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ESSAYS ON UNEMPLOYMENT DURATION AND PROGRAMME EVALUATION

Anton Nivorozhkin

To the best mother, father and brother I could ever wish for

Лучшим родителям и брату на свете

Abstract

The process of labour market transformation in the 1990s attracted a lot of attention from economists and policy makers. Unprecedented changes, like rapid reforms in Central and Eastern Europe and later the expansion of the European Union, require a deeper understanding of current labour-market trends. This dissertation provides three essays focusing on the impact of the active labour market programmes and the determinants of unemployment duration in the second half of the 1990s in Russia and Sweden.

The first two chapters of my dissertation provide a foundation for a policy analysis of issues related to unemployment duration and for an evaluation of the effect of training programmes offered by the state to unemployed individuals in urban Russia.

Paper 1 investigates the impact of training programmes on wages of individuals. Using data from the official unemployment register combined with the information from the follow-up survey, I use the method of 'propensity-score matching' to evaluate the effect of training programmes. The result suggests that participants of training programmes receive higher wages after deregistering from the employment office. The paper identifies important gender differences; the effect of training was smaller for females.

Paper 2 examines the determinants of unemployment duration of individuals registered as unemployed. The results of a piece-wise constant proportional hazard model imply that the hazard of finding a job is non-monotonic and tends to decrease with time spent in unemployment. An important finding is that only 29% of the unemployed obtained a job simultaneously with deregistering from the Public Employment Office (PEO). Others continued to search for job on their own. I find that the intensity of the job search increases after individuals leave the public employment office.

The final chapter of the thesis, *Paper 3,* addresses the question of whether the possibility of exit from unemployment to the previous employer affects the duration of unemployment spells in Sweden. The empirical analysis is performed using an employee-employer dataset that includes a number of enterprise characteristics and provides information on individual tenure. The econometric approach employs estimation of a

competing risk duration model to distinguish between exits to the previous employer and exits to a new job. The findings suggest that greater tenure raises the risks of transitions to the previous employer, while high education levels increase the risk of obtaining a new job. Moreover, the impact of benefit exhaustion is observed only for transitions to new employment.

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Nuremberg, somewhere around the New Year 2006
Anton Nivorozhkin

Contents

Introduction

Reduction of high levels of unemployment remains one of the major challenges of modern society. The social costs of unemployment could be reflected in terms of goods and services not produced, as well as the personal costs. Sen (1997) discusses diverse consequences of unemployment. Besides deterioration of individual economic well-being, Sen identifies at least ten distinct concerns related to unemployment: among them a pressure on the social security system from excessive unemployment, and the fact that unemployment tends to adversely affect individual health status and contributes to the deterioration of social values. To reduce the negative consequences of unemployment, the state provides various kinds of support to unemployed individuals.

The first publicly financed and administrated unemployment insurance system was introduced in Britain in 1911 (Topel and Welch, 1980). Since then a majority of industrialised countries have adopted Unemployment Insurance (UI) systems aimed at rendering financial support and assisting in finding employment for those who have lost their jobs. In 1935 Sweden introduced voluntary, state-supported unemployment insurance. In 1991 the system of unemployment compensation was adopted in Russia.

This thesis focuses on various aspects of the functioning of the unemployment insurance systems in Russia and Sweden. The first two chapters look into the problems of evaluating of training programmes for the unemployed and the impact of registration with the employment office in Russia. The last chapter examines the determinants of the duration of unemployment spells in Sweden, accounting for the possibility for workers to return to former employers.

In the beginning of the transition in Russia, the common belief was that abandonment of the full-employment principle, when everyone was guaranteed a job, would raise the open unemployment to above 10%. To respond to this problem the National Employment Service (NES) was established by government decree in 1991, with a decentralised structure and independently operating employment offices in each region.

Until recently, few studies have examined the information provided by the NES. One of the reasons is that a national integrated database is not available in Russia. Moreover, data lacks important information on what happens to unemployed individuals after they deregister from the employment office.

Chapters 1 and 2 partially resolve the latter problem. In order to learn what happens to unemployed individuals after they leave the employment office I use the results of the first follow-up survey of unemployment benefit claimants in Rostov-on-Don. Rostov-on-Don is

one of the largest cities in Russia with a population of over one million. It is the centre of the fifth largest Russian region (oblast'). The city has acquired extra political and economic importance since it became the capital of the Southern Federal District organised as a result of the recent federal system reform. The survey was undertaken in September 2002 and covered 2000 randomly selected individuals who became registered with the employment office in 2000. We obtained information on exact dates of employment and wages for 1547 individuals.

The first chapter of the thesis, 'An evaluation of government-sponsored vocational training programmes for the unemployed in urban Russia', evaluates the effect of training programmes offered to unemployed in Russia. The main issue in conducting evaluation research is that we need to construct a counterfactual situation: What would have happened to the unemployed had they not participated in the programme? Since randomisation was not possible I used the propensity score method, which tries to mimic a controlled experiment. The results suggest that training programmes produce moderate wage gains for male workers upon deregistration from the employment office.[1] However, this positive effect of the training programmes vanished one year after deregistration from the employment office. Moreover, the paper did not identify any gain for women participating in the training programme. The results were consistent with the previous findings for Russia by Berger et al. (2001), who report that on-the-job training increased wages by 35.5%, which is considerably more than found here, perhaps because of differences in the construction of the samples and the different period analysed.

The second paper of the thesis, 'New estimates of the risk and duration of registered unemployment in urban Russia', looks at the impact of deregistration from the employment office. The main finding concerns the fact that only 29% of unemployed individuals deregister from the employment office due to finding a job. The econometric part of the paper involves the estimation of a proportional hazard model in order to identify factors that influence the duration of unemployment spells. An important result that emerges from the analysis is that deregistration of individuals from the employment office increases the hazard of exit from unemployment. Given that I control explicitly for the duration dependency of the hazard, the results point to potential disincentive effects of being registered with the Public Employment Office (PEO). These disincentives are likely to be a combination of the effects of monetary transfers and social benefits provided by the registration. The latter perhaps plays a greater role given the relatively low magnitude of unemployment benefits and the fact that

[1] A companion paper Nivorozhkin and Nivorozhkin (2006) analyses the employment effect of training programmes using the same data set.

the size of the benefits does not appear to affect the hazard of exit to employment in a significant manner. This finding may in turn suggest that a reduction of benefits may not produce an expected increase in job-finding rates for the majority of the unemployed.

The inferences that can be drawn from the results of these papers are threefold. First, considering a low quality of the vacancy bank, tough rules for suitable jobs and a low level of unemployment benefits, registration with the NES is the 'last resort' for a majority of the unemployed. However, the employment office provides important support for some individuals, namely those who are particularly interested in non-monetary transfers. This group is likely to stay unemployed for a long period and have smaller incentives for finding a job. Second, contrary to a widespread belief that the services of the employment office are of poor quality due to relatively inexperienced NES staff and volatile labour market conditions, training programmes offered to the unemployed did produce moderate wage gains. However, the latter result should be interpreted with caution, since it does not necessarily imply that training programmes are effective policy tools, as the data did not allow for the calculation of general equilibrium effects.

In the last chapter of the thesis, 'Layoffs, Recalls, and Unemployment Duration: Evidence from Sweden', I used a matched employee-employer dataset together with an unemployment registry to look into the issue of worker recall to previous employers. I find that approximately 47% of all transitions from unemployment to employment were made to the previous employer.[2] More importantly, spells that ended in recall were usually much shorter compared to spells that ended in new employment. The findings suggest that greater tenure raises the risks of transitions to the previous employer, while high education levels increase the risk of obtaining a new job. Moreover, the impact of benefit exhaustion is observed only for transitions to new employment. A practical value of the paper is the fact that it offers a more realistic picture of the unemployment duration process in the Swedish labour market, advocating that the separation of transitions from unemployment to a new job and recall may be important for the evaluation of government policy and the targeting of active labour market programmes.

[2] Similar findings are reported in Jansson (2002).

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New Estimates of the Risk and Duration of Registered Unemployment in Urban Russia

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Abstract

This paper examines whether deregistration from the employment office decreases unemployment duration. The study is based on Russian individual-level data from the Public Employment Office of Rostov-on-Don combined with information from the 2000 household survey. Using a proportional hazard model, I find a significant excess in job finding rates following employment office deregistration. The predicted risk of getting a job is non-monotonic and tends to decrease at longer duration intervals. An important finding is that only 29% of the unemployed obtained a job simultaneously with deregistering from the Public Employment Office. Others continued to search for job on their own.

Keywords: Unemployment, duration, transition economics.

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1. Introduction

The persistence of high unemployment is a major challenge for any society, and the problem becomes particularly acute in transition economies where unemployment was virtually non-existent fifteen years ago.

The social costs of unemployment could be reflected in terms of goods and services that were not produced, but equally important are the personal costs imposed by unemployment. Sen (1997) discusses diverse consequences of unemployment. Besides deterioration of individual economic well-being, Sen identifies at least ten distinct concerns related to unemployment. One being that excessive unemployment imposes a pressure on the social security system. Unemployment also adversely affects individual health status and contributes to the deterioration of social values. Long-term unemployment may cause physiological harm and destroy the motivation to acquire skills.[1] Thus, the determinants of the probability of finding a job after a certain period of time being unemployed attract considerable attention from economists and policy makers.

Job-search theory (e.g. Mortensen, 1977; van den Berg, 1990) suggests that people are more likely to stay unemployed if they receive benefits. However, as benefits run out, individuals tend to increase job-search intensity and decrease their reservation wage. Empirical work for North America (e.g. Moffitt, 1985; Ham and Rea, 1987), Europe (e.g. van den Berg and van Ours, 1994; Carling et al., 1996), and transition economies (e.g. Lubyova and van Ours, 1999; Miklewright and Nagy, 1996) often found negative or inverse U-shape duration dependence, with clear impact of benefit exhaustion.[2]

Studies of the determinants of unemployment duration in Russia are limited and could be categorized according to the definition of unemployment and data-sources used in the analysis. Foley (1997), Grogan and van den Berg (2001) define unemployed according to the ILO guidelines and use the Russian Longitudinal Monitoring Survey (RLMS) database which is representative for Russia. A problem related to the usage of RLMS is that the exact unemployment duration is often

[1] Recent studies for Russia show that unemployment is one of the major factors affecting household welfare, child health and property crimes (Fedorov and Sahn, 2003; Klugman and Kolev 2001; Andrienko, 2001). Moreover, in 1998 the expenditures on labor market programs in Russia amounted to 921 million US$, which corresponded to 0.2% of the country's GDP (O´Leary et al., 2001)

[2] See Atkinson and Micklewright (1991), Bean (1994), and Meyer (1995) for literature surveys on the impact of unemployment insurance in OECD countries.

unknown and the number of unemployment benefit claimants is small.[3] Thus, the conclusions of the above papers on the duration dependence and impact of unemployment insurance are uncertain. Denisova (2002) and Nivorozhkin et al. (2004) investigate the determinants of unemployment duration of individuals registered with the Public Employment Office (PEO) using state unemployment register data. Neither study contains precise information on reasons for leaving unemployment, treating all exits from the employment office as transitions to a job. The results of the studies on unemployment duration are summarized in Table 1.

Table 1: Summary of the empirical findings for Russia

Study	**Data**	**Definition of Unemployment**	**Duration dependence (exit to a job if not otherwise stated)**
Foley (1997)	RLMS 1994 – 1996	ILO	Inverse –U shape relationship
Grogan and van den Berg (2001)	RLMS 1996 – 1998	ILO; Discourage workers; Unpaid leave; Wage arrears	The exit rate is highest between 6 – 12 months, reaching the peak between 9 and 12 months
Nivorozhkin et al. (2004)	Registry data, Rostov-on-Don city 1997 – 1998	Registered unemployed	Negative duration dependence for exit from the PEO with employment and inverse –U shape relationship for exit from the PEO without employment
Denisova (2002)	Registry data, Voronezh region 1996 – 2000	Registered unemployed	Positive duration dependence for exit from the PEO

The objective of this study is to present new evidence on the determinants of unemployment duration. Based on the data collected in the survey in the big industrial city of Rostov-on-Don, combined with the information obtained from the registries of the PEO I present new evidence on the determinants of unemployment duration among benefit recipients. The paper fills the unemployment duration knowledge gap by presenting results of the first follow-up survey of unemployed individuals registered with the Russian PEO during the year 2000. Similar surveys have been conducted in a number of other countries (e.g. O`Leary et al., 2001; Micklewright and Nagy, 1999: and Bring and Carling, 2000; van den Berg et al., 2004).

Using the results of the follow-up survey I demonstrate that registration with the PEO ended with a transition to a job in only 29% of the cases; 71% of the unemployed continued to search for a job after deregistration. Relying only on exit

[3] See Grogan and van den Berg (2001) for the discussion of problems related to spell construction in RLMS database.

information from the PEO would produce a deficient picture of flows to employment. By taking into account the large differences between the outflow from the PEO and the inflow to employment, I address the question of whether the individual job search intensity changes following deregistration from the PEO.

The difference between outflow from unemployment registries and inflow to work are not truly unique to Russia. Micklewright and Nagy (1999) report that a majority of the unemployed deregistered from the employment office in Hungary due to the exhaustion of benefits and not because they found a job.

The next section presents an overview of the institutional setup of the Russian labor market. Section 3 describes the data used in the analysis. Section 4 presents the results of estimation and Section 5 concludes the paper.

2. Unemployment in Russia: Background

The Russian economic decline throughout most of the 1990s led to a rise in unemployment. To respond to this problem the Public Employment Office (PEO) was organized in Russia in the beginning of 1990s. The PEO is the main component of the social safety net for the unemployed and provides unemployment benefits and offers active labor market programs.

Unemployment benefits are awarded to individuals who have left employment regardless of the reason. The benefits are calculated as a percent of the average wage during the proceeding three months if the individual had a paid full-time job during at least 26 weeks out of the last 12 months. The amount of unemployment benefits during the first three months equals 75% of the wage received at the previous job, 60% during the next four months and from then on - 45%. Individuals who do not qualify are entitled to receive minimum benefits equal to 20% of the regional subsistence equivalent.[4] In any case, the benefits cannot exceed the regional subsistence equivalent and cannot be lower than 100 Rubles per month. The duration of benefit payments should not exceed 12 cumulative months during a period of 18 calendar months. For individuals entering the labor market for the first time, those without a profession, and the long-term unemployed the duration of benefit payments should not exceed six cumulative months in an 18 calendar month period.[5]

[4] In the fourth quarter of 2003 the survival equivalent in the Rostov region was set to, 1961 Rubles.
[5] Several recent amendments were introduced to the law, but they do not apply to our study.

The benefit payments may be interrupted for a period of three months if an individual refuses to participate in public works or refuses to accept two "suitable" job offers. Moreover, the period of benefit entitlement is shortened by three months and credits towards retirement stop to accumulating. The job is considered "suitable" if it matches the profession of the unemployed and provides the subsistence equivalent for those who had a wage equal or above the subsistence equivalent prior to becoming unemployed.[6]

The definition of unemployment provided by the PEO of Russia has been criticized (Grogan and van den Berg, 2001, Kapelushnikov, 2002). The criticism has focused mainly on the fact that the population of registered unemployed individuals reflects the population of unemployed defined according to the ILO guidelines poorly.[7] However, the large differences in the levels of unemployment are not truly unique for Russia. Such differences persist in a large number of countries (e.g. ILO, 1995; Hussmanns 1994, 2001). The major limitation of the information supplied by the PEO is that the composition of the population of registered unemployed may depend on the rules and conditions governing eligibility to unemployment benefits. Thus the results of this study should be viewed as being conditional on the current legislation. Yet, datasets supplied by the PEO have three major virtues. First of all they are inexpensive and easy to acquire, since they are a side product of the functioning of the PEO. Second, the data on benefit claimants can be collected quickly and frequently. Finally, information from the PEO registries is the only source of systematic information on unemployment in Russian cities.

This study is based on data on individuals who registered with the Rostov-on-Don PEO and received the status of unemployed in 2000. Rostov-on-Don is one of the largest cities in Russia with a population of over one million.[8] It is the center of the fifth largest Russian region, *Rostov oblast'*. The city has acquired extra political and economic importance since it became the capital of the Southern Federal District, organized as a result of the recent federal-system reform. According to official statistics in 1999, the index of physical volume of GDP in the Rostov region rose by

[6] If individual has not been working for more than a year or does not have a profession she can be offered any type of job.

[7] During the period 1992-2000, unemployed registered at the PEO were on average only 23% of the unemployed defined according to the ILO concept. The reasons for a disparity between reported levels of unemployment are discussed in Kapelushnikov (2002), Nivorozhkin (2003) and Tchetvernina et al. (2001).

[8] A national unemployment register does not exist in Russia.

9.5% and continued to increase at an accelerating rate in 2000 (Russian Statistical Agency, 2002). The regional unemployment rate was 14.9%, which was higher than the Russian average of 10.5%.

The study of the determinants of unemployment duration in one city raises a question about the representativeness of the results for the rest of Russia. Indeed, Russia shows marked regional economic differentiation. However, with the exception of Moscow, the results are likely to apply to other big industrial cities because of a common set of factors affecting labor markets in these cities. First of all, a uniform legislative framework determines rules of registration with the PEO. Moreover, large cities are usually similar in having a diversified industrial structure, with one or two large industrial enterprises dominating. Large cites also have a well-developed educational and training infrastructure. Finally, the preserved system of population registration and under-developed housing markets discourage labor mobility creating stagnant unemployment pools in the cities. Thus, labor market processes in large industrial cities are likely to be similar and can be addressed by studying only one representative city.

3. Data

The PEO had 17,270 individuals registered as open unemployed in 2000. In order to trace unemployed individuals up to the point of employment a follow-up house-to-house survey was organized.[9] The original sample consisted of 2,000 randomly selected individuals. The main advantage of the survey was the possibility to collect information about the individuals' job positions after deregistration from the PEO. The survey was implemented in September, 2002. The respondents were asked about their labor market status after leaving the PEO and about the precise date of finding a new job.[10]

The overall survey response rate was 77.3 %. There were two main reasons for non-response: refusal to let the interviewer in or refusal to answer the questions. In

[9] The support of the Institute of Independent Social Policy (Grant No. SP-02-2-12, Ford Foundation) in data collection is gratefully acknowledged.

[10] The data lacked information on secondary employment, but this should not pose a problem when considering the short-term effect, since it is unlikely that individuals would find primary and secondary jobs simultaneously. There are several different estimates of secondary employment in Russia. According to official figures in 2000, only 1.8% of labour-force survey respondents reported having a secondary job. The results of the RLMS study indicate that 4–11% of workers have secondary employment, however.

some cases individuals had moved to new locations without providing new addresses.

The information about employment collected during the follow-up survey was, combined with the characteristics of the unemployed individuals, available in the PEO database. Social-demographic information on registered individuals (age, gender, marital status, number of children, and dependents, etc.), and professional characteristics (working experience, previous wage, education, profession, and qualification) were included.

4. Empirical application

Transition data analysis or duration modeling was used to model the impact of various socio-economic characteristics on the unemployment duration among individuals registered with the PEO. Comprehensive overviews of duration models are presented in Kiefer (1988), Lancaster (1990), and Tasiran (1995). More, recent developments are summarized in van den Berg (2001).

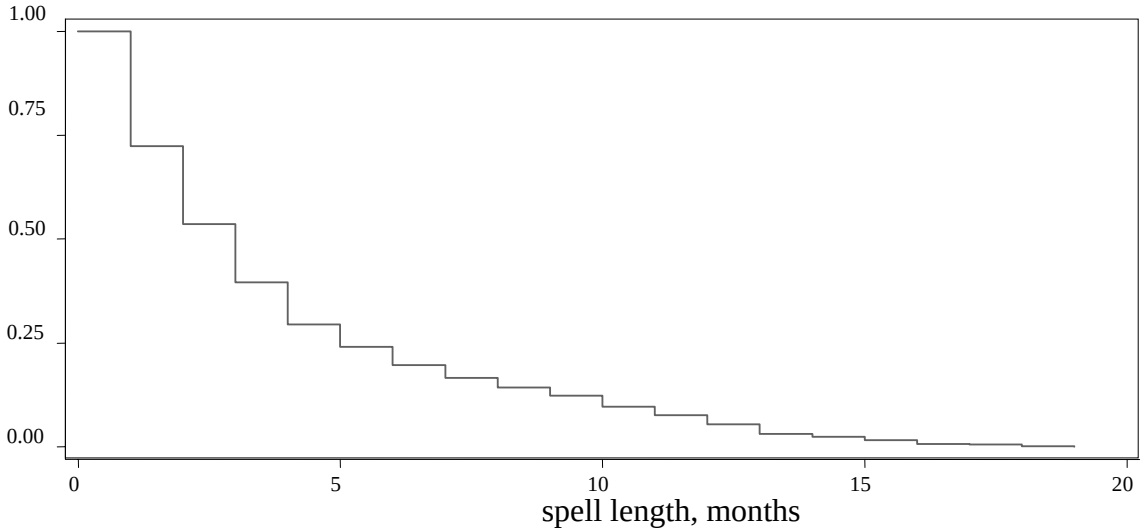
Individuals transiting to early retirement were removed from the analysis. The reason is that these individuals are likely to behave differently regarding obtaining a regular job and are likely to correctly forecast the destination of their transition. Moreover, we excluded all individuals participating in active labor market programs. This leaves us with 1,099 observations.

4.1 Non-parametric estimation

A useful start in the application of transition data analysis is to consider simple non-parametric estimators of survival and hazard functions. The Kaplan-Meier plot of survival function (see Figure 1) measures how many people remain in the unemployment pool (survived) as time passes.

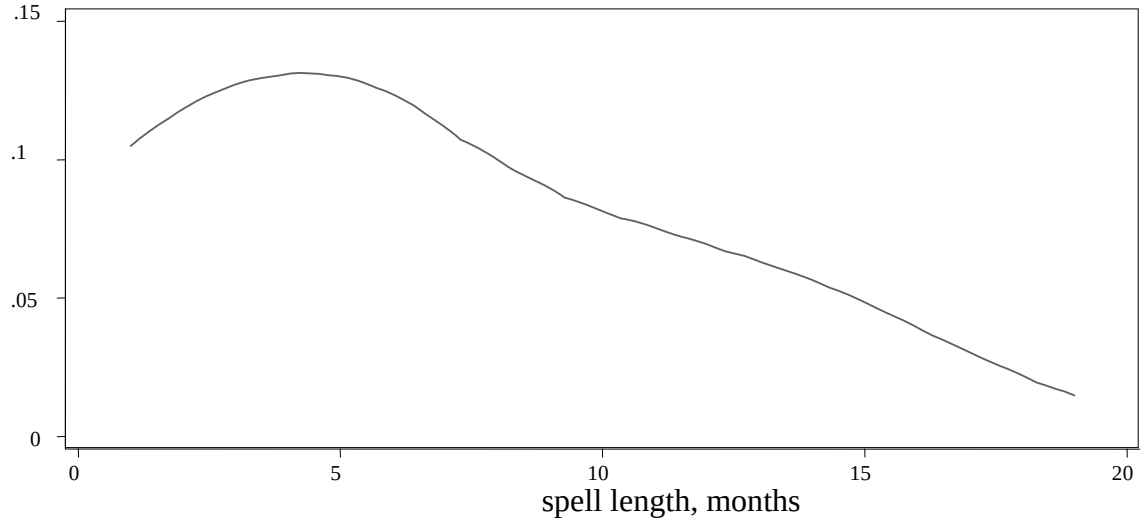
Unemployment was measured in days beginning from the date of registration and ending with the date of employment. The spell is considered to be right-censored if an unemployed individual was still unemployed at the end of our observation period.

