transition rates into new jobs of blue and white collar workers differ only little. They are characterised by a transition rate into new jobs that varies from 1.1 and 1.3 %. Only workers who belong to the category missing, self-employment or trainee, which represents less than nine percent of our male spells, exit into a new job at a substantially lower rate. There is though considerable variation of the transition rates into unemployment with occupation. A blue collar worker is characterised by an unemploy-



ment transition rate of about 1.7 %. It is with 2.7 % much higher for the category foreman, un- and semi-skilled white collar workers and highest for males in a professional or managerial position at 3 %. This high exit rates of white-collar workers are somewhat surprising. A possible explanation may be that under socialism some of these positions were not only filled due to adequate skills of the employee but due the employee's position in the socialist party. Therefore, a high share of workers in professional and managerial positions may have lost their jobs, when the old firms were privatised or still restructuring under the authority of the Trustfund.

Now regard tenure. The reference male has a tenure of two years or less. The job transition rates for the tenure category 3-4 years at 1.4 % is about the same as that of the reference male. All the other tenure categories, 3-4 years, 5-7 years, 8-10 years, 11-15 years and more than 15 years, imply lower transition rates. By and large we find the job transition rates of men to decline with tenure. However, the two lowest transition rates are found for, 5-7 years and more than 15 years of tenure. For the unemployment transition rate the pattern is clear, it always declines with tenure. Men with the highest tenure of more than 15 years exit into unemployment at less than half the rate of men with two or less years of tenure.

The results with respect to tenure are by and large in line with economic intuition. It is harder to dismiss workers with a high tenure than workers with a low one. For that reason also an individual's incentives to change the job decrease with tenure. One may also suggest that employers tend to dismiss workers with a relatively low tenure more easily because they have invested little in their firm-specific human capital. But one may doubt that this is really the case for workers during the transition process. The tenure variable that we regard here is tenure prior to the transition process. Thus, the firm-specific human capital stems from the socialist period and is likely to have quickly lost its value after the introduction of the GEMSU.

Men, who were public sector employees at the beginning of the transition process, exit into new jobs and into unemployment at a substantially lower rate than other workers. In particular, their job change rate is less than half that of the reference male. The exit rate into unemployment varies highly with short-time work. Short-time male workers exit into unemployment at a rate that is about three times as high as for the references male. Thus, short-time work is a clear signal that a job is about to be lost.

To quantify the impact of the hourly wage in 1990 on the transition rates, we computed elasticities. They are calculated for the male reference individual. The elasticity of the job transition rate is 0.31, while that of the unemployment transition is  $-0.52$ . Both may reflect that high wages prior to the transition process of the economy were positively related to talents and hence a high productivity of the

workers. The rapid wage adjustment to West German wage levels implied that new jobs were mainly ‘good jobs’ in the sense of a high productivity and wage level. It also implied that firms under the shock of transition retained old jobs, that already were high productivity jobs or could rapidly be turned into such jobs. Under these considerations the signs of these elasticities are plausible. However, we are not very confident of these results as the coefficients of the log-hourly wage were badly determined.

Let us turn to the impact of old job characteristics on the transition rates of women. The speed of exit into new jobs for women varies somewhat over the different occupations. Blue collar workers, the reference group, exit at a rate of 1.7 %. Foreman, un- and semi-skilled white collar workers exit at a rate that is more than 80 % higher. In contrast the transition rate into new jobs of professional or managerial women is only a little higher than that of blue collar workers. The group missing, self-employed or trainee has the far highest transition rate. But they represent only less than 6 % of the women in our sample. The estimated transition rates into unemployment show that, compared with blue collar workers, both groups of white collar workers enter less rapidly into this destination state. The opposite was true for men.

Similar to men the job transition rates of women do not decline generally with their job tenure. However, the predicted probabilities in column three at least demonstrate, that women with a very high job tenure of more than 10 years exit into new jobs as a speed, that is about 25 to 40 % lower than that of women with a tenure of two years or less. Also for the unemployment transition rates of women we cannot find a general decline with their job tenure. A tenure of 5-7 years and more than 15 years lead to the lowest unemployment hazards. In both cases they are about half as high as the unemployment hazard of the reference woman with the lowest tenure.

The covariate for “not working in the job trained for” raises the transition rates of women into unemployment substantially. This covariate indicates a relatively bad quality of the job match. Hence, the effect is not surprising and in line with our hypothesis. What is also in line with our expectations is that public sector workers exit into both destination states at a far lower rate than other workers.

Both for men and women the time-varying covariate “company has been taken over” decreases the speed of exit into both exit states substantially. The interpretation of this result is that this event occurred particularly for firms, which restructured relatively quickly and were relatively profitable. For this reason job security in these firms became higher than for other old jobs. The results with respect to working short-time are also similar to men. For women it leads to a transition rate into unemployment that is more than 70 % above that of a comparable worker on a normal

work schedule.

Let us finally turn to the female hourly wage rate. As for men we computed the elasticities of the female transition rates with respect to the hourly wage rate for the reference individual. This elasticity is 0.80 for the transition rate into new jobs and  $-0.84$  for the transition rate into unemployment. So, the conclusions that we have drawn for men also apply to women.

