Worker Flows in Russian Economic Transition: Longitudinal Evidence from Four Cities

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January 8, 2002

Abstract

This paper investigates worker flows in four Russian cities using the first longitudinal work history data available for that country and the Russian Longitudinal Monitoring Survey (RLMS). Trends in worker flows in the late Soviet and post–Soviet era are examined. Effects of demographic characteristics of individuals, local factors, and the sector of current employment, on different types of transitions are identified. Worker flows are found to have been comparable to those in Western European countries in the late Soviet era, and to have increased in the late 1990s. Job–to–job transitions are found to strongly dominate job–to–non–employment transitions in the post–Soviet era.

Keywords: worker flows, duration models, Russia
JEL codes: J60, J63, C41
The author is grateful to Audra Bowlus, Simon Clarke, Maarten Lindeboom, Katarina Katz, and two anonymous referees for suggestions which considerably improved the quality of this paper. Support from the Tinbergen Institute, and data from the Center for Comparative Labor Studies at Warwick University and ISITO (Moscow) made this project possible. All remaining errors are the responsibility of the author.

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1 Introduction

This paper investigates the movement of workers into new employment and non-employment from jobs held at the end of the Soviet period, and the movement of workers between jobs during the post-Soviet era. Multinomial logit and competing risks models for transitions to different labor market states are estimated. Analysis is performed separately for jobs underway in January 1991, and those which began after that date. The effects of demographic characteristics of individuals, local factors, and macroeconomic trends on different types of movements between jobs are identified. Together, the results of the two estimations form a picture of how worker flows have evolved under deregulated labor markets, and of how these vary by observable individual characteristics.

This analysis of worker flows using micro survey data complements existing work which has looked at labor turnover in Russian firms. While extensive use has been made of the Russian Longitudinal Monitoring Survey (RLMS) (see for example Lehmann and Wadsworth (1999)) to look at year-on-year transition intensities, complete longitudinal information on worker transitions did not exist until 1998. Data on the labor market histories of individuals allows determination of the extent to which labor hoarding implies that worker flows in and out of such firms are low. At the time of writing, the Institute for Labor Relations Research (ISITO) 1998 household survey was the only existing household survey containing full information about the labor market trajectories of individuals over the initial period of economic transition. As such, the analysis carried out in this paper using the ISITO survey is the first duration analysis of worker flows (known to the author) carried out for Russia.

The goal of this paper is to characterize the nature of worker transitions made by individuals in the post-transition Russian labor market, and to investigate how individuals move between sectors of ownership. The paper is organised as follows. Section 2 is devoted to background information about the liberalization of labor markets in post-Soviet Russia and the existing literature on labor market dynamics. In section 3 the Russian Longitudinal Monitoring Survey(RLMS) panels and the ISITO household survey data used in the empirical analysis are introduced. Section 4 is devoted to the discussion of descriptive statistics from the RLMS on individuals in new jobs and from ISITO on the frequency of job transitions. In section 5 the econometric frameworks used are introduced, and models estimated. Section 6 concludes.

2 Background

In 1992 it was expected that rapid privatization of state-owned enterprises and deregulation of prices would lead to large-scale labor shedding and to the quick bankruptcy of non-profitable enterprises in the former Soviet Union. The workers made redundant by these bankrupcies were expected to flow through a transitional unemployment pool and then to be absorbed into surviving profitable enterprises, new firms, and self-employment. Instantaneous deregulation of wages and prices was seen as the quickest way to break the bonds of workers with unproductive Soviet enterprises, and to allow them to reallocate themselves across the labor market according to their skills (see for example Boeri (1999)). Speedy privatization of state-owned enterprises in Russia was deemed to be the quickest way of enforcing rationalization of the labor forces of enterprises.

Despite the deregulation of wages and prices in January 1992, the legalisation of unemployment, and the privatization of the majority of state-owned enterprises, the Russian labor market still suffers from allocational inefficiencies. The Russian statistical agency Goskomstat reports that GDP fell by 40% between 1992 and 1995, while employment fell by only 7%. Slack labor demand instead facilitated a general decline of real wages in Russia, and a simultaneous growth in wage arrears [1].

In 1994, only 2% of the Russian labor force was made redundant (Layard and Parker (1996)). This level of dismissals suggests levels of job destruction were far below the 10% annual figure measured for the U.S. during this period (Davis and Haltiwanger (1999)). The shedding of excess labor that was expected by Western-trained economists at the beginning of the Russian transition largely failed to materialise. Figure 1 shows trends in employment rates in Russia since 1987 using one of the surveys to be used in the following analysis, the ISITO. It is evident that, employment rates have trended downwards only very slowly, and were still high compared to Western European countries in 1997, at 84%.