Figure 1: Survival probability



The product limit estimate of hazard function can be derived from this plot. It shows the number of people who left unemployment relative to the total number of individuals unemployed at each point in time. Non-parametric estimates of hazard function are presented in Figure 2. A “rapid” increase in hazard rate in the interval up to three months can be observed. In the interval from three months and onwards, the function monotonically decreases.

Figure 2: Transition rates to a job



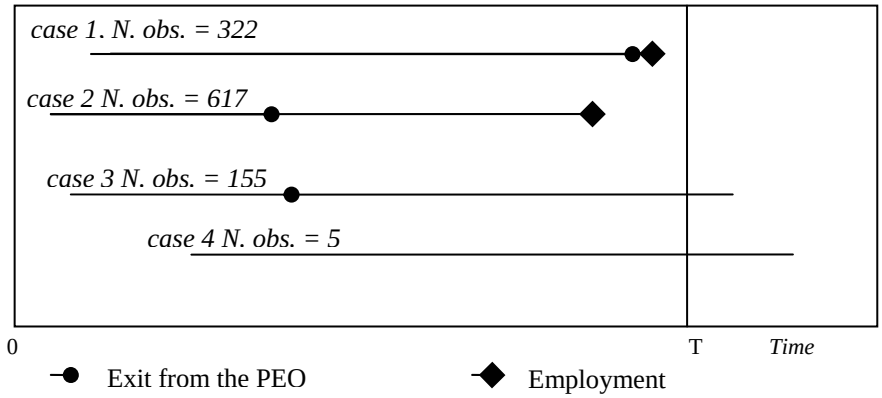
Among unemployed with complete duration, 94% experienced transition to employment within one year from registering with the PEO. The fluctuation of the hazard function in the duration interval exceeding one and a half years is explained by the presence of a relatively small group of individuals most of whom did not find a

job under the period of investigation. The results indicate that mean complete duration of unemployment is 109 days. Duration is shorter for those who left the PEO simultaneously with obtaining a job relative to those who left the PEO without a job (85 versus 121 days).

4.2 Semi-parametric estimation

Discussion of the duration of registered unemployment often assumes that all recipients deregister from the PEO for the reason of obtaining a job. This ignores the possibility that individuals may continue to be unemployed and search for job after deregistration from the PEO. To analyze the changes in the intensity of the job search among those who left the PEO without employment a time-varying covariate as an indicator variable representing registration with the PEO was constructed. This variable *(Search with the PEO)* takes a value of *1* when an individual searched for a job with the PEO, and *0* when she had left the PEO and continued to search for a job on her own. In order to understand the construction of the dataset, it may be appropriate to represent it graphically (see Figure 3).

Figure 3: Event space



In the dataset 939 individuals (Case 1 and Case 2) found a job during the period of investigation. The difference between the cases is that in Case 1 individuals deregistered from the PEO because they found a job and in Case 2 individuals continued to search for a job after deregistration from the PEO. In Cases 3 and 4, 160 individuals failed to find a job during the period of investigation. However, in Case 3 individuals deregistered from the PEO and continued to search for a job without extra assistance from the PEO. It is also evident from the figure that only 29% of the

individuals left the PEO with employment; the others continued to search for jobs on their own.[11]

If deregistration from the PEO has a positive impact on the individual job search intensity, then the coefficient of the variable *Search with the PEO* would have a negative sign; otherwise it would be positive.

A number of studies (e.g. Blossfeld, Hamerle and Mayer, 1989; Lancaster, 1990; and Tasiran, 1995) point out that estimating a model that incorporates time-varying covariates may be complicated for two reasons. First, it may be difficult to separate the effect of time-dependent covariate from possible duration dependence. Second, time-varying variables may be endogenous to the process of finding a job.

The first problem may be solved by a careful interpretation of time-varying covariates, taking into account their interaction with time.[12] The problem of endogenously defined covariates is harder to solve. Lancaster (1990) suggests an example of a marital status covariate in a model of job tenure where one cannot rule out the possibility that the covariate is neither endogenous nor exogenous. The same logic can be applied to this model. Assuming for now that the decision to search for a job with or without the PEO is completely choice driven, it can be said that the path of the covariate *Search with the PEO* and the information that an individual is still unemployed at $t + dt$ may or may not help predict the course of the covariate in the time interval $(t, t + dt)$. Thus, the covariate could either be endogenous or exogenous for duration of unemployment. Moreover, rules that govern deregistration from the PEO indicate that deregistration is not necessarily a choice variable. In fact, it may take place before the exhaustion of a benefit entitlement period. For example, the rule about two "suitable" job offers forces a large number of individuals to leave the PEO involuntarily. Such individuals do not necessary transit to employment; on the contrary most of them continue to search for jobs on their own after deregistering from the PEO.

[11] Note also that out of 617 individuals who left the PEO and continued to search for jobs on their own, 76% stayed unemployed for more than one extra week.

[12] To control for time dependency an interaction term of the variable *Search with the PEO* and logged duration was included.

4.3 Means of variables used in the analysis

Table 2 presents definitions of variables and their means, stratified for two subgroups: those who found jobs while being registered with the PEO and those who continued to search for jobs after deregistering from the PEO.

Variables reflecting the socio-demographic and professional status of unemployed, describing the circumstances of entering the PEO, and unemployment benefits received were used in the analysis. The following socio-demographic characteristics were used: gender, age, marital status, and number of children. These characteristics are likely to influence the behavior of unemployed individuals. Level of education, professional experience, and profession prior to starting unemployment spell were captured by a set of dummy variables. Additional dummies to control for whether the individual received wage above or below the city average as opposed to not having a wage were included. These variables aim to proxy for the type of job that the PEO officer may offer to unemployed individuals. Finally, dummy variables for minimum benefits and disadvantage status awarded by the PEO were included.[13]

[13] Disadvantage variable captures different groups of unemployed who are by law considered to be deprived and thus may receive special treatment from the PEO officers.

Table 2: Means of variables used in the analysis

Variable	Total sample	Obtained a job while been in the PEO	Searched for job after left the PEO
Male	0.34	0.36	0.33
Age $\leq$ 20	0.16	0.18	0.15
20 < Age $\leq$ 30	0.30	0.32	0.28
30 < Age $\leq$ 40	0.18	0.15	0.19
40 < Age $\leq$ 50	0.25	0.25	0.26
Age > 50	0.11	0.11	0.12
One child	0.22	0.20	0.23
More than two children	0.07	0.06	0.08
Married	0.44	0.43	0.46
University education	0.34	0.31	0.35
Technical secondary	0.27	0.26	0.27
General secondary	0.21	0.29	0.18
Only primary	0.18	0.14	0.19
No work experience	0.25	0.31	0.23
No profession	0.19	0.25	0.16
Blue collar worker	0.32	0.29	0.34
White collar worker	0.49	0.46	0.50
From out of the labor force	0.62	0.61	0.62
Wage is less than city average	0.2	0.19	0.20
Wage is above than city average	0.15	0.13	0.15
Minimum Benefit	0.60	0.67	0.57
Disadvantage	0.06	0.05	0.06
Number of observations	1099	327	772

4.4 Model selection

A single destination model of exit to a job is estimated. Compared to earlier studies of duration of registered unemployed (Denisova, 2002; Nivorozhkin et al., 2004) the estimates account for actual date of employment as opposed to deregistration from the PEO. The analysis of the withdrawal from the labor force is omitted.[14]

[14] Nesporova (1999) indicates that in transition countries individuals withdraw themselves from the labor market because they are unable to find suitable jobs that would give them reasonable remuneration. Such individuals may be classified rather as discouraged long-term unemployed than as

Two issues are of special concern in the application of duration analysis. The first is the way to control for possible unobserved heterogeneity and the second is the choice of distribution of the hazard function.

A model may lead to the wrong conclusion about the estimated hazard rate and probability of survival when unobserved heterogeneity is neglected. Controlling for unobserved heterogeneity is therefore important (e.g. Lancaster, 1990; and van den Berg, 2001). In order to control for possible heterogeneity, the model assuming parametric form of gamma distributed unobserved heterogeneity was estimated.[15]

One can also estimate several duration models by assuming different distributions for baseline hazard functions, and as a result arrive at a different conclusion about the shape of the hazard. It is therefore important to test the appropriateness of distributional assumption. The model was selected according to the Akaike Information Criterion (AIC).[16] The criterion is based on the modified version of the maximum-likelihood criterion, where the likelihood of each model is penalized by the number of parameters estimated in the model. According to the test the preferred model should produce the smallest AIC value. AIC provides a convenient framework to discriminate among different distributional assumptions, but does not justify the appropriateness of the model itself. Table 3 presents the results from estimating of the AIC. Our estimates indicate that the piecewise constant exponential model has the lowest score among all estimated models and thus should be preferred.[17] The piecewise constant exponential model is also preferable if sudden changes in hazard rate, for example due to the changes in the benefit levels, are expected. The hazard rate is assumed to be constant within time intervals but is allowed to differ among time intervals. The hazard intervals are defined to be constant within nine intervals [0, 60), [60, 120),…, [480, 540), [540, ∞) and the indicators are constructed so that the baseline interval (for which all indicators are equal to zero) is the interval [540, ∞).

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individuals in out of the labor force. This claim can be supported by the analysis of RLMS data. Grogan and van den Berg (2001) report that in 1995, 85% of non-workers who reported that they did not search for jobs in the month preceding the interview also reported that they wanted jobs.

[15] See Gutierrez (2002) for an overview of duration model estimation in Stata.

[16] Here AIC is defined as $AIC = -2/N*(L_m) + 2k_m/N$, where L_m is the likelihood of the model m, k_m is the parameters estimated in the model m, and N is the number of observations.

[17] Similar results are obtained when applying the Schwarz Criterion was applied.

Table 3: Overview of the Akaike Information Criterion Scores

Distribution	Log likelihood	AIC	rank
Exponential	-1189.69	2.20	3
Weibull	-1185.21	2.20	2
Lognormal	-1277.32	2.36	4
Log/logistic	-1526.12	2.82	5
Piecewise exponential with 9 60 days pieces	-1043.85	1.96	1

4.5 Results of estimation

Table 4 presents two specifications of the piecewise constant exponential model with unobserved heterogeneity.[18] The results are robust to the model specification.[19]

Being male shortens expected time in unemployment relative to females. The results presented by Foley (1997) support these findings. The author found that women tend to have longer unemployment spells, and that this effect is even more pronounced for married women. Grogan and van den Berg (2001) indicate the opposite relationship; they report shorter survival time (earlier exit from unemployment) for women.

The age coefficients imply that older individuals are disadvantaged compared to younger counterparts, although in the specification which includes time-varying covariates this relationship is insignificant for individuals younger than twenty and for the 30-40 cohort. In terms of education, only individuals with general secondary education are found to obtain jobs faster than individuals with only primary education. Concerning the household composition, neither the fact that the individual is married nor that the individual has children impacted on the hazard rate significantly.[20]

Summarizing our results on the social-demographic profile of unemployed, one may conclude that males and individuals with general secondary education have higher risk of transiting to a job. However, this conclusion needs several clarifications.

[18] The results of the estimation without unobserved heterogeneity are available on request. Accounting for unobserved heterogeneity is important; the likelihood ratio test for the absence of unobserved heterogeneity suggests that the hypothesis that the unobserved heterogeneity parameter is equal to zero could not be accepted.

[19] Several specifications including interaction terms of various socio-economic characteristics and interactions with benefit levels were estimated, but none of them was statistically significant.

[20] It should be noted that information on the composition of households is limited; there is no information on a size of a household and head of a household. It is also not clear whether spouse is unemployed.

There is a large body of literature aiming to explain gender-based differences. Some studies attribute the higher incidence and longer duration of unemployment of females to the issue of discrimination. Rhein (1998) shows that, in Russia, women have become increasingly unable to secure their employment and are more likely to become unemployed. On the other hand, the longer unemployment duration of females may also be explained by the inherent conditions of the urban labor market. There are simply less vacancies for females on the labor markets of big industrial cities. If there are relatively few female positions on the market than it may be reasonable for women to search for job less intensively (Grogan and van den Berg, 1999). This hypothesis is supported by the results of the survey of benefit claimants undertaken by the PEO of Rostov-on-Don in 1999. According to the survey in 8% of the cases employers, who place the job offer into the vacancy bank of the PEO, rejected applicant due to unsuitable gender (Nivorozhkin et al., 2004).

Among the previous employment characteristics, only the wage earned at the last place of work affects hazard rate significantly. Individuals who reporting zero wages are likely to leave unemployment faster. There are two possible closely linked explanations to this fact. First, individuals who report zero wages, reference category, are more likely to find "suitable jobs" at the PEO vacancy bank. Second, individuals who report non-zero wage at the last place of work are likely to have higher reservation wage and thus stay unemployed longer. Entitlement to a minimum benefit within a period of registration with the PEO is found to be insignificant, suggesting that benefit provision has no direct impact on the risk of exit to a job. One should also keep in mind that previous research (Nivorozhkin et al., 2004) indicates that individuals who are entitled to a minimum benefit are more likely to leave the PEO sooner. Provision of benefits has some impact on the duration of registration with the PEO, but is unlikely to have impact on the duration of unemployment.

I also included a variable aiming to capture individuals coming from outside the labor force or belonging to a disadvantaged group. In the estimation these variables are found to be negative, thus decreasing the risk of transition from unemployment (although statistically insignificant).

The purpose of including the time-varying variable *Search with the PEO* is to access the individual job search intensity inside and outside the PEO. The coefficient *Search with the PEO*, which takes the value *1* when an individual is registered with the PEO and *0* otherwise, indicates that an individual's job search intensity tends to

increase if the individual deregisters from the PEO and continues to search for a job on her own. Formally, a negative sign on the variable *Search with the PEO* indicates that deregistration from the PEO increases the hazard of exit from unemployment. An important issue in our interpretation of the job search intensity is its interaction with time. The interaction term *Search with the PEO* with logged duration (*Search with the PEO*$\times$*logDUR)* was included in the estimation. In the estimation this variable turns out to be statistically insignificant, thus I conclude that duration itself does not influence our conclusion on the impact of *Search with the PEO.*

To check for robustness of the results I labeled all individuals who obtained a job within 7 days after deregistration from the PEO as employed at the moment of leaving the PEO. This had no significant effect on the results.[21]

In the estimation a baseline hazard could vary within a period of 18 months, but was held constant during each 60 day interval.

A comparison of the models with and without unobserved heterogeneity reveals that duration dependency is affected by the presence of unobserved heterogeneity. Lancaster (1990) shows that ignoring unobserved heterogeneity when it is important would result in overestimation of the degree of negative duration dependency or underestimation of positive duration dependency.

The hazard rate to a job appears to be non-monotonic. The sharp increase on interval from 60 to 180 days may be explained by two competing hypothesis. During this period the most significant reduction of unemployment benefits occurs, thus a lot of individuals may be motivated to increase the job search intensity. Another explanation is that at early periods of unemployment individuals are more likely to receive job offers from the PEO. Thus, the increase in hazard rate may be due to the process of filling the available vacancies available with the PEO vacancy bank.

[21] Results are available on request.

Table 4: Estimation of piece-wise constant exponential model with unobserved heterogeneity

Variable	Includes time-varying covariate		Excludes time-varying covariate	
	Coefficient	St.D.	Coefficient	St.D.
Male	0.442	(0.149)***	0.503	(0.115)***
Age $\leq$ 20	0.380	(0.362)	0.689	(0.275)**
20 < Age $\leq$ 30	0.653	(0.259)**	0.707	(0.206)***
30 < Age $\leq$ 40	0.420	(0.272)	0.490	(0.216)**
40 < Age $\leq$ 50	0.413	(0.243)*	0.354	(0.195)*
One child	0.111	(0.185)	-0.110	(0.145)
More than two children	-0.248	(0.284)	-0.278	(0.223)
Married	0.088	(0.158)	0.154	(0.123)
University education	0.168	(0.238)	-0.003	(0.181)
Technical secondary	-0.013	(0.226)	-0.196	(0.171)
General secondary	0.627	(0.232)***	0.179	(0.174)
No work experience	0.172	(0.320)	0.304	(0.232)
No profession	0.409	(0.312)	-0.062	(0.227)
Blue-collar worker	-0.026	(0.179)	0.078	(0.138)
From out of the labor force	-0.161	(0.170)	-0.014	(0.132)
Wage is less than city average	-0.447	(0.229)*	-0.893	(0.185)***
Wage is greater city than	-0.557	(0.260)**	-1.069	(0.212)***
Minimum Benefits	0.197	(0.177)	-0.217	(0.139)
Disadvantaged	-0.100	(0.307)	0.165	(0.235)
Search with the PEO	-3.586	(0.237)***	-	-
Search with the PEO$\times$*logDUR*	-0.053	(0.055)	-	-
Piece-wise constant hazard rates days				
0-60	3.814	(1.046)***	3.803	(1.051)***
61-120	4.308	(1.039)***	4.318	(1.030)***
121-180	4.377	(1.036)***	4.176	(1.022)***
181-240	3.930	(1.039)***	3.960	(1.022)***
240-300	3.958	(1.039)***	4.187	(1.019)***
301-360	3.971	(1.039)***	4.220	(1.020)***
361-420	4.346	(1.034)***	4.630	(1.017)***
421-480	4.043	(1.044)***	4.145	(1.030)***
481-540	3.088	(1.087)***	3.224	(1.081)***
$\ln(\sigma_u^2)$	2.20	(0.143)***	1.05	(0.16)***
Constant	-6.358	(1.110)***	-8.721	(1.09)***
Log-likelihood	-1043.85		-1841.71	
N of subjects	1099		1099	

Notes: Standard errors in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%. Coefficients indicate variables' effects on the hazard function, a positive coefficient increasing the probability of exit, and thereby decreasing expected duration. Reference categories: Female; Older than 50; No children; Single; Primary education; Some work experience; White-collar worker; Previously employed; No wage prior to registration; Receive non-minimum benefit.

5. Conclusion

Leaving the PEO without obtaining a job is one of the most common ways to exit the unemployment register in urban Russia. The analysis sheds light on what happens after deregistration and thus is important for the analysis of unemployment duration, labor market flows, and government policy. The results found for Russia may have implications for other Central and Eastern European counties with similar unemployment insurance system. Micklewright and Nagy (1999) show that in Hungary, a majority of unemployed individuals deregister from the employment office without obtaining a job.

The rules and regulations governing benefit entitlement induce a majority of individuals to leave the PEO before they are able to find a job. The results show that 71% of individuals leave the PEO without employment. This finding raises concerns and calls for a formal evaluation of the job-search programs offered to unemployed individuals. Deregistration of individuals from the PEO increases the hazard of exit from unemployment. Given that I control explicitly for the duration dependency of the hazard, the results point to potential disincentive effects of being registered with the PEO. These disincentives are likely to be a combination of the effects of monetary transfers and social benefits provided by the registration. The latter perhaps play a greater role given the relatively low magnitude of unemployment benefits and the fact that the size of the benefits does not appear to affect the hazard of exit to employment in a significant manner. This finding may in turn suggest that a reduction of benefits may not the produce expected increase in job-finding rates for the majority of unemployed.

A positive impact of deregistration from the employment office on the probability to find a job was found in other countries. Cockx and Ries (2004) found for Belgium that termination of unlimited payments of benefits, for selected groups of unemployed, increased the job-finding rates by up to 25%. Indirect evidence is presented in Lalive et al. (2005), in which the authors found that benefit sanctions significantly reduce unemployment duration.

Taking into account the fact that the hazard to a job is non-monotonic and declining in the long run, indicating a negative effect of time on individual probability of leaving unemployment, it may be worthwhile to identify groups expected to stay unemployed longer and provide them with proper incentives to search for jobs in the earlier stages of unemployment.

From a policy standpoint, an important issue that deserves future investigation is the impact of deregistration from the PEO on individual living standards. More research on this topic is warranted.

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Layoffs, Recalls and Unemployment Duration: Evidence from Sweden

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Abstract

The question addressed in this paper is whether the possibility of exit from unemployment to the previous employer affects the duration of unemployment spells in Sweden. The empirical analysis is performed using an employee-employer dataset that includes a number of enterprise characteristics and provides information on individual tenure. The econometric approach employs estimation of a competing risk duration model to distinguish between exits to the previous employer and exits to a new job. The findings suggest that greater tenure raises the risk of transition to the previous employer, while high education levels increase the risk of obtaining a new job. Moreover, the impact of benefit exhaustion is observed only for transitions to new employment.

Keywords: Unemployment, unemployment duration, temporary layoffs.
JEL classification: J64, J68.

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1. Introduction

When firms expand employment, previously laid-off workers represent an important pool of potential employees. A number of studies showed that temporary layoff (also known as recall or rehire), defined as unemployment ending in reemployment with the previous employer is common in North America and Europe.[1]

Recent evidence (Jansson, 2002) indicates that temporary layoffs also are an important phenomenon on the Swedish labour market. This paper further revises the impact of temporary layoffs on the duration of unemployment in Sweden. Using the registry dataset for individuals who became unemployed in 1998, I examine how the possibility to return to the previous place of work affects worker job search behaviour. In addition to a large set of personal characteristics, the estimation includes characteristics of the last place of employment (size of the enterprise, industry and firm ownership), which are expected to be particularly important for the process of worker recall. Moreover, the empirical literature on the duration of unemployment in Sweden is extended by explicitly accounting for worker tenure at the enterprise

The focal point of the paper is that accounting for the possibility of recall is important. About 47% of all transitions from unemployment to employment are done on recall. The impact of covariates on the risk of transition to a new job and recall varies, suggesting that these two transitions may be governed by two separate processes. Moreover, the predicted risk of exit from unemployment over time has different shapes depending on the destination of the transition. The latter fact has important policy implications for the design of unemployment insurance, the targeting of active labour market programmes and the evaluation of labour market policy.

The estimates of the degree of temporary layoffs vary substantially across countries and analysed periods. In the US, Lilien (1980) reported that temporary layoffs account for 30% of the unemployment stock in manufacturing. A somewhat smaller figure, 13%, is presented in Clark and Summers (1979). In Denmark, Jensen and Westergård-Nielsen (1990) and Jensen and Svarer (2003) found that temporary layoffs account for 16-20% of

[1] e.g. Feldstein (1978), Robertson (1989), Katz and Meyer (1990), Jensen and Westergård-Nielsen (1990), Fisher and Pichelmann (1991), Mavromaras and Rudolph (1998), Roed and Nordberg (2003) and Alba-Ramirez and Munoz-Bullon (2004)

unemployment. Finally, recent evidence for Sweden (Jansson, 2002) indicates that at any given point in time, 10% of the unemployed are waiting to be recalled.[2]

It is important to stress that the regulatory framework of temporary layoffs is complex and varies from one country to another. Some countries, like the U.S., have adopted an experience-rated system, where the unemployment contributions depend on the previous layoff history. Other countries (e.g. Norway) make a clear distinction between temporary and permanent layoffs, but allow firms to shift part of the costs to the unemployment insurance. Moreover, the prevalence of seasonal jobs in industries like agriculture, tourism, and construction may be responsible for the cross-country variation in the number of temporary layoffs.

This paper rests on two theories: job-search theory and implicit contract theory. The job-search theory emphasizes supply side relationships, while the implicit contract theory assumes workers to be inactive and firm incentives to play a key role in the timing of worker recall. Papers by Feldstein (1976) and Baily (1977) focused on the potential collusion between employers and workers. Firms facing changes in demand for the products enter implicit contracts with workers to shift part of the production costs to the unemployment insurance systems. The authors conclude that only fully experience-rated unemployment insurance system would eliminate incentives for collusion. Job-search theory (e.g. Mortensen, 1990) examines the temporary layoffs from the worker point of view. The workers compare pros and cons of waiting to be recalled and searching for a job with a new employer. The job-search models predict that generosity of unemployment insurance relates positively to the length of unemployment spells, and in the case when benefits are of a limited duration, recalls are concentrated around the point of benefit exhaustion. Moreover, general job-search theory conclusions (e.g. Mortensen, 1977) about the impact of unemployment compensation and unemployment duration until finding a new job remain unchanged in the presence of temporary layoffs.

Pissarides (1982) combined both approaches, considering simultaneously incentives of firms and workers. He showed that recall expectations influence job-search behaviour and, more importantly, that firm recall policy has an impact on the decision of individuals to search for a new job. Firms adjust their behaviours depending on the costs of layoffs and recall, and on the probability of losing workers.

[2] Details on the calculation can be found at www.ams.se/admin/Documents/rapporter/ura99_10.pdf

Among the first empirical studies to model the unemployment spell duration accounting for the possibility to be recalled is Katz and Meyer (1990). They showed that recalls are a quantitatively very important feature in the U.S. labour market. The authors stress that the expectations concerning the likelihood of recall affect the duration of unemployment. Thus studies that fail to account for the possibility of recall may lead to misleading conclusions concerning the determinants of job search behaviour and unemployment duration. Those who are expecting to be recalled have shorter unemployment spells compared to the unemployed who report low expectations of recall. However, individuals who have high recall expectations and are not recalled at the beginning of the unemployment spell tend to have excessively long unemployment periods.

Recent studies of unemployment duration in Europe stressed that the recall process and hence the determinants of unemployment duration are likely to be a combination of worker and firm incentives. Mavromaras and Orme (2004) report that firm incentives influence the duration of unemployment spells among of workers with strong worker-firm attachments. In their study of Norway, Roed and Nordberg (2003) investigated changes in the regulation of temporary layoff unemployment spells and arrived at the conclusion that the duration of an unemployment spell is highly sensitive towards firm incentives.

The next section describes the Swedish labour market, while Section 3 describes the data. Section 4 analyses the determinants of the probability of recall, and Section 5 models the determinants of unemployment duration before transition to recall or a new job. Section 6 summarizes the paper and draws conclusion.

2. The Swedish labour-market: legal and other rules

Sweden and other Nordic countries fall neither into the British common-law nor into the French civil-law tradition, but rather constitute a separate Scandinavian legal tradition, characterised in recent decades by a relatively high degree of employment security and well developed social protection (Botero et al., 2004).[3]

In event of unemployment, workers in Sweden are entitled to compensation lasting up to 300 working days (450 days for individuals older than 55), financed by the tax on

[3] Fahlbeck (1997) reviews Swedish labor law. van Peijpe and Blanpain (1998) compare Swedish labor protection to that of other countries. Holmlund and Storrie (2002) also discuss labor protection issues.

individuals.[4] Benefits cannot exceed 80% of the previous wage or 570 SEK (63.20 EUR) per day. To qualify for unemployment insurance, one needs to first have worked for six months. Those who do not qualify for unemployment insurance may receive cash assistance of 240 SEK (26.15 EUR) per day for up to 150 days.

Employment relations in Sweden are regulated by the Swedish Employment Protection Act (*Lagen om anställningsskydd, LAS*), which both introduced fundamental restrictions on employer rights to dismiss workers, and defined the possible scope for deviation through collective agreements.[5] It covers virtually all categories of workers, and contains provisions on types of employment, dismissal procedures, notification periods and priority rules in the case of layoff and recall.

The law defines two types of layoffs: temporary with a fixed recall-date (*permittering*) and indefinite ones. *Permittering* is allowed only if provided for in a collective agreement, and in that case laid-off workers do not generally register with the employment office nor engage in a job-search. Since 1985 employers have borne all costs of *permittering,* and its attractiveness has been substantially reduced. This paper focuses primarily on indefinite layoffs.

According to the recall rules defined in the law, an indefinitely laid-off employee who had been working with the enterprise for at least 12 months in the preceding 3 years has precedence to the job if a new position becomes available within one year.[6] If several individuals apply for the same position, they are ranked according to firm-specific seniority or are given equal seniority based on age (oldest have preference). These rules are not binding, and can be changed by collective agreements. Recent amendments to the law have reduced recall rights, so that part-time workers who wish to increase their working hours now have priority over laid-off workers.

3. Available information

The Händel database (unemployment registry) provides complete information on all registrants at the state employment agency, including unemployment periods and their durations, participation in active labour market programmes and reasons for deregistration

[4] The Swedish unemployment insurance system, unlike the American, has no 'experience rating', which might increase the incidence of temporary layoffs. However, the impact of 'experience rating' has been questioned in a number of studies; see Holmlund (1998) for the discussion.
[5] English translation of the law is available at (www.sweden.gov.se).
[6] For people hired after 1 January 1997, 9 months applies.

from the employment office.[7] However, the unemployment registry is incomplete regarding individual employment history prior to becoming unemployed, and lacks information on where job-seekers eventually found work.[8] Instead, such information is available in an employee-employer matched dataset, Statistics Sweden's Business Register (RAMS), which tells where approximately 200,000 individuals work as of November of each year.[9]

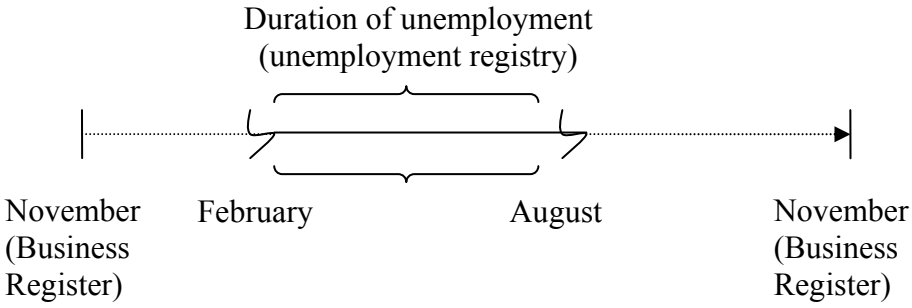
Individuals were considered unemployed if and only as long as they were listed by the employment agency as unemployed and searching for a job. This definition ensures that individuals are openly unemployed and do not participate in active labour market measures.[10]

The unemployment registry gives reasons for termination of registration with the employment agency. Individuals thus identified as transitioning to a job were then identified in the Business Registry (if they were included there). They were considered to have been recalled if they were found working for their previous employer in the November following unemployment.

Figure 1 illustrates what was known and what was assumed. Suppose a previously employed individual entered the employment office in February and remained unemployed until August when he/she found employment and therefore exited the registry. If this individual was working at a firm included in the Business Register, when the enterprise he/she was working for in November before and after unemployment were identified. If the identification numbers of the enterprises were the same, they were considered to have been recalled. If the identification numbers were not the same, or if one was missing because the particular enterprise was not included in the Business Register, then the individual was considered to have started a new job. Dotted lines represent periods when place of employment was assumed.[11]

[7] The database has been found to be representative of the unemployed about 96% of whom had contacted the employment agency (Jansson, 1996).
[8] Based on the result of a follow-up survey Jansson (2002) concludes that information on recalls is often missing in Händel dataset.
[9] Edin and Fredriksson (2001) describe this data in detail.
[10] Similar definition of unemployment was used in other papers for Sweden (e.g. Carling et al., 2001). See the Appendix of the working-paper version (Carling et al., 2001) at http://linda.nek.uu.se/1999wp20.pdf for more details on the definition of unemployment and calculation of the duration of the unemployment spell.
[11] The data available thus left two unavoidable sources of ambiguity: First, unemployment duration might be longer than recorded in the registry if the unemployed did not register as unemployed immediately upon losing the previous job. Second, the individual might not return to the previous enterprise immediately but might first have some other employment, or conversely return initially to the previous employer but then move on to a new job.

Figure 1. Sample construction



Large firms may consist of several divisions, each with a different identification number. Thus, only those unemployed who returned to work at the same division were considered recalled.

Individuals were considered employed by the enterprise if and only if the wage received there was their main source of labour-income. The data neither contains information on individual hours worked or whether the labour-contract was temporary, nor on individuals' subjective expectations of recall.[12]

An important variable used in the analysis is tenure at the enterprise. A number of empirical studies have found that length of tenure correlates positively with job-security (Parson, 1972; Valletta, 1999, 2000; Arai and Vilhelmsson, 2004). On the other hand, tenure correlates negatively with the probability of finding a new job, and positively with unemployment duration (Katz and Meyer, 1990; Idson, and Valletta, 1996). Previous studies of unemployment duration in Sweden have not accounted for tenure, concentrating instead on total work experience. Data from the Business Register was therefore used to trace individuals back to 1990, and thereby to construct a dummy variable for tenure with maximum tenure equal to eight.[13]

3.1 Sample selection

The initial sample consisted of 12,630 individuals aged 18-64 who registered with the employment agency as unemployed during the 12-month period from November 1997 to November 1998, and who could be identified in the Business Register as previously

[12] Individuals' expectations of recall might influence their job-search behavior (Katz and Meyer, 1990; Anderson, 1992; Burgess and Stuart, 1998).
[13] The RAMS dataset is available from 1990.

employed. Each individual was followed until the exit from unemployment or until November 2000, whichever came first.

Because of the focus on the possibility of recall and influence of regular unemployment insurance, individuals receiving cash assistance (3,945), disabled individuals, those who lost their jobs due to enterprise liquidation or restructuring (732), and individuals who transitioned to unknown destinations (405) were excluded.[14] The final sample used in the analysis included 7,548 individuals.[15]

3.2 Basic sample-statistics

Consistent with Jansson (2002) who reported a 45% recall-rate, almost 47% of those in the sample used here who found jobs during the study-period returned to their previous employers (Table 1). Splitting the population into age groups reveals that older people are less likely to transition to employment, though the proportion of recalls is the highest among this group. Those with more tenure were also recalled more often (Table A1 in the Appendix) and the share of those transitioning to employment was roughly constant, except for the highest and lowest categories of tenure.

Table 1. Share of transitions to any job, divided into destination: (recall or new job) and into age categories

Age	All ages	18-24	25-54	55-64
Transitioning to any job	49.7	49.14	50.10	46.57
Recall (N = 1751)	46.68	41.12	46.63	65.26
New Job (N = 2000)	53.32	58.88	53.37	34.74

The average unemployment duration was 83 days; shorter for recall and longer for transition to a new job. Those recalled also had shorter unemployment spells than those who found new jobs, while younger workers had shorter unemployment spells either way (Table 2.). Those with less tenure also generally had shorter unemployment either way (Table A2 in

[14] Enterprises were considered liquidated or restructured if their identification numbers disappeared from the Business Registry. Although individuals dismissed from such enterprises might still be eligible for recall, the possibility was considered negligible.
[15] 3,453 individuals were receiving cash assistance.

the Appendix). Tenure and age-effects thus seemed correlated with respect to both recall and unemployment duration.

Table 2. Unemployment duration by transition type and age (days)

	Any job			Recall			New job		
Age	Mean	St.D.	Median	Mean	St.D.	Median	Mean	St.D.	Median
All	82.65	80.48	61	77.1	71.8	58	87.48	87.13	62
18-24	59.10	52.94	44.5	53.17	42.88	42.5	63.24	58.66	48
25-54	84.20	79.25	62	77.61	67.94	61	89.95	87.56	63
55-64	134.01	130.23	92.5	120.2	122.02	86.5	159.87	141.78	122

4. Empirical determinants of the probability of recall

The determinants of being recalled were analyzed first, using a binary-logistic model. The dependent variable took the value 1 if the individual was recalled; otherwise 0.

Large firms might rely more on temporary internal labour-reallocation, whereas smaller firms might rely more on temporary layoffs, which might also be shorter when used by large firms (Mavromaras and Rudolph, 1998). To control for the size of the enterprise, the natural logarithm of the number of employees was thus included in the estimation. The type of ownership and the particular industry might also influence the probability of recall and the duration of unemployment analysed in the next section. The estimation thus included dummies for private ownership and for industry-types.

A high local unemployment rate can increase the probability of recall, though it can also increase unemployment duration before a new job is found (Jansson, 2002). Residing in a big city should reduce the recall probability but decrease the unemployment duration (Lazear, 2003), as labour market where is likely to offer more job openings, keeping search costs relatively low and making it easier for individuals to find new jobs matching their skills. Thus, the regional unemployment rate and a dummy for residence in a big city were used.[16]

To control for individual specific characteristics, a standard set of control variables (age, gender, education, country of origin and the presence of children under 7 years old) were also included. Finally, possible seasonal effects were captured by dummies for the quarters of inflow into unemployment.

[16] The big cities are Stockholm, Gothenburg and Malmo.

4.1 Regression results on the probability of recall

The first three columns of Table 3 give means and shares of variables by type of transition from unemployment, while the last two columns show the results of the logistic regression. Consistent with what we saw before, those who were recalled were on average 2.5 years older than those who started a new job. However, the age-coefficients in the regression results were not significant at any conventional level. Men were slightly over-represented (59%) among the recalled individuals. Again consistent with what we saw before, those who were recalled had more tenure than those who started a new job, and those with more tenure made up a larger proportion of those recalled. The regression confirms that tenure was a significant determinant of recall. Recalled individuals seem to have had less education. This result was confirmed when controlling for other characteristics in the regression. Native and non-native born were roughly equally distributed between recall and a new job, while the regression results gave no conventionally significant effects for country of origin. Those recalled were less likely to come from a big city, and their local unemployment rates were on higher on average. Both variables significantly affected the probability of recall. Those recalled and those who started a new job were equally likely to work in privately owned firms, but when controlling for other characteristics in the regression, private ownership gave a significantly reduced probability of recall. A higher proportion of those recalled were in construction, a lower proportion in service and finance, and these results were confirmed by the regression. Finally, although a higher proportion of those recalled had become unemployed in the summer, the winter was the best season for the probability of recall, and summer the worst.

Table 3. Means and shares of variables by transition type, and logistic regression results on the probability of recall

Variable		Mean values and shares			Logistic regression	
		New Job N = 2000	Recall N = 1751	Other N = 3797	Odds ratio	St.D.
Age:		32.67	35.10	33.52		
	18-24	0.18	0.14	0.16	0.90	(0.08)
	25-54	0.79	0.79	0.78		
	55-64	0.03	0.07	0.06	1.11	(0.13)
Male:		0.54	0.59	0.45	1.23[1]	(0.08)
Child < 7:		0.23	0.23	0.24	0.95	(0.069)
Tenure:		2.34	3.00	2.68		
	Tenure<=1	0.51	0.36	0.46		
	1<Tenure<=2	0.18	0.20	0.18	1.51[1]	(0.077)
	2<Tenure<=3	0.10	0.12	0.11	1.54[1]	(0.092)
	3<Tenure<=4	0.07	0.10	0.08	1.62[1]	(0.103)
	4<Tenure<=5	0.03	0.04	0.03	1.63[1]	(0.146)
	5<Tenure<=6	0.04	0.06	0.05	1.60[1]	(0.127)
	6<Tenure<=7	0.01	0.02	0.01	1.78[1]	(0.222)
	7<Tenure	0.05	0.09	0.08	1.47[1]	(0.109)
Education:	< Upper secondary, 2 years	0.15	0.25	0.21		
	Upper secondary, 2 years	0.39	0.41	0.41	0.77[1]	(0.075)
	Upper secondary, 3 years	0.21	0.18	0.22	0.73[1]	(0.094)
	University	0.25	0.16	0.17	0.75[1]	(0.094)
Country of origin:	Sweden	0.94	0.93	0.92		
	Other Nordic	0.03	0.03	0.03	0.87	(0.179)
	Other Europe	0.01	0.02	0.02	1.20	(0.217)
	Other	0.03	0.03	0.04	0.91	(0.172)
Regional characteristic:	Regional unemployment rate	5.27	5.38	5.36	1.05[3]	(0.021)
	Big city	0.17	0.12	0.16	0.75[1]	(0.089)
	Private ownership	0.70	0.70	0.69	0.85[5]	(0.081)
Enterprise characteristics:	ln(size)	3.41	3.39	3.45	1.00	(0.018)
Industry:	Manufacturing	0.17	0.19	0.19	1.05	(0.090)
	Construction	0.12	0.20	0.06	2.18[1]	(0.098)
	Service & finance	0.06	0.04	0.07	0.74[1]	(0.092)
	Other					
Quarter of inflow:	Autumn	0.18	0.16	0.16	0.76[1]	(0.087)
	Winter	0.28	0.32	0.22		
	Spring	0.20	0.19	0.18	0.85[7]	(0.083)
	Summer	0.34	0.33	0.44	0.73[1]	(0.072)
Constant					-1.309[1]	(0.171)
Log-likelihood value					-3918.59	

Notes: The dependent variable in the logistic regression took the value 1 if individuals were recalled; and otherwise 0. Superscripts denote significance levels.

5. Empirical determinants of unemployment duration

So far we have looked at the probabilities of recall vs. starting a new job. Next unemployment duration was analysed using an independent competing risk model where the competing risks were again recall or getting a new job (Lancaster, 1990; Narendranathan and Stewart, 1993; Jenkins, 2004). A competing risk model, in which exits to different destinations are treated as censored, is required because of the possibility of a different underlying process determining the rates of recall vs. starting a new job. Following Carling et al. (1996, 2001) who also studied unemployment durations in Sweden, the cause specific hazard rate was written as:

$$\theta_{ij}(t) = \alpha_j(t) \, [\exp x_i(t)'\beta_j],$$

where $i = 1, \ldots, N$; j = recall, new job and other destinations; t is continuous time measured in weeks; $\alpha(t)$ is a baseline hazard rate; x_i is a vector of explanatory characteristics; and β is a vector of unknown parameters to be estimated.[17] The baseline hazard rate could vary among the 18 months, but was held constant during each month. Any possible heterogeneity was assumed to be captured by observed variables, which were assumed time-invariant.[18] Once hazard rates were determined it was simple to interpret results in terms of duration, since a higher risk of recall or starting a new job implies shorter unemployment durations, and vice versa.[19]

5.1 Estimation results for the competing risk model

In order to have a baseline against which to judge the usefulness of the competing risk model, it was first collapsed into a single risk model, combining data for both recall and new jobs. Table 4 shows the results of both the single risk and the competing risk models. The explanatory variables are the same as in the previous analysis of the probabilities of being recalled or starting a new job.

The risk of finding employment declined with age in the single risk model, and for both recall and new job in the competing risk model. All results were statistically significant, but with a stronger effect for new jobs as opposed to recall.

[17] Since the focus of the paper is on transitions to employment, we do not present results of estimation for the category "other", which includes transitions to out of the labor force and active labor market programmes.
[18] A model including a gamma distributed unobserved heterogeneity term was estimated, but the results indicated negligible heterogeneity.
[19] In order to avoid recurrent event problems and dependence among unemployed spells for the same individual, I concentrate on the first spell of unemployment.

Men had a higher risk of finding work overall, though in the competing risk model the effect was only statistically significant at conventional levels for recall, and not for new jobs. Having young children had no statistical-significant effects in either model.

In the single risk model the risk of finding work seems to have been higher with less tenure, and then generally declining, but almost none of the results are statistically significant. In the competing risk model, however, the cause of the mixed effect is clear: Tenure had a positive and statistically significant effect for all except the highest category (more than 7 years) for recall, but usually a significant, generally increasing negative effect on finding a new job. Consistent with the findings presented earlier, those with more tenure were recalled faster but took longer to find new jobs than those with less tenure.[20]

We saw earlier that those with less than secondary education were more likely to be recalled than those with more education, which is confirmed in the competing risk model where more educated individuals had a lower risk of being recalled. Individuals with less than secondary education had a lower risk of finding a new job however, while more education seems to have helped more. The single risk model masks this relationship, thus possibly also disguising the true return to education. The effects were strongest (negative for recall, positive for new job) for those with university education. This suggests that education, which provides a more universal form of human capital, was more valued by new employers, whereas, as we saw, those with firm-specific human capital (tenure) were more likely to be recalled. If firms and workers share costs and profits from investment in on-the-job training, recall should be likely (Becker, 1964; Hashimoto, 1981).

Non-natives, and especially non-Nordics, found it harder to find employment in the single risk model, with the strongest and most significant effect for non-Europeans. Similar results were found for getting a new job in the competing risk model, while there were no statistically significant results for recall, and the value for non-Nordic Europeans was actually positive. Thus, while there may be discrimination involved in new hiring, once employees are known to a firm it seems much less prevalent.

The single risk model generated statistically significant negative results for both the local unemployment rate and residence in a big city, but again the competing risk model showed striking differences. The risk of recall was negatively affected by residence in a big city, whereas those living elsewhere were recalled earlier, and the effect of local unemployment was actually positive, though again not statistically significant. Conversely, the risk of

[20] Katz (1986), Katz and Meyer (1990) and Idson and Valletta (1996) documented the relationship between tenure and the probability of finding a new job.

finding a new job was negatively affected by local unemployment, as one might expect, whereas the effect of living in a big city was actually positive, though, again, not statistically significant.

Firm size had no significant effect in either model, but having been employed in a private firm negatively influenced the risk of recall. Perhaps private firms were more aggressive in attracting new workers.

Construction employees had by far the highest risk of finding work. Service and finance employees had the lowest risk of finding a new job.[21]

The single risk model did not provide an accurate picture of the impact of covariates on the risk of being recalled or finding a new job, making the competing risk model clearly preferable. The models were also tested against each other; following Narendranathan and Stewart (1993) the null hypothesis that both models are the same could be rejected. [22]

[21] A separate model was also estimated for the manufacturing industry, and the results appeared to be sufficiently robust.

[22] The test-statistic is $2[\ln(L_{CR}) - \ln(L_{SR}) - \sum_j n_j \ln(p_j)]$, where $\ln(L_{CR})$ is the maximized log-likelihood value of the competing-risks model; $\ln(L_{SR})$ is the maximized log-likelihood value of the single-risk model, n_j is the number of exits to state j (j = 2); and $p_j = n_j / \sum_j n_j$. The test-statistic is distributed Chi-squared with degrees of freedom equal to the number of restrictions. The value of the test was 328.9, which is highly significant.

Table 4. Estimation results from single risk and competing risk models

		Single risk		Competing risks			
		Recall & New Job		New job		Recall	
Variable		Coeff.	Std.	Coeff.	Std.	Coeff.	Std.
Age:	18-24	0.339[1]	(0.049)	0.442[1]	(0.065)	0.215[1]	(0.075)
	25-54						
	55-64	-0.651[1]	(0.083)	-0.988[1]	(0.134)	-0.402[1]	(0.102)
Male:		0.080[3]	(0.036)	0.062	(0.049)	0.103[7]	(0.055)
Child<=7:		0.014	(0.040)	0.025	(0.056)	0.003	(0.059)
Tenure::	Tenure <=1						
	1<Tenure<=2	0.041	(0.043)	-0.144[2]	(0.059)	0.285[1]	(0.067)
	2<Tenure<=3	0.044	(0.054)	-0.201[1]	(0.076)	0.345[1]	(0.079)
	3<Tenure<=4	-0.061	(0.060)	-0.363[1]	(0.087)	0.284[1]	(0.086)
	4<Tenure<=5	-0.076	(0.088)	-0.408[1]	(0.137)	0.281[2]	(0.116)
	5<Tenure<=6	-0.117	(0.072)	-0.417[1]	(0.115)	0.218[3]	(0.097)
	6<Tenure<=7	-0.008	(0.121)	-0.288	(0.186)	0.305[8]	(0.171)
	7<Tenure	-0.305[1]	(0.068)	-0.706[1]	(0.107)	0.094	(0.090)
Education:	< Upper secondary, 2						
	Upper secondary, 2	0.068	(0.045)	0.310[1]	(0.069)	-0.145[2]	(0.061)
	Upper secondary, 3	0.093[10]	(0.055)	0.350[1]	(0.080)	-0.139[8]	(0.077)
	University	0.221[1]	(0.052)	0.610[1]	(0.075)	-0.205[1]	(0.078)
Country of origin:	Sweden						
	Other Nordic	-0.131	(0.107)	-0.080	(0.143)	-0.194	(0.154)
	Other Europe	-0.233[10]	(0.141)	-0.531[3]	(0.229)	0.053	(0.181)
	Other	-0.345[1]	(0.101)	-0.447[1]	(0.139)	-0.226	(0.151)
Regional characteristic:	Unemployment rate	-0.022[8]	(0.012)	-0.063[1]	(0.017)	0.026	(0.018)
	Big city	-0.125[1]	(0.047)	0.019	(0.062)	-0.320[1]	(0.078)
Enterprise characteristics:	Private ownership	-0.089[5]	(0.046)	-0.023	(0.061)	-0.171[2]	(0.067)
	ln(size)	0.009	(0.010)	0.007	(0.013)	0.011	(0.015)
Industry:	Manufacturing	-0.100[6]	(0.053)	-0.154[4]	(0.073)	-0.041	(0.076)
	Construction	0.414[1]	(0.053)	0.181[3]	(0.081)	0.626[1]	(0.074)
	Services & finance	-0.177[1]	(0.050)	-0.092	(0.067)	-0.296[1]	(0.080)
	Other						
Quarter of inflow:	Autumn	-0.119[2]	(0.047)	0.004	(0.066)	-0.253[1]	(0.070)
	Winter						
	Spring	-0.076	(0.048)	-0.028	(0.067)	-0.125[8]	(0.069)
	Summer	-0.037	(0.042)	-0.016	(0.059)	-0.050	(0.061)
Constant		-4.282[1]	(0.403)	-4.651[1]	(0.574)	-5.403[1]	(0.591)
Log-likelihood value		-8313.13		-5547.68		-5196.82	

Notes: Superscripts denote significance levels. Coefficients indicate variables' effects on the hazard function, a positive coefficient increasing the probability of exit, and thereby decreasing expected duration. Estimated duration parameters can be found in the Appendix, Table A3.

5.2 Duration dependence

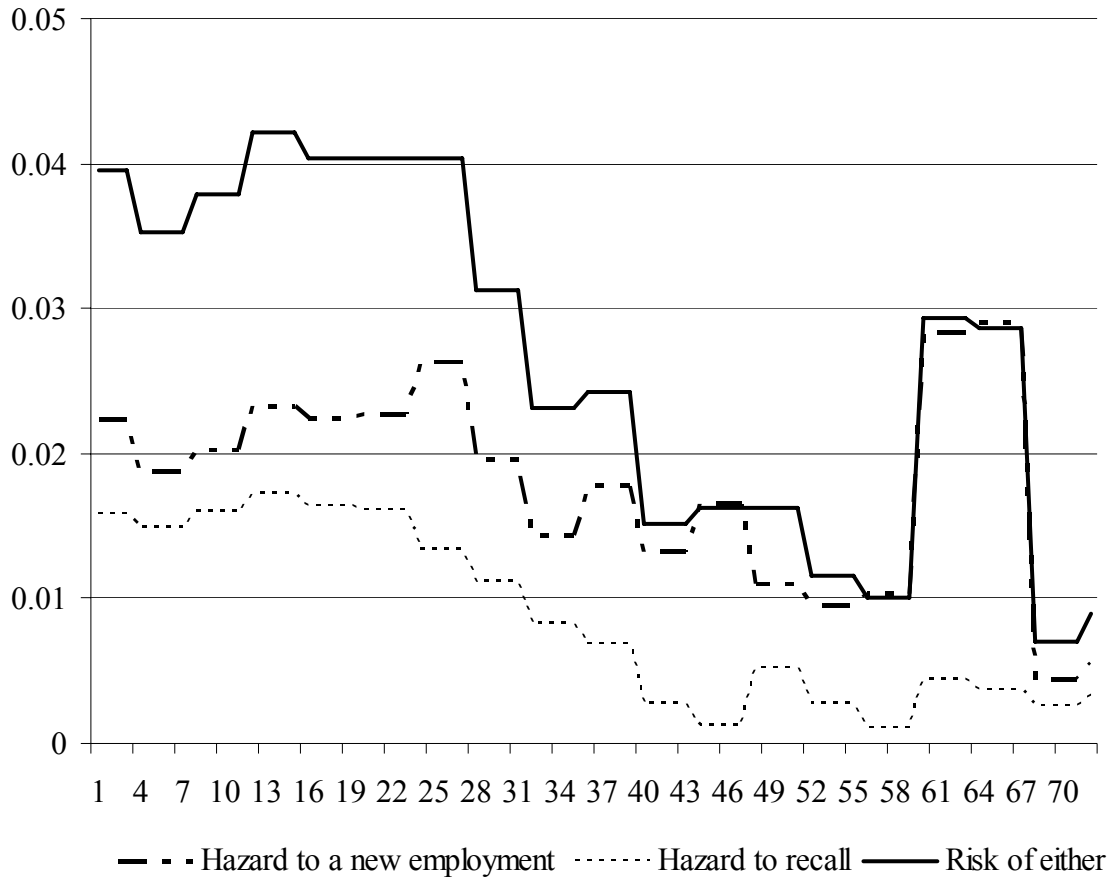
Duration dependence was captured in this model by 18 dummy variables of 4 weeks each up to a maximum of 72 weeks (see Table A3 in the Appendix).

Carling et al. (1996) found negatively-sloped risks of finding new job for Sweden. The authors reported a substantial surge in job-findings in the weeks just before unemployment benefits ran out. Several other studies (Katz, 1986; Katz and Meyer, 1990; Jurajda and Tannery, 2003) have also reported that both recall and finding new jobs increased at that point. The results found here do not fully support those conclusions, but are instead closer to those of Jansson (2002).

Figure 2 shows the baseline risk with all covariates set to zero. After an initial decline and then increase in the risk of either recall or finding a new job, followed by a long decline from 28 to 60 weeks, there is a pronounced spike around week 64, the point of benefit exhaustion.[23] However, when the risks of recall and of finding a new job are distinguished, different patterns emerge. The risk of finding a new job was similar though the immediate decline was more moderate. However, the risk of recall showed almost no sensitivity to benefit exhaustion.

[23] 'The risk of either' refers to the results of the single destination model, without distinguishing between new jobs and recalls.

Figure 2. Predicted baseline risks of recall, new job, or either



5.3 Sensitivity analysis excluding those over 44

According to Section 3 §3 of the Swedish Employment Protection Act: 'The employee may include in the calculation one extra month of employment for each month of employment commenced after the age of 45. However the employee may only be credited with a maximum of 60 such extra months.[24] Thus a modified rule is used when calculating seniority for workers older than 45. To check if the results found here are sensitive to exclusion of workers over 45, a Cox proportional-hazard model was estimated with the sample restricted to individuals aged 18 to 44 (see Table A4 in the Appendix). The original results appear robust. Although there are some changes in statistical significance, the impacts of covariates on the hazard rates remain essentially unchanged.

[24] English translation of the law is available at (www.sweden.gov.se).

5.4 Age and tenure profile of the risk of recall

So far we have found that the shape of the predicted risk of recall is not sensitive to the expiration of unemployment insurance. This may suggest that workers expecting recall remain passive and firm incentives play a more important role in the decision to recall workers. Yet, the small number of observations 'surviving' until the moment of benefit exhaustion may mask the increase in the risk of transition to recall at the moment when the payment of benefits terminates.

To see further whether firms behave strategically, we test the proposition of the Swedish Employment Protection Act which suggests that, given equal tenure, older workers should have a priority to be recalled. Thus, we would expect that, given equal tenure, older workers would be recalled faster compared to younger ones. However, old workers have a prolonged entitlement to unemployment benefits, thus they can remain unemployed longer compared to younger individuals. It follows that if a firm wants to keep laid-off workers attached to the enterprise, it should first recall younger workers.

We can test this proposition further in the context of a duration model by treating tenure as a continuous variable and interacting it with age categories. The results are presented in Table 5. Young workers (18-24) with more tenure were more likely to be recalled, but older workers (55-64) with more tenure were less likely to be recalled, and thus remained unemployed longer. It seems that firms tended to deviate from the legislated norm in favour of younger individuals, perhaps because workers over age 55 are entitled to longer unemployment compensation. Firms may prefer to recall younger workers first, expecting that these workers cannot wait too long.

Table 5. Effects of age, tenure and their interaction on the risk of recall

		Risk of recall including interaction-terms		Previous results from Table 4	
		1		2	
Variable		Coeff.	St.D.	Coeff.	St.D.
Age:	18-24	0.062	(0.125)	0.215[1]	(0.075)
	25-54				
	55-64	-0.168	(0.185)	-0.402[1]	(0.102)
Age*tenure:	(18-24)*tenure	0.085[6]	(0.044)	-	-
	(55-64)*tenure	-0.055[10]	(0.033)	-	-
Tenure:		0.024[3]	(0.011)	-	-

Notes: Except tenure (which is now a continuous variable) and it's interaction with age, all other variables are the same as in Table 4. Superscripts denote significance levels.

6. Summary and conclusions

The main goal of this paper is to identify factors that influence unemployment duration with exit to a job in Sweden in the end of the 1990s. The empirical analysis is performed using an employee-employer dataset that includes a number of enterprise characteristics and provides information on individual tenure. The econometric approach employs estimation of the competing risk duration model to distinguish between exits to the previous employer (recall) and exits to a new job.

I find support for the hypothesis that recall and new employment are two distinct transitions. Specifically, the relationship between the risk of exit to recall and time spent in unemployment was close to constant, while the risk of obtaining a new job over time was first decreasing and then sharply increasing around the point of benefit exhaustion. A possible explanation to this fact is that a vast majority of recalls happen before unemployment benefits exhaust, and few unemployment spells with exit to recall last for more than a year. The results suggest that almost 47% of the unemployed who exit employment to a job return to the previous employer. Moreover, unemployment spells that end in recall are much shorter compared to spells that end in a transition to a new job. These results may suggest that policies promoting participation in active labour market programmes relatively early during unemployment (Ackum-Agell et al., 2002) may have two opposite effects. First, such programmes may increase the reemployment probability of individuals who searching for new jobs. Second, individuals expecting recall but participating in some active labour market programmes may not accept a 'recall' job offer. Thus, their unemployment duration may increase. It is likely that in the short run, there can be a trade-off between active labour market policies and passive ones for unemployed individuals with strong expectations of being recalled. It remains an open question how early labour market interventions affect reemployment wages of individuals who are likely to be recalled.

Although undoubtedly important, the relationship between recall expectations and duration of unemployment does not represent the main focus of the study. I have searched for specific economic factors and non-economic forces that determine the type of exit from unemployment to two competing destinations.

The empirical results indicate that tenure at the last place of work and enterprise related characteristics have an important effect on the risk of exiting unemployment. Moreover, the impact of these characteristics also changed depending on the destination of exit from unemployment. More specifically, I find that tenure prior to unemployment

increased risk of exit to recall, but decreased the risk associated with exit to new employment. I examined the relationship between age and tenure, expecting that older workers may accumulate more tenure, and the results were robust to the exclusion of workers over 44 who are protected by the Swedish labour law. The model, which included the interaction of age and tenure, suggests that despite being protected by the Swedish legislation, older workers stay unemployed longer conditioned on the same tenure. A possible explanation is that employers are aware that workers aged 55 and over are entitled to longer unemployment benefits. On the other hand, firms may prefer younger workers because they consider older workers to be less productive, or to have higher probabilities of being on sick leave. Companies in Sweden may thus deviate from the norms suggested by the Swedish labour law by first recalling younger workers. It is important to mention that such deviations are generally allowed subject to trade union approval.

Recalls were found to be more common in the construction industry than in any other industry, though in general private employers tend to rely on recalls less than public ones.[25] The later result is in line with other Swedish evidence presented in Agell and Lundborg (2003), who found that approximately 57% of private companies in their sample used flexible arrangements to reduce costs associated with permanent labour contracts.

I find personal characteristics to be important determinants of the risk of transition from unemployment. Education, country of origin, city size and local unemployment rate generally had different effects on the risk of recall or finding a new job. For example, better educated individuals were more likely to find a new job, while less educated individuals were more likely to be recalled. A possible explanation to this fact is that higher levels of human capital make skills of individuals more transparent among different firms. It appears that recalls concentrate on relatively selected areas and among specific groups of workers. A possible explanation to this fact is that firms outside big cities rely on the same pool of workers with specific qualifications.

[25] It should be noted however that the construction industry is sensitive to business cycle effects.

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Appendix A

Table A1. Share of recall among employed workers by tenure

	All transitions to a job	Recall	New job
Tenure<=1	48.88	37.97	62.03
1<Tenure<=2	51.98	48.82	51.18
2<Tenure<=3	50.42	51.90	48.10
3<Tenure<=4	50.30	55.52	44.48
4<Tenure<=5	51.50	56.93	43.07
5<Tenure<=6	51.14	56.68	43.32
6<Tenure<=7	53.77	56.14	43.86
7<Tenure	45.49	62.17	37.83

Table A2. Distribution of mean unemployment duration days by tenure

	Total			Recall			New Job		
	Mean	Std.	Median	Mean	Std.	Median	Mean	Std.	Median
Tenure<=1	76.02	72.57	53	71.89	65.85	53	78.55	76.31	53
1<Tenure<=2	82.46	79.34	62	74.23	66.21	56.5	90.31	89.49	69
2<Tenure<=3	76.62	71.47	59	67.15	60.63	47.5	86.84	80.48	65.5
3<Tenure<=4	85.37	81.62	62	73.74	67.07	56	99.88	95.05	77
4<Tenure<=5	91.31	81.02	70	88.32	77.74	70	95.25	85.67	72
5<Tenure<=6	95.82	79.23	77	95.17	73.01	82.5	96.67	87.15	82.5
6<Tenure<=7	102.88	96.80	79	90.13	54.40	84.5	119.20	132.46	77
7<Tenure	112.61	120.88	70	100.55	107.13	70.5	132.42	138.91	70

Table A3. Estimated hazard parameters

	Single risk		Competing risks			
Duration parameters	New job	Recall	New job		Recall	
	Coeff.	Std.	Coeff.	Std.	Coeff.	Std.
1-4 weeks	1.112[1]	(0.390)	0.893	(0.582)	1.317[3]	(0.574)
5-8 weeks	1.002[2]	(0.391)	0.731	(0.583)	1.265[3]	(0.574)
9-12 weeks	1.083[1]	(0.391)	0.816	(0.584)	1.340[2]	(0.575)
13-16 weeks	1.204[1]	(0.392)	0.970[10]	(0.584)	1.427[2]	(0.576)
17-20 weeks	1.172[1]	(0.393)	0.947	(0.586)	1.383[2]	(0.577)
21-24 weeks	1.182[1]	(0.394)	0.975[10]	(0.588)	1.376[2]	(0.580)
25-28 weeks	1.196[1]	(0.396)	1.138[6]	(0.589)	1.202[4]	(0.584)
29-32 weeks	0.953[2]	(0.402)	0.849	(0.596)	1.026[9]	(0.592)
33-36 weeks	0.663	(0.412)	0.556	(0.609)	0.744	(0.607)
37-40 weeks	0.731[8]	(0.416)	0.792	(0.610)	0.562	(0.625)
41-44 weeks	0.273	(0.441)	0.513	(0.628)	-0.334	(0.725)
45-48 weeks	0.354	(0.447)	0.755	(0.625)	-1.08[5]	(0.907)
49-52 weeks	0.365	(0.457)	0.355	(0.660)	0.328	(0.683)
53-56 weeks	0.050	(0.498)	0.237	(0.691)	-0.327	(0.810)
57-60 weeks	-0.075	(0.542)	0.336	(0.708)	-1.217	(1.150)
61-64 weeks	1.032[3]	(0.463)	1.409[3]	(0.647)	0.189	(0.809)
65-68 weeks	1.057[3]	(0.487)	1.517[3]	(0.667)	0.068	(0.904)
69-72 weeks	-0.303	(0.803)	-0.326	(1.155)	-0.286	(1.151)

Notes: Superscripts denote significance levels.

Table A4. Cox model, excluding individuals above 44

		Single risk		Competing risks			
		Recall & New Job		New job		Recall	
		Coeff.	Std.	Coeff.	Std.	Coeff.	Std.
Age:	18-24	0.184[1]	(0.045)	0.208[1]	(0.059)	0.148[4]	(0.069)
	25-34						
	35-44	-0.116[2]	(0.046)	-0.217[1]	(0.064)	-0.001	(0.067)
Male:		0.077[6]	(0.040)	0.054	(0.053)	0.107[9]	(0.062)
Child<=7:		-0.009	(0.042)	-0.023	(0.058)	0.011	(0.063)
Tenure:	Tenure <=1						
	1<Tenure<=2	0.042	(0.047)	-0.143[3]	(0.064)	0.296[1]	(0.073)
	2<Tenure<=3	0.074	(0.058)	-0.148[7]	(0.080)	0.365[1]	(0.086)
	3<Tenure<=4	-0.014	(0.065)	-0.268[1]	(0.092)	0.301[1]	(0.097)
	4<Tenure<=5	-0.096	(0.100)	-0.340[3]	(0.149)	0.215	(0.141)
	5<Tenure<=6	-0.108	(0.076)	-0.414[1]	(0.121)	0.246[2]	(0.105)
	6<Tenure<=7	-0.036	(0.153)	-0.263	(0.239)	0.226	(0.215)
	7<Tenure	-0.205[3]	(0.091)	-0.522[1]	(0.138)	0.158	(0.120)
Education:	< Upper secondary, 2						
	Upper secondary, 2	0.055	(0.054)	0.220[1]	(0.079)	-0.111	(0.075)
	Upper secondary, 3	0.168[1]	(0.062)	0.349[1]	(0.087)	-0.016	(0.088)
	University	0.233[1]	(0.061)	0.549[1]	(0.084)	-0.159[9]	(0.092)
Country of origin:	Sweden						
	Nordic	-0.031	(0.130)	0.084	(0.165)	-0.203	(0.204)
	Europe	-0.431[3]	(0.194)	-0.749[2]	(0.293)	-0.110	(0.240)
	Other	-0.340[1]	(0.111)	-0.441[1]	(0.149)	-0.220	(0.167)
Regional characteristics:	Regional unemployment rate	-0.014	(0.014)	-0.051[1]	(0.018)	0.030	(0.021)
	Big city	-0.176[1]	(0.052)	-0.056	(0.067)	-0.348[1]	(0.086)
Enterprise characteristics:	Private ownership	-0.104[4]	(0.050)	-0.058	(0.067)	-0.163[3]	(0.074)
	Ln(size)	0.017	(0.011)	0.005	(0.015)	0.0345	(0.017)
Industry:	Manufacturing	-0.127[4]	(0.058)	-0.134[10]	(0.079)	-0.118	(0.086)
	Construction	0.363[1]	(0.059)	0.158[8]	(0.088)	0.566[1]	(0.085)
	Service & finance	-0.168[1]	(0.055)	-0.062	(0.072)	-0.330[1]	(0.090)
	Other						
Quarter of inflow:	Autumn	-0.148[1]	(0.053)	-0.037	(0.072)	-0.291[1]	(0.083)
	Winter						
	Spring	-0.063	(0.052)	-0.057	(0.072)	-0.062	(0.077)
	Summer	-0.062	(0.046)	-0.073	(0.063)	-0.041	(0.069)
Log-likelihood value		-24346.28		-13376.28		-10883.62	

Notes: Superscripts denote significance levels. The sample consists of 6,175 individuals. Coefficients indicate effects of variables on the hazard function, a positive coefficient increasing the probability of exit, and thereby decreasing expected duration.