## 6 Preliminary Conclusions

The paper demonstrated the high speed at which old jobs terminated in the East German economy. It also showed that many of these job terminations ended by a job change. The results of our econometric analysis suggest that the speed of exit into jobs and into unemployment vary considerably with the characteristics of the individuals. The evidence is not in line with Boeri's assumption that past occupation, wages and vocational attainment do not signal an applicant's productivity to a new employer. For men the results imply a substantial variation of the speed of exit from old jobs into new jobs with skills. There is also considerable variation of this transition rate with the past occupation for women and their wage rates prior to the transition process.

As far as skills are considered, we did not find clear evidence that old firms attempted to keep their highly skilled workers for both sexes. Nevertheless, we could show that they attempted to keep the workers who were working in a job they were trained for. Their transition rates into unemployment were quite low compared with other workers. Hence, the old employers apparently knew about the quality of job matches.

Our results also showed, that workers exit at a relatively high speed from their old job into a new one prior to March 1992 for men and prior to August 1992 for women. The speed of job change slowed down substantially in the year 1993. This could imply that new employers hired workers from old firms mainly as long as the special short-time allowance was in force. Due to this program the old firms had a high incentive to keep their best staff, as parts of the wage of their workers were financed by transfers from the state. So, new employers considered people who became unemployed as workers with a very low productivity. However, once this program ended old firms no longer could postpone the decision to dismiss workers in jobs that were unlikely to become profitable. They presumably had to dismiss also a larger proportion of highly talented workers than before. Therefore, hiring workers from the unemployment pool should have become more attractive and indeed the outflow rate from unemployment increased after 1993. According to Federal labour office data, the monthly average outflow rate from unemployment from 1994 to 1996

ranged from 12.6 to 14.9 %. It exceeded hence the outflow rate from 1991 to 1993, which was around 10 % in the previous three years.

That the rate of job-change was found to be particularly high in a short period after the special short-time work allowance terminated. So, this passive labour market program may have slowed down the rate of job change prior to its end. However, we have to be cautious with the interpretation of this finding, as it could well reflect some seasonal effect.

One of our main hypotheses was that the speed of exit into new jobs of men should exceed that of women. The opposite should be true with respect to exit into unemployment. A reason for this may be discrimination against women both by new and old employers. The Kaplan-Meier estimates of the transition rate of both gender are in line with this hypothesis. However, as the male and female samples differ with respect to the covariates, we need to carry out some further analysis, to shed more light on this issue.

## References

- ALLISON, P. D. (1982): "Discete-time methods for the Analysis of Event Histories," in *Sociological Methodology*, ed. by S. Leinhardt, pp. 61–98, San Francisco. Jossey-Bass Publishers.
- BLANCHARD, O., AND P. DIAMOND (1989): "The Beveridge Curve," *Brookings Papers on Economic Activity*, 0(1), 1–76.
- BOERI, T. (1994): "Labour Market Flows and the Persistence of Unemployment in Central and Eastern Europe," in *Unemployment in Transition Countries: Transient or Persistent?*, ed. by T. Boeri, pp. 13–57, Paris. OECD.
- (1997): "Heterogeneous workers, economic transformation and the stagnancy of transitional unemployment," *European Economic Review*, 41, 905–914.
- BURDA, M., AND C. WYPLOSZ (1994): "Gross Worker and Job Flows in Europe," *European Economic Review*, 38(6), 1287–1315.
- COUNCIL OF ECONOMIC EXPERTS (Annual report 1990/91): *Auf dem Wege zur wirtschaftlichen Einheit Deutschlands*. Stuttgart.
- GERMAN FEDERAL LABOUR OFFICE (1994): *Amtliche Nachrichten der Bundesanstalt für Arbeit: Arbeitsmarkt 1993*, vol. 43. Nürnberg.
- GERMAN INSTITUTE FOR ECONOMIC RESEARCH (1999): *Gesamtwirtschaftliche und unternehmerische Anpassungsfortschritte in Ostdeutschland*, vol. 23. Berlin.

- HUNT, J. (2001): “Post-Unification Wage Growth in East Germany,” *Review of Economics and Statistics*, 83(1), 190–195.
- JENKINS, S. P. (1995): “Easy Estimation Methods for Discrete-Time Duration Models,” *Oxford Bulletin of Economics and Statistics*, 57(1), 129–137.
- LICHT, G., AND V. STEINER (1994): “Where Have All the workers gone? Employment Termination in East Germany after Unification,” in *Labour market dynamics in present day Germany*, ed. by F. Buttler, and G.-G. Wagner, pp. 40–66. Campus/Westview, Frankfurt, New York, Boulder (Colorado).
- PISSARIDES, C. (1994): “Search Unemployment with On-the-job Search,” *Review of Economic Studies*, 61, 457–475.
- SCHWENGLER, B. (1997): “Risikolagen im ostdeutschen Transformationsprozess - eine multivariate Analyse,” in *Der Arbeitsmarkt Ostdeutschlands im Umbruch : Datensätze, Methoden und ausgewählte Ergebnisse des Arbeitsmarkt-Monitors 1989-1994*, Beiträge zur Arbeitsmarkt- und Berufsforschung Nr. 210, pp. 68–107. Institut für Arbeitsmarkt- und Berufsforschung, Nürnberg.
- WAGNER, G. G., R. V. BURKHAUSER, AND F. BEHRINGER (1993): “The English Language Public Use File of the German Socio-Economic Panel,” *Journal of Human Resources*, 28(2), 429–433.
- WOLFF, J. (1998): “Essays in Unemployment Duration in two Economies in Transition: East Germany and Hungary,” Ph.D. thesis, European University Institute, Florence.