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# TEMPORARY JOBS AND THE EXIT TO OPEN-ENDED JOBS IN THE SWEDISH LABOUR MARKET\*

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(Currently under revision)

## **Abstract:**

This paper analyses exit probabilities from different types of temporary jobs to open-ended jobs in Sweden during 1991-1999. The main aim of the study is to illuminate how the exit probabilities, and their determinants, differ by type of temporary job. A second focus is how the exit probabilities differ depending on origin and gender, i.e. a segmentation aspect. The results show that the exit probabilities differ between different types of temporary jobs, and that variables that have been shown to affect the incidence of temporary jobs also in many cases are significant determinants of the probability to leave (or not leave) a temporary job. Our results also show that all types of temporary jobs (but probation) on average perform rather poorly as stepping-stones into open-ended jobs. By calculating predicted exit probabilities we also show that there are differences between the genders, and also between native origins. The probability to exit to open-ended jobs are on average lower for females than for males, and they are also, on average, lower for foreign-born workers than for native Swedes.

Keywords: Temporary jobs; exit probability; foreign-born; gender; segmentation.

JEL classification: J21; J40; J49.

## **1 INTRODUCTION**

In 1990 approximately 10 per cent of all employed Swedish workers had temporary jobs, but by 1999 the figure had increased to around 15 per cent. All demographic groups in the labour market were affected. In absolute numbers the increase amounted to over 150,000 temporary jobs, while the number of open-ended jobs decreased by over

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400,000 during the same period. Temporary jobs have thus become an essential feature of the Swedish labour market, and in a European perspective the share of temporary jobs in Sweden is above average (see Wallete, 2004).

One interesting question, in view of the evolution during the 1990s, is whether workers who hold temporary jobs exit to open-ended jobs, or if they tend to get stuck in their temporary jobs. In other words, do temporary jobs function as stepping-stones to open-ended jobs? An important aspect in this respect is that temporary jobs do not constitute a homogeneous group of employment contracts. There are several different types of temporary jobs with, for example, different legal restrictions and different underlying purposes. It is also the case that the determinants of the incidence of holding a temporary job can differ significantly between different types of temporary jobs (see Wallete, 2004). Does this mean that we can also expect the determinants of the transitions from temporary jobs to open-ended jobs to differ between different types of temporary jobs?

The main aim of this paper is to shed some light on the question of transitions from different types of temporary jobs to open-ended jobs (*the heterogeneity aspect*). A second aim is to examine differences in exit probabilities between men and women, and between native origins (*the segmentation aspect*). The types of temporary jobs considered in this paper are replacement jobs, probation jobs, on-call jobs, and project jobs. Our data comes from the *Swedish Labour Force Surveys* (LFS) conducted by *Statistics Sweden* (SCB) and covers the years 1991-1999. The data is analysed by means of a time-discrete duration model.

Research interest in temporary jobs has increased in Sweden, as well as in several other countries, during the last decade.<sup>1</sup> However, the question of transitions from temporary jobs to open-ended jobs is still relatively unexplored.<sup>2</sup> Håkansson (2001) studies different types of temporary jobs in Sweden and the transition to open-ended jobs. The study is not a duration study but focuses instead on one cohort at two different points in time. The results show, for instance, that workers with probationary jobs are more likely to have an open-ended job after two years compared with on-call workers and individuals with seasonal jobs. Females have a lower probability of exiting to open-ended jobs than males. Age affects the transition, workers aged 16-24 or 45-64 have lower exit probabilities than the reference group aged 25-44. Finally, foreign-born workers are significantly less likely than native Swedes to exit to open-ended jobs. Booth *et al.* (2002) find some evidence that temporary jobs (seasonal and fixed-term jobs) in the UK are stepping-stones to open-ended jobs. Amuedo-Dorantes (2000) concludes that temporary jobs in Spain are more likely to be a trap than a bridge to open-ended jobs. Guell & Petrongolo (2000) suggest two possible uses of temporary jobs in Spain. A first possibility is that temporary jobs for some workers are used as screening devices, but there is also evidence that some individuals are only offered open-ended jobs when the maximum legal duration (in Spain) of temporary jobs is reached.

The paper is structured as follows. *Section 2* gives a brief description of the evolution of temporary jobs in Sweden. *Section 3* contains a theoretical discussion. *Section 4* describes our data set and the econometric model, and in *section 5* the empirical results are presented. *Section 6* sums up the results and draws some conclusions.

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<sup>1</sup> One striking example is that an entire issue of *The Economic Journal* in June 2002 addressed different aspects of temporary jobs in different countries. For different Swedish studies see for example Storrie (1998), Håkansson (2001), Jonsson & Wallette (2001), Holmlund & Storrie (2002), and Wallette (2004).

## 2 TEMPORARY JOBS IN SWEDEN 1991-1999

As mentioned above, the share of temporary jobs in total employment increased from 10 per cent in 1991 to 15 per cent in 1999. *Figure 1* also shows that the increase was larger for foreign-born workers than for native Swedes (regardless of gender).<sup>3</sup> Swedish-born males, all through the 1990s, had the lowest share of temporary jobs, while the share for foreign-born females exceeded the share for all other groups. The evolution for Swedish-born females and foreign-born males was more or less similar.

[Figure 1]

In *table 1* temporary jobs are disaggregated into replacement jobs, probation jobs, project jobs, and on-call jobs, and other types of temporary jobs as a residual. There is evidence of marked differences between the different types of temporary jobs as well as between the genders. Replacement jobs and on-call jobs are more common among females than among males (regardless of native origin), while the opposite is the case for probation jobs and project jobs (regardless of native origin). The large differences between the genders might reflect the relatively strong gender segmentation in the Swedish labour market. *Table 1* also shows that the composition of temporary jobs does not differ that much between native origins. Still, some differences do exist. The probability of holding probationary jobs and project jobs is higher for foreign-born workers. Further, the evolution of the composition over time shows an interesting and rather dramatic pattern (see Holmlund & Storrie, 2002, and Wallete, 2004). In 1991 replacement temporary jobs

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<sup>2</sup> Transition studies that include temporary jobs are often more interested in unemployment risks than in transitions to open-ended jobs, see for example Levin (1998), and Thoursie (1997) for Sweden.

<sup>3</sup> The data used in this section is the same as the data used in the empirical analysis (see *section 4*). However, the descriptive statistics in this section are calculated prior to the data set being transformed into a duration data set, see also Wallete (2004).

accounted for almost 50 per cent of all temporary jobs, while by 1999 this share had decreased to roughly 30 per cent. During the same period on-call temporary jobs and project temporary jobs increased their respective shares from 8-9 per cent in 1991 to approximately 17 per cent each in 1999. One implication of this change is that temporary jobs on average became more insecure during the 1990s, as on-call jobs and project jobs on average tend to be more insecure than other types of temporary jobs.

[Table 1]

### 3 THEORETICAL DISCUSSION

A temporary job might have both pros and cons for the worker, and for the society. An important factor is whether an individual holds a temporary job (assuming that the temporary job is “involuntary”) for only a short period of time, i.e. if the job truly is a *temporary* job. Otherwise individuals might risk getting trapped in this employment form. Moreover, if it is the case that some groups (for example women and/or immigrants) have lower exit probabilities compared to, for example, Swedish-born males, this might create an unwanted segmentation in the labour market for groups that are already exposed to various labour market related difficulties. Thus, the potential welfare problem is to a large extent dependent on whether the temporary job is of a *temporary and transitory nature*. The related risk is that we might create a new form of labour market segmentation, perhaps (as in the theory of dual labour markets) a kind of dual labour market structure with a primary sector and a secondary sector.<sup>4</sup>

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<sup>4</sup> See Piore (1971) and Doeringer & Piore (1971) for the theory of dual labour markets.

What factors can be expected to influence the exit rate from temporary jobs to open-ended jobs? We suggest that the determinants of the exit probabilities are likely to be similar to the determinants of the incidence of holding a temporary job.<sup>5</sup> Why should this be the case? Consider a worker who has a low probability of being offered an open-ended job in the first place. It is then also most likely the case that this worker has a low probability of being offered an open-ended job once he/she holds a temporary job. The duration of temporary jobs can of course have additional determinants as well; for example, different types of temporary jobs have different legal restrictions and are used for different purposes, and therefore they are also likely to have different exit patterns.<sup>6</sup> In Wallette (2004) theoretical hypotheses are formulated about different job/worker characteristics that are expected to affect firms' offer probability of temporary jobs, and about different job/worker characteristics that are expected to influence workers' acceptance probability. These hypotheses about factors affecting the incidence of holding a temporary job are also supported in most cases by the empirical results. Using the empirical findings, and the underlying theoretical discussion in Wallette (2004), we suggest the following hypotheses concerning the transitions from temporary jobs to open-ended jobs.

First of all, due to the heterogeneity of temporary jobs we expect the exit probabilities to differ between different types of temporary jobs. We further expect a number of individual characteristics to affect the exit probabilities; for instance, the exit rates are expected to be higher for workers in "prime working age". Workers in this age group have in general both extensive labour market experience and many productive years left,

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<sup>5</sup> A similar discussion is found in Asplund & Persson (2001). They argue that characteristics affecting the risk of being low paid are likely to be the same as those explaining the probability of leaving the status of low paid.

<sup>6</sup> See for example Wallette (2004) and Holmlund & Storrie (2002).

and are thus expected to have the largest probability of finding (or being offered) open-ended jobs. The vacancy pool of open-ended jobs available to the individual is also expected to be affected by individual characteristics such as educational attainment and socio-economic status.

In a competitive labour market one would expect no systematic differences between the genders as regards the exit probabilities from temporary jobs. However, there might be market imperfections that affect these probabilities. For example, a systematic difference between the genders could be the result of labour market discrimination. A possibility is also that males and females differ as regards the probability of accepting an open-ended job, for example due to differences as regards the preferences for non-market activities.

A strong result in Wallette (2004) is that foreign-born workers have a higher probability of holding temporary jobs. Theoretical arguments such as screening and signalling are strong candidates to be part of the explanation of this finding. For instance, lack of information and uncertainty about worker characteristics are often larger for foreign-born individuals. Another factor that might have negative implications for foreign-born workers is labour market discrimination, i.e. Becker-type discrimination and/or statistical discrimination. Once an individual holds a temporary job the above factors might also be potential determinants of the exit probability. Why should this be the case? The argument regarding Becker-type discrimination is straightforward. If the incidence of holding a temporary job is affected by discrimination of the Becker-type, the offer probability of open-ended jobs is most certainly also affected by the same discrimination. As regards the effect of uncertainty the relation between incidence and exit might be weaker. One argument is that for some workers (for example immigrants with limited experience in the Swedish labour market) it might be the case that the employer needs a



longer screening-period, which could result in lower exit probabilities for foreign-born workers.

Different job characteristics might also influence the exit probabilities. For example, the incidence of different types of temporary jobs differs between industries, and also between the private and the public sector. Can we expect the same to hold concerning the exit probabilities? Not necessarily. We do not have any clear *a priori* expectations regarding the exit probabilities from temporary jobs in different industries. However, we might expect to find differences between different types of temporary jobs in a particular sector. In the empirical analysis we will test for the influence of different industry sectors on the exit probability, and also how holding a job in the private versus the public sector influences the probability of exiting from a temporary job to an open-ended job. We will also test for the influence of different working time arrangements.

Finally, the macroeconomic situation is likely to affect the exit rates. We expect to find a negative correlation between the unemployment rate and the exit probabilities from all types of temporary jobs. The simple reason is that in an economic downturn fewer open-ended jobs are created, and thus fewer workers who hold temporary jobs are likely to be offered open-ended jobs. The strong increase in temporary jobs during the 1990s might also have contributed to a structural shift in the probability of exiting to open-ended jobs. We will test for this by including a shift-variable in the analysis.

#### 4 THE DATA AND ECONOMETRIC MODEL

Our longitudinal dataset comes from the *Swedish Labour Force Surveys* (LFS), conducted by *Statistics Sweden* (SCB) and covers the period 1991-1999. The LFS is an interview-based rotating panel survey undertaken every month and describes the current situation in the

labour market.<sup>7</sup> An individual can be part of the panel for a maximum consecutive period of two years (eight quarters in total). Our data set covers one month out of every quarter (January, April, July and October). To arrange the data in a manner suitable for a single risk time-discrete analysis, the following steps have been undertaken:<sup>8</sup> (i) we have excluded all individuals who did not report having a temporary job at least one of the times he/she was part of the survey. (ii) we want all individuals to hold a temporary job as a first observation in our data set. This could arise in two different ways, (1) individuals can enter the LFS holding a temporary job, or (2) individuals can enter the LFS holding anything but a temporary job, but change labour market status to a temporary job during the survey period. In the case of (2) we rearrange our data set so that we exclude initial observations for those individuals who do not enter the LFS holding a temporary job. (iii) individuals are right censored if they exit from a temporary job to labour market status other than an open-ended job, or if they hold temporary jobs throughout the maximum of eight quarters.

The restrictions in (i)-(iii) result in four different data sets that consist of 15,425 (replacement data set), 3,975 (probation), 6,240 (on-call), and 6,992 (project) observations. We only observe an individual's labour market status during the time he/she is included in the survey. That is, we do not have any knowledge of his/her previous labour market status. Our data set is thus typically subject to left censoring in the sense that an individual might have been exposed to risk (i.e. holding a temporary job) before he/she came under observation. In a data set like ours there is, however,

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<sup>7</sup> For a detailed description of the Swedish LFS see Statistics Sweden (1993).

<sup>8</sup> See for example Jenkins (2002) and Allison (1982) for a description of how the data should be arranged in a time-discrete framework.

nothing that can be done to control for the possible problem that may arise due to left censoring.<sup>9</sup>

Our econometric model is a time-discrete duration model.<sup>10</sup> We observe  $n$  independent individuals and we have a dependent variable,  $y$ , indicating whether an individual has exited ( $y_i=1$ ) to an open-ended job or not ( $y_i=0$ ).<sup>11</sup> The discrete-time hazard rate is defined as:  $P_{it} = Pr[T_i = t | T_i \geq t, X_{it}] = P(T_i = t) / P(T_i \geq t)$ , where  $T_i$  is the discrete random variable giving the time of occurrence of an event.  $P_{it}$  gives the probability that an event occurs at time  $t$ , given that it has not occurred before, and  $X_{it}$  is a vector of individual-specific variables. For the specification of how the hazard function depends on time and on the covariates we choose the logit model. A problem that often arises when analysing panel type data is the problem of unobserved heterogeneity (see for example Jenkins, 2002). This may arise from omission of relevant variables and/or from incorrect specification, or it can be the case that the individuals differ in characteristics that are unobserved in the data set, for example in ability, motivation or effort, i.e. something that affects the data but that we are not able to observe. Failure to control for unobserved heterogeneity that may affect the hazard function can lead to inconsistent estimates and thus result in misleading inferences (Lancaster, 1990). We control for unobserved

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<sup>9</sup> If the labour market history was known for the individuals in our sample, or if we had some other useful retrospective information, or if we had knowledge of the starting point of the temporary job, we could have tried to model the exit patterns based on this information. Further, if we know for sure that the risk pattern for individuals with left-censored temporary jobs differs significantly from the risk pattern for individuals for whom we know the starting point of the temporary job, we could exclude the left-censored individuals from the estimations. This, however, requires that we know if an individual is left-censored or not – which we do not know.

<sup>10</sup> See for example Jenkins (2002), Jenkins (1995), and Allison (1982).

<sup>11</sup> It should be noted that we cannot observe whether an individual changes employer or not, i.e. a worker can hold a temporary job with one employer and then change to an open-ended job with another employer and we are not able to observe this.

heterogeneity by including a random variable  $\varepsilon$ , with zero mean and finite variance.<sup>12</sup> The logit model is thus expressed as:  $\log[P_{it}/(1-P_{it})] = \alpha_i + \beta' X_{it} + \varepsilon_{it}$ . For the baseline hazard function ( $\alpha$ ) we choose a non-parametric baseline. The binary model that we estimate to take heterogeneity into account is a random effects logit model, where the heterogeneity is assumed to have a normal distribution.<sup>13</sup>

We base our empirical specification on the hypotheses outlined in *section 3*, and also on what variables we actually have access to in the LFS. Definitions and summary statistics for the included variables are listed in *appendix 1*. As a reference individual in the estimated equations we have chosen a 35-44 year-old Swedish-born married male with no dependent children, and who works full time in the private sector in industry sector 2 (manufacturing). His educational attainment is comprehensive school, and he is a low-skilled blue-collar worker with membership in a trade union organisation.

## 5 EMPIRICAL RESULTS

A first illustrative approach in a duration framework is to calculate a so-called non-parametric survival function.<sup>14</sup> The Kaplan-Meier function in *table 2* shows the probability of surviving within a particular state (i.e. the probability of continuing to hold a temporary job in our case) in each time period  $t$ .<sup>15</sup> Firstly, the survival function differs between different types of temporary jobs. The highest exit probability is found for

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<sup>12</sup> Following Jenkins (2002).

<sup>13</sup> See for example Baltagi (1995), and Greene (2000).

<sup>14</sup> See for example Blossfeld & Rohwer (1995).

<sup>15</sup> It should be emphasized that “time period” does not correspond to any particular calendar time. Our measure of time period is the number of periods during which we observe an individual to hold a temporary job before exiting to an open-ended job (i.e. from period  $0$  to period  $t$ ).

probationary jobs, which is probably due to the legal framework for this type of temporary job.<sup>16</sup>

[Table 2]

For other types of temporary jobs the survival rates are rather high (over 50 per cent in the last period), implying that exit probabilities from these types of temporary jobs are rather low. Secondly, concerning the estimates for males and females, the figures in *table 2* are unambiguous; the probability of exiting from any type of temporary job to an open-ended job is higher for males. The non-parametric exit probabilities for female workers are thus systematically lower than for male workers.

The exit probabilities are, however, affected by different individual and job characteristics. The estimated coefficients from the parametric model are presented in *appendix 2*.<sup>17</sup> From the baseline estimates we see that the exit probabilities are in general increasing for each time period for all types of temporary jobs, although the increase seems to be diminishing. That is, the duration does affect the transition from temporary jobs to open-ended jobs. The magnitudes of the estimates also differ between different types of temporary jobs, which implies that the effect of duration varies between different types of temporary jobs.

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<sup>16</sup> For probation jobs the maximum legal duration is six months. However, collective agreements between employer organisations and trade unions can in some cases permit longer probation periods. The legal framework regarding different types of temporary jobs is for example discussed in Holmlund & Storrie (2002) and in Wallette (2004).

<sup>17</sup> The econometric software used in the analysis is Stata 7.0.

The estimates of the variables indicating gender and native origin are rather discouraging with regard to the probability of exiting from a temporary job to an open-ended job. Females born outside Sweden and holding temporary jobs have, in all cases (but for on-call jobs), significantly lower exit probabilities compared to the reference group Swedish-born males. An identical result is found for foreign-born male workers holding temporary jobs, although the estimates are in general less negative for this group than for foreign-born females. In addition Swedish-born females have, in general, lower exit probabilities than the reference group Swedish-born males. The estimates for Swedish-born females are, in all cases but for probation jobs, negative and significant, even if less negative than for the foreign-born groups.

Our hypothesis concerning the impact of age receives support. For all types of temporary jobs the reference age group (35-44) has a significantly higher probability of exiting to open-ended jobs than all other age groups (but for one single case). We also find that the magnitudes of the estimates differ between different types of temporary jobs.

In many cases socio-economic class has a large influence on the probability that temporary jobholders exit to open-ended jobs. For replacement temporary jobs the estimates show that medium/high skilled white-collar workers have significantly higher exit probabilities than other types of socio-economic classes. The results for probationary jobs reveal that skilled blue-collar workers and low-skilled white-collar workers have significantly lower exit probabilities compared to the reference group unskilled blue-collar workers. Unskilled blue-collar workers also have lower exit probabilities regarding on-call temporary jobs, while other types of workers have higher exit probabilities, compared to the reference group. Finally, with regard to project jobs the reference group unskilled blue-collar workers has a higher probability than all other types of workers of

exiting to open-ended jobs. These estimates thus clearly confirm the heterogeneity of temporary jobs, and also show that it is not only workers in high-skilled jobs that exit to open-ended jobs.

Further, short part-time work as well as long part-time work decrease the exit probability for all types of temporary jobs, and in all but one case the estimates are statistically significant. The variable we have included to capture motivation and effort, namely overtime work, is found to be positive for all types of temporary jobs but only significant for on-call jobs.<sup>18</sup> Compared to the reference industry sector (manufacturing) the exit probabilities are significantly lower for almost all other sectors, and also for all types of temporary jobs. Besides, working in the public sector significantly reduces the exit probabilities regarding replacement jobs, project jobs and on-call jobs. Moreover, an increase in the unemployment rate significantly decreases the exit rate from all types of temporary jobs, i.e. the exit probability is lower during “bad times”, as expected. Finally, concerning our “shift-variable”, it turns out that there was a negative and significant effect in the period 1995-1999 compared to 1991-1994 for jobs such as probationary jobs, project jobs, and on-call jobs. This indicates that the sharp increase in temporary jobs during the 1990s went together with the decrease in the transition from temporary jobs to open-ended jobs.

To further illustrate our results we continue by studying predicted hazard rates for some specific variables.<sup>19</sup> *Figure 2* shows the average predicted probability of exiting to an open-ended job for each time-period. The risk patterns and the probabilities clearly differ

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<sup>18</sup> Overtime is also used as an indicator of effort in Booth *et al.* (2002), and in Engellandt & Riphahn (2003).

<sup>19</sup> To predict the hazard in a model with unobserved heterogeneity we have to condition on the mean value of the error term, i.e. the error term is set to zero (see Jenkins, 2002).

between different types of temporary jobs. The exit probability for replacement temporary jobs is continuously increasing from approximately four per cent in period one to 17 per cent in period seven. For probationary jobs the pattern is different. The probability increases sharply during the first two periods up to approximately 75 per cent, and remains stable at this level for later time periods. The high exit probability for probation temporary jobs is of course related to the legal restrictions. Regarding on-call temporary jobs we notice an increase in the probability up to time period three, and then another increase from period four to period six, to approximately 10 per cent. For project temporary jobs the exit probability increases continuously until time-period four (to approximately 15 per cent), and remains more or less stable during later periods. For all types of temporary jobs, except for probation, the exit probabilities are notably small. This might imply that the function of temporary jobs as stepping-stones to open-ended jobs is rather weak. There are also striking differences in exit probabilities between males and females. For all types of temporary jobs (except probation jobs) the average probability of exiting from a temporary job to an open-ended job is much higher for male workers.

[Figure 2]

The share of temporary jobs in Sweden increased from about 10 to 15 per cent during the 1990s. If the incidence increases, this might reflect that the inflow into temporary jobs has increased and/or that the exit rate has decreased. Thus there is reason to suspect that the exit probabilities changed during the 1990s, perhaps because a smaller fraction of temporary workers were being offered open-ended jobs. Our estimated average hazard rates in *figure 3* confirm that the exit probabilities from temporary jobs were lower during



the second than during the first half of the 1990s regarding probationary jobs and project jobs. For replacement jobs the situation was the reverse, and for on-call jobs the picture was more ambiguous.

[Figure 3]

Finally, let us also illustrate how the exit probabilities differ depending on native origin and gender. In *figure 4* we first present the average hazard rates for Swedish-born versus foreign-born (the four top figures). There seem to be some systematic differences. For probationary jobs and project jobs the hazard rate is lower for foreign-born workers.

[Figure 4]

Regarding replacement jobs the hazard rates are more or less the same regardless of origin, and for on-call jobs the picture is rather ambiguous.

In the lower figures of *figure 4* we have also separated origin by gender. Concerning replacement temporary jobs we see that the differences between genders (within origin) are rather large. Males have higher exit probabilities. For on-call jobs there is also evidence of a gender difference. For probationary jobs and project jobs the difference between the origins is maintained. Moreover, Swedish-born males have, in all cases, higher probabilities of exiting from a temporary job than the three other groups. Foreign-born females often have the lowest exit probability.

## 6 CONCLUSIONS

Do temporary jobs function as stepping-stones to open-ended jobs in the Swedish labour market? The answer is that in some cases they do, while in other they do not, it all depends on what type of temporary job, and which “type of worker” we are studying. In this paper we analysed the probabilities of exiting from different types of temporary jobs to open-ended jobs. A special aim was also to analyse the exit patterns for different demographic groups in the labour market, males versus females, foreign-born workers versus native Swedes.

Calculations of Kaplan-Meier survival rates (not controlling for individual and job characteristics) show that the exit probabilities vary between different types of temporary jobs, and also between males and females. By far the lowest survival rate (i.e. the highest exit rate) is found for probation temporary jobs. After only two time periods the survival rate for such jobs is approximately 30 per cent, and after three periods 20 per cent. Probationary jobs thus do have a stepping-stone function to open-ended jobs. For other types of temporary jobs the survival rates are considerably higher. For replacement temporary jobs the survival rate is roughly 50 per cent when the last time period is reached. The corresponding figure for on-call temporary jobs is about 60 per cent, and for project temporary jobs just below 50 per cent. Hence, in terms of stepping-stones to open-ended jobs it appears, based on the Kaplan-Meier estimates, that all types of temporary jobs (but probation) on average perform rather poorly. It is also the case that the survival rates for female workers always are higher than for male workers, indicating that the average uncontrolled probability for female workers to exit to open-ended jobs is lower than for male workers.

A major aim in this study is to illuminate differences in exit probabilities between males and females, and between native Swedes and foreign-born workers. The results we reach are rather discouraging for jobholders other than Swedish-born males. For Swedish-born female workers, as well as for foreign-born workers (regardless of gender), the probability of exiting to open-ended jobs is lower than for comparable Swedish-born males, when a number of variables are controlled for. The only exceptions are probation jobs for Swedish-born females, and on-call jobs for foreign-born workers.

Further, workers in the age group 35-44 are often more likely than other age groups to leave a temporary job for an open-ended job, regardless of the type of temporary job. Compared to being a blue-collar worker, the effects of being either a low/medium-skilled white-collar worker or a high-skilled white-collar worker are in general positive. Working in the public sector and working part-time (short part-time as well as long part-time) reduce the probability of transition to open-ended jobs for all types of temporary jobs. A worker who holds a temporary job in the manufacturing sector has a higher exit rate than corresponding workers in other sectors.

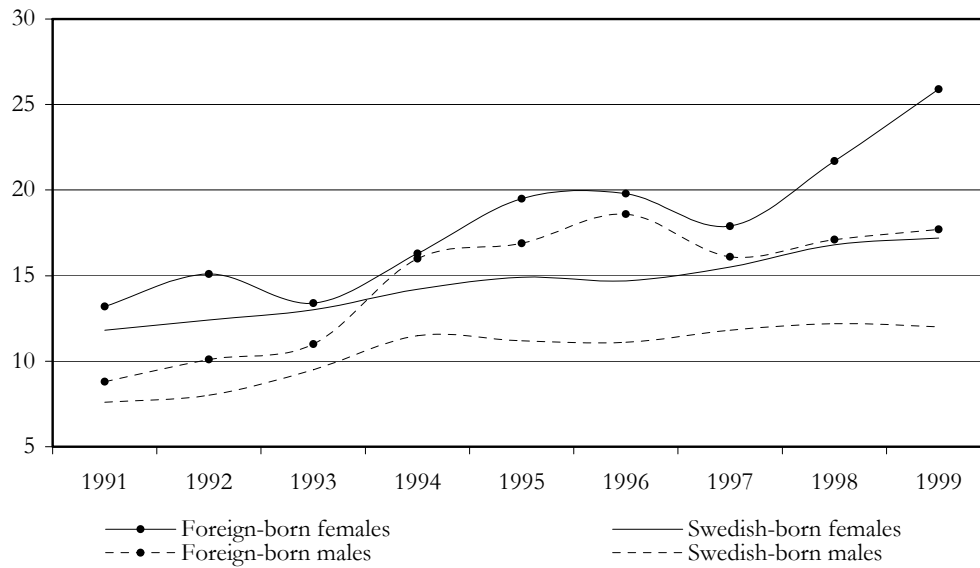
Moreover, an increase in the regional unemployment rate reduces the probability of exiting from temporary jobs to open-ended jobs, which is as expected since fewer open-ended jobs are created during an economic recession. We also find evidence that the probability of exiting from all types of temporary jobs (except for replacement jobs) were significantly lower during the period 1995-1999 compared to the earlier period 1991-1994. In this respect the Swedish labour market might thus have experienced a negative structural development during the 1990s.

To further address the segmentation aspect of temporary jobs we have calculated average exit probabilities for otherwise equal males and females, and Swedish-born and foreign-born workers. Males have on average a higher probability of exiting to open-ended jobs than females (regardless of type of temporary job), which indicates a systematic difference between the genders and that temporary jobs are less of a bridge for females workers than for male workers. Further, native Swedes have a higher predicted exit rate than foreign-born workers with regard to probationary jobs and project jobs. These results suggest that there is some kind of segmentation process in the Swedish labour market regarding the probability of exiting from a temporary to an open-ended job. Our results also show that Swedish-born males in a majority of the cases are more favoured than other groups, while the opposite is the case for foreign-born females.

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**Figure 1** *Share (%) of temporary jobs in total employment in Sweden 1991-1999, by gender and origin.*



*Note:* The share of temporary jobs is calculated as the share of temporary jobs in total employment (excl. self-employment) for each group separately. Yearly averages.

*Source:* Statistics Sweden. Calculations from the Swedish Labour Force Surveys (see also section 4, and Wallette, 2004, chapter 2).

**Table 1** *Absolute and relative (%) composition of temporary jobs in Sweden 1991-1999, by gender and origin.*

<i>Type of temporary job</i>	<i>Females</i>				<i>Males</i>			
	<i>Swedish-born</i>	<i>%</i>	<i>Foreign-born</i>	<i>%</i>	<i>Swedish-born</i>	<i>%</i>	<i>Foreign-born</i>	<i>%</i>
Replacement	11,532	46.6	1,391	45.3	3,842	22.6	559	26.5
Probation	1,157	4.7	216	7.0	1,706	10.1	281	13.3
Project	2,683	10.8	442	14.4	3,657	21.1	499	23.7
On-call	3,992	16.1	462	15.1	2,088	12.0	239	11.4
Others	5,382	21.8	559	18.2	5,676	33.5	528	25.1
<i>Total</i>	<i>24,746</i>	<i>100</i>	<i>3,070</i>	<i>100</i>	<i>16,969</i>	<i>100</i>	<i>2,106</i>	<i>100</i>

*Note:* The category “others” includes categories such as “seasonal work”, “work during holidays”, “work practice” and different active labour market programmes that are coded as temporary jobs by Statistics Sweden (mostly programmes for youths).

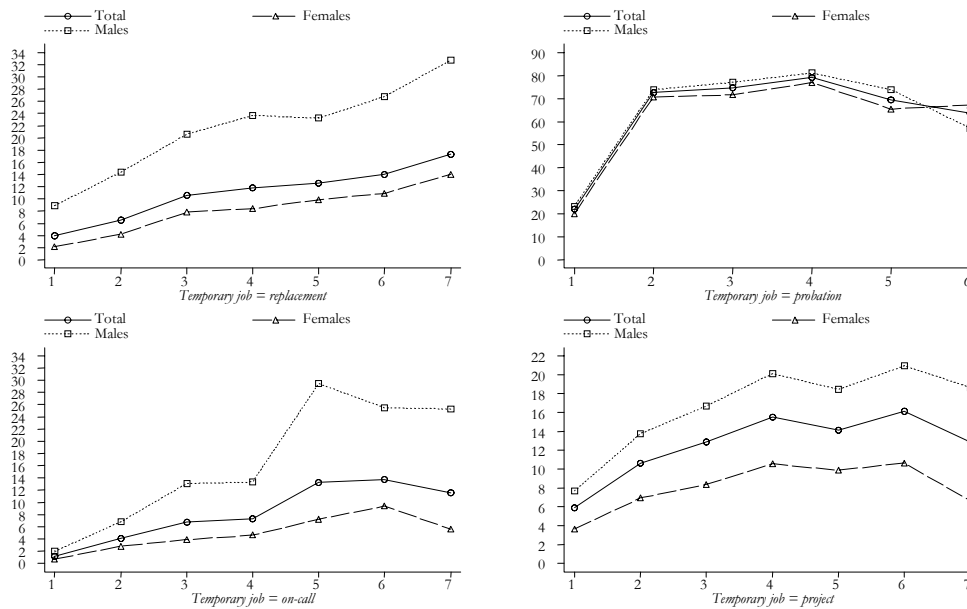
*Source:* Statistics Sweden. Calculations from the Swedish Labour Force Surveys (see also section 4, and Wallette, 2004, chapter 2).

**Table 2** *Kaplan-Meier survival estimates for the probability of exiting from a temporary job to an open-ended job, by gender.*

Time period	0	1	2	3	4	5	6	7
<i>Replacement jobs</i>								
Males	1	0.85	0.75	0.65	0.57	0.52	0.47	0.41
Females	1	0.91	0.82	0.74	0.69	0.63	0.59	0.54
Total	1	0.89	0.80	0.72	0.66	0.60	0.56	0.51
<i>Probation jobs</i>								
Males	1	0.70	0.31	0.20	0.14	0.11	0.09	<i>n.a.</i>
Females	1	0.68	0.33	0.23	0.17	0.16	0.15	<i>n.a.</i>
Total	1	0.69	0.32	0.21	0.15	0.13	0.12	<i>n.a.</i>
<i>On-call jobs</i>								
Males	1	0.89	0.77	0.70	0.63	0.60	0.56	0.53
Females	1	0.91	0.85	0.78	0.75	0.69	0.63	0.61
Total	1	0.90	0.82	0.75	0.71	0.66	0.61	0.58
<i>Project jobs</i>								
Males	1	0.86	0.73	0.63	0.55	0.50	0.47	0.43
Females	1	0.90	0.82	0.75	0.69	0.63	0.57	0.55
Total	1	0.88	0.77	0.68	0.61	0.56	0.51	0.48

*Note:* As a result of our way of organising the data, i.e. all individuals enter the data set holding a temporary job, the Kaplan-Meier survival estimates in the initial period are of course equal to one for all individuals as there are no exits in this period. There are no exits regarding probationary jobs and time period seven.

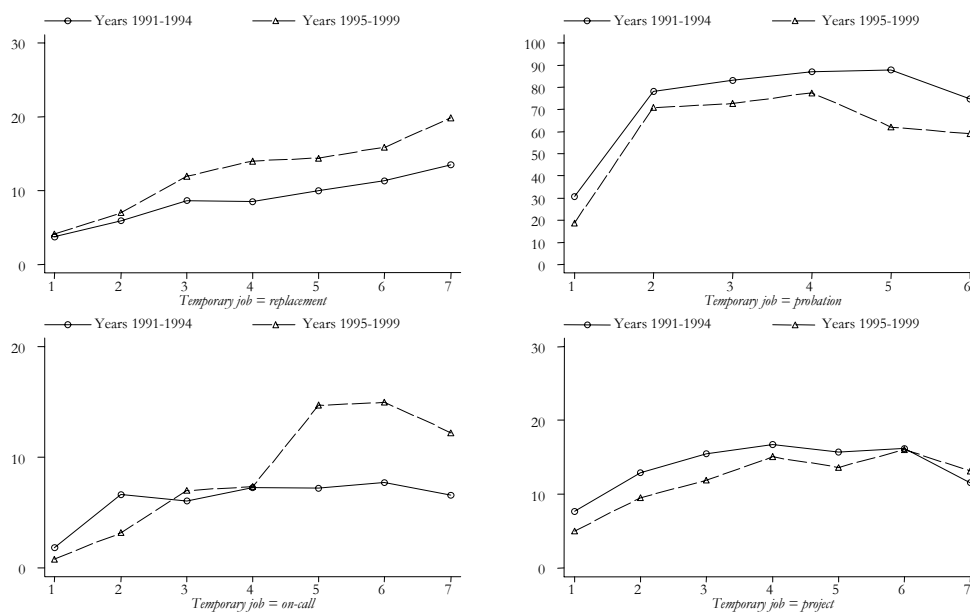
**Figure 2** *Estimated average hazard rates for the probability of exiting from a temporary job to an open-ended job, total and by gender.*



Estimated average hazard rates. Males versus females.

*Note:* We only have predictions for time periods when we can observe an exit to an open-ended job. Note the different scales in the figures.

**Figure 3** *Estimated average hazard rates for the probability of exiting from a temporary job to an open-ended job during 1991-1994 versus 1995-1999.*

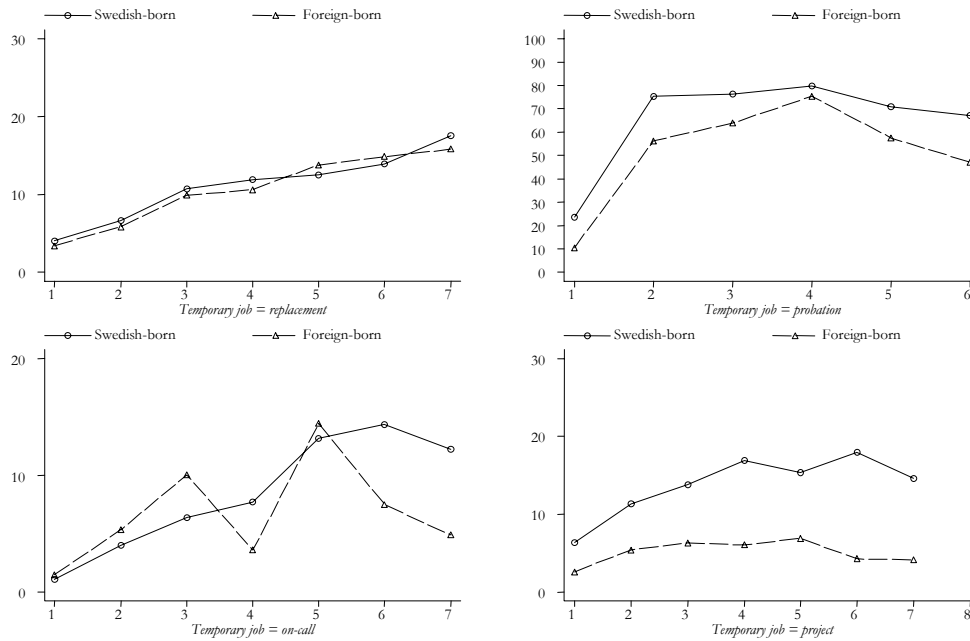


Estimated average hazard rates. The period 1991-1994 versus 1995-1999.

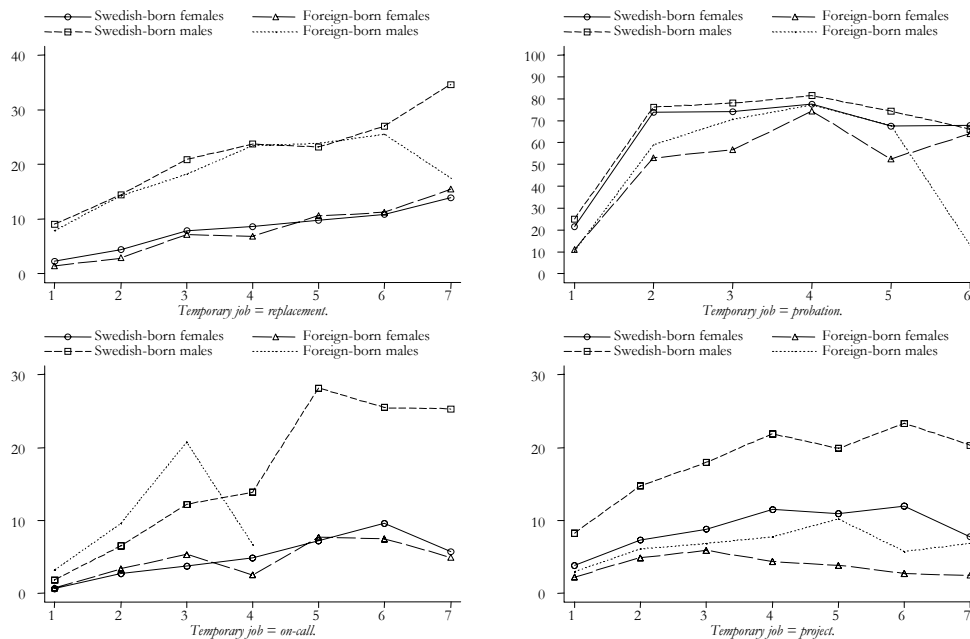
*Note:* We only have predictions for time periods when we can observe an exit to an open-ended job. Note the different scales in the figures.



**Figure 4** *Estimated average hazard rates (%) for the exit from a temporary job to an open-ended job. By origin (upper set), and by origin and gender (lower set).*



Estimated average hazard rates. Swedish-born versus foreign-born.



Estimated average hazard rates. By gender and origin.

*Note:* We only have predictions for time periods when we can observe an exit to an open-ended job. Note the different scales in the figures.

## Appendix 1

### Definition of variables

Variable	Definition
Baseline0 to Baseline7	= 1 for each time unit, 0 otherwise.
Exit	= 1 if exit to open-ended job, 0 otherwise.
Swefem	= 1 Swedish-born female, 0 otherwise.
Swemale	= 1 Swedish-born male, 0 otherwise.
Forfem	= 1 Foreign-born female, 0 otherwise.
Formale	= 1 Foreign-born female, 0 otherwise.
Age1	= 1 if age 16-24, 0 otherwise.
Age2	= 1 if age 25-34, 0 otherwise.
Age3	= 1 if age 35-44, 0 otherwise.
Age4	= 1 if age 45-54, 0 otherwise.
Age5	= 1 if age 55-64, 0 otherwise.
Single	= 1 if single, 0 otherwise (married or cohabiting).
No_children	= 1 if no dependent children, 0 otherwise.
Education1	= 1 if comprehensive school, 0 otherwise.
Education2	= 1 if upper secondary school, 0 otherwise.
Education3	= 1 if university or higher, 0 otherwise.
Socio_class1	= 1 if unskilled blue-collar worker, 0 otherwise.
Socio_class2	= 1 if skilled blue-collar worker, 0 otherwise.
Socio_class3	= 1 if low-skilled white-collar worker, 0 otherwise.
Socio_class4	= 1 if medium-skilled white-collar worker, 0 otherwise.
Socio_class5	= 1 if high-skilled white-collar worker, 0 otherwise.
Sector	= 1 if public sector, 0 otherwise.
No_union	= 1 if not a trade union member, 0 otherwise.
Hour1	= 1 if short part-time work (1-19h), 0 otherwise.
Hour2	= 1 if long part-time work (20-34h), 0 otherwise.
Hour3	= 1 if full-time work (>34h), 0 otherwise.
Industry1	= 1 if primary sectors, 0 otherwise.
Industry2	= 1 if manufacturing, mining & engineering, 0 otherwise.
Industry3	= 1 if construction, 0 otherwise.
Industry4	= 1 if communications & trade, 0 otherwise.
Industry5	= 1 if financial services, 0 otherwise.
Industry6	= 1 if education & research, 0 otherwise.
Industry7	= 1 if health & care, 0 otherwise.
Industry8	= 1 if personal & cultural services, 0 otherwise.
Industry9	= 1 if public administration, 0 otherwise.
UE_region	= Regional unemployment rates (%).
Overtime	= 1 if overtime work, 0 otherwise.
Year9599	= 1 for the period 1995-1999, 0 otherwise.

## Summary statistics

	Replacement		Probation		On-call		Project			
<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Obs</i>	<i>Mean</i>	<i>Obs</i>	<i>Mean</i>	<i>Obs</i>	<i>Mean</i>	<i>Min</i>	<i>Max</i>
Exit	15,425	0.06	3,975	0.20	6,240	0.05	6,992	0.07	0	1
Baseline0	15,425	0.352	3,975	0.458	6,240	0.446	6,992	0.39	0	1
Baseline1	15,425	0.222	3,975	0.315	6,240	0.235	6,992	0.24	0	1
Baseline2	15,425	0.145	3,975	0.149	6,240	0.131	6,992	0.14	0	1
Baseline3	15,425	0.100	3,975	0.046	6,240	0.076	6,992	0.09	0	1
Baseline4	15,425	0.072	3,975	0.018	6,240	0.049	6,992	0.06	0	1
Baseline5	15,425	0.051	3,975	0.007	6,240	0.031	6,992	0.04	0	1
Baseline6	15,425	0.036	3,975	0.004	6,240	0.019	6,992	0.03	0	1
Baseline7	15,425	0.023	3,975	0.003	6,240	0.013	6,992	0.02	0	1
Swefem	15,425	0.66	3,975	0.35	6,240	0.58	6,992	0.37	0	1
Swemal	15,425	0.23	3,975	0.52	6,240	0.31	6,992	0.50	0	1
Forfem	15,425	0.08	3,975	0.06	6,240	0.07	6,992	0.06	0	1
Formal	15,425	0.03	3,975	0.08	6,240	0.04	6,992	0.07	0	1
Age1	15,425	0.32	3,975	0.39	6,240	0.45	6,992	0.22	0	1
Age2	15,425	0.33	3,975	0.35	6,240	0.29	6,992	0.34	0	1
Age3	15,425	0.20	3,975	0.16	6,240	0.12	6,992	0.20	0	1
Age4	15,425	0.11	3,975	0.08	6,240	0.09	6,992	0.15	0	1
Age5	15,425	0.04	3,975	0.01	6,240	0.05	6,992	0.07	0	1
Single	15,424	0.40	3,975	0.50	6,240	0.52	6,992	0.38	0	1
No_children	15,425	0.61	3,975	0.68	6,240	0.70	6,992	0.60	0	1
Education1	15,218	0.16	3,915	0.22	6,100	0.31	6,835	0.18	0	1
Education2	15,218	0.55	3,915	0.59	6,100	0.54	6,835	0.44	0	1
Education3	15,218	0.29	3,915	0.20	6,100	0.14	6,835	0.38	0	1
Sector	15,415	0.65	3,963	0.09	6,226	0.40	6,979	0.40	0	1
Socio_class1	15,410	0.39	3,966	0.40	6,229	0.59	6,972	0.22	0	1
Socio_class2	15,410	0.17	3,966	0.19	6,229	0.20	6,972	0.18	0	1
Socio_class3	15,410	0.14	3,966	0.21	6,229	0.12	6,972	0.15	0	1
Socio_class4	15,410	0.20	3,966	0.13	6,229	0.07	6,972	0.22	0	1
Socio_class5	15,410	0.09	3,966	0.06	6,229	0.02	6,972	0.23	0	1
Hour1	15,422	0.09	3,975	0.06	6,210	0.44	6,986	0.15	0	1
Hour2	15,422	0.34	3,975	0.15	6,210	0.33	6,986	0.17	0	1
Hour3	15,422	0.57	3,975	0.79	6,210	0.23	6,986	0.69	0	1
Overtime	15,422	0.05	3,974	0.10	6,240	0.03	6,992	0.09	0	1
No_union	15,420	0.21	3,974	0.35	6,239	0.42	6,992	0.31	0	1
Industry 1	15,415	0.01	3,959	0.01	6,236	0.01	6,972	0.01	0	1
Industry 2	15,415	0.08	3,959	0.25	6,236	0.06	6,972	0.14	0	1
Industry 3	15,415	0.01	3,959	0.05	6,236	0.03	6,972	0.11	0	1
Industry 4	15,415	0.13	3,959	0.30	6,236	0.24	6,972	0.08	0	1
Industry 5	15,415	0.05	3,959	0.17	6,236	0.08	6,972	0.12	0	1
Industry 6	15,415	0.12	3,959	0.03	6,236	0.04	6,972	0.21	0	1
Industry 7	15,415	0.49	3,959	0.07	6,236	0.36	6,972	0.14	0	1
Industry 8	15,415	0.07	3,959	0.09	6,236	0.18	6,972	0.13	0	1
Industry 9	15,415	0.04	3,959	0.02	6,236	0.01	6,972	0.06	0	1
Year9599	15,425	0.59	3,975	0.73	6,240	0.71	6,992	0.69	0	1
Ue_region	15,425	7.16	3,975	6.87	6,240	7.22	6,992	7.16	2	13

*Appendix 2      Estimated coefficients from time-discrete regression models  
(random effects logit). Dependent variable is exit to an open-ended  
job = 1.*

	Exit from replacement	Exit from probation	Exit from on-call	Exit from project
Baseline0	<i>n.a.<sup>a</sup></i>	<i>n.a.<sup>a</sup></i>	<i>n.a.<sup>a</sup></i>	<i>n.a.<sup>a</sup></i>
Baseline1	5.150 (0.597)***	6.643 (1.132)***	8.956 (1.335)***	4.408 (0.541)***
Baseline2	6.136 (0.804)***	9.859 (1.732)***	11.168 (1.665)***	5.380 (0.723)***
Baseline3	7.073 (0.940)***	10.126 (2.002)***	12.320 (1.836)***	5.765 (0.832)***
Baseline4	7.526 (1.046)***	10.701 (2.193)***	12.675 (1.949)***	6.244 (0.914)***
Baseline5	7.984 (1.122)***	10.438 (2.381)***	14.235 (2.209)***	6.257 (0.986)***
Baseline6	8.294 (1.190)***	10.400 (2.511)***	14.336 (2.263)***	6.528 (1.045)***
Baseline7	8.915 (1.257)***	<i>n.a.<sup>a</sup></i>	13.902 (2.398)***	6.423 (1.115)***
Swefem	-0.918 (0.235)***	-0.224 (0.259)	-0.749 (0.449)*	-0.553 (0.235)**
Forfem	-1.794 (0.397)***	-2.012 (0.582)***	0.050 (0.687)	-1.555 (0.508)***
Formal	-0.976 (0.455)**	-2.003 (0.553)***	0.122 (0.874)	-0.995 (0.451)**
Age1	-1.196 (0.295)***	-1.099 (0.400)***	-2.457 (0.804)***	-0.923 (0.346)***
Age2	-0.672 (0.224)***	-0.757 (0.330)**	-0.687 (0.519)	-0.452 (0.258)*
Age4	-0.604 (0.286)**	-1.182 (0.497)**	-2.691 (0.671)***	-1.044 (0.319)***
Age5	-2.086 (0.548)***	-2.311 (0.955)**	-3.841 (1.041)***	-1.687 (0.474)***
Single	-0.426 (0.179)**	-0.206 (0.261)	-0.235 (0.451)	-0.516 (0.232)**
No_children	-0.578 (0.220)***	-0.451 (0.308)	-1.046 (0.541)*	0.142 (0.234)
Education2	-1.183 (0.257)***	-0.217 (0.284)	-0.684 (0.428)	-0.540 (0.262)**
Education3	-0.874 (0.311)***	-0.182 (0.388)	-2.371 (0.704)***	-0.364 (0.322)
Sector	-1.875 (0.345)***	-0.903 (0.604)	-5.230 (0.904)***	-0.896 (0.354)**
Socio_class2	-0.118 (0.241)	-0.665 (0.348)*	-1.806 (0.620)***	-0.648 (0.315)**
Socio_class3	-0.124 (0.249)	-0.578 (0.337)*	1.939 (0.570)***	-0.691 (0.320)**
Socio_class4	0.618 (0.280)**	-0.217 (0.380)	2.529 (0.771)***	-1.014 (0.337)***
Socio_class5	0.662 (0.402)*	-0.018 (0.513)	2.405 (1.003)**	-0.815 (0.358)**
Hour1	-0.804 (0.272)***	-0.599 (0.467)	-2.466 (0.490)***	-1.221 (0.328)***
Hour2	-0.583 (0.163)***	-0.538 (0.306)*	-1.225 (0.397)***	-0.669 (0.271)**

Overtime	0.009 (0.225)	0.081 (0.269)	0.862 (0.509)*	0.098 (0.236)
No_union	0.603 (0.206)***	-0.418 (0.247)*	0.433 (0.385)	-0.011 (0.204)
Industry1	-3.637 (1.167)***	-2.562 (1.201)**	-1.230 (1.300)	-2.891 (1.074)***
Industry 3	-1.312 (0.678)*	-1.830 (0.601)***	-2.189 (1.005)**	-1.259 (0.369)***
Industry 4	-2.013 (0.359)***	-1.219 (0.378)***	-2.992 (0.657)***	-0.376 (0.340)
Industry 5	-1.957 (0.421)***	-1.158 (0.433)***	-4.050 (1.205)***	-0.862 (0.332)***
Industry 6	-2.520 (0.494)***	-1.104 (0.778)	-0.501 (1.056)	-2.911 (0.568)***
Industry 7	-2.493 (0.484)***	-1.506 (0.630)**	-2.205 (0.865)**	-1.349 (0.501)***
Industry 8	-2.028 (0.416)***	-0.573 (0.437)	-3.322 (0.748)***	-1.840 (0.410)***
Industry 9	-1.873 (0.541)***	-1.732 (0.948)*	1.661 (1.161)	-1.535 (0.595)***
Year9599	0.094 (0.158)	-0.944 (0.262)***	-0.926 (0.423)**	-0.606 (0.190)***
Ue_region	-0.563 (0.067)***	-0.654 (0.119)***	-1.166 (0.183)***	-0.535 (0.068)***
<i>Observations</i>	<i>15,182</i>	<i>3,889</i>	<i>6,049</i>	<i>6,792</i>
<i>Number of id</i>	<i>5,345</i>	<i>1,774</i>	<i>2,687</i>	<i>2,640</i>
<i>Estimated rho</i>	<i>0.76</i>	<i>0.72</i>	<i>0.92</i>	<i>0.63</i>
<i>LR test of rho=0</i>	<i>110.13</i>	<i>44.30</i>	<i>26.77</i>	<i>39.98</i>
<i>P-value (rho)</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>
<i>Log-Likelihood</i>	<i>-3,111.50</i>	<i>-1,370.92</i>	<i>-949.00</i>	<i>-1,426.30</i>
<i>Standard errors in parentheses</i>				
<i>* significant at 10%; ** significant at 5%; *** significant at 1%</i>				

<sup>a</sup> As there are no failures (no exits) in this time-period we do not use this variable in the estimations.