While the focus of this investigation is on job durations and transitions, the ISITO survey also provides information on transitions from non-employment. Amongst people of working age, the non-employment rate was 3.7% in the 1990-1991 period. Of individuals who flowed into the non-employment pool after January 1st, 1991, 63.4% had not exited this state by the time of the spring 1998 interview. This large exit from employment is reflected in Figure 1. More than 1/2 of all exits from non-employment were to jobs in

[1] According to Lehmann et al. (1999), less than 50% of employees in mining, agriculture, and manufacturing received their wages in full and on time in March, 1996. Still, unemployment remained under 10%. Goskomstat reported average real wages in Russia in 1995 to be just 34% of those in 1991.

the government/budgetary sector, 1/4 to privatised enterprises, and a small fraction to self-employment.

Residual distortions in the incentives facing firms have been put forward as a reason for the failure of Russian unemployment to rise to a level commensurate with output falls, and for low rates of job destruction. Roxburgh and Shapiro (1996) suggest that the corporate tax structure in Russia encouraged firms to keep on surplus labor in the first years of reform. Until late 1996, an excess profit tax was applicable at a threshold of six times the minimum wage. Roxburgh and Shapiro argue that enterprises had strong incentives to maintain surplus employees on their books in order to keep the average wage in the firm below this taxation threshold. However, there is not clear evidence that redundancies in Russian firms have increased since the alteration of the profit taxes at the end of 1996 to make them independent of the average wage bill.

The form which privatization efforts took in Russia is also cited as a cause of continued, high labor demand of firms. Using a 1995-96 survey of Russian manufacturing firms, Commander et al. (1996) find evidence that worker shareholder schemes are a possible factor in the apparent failure of enterprises to shed excess labor. According to this explanation, workers who obtained shareholder rights in the privatization of their enterprises have incentives to vote for managers and enterprise plans which preserve the security of their employment. As a result, shareholder firms continue to hoard labor. Vanek (1977), Svejnar and Estrin (1993), and Blanchard (1997) and many others, have contributed to a substantial theoretical and empirical literature relating insider resistance, union power, and unemployment levels, in the problem of reallocating labor efficiently.

Regulations regarding worker redundancies appear to favor continued labor hoarding in Russia. Firms can avoid 2-3 months of statutory severance pay by sending workers on leave rather than dismissing them. As well, firms seem to be able to maintain their workforces, and even to continue hiring, without paying their workers. In a 1995-96 survey of St. Petersburg firms, Brown (1998) found that managers justified continued labor hoarding in their firms in terms of the low wages paid, their expectations of a recovery in product demand, and high hiring costs. The results obtained by Standing (1996) using the Russian labor Flexibility Survey (RLFS) show that sending workers on unpaid leave was the preferred measure of reducing surplus labor amongst firms, aside from dismissal, during the 1992-1993 period. Sending workers on partially-paid leave, allowing wage arrears to accumulate, and reducing working hours were also popular cost-reducing strategies of enterprises.

There is now substantial evidence from firm level data on job flows in Russia.Gimpelson

and Lippoldt (1999), Earle and Brown (2001), and Lehmann et al. (1999) use firm–level data to look at several aspects of job creation and destruction across industries during the first years of transition. These studies complement existing studies of worker flows, which suggest important degrees of flexibility in labor supply. Commander et al. (1995), Foley (1997), Lehmann and Wadsworth (1999), and Gimpelson and Lippoldt (1997) find evidence of high year-on-year levels of worker flows in Russia. However, the data used in these analyses does not provide a complete account of worker transitions over time, nor information about worker flows prior to 1991. As such, they cannot be used to model transition intensities between sectors.

The availability of the ISITO longitudinal work history data, collected in April and May of 1998, provides an opportunity for the gap in the literature on post-Soviet labor supply dynamics to be bridged. In order to analyse the nature of transitions from jobs held at the end of the Soviet era, and those begun after the end of the Soviet era, the ISITO survey, and the long-running RLMS are used. These data sets provide information on the transitions of workers between labor market states and sectors over time. Although it is limited to four Russian cities, the ISITO is the first individual-level data to provide a complete account of labor market spells spanning the *perestroika* and post-Soviet eras. Each of the surveys has its own strengths and limitations. In the following section the information contained in these data sets is described.

3 Data

The RLMS is a panel survey while the ISITO survey is a cross-sectional survey containing extensive work history data. These surveys are briefly introduced below. For more information about these surveys, and a comparison of their sample compositions, the reader is referred to the data appendix at the end of the paper.

The one nationally-representative Russian household panel, the RLMS, has been used by labor economists studying such problems as: wage arrears, unemployment durations, job creation and destruction, and gender wage differentials (see for example Popkin et al. (1996), Mroz and Popkin (1995), Lehmann et al. (1999), Newell and Reilly (1996), and Earle and Sabirianova (1998)). It is a household-based survey that was designed to capture the effects of economic transformation on the welfare of households and individuals. The survey was designed primarily to answer policy-related questions regarding poverty, health, nutrition, and economic status.

The ISITO survey is the main source of information for the estimation of the multiple

destination state duration models. This is a 4000 household survey carried out jointly by the University of Warwick Centre for Comparative labor Studies and the Institute for Labor Relations Research (ISITO) in Moscow. Interviews were conducted with individuals in non-institutionalised households in the cities of Moscow, Kemerovo, Samara, and Syktyvkar in April and May of 1998. The ISITO household survey avoids clustering of sampled households by drawing local samples from computerised databases of the populations of each city. Thus, at the city level, the ISITO data contain a random sample of local populations.

Unlike the RLMS the four cities chosen for the ISITO household survey are not representative of the Russian population. They are all relatively prosperous centers. The fall in living standards and real wages in these cities has been lower than the Russian average (see Clarke (1999)). Nevertheless, these cities are very different from each other, and as such provide information on the relative importance of local factors in determining labor market dynamics.

Kemerovo is the capital of an industrial region of Western Siberia that has traditionally relied on coal-mining, metallurgy and chemicals (Clarke (1999)). Its population is approximately 500 000 individuals. At the time of the ISITO surveys, registered unemployment in Kemerovo was less than three percent. Samara is a city of one million that has undergone rapid restructuring from the days when it was one of the linchpins of the Soviet military-industrial complex. Lyubertsy is a small city in the Moscow oblast, and about half of its workers commute daily to Moscow. Syktyvkar is the capital city of the northern Komi Republic, and is home to approximately 250 000 individuals. It has benefited from the robustness of timber and paper industries to which it is home (Clarke (1999)), and is prosperous relative to other population centres in the Komi Republic.

The main advantage of the ISITO is that it provides more detailed information on labor market transitions than does the RLMS. Interviewers obtained information about labor market transitions dating back to 1987. Unlike in the RLMS it is known when and in which state a job ends. It is this feature of the ISITO job spell data which is exploited in the empirical analyis.

4 Descriptive statistics on worker transitions

Prior to estimating reduced-form models of worker transitions using the ISITO data, some of the features of Russian worker flows are compared using the RLMS data, and similar data from several Eastern and Western European countries. Although the RLMS is not

suitable for estimation of multivariate models of job tenure, it does contain information on elapsed job tenures of individuals at work at the time of the RLMS interview. As such, it allows a first glimpse at the rapidity of worker transitions in Russia.

4.1 Flows into new jobs

In order to gauge the level of worker flows into new jobs in Russia, sample statistics from the RLMS are compared to those for the mid 1990s in several other European countries. Data from national labor force surveys from the UK, France, Slovakia, Slovenia, the Czech Republic, and Poland, is used to situate the level of worker flows in Russia in the international context.

Table 1 shows that there was a steady drop in employment and a rise in both unemployment and non-participation in Russia through the 1990s. Still, even by 1998 the level of non-participation in Russia was still lower than in Western European countries (except for Sweden). Male employment rates have fallen more dramatically than female in the initial years of Russian economic transition. As a result, male and female employment rates are very similar. Differences in the employment rates of males and females were smaller in Eastern than in Western Europe (except for Sweden) in the mid 1990s. As in the other former communist countries, female labor force participation rates remained high in Russia. Table 1 also shows there were large variations in unemployment rates in the mid 1990s between Eastern and Western European countries. ILO-style unemployment rates were not consistently higher in Eastern than Western Europe.

Next the relative prevalence of new jobs amongst different population subgroups in the RLMS is examined. New jobs are defined here as jobs that have been held for less than one year at the time of interview. Given that the RLMS does not collect information on reasons for, or the dates of job spell ends, this is one of the few job spell statistics that can be readily calculated with the given data. Table 2 shows the fraction of individuals in new jobs by demographic characteristics for several Eastern and Western European countries in the mid-1990s. It is clear that entry into new jobs was at a stable and high level in Russia in the mid-1990s. By this measure, comparable levels of transitions into jobs are occurring in Russia and Eastern and Western European countries. There is no strong tendancy for flows into new jobs to be higher or lower in the East or West by demographic group. In Russia, as in Poland, the Czech Republic, and Slovakia, rates of flows into new jobs are lower for women than for men. Across all countries, flows into new jobs are higher for younger than older age groups.

Another question of relevance regarding flows into jobs is the relative quality of new jobs. Table 3 suggests that, in the RLMS a substantial proportion of individuals in new jobs are not paid in full and on time. Firms appear to systematically hire workers that they cannot pay properly, and individuals accept such positions. For many workers in Russia, then, a change of job does not bring financial security. From the Western perspective it may appear puzzling that firms are able to hire new workers that they cannot afford to pay. Partly these enterprises may be practicing Soviet-style paternalism by "keeping them off the streets" however the acceptance of voluntary labor can be explained also by rational self-interest. Workers may still accept such jobs if they maintain some small probability of obtaining the stipulated salary or ancilliary benefits, if the probability of not being paid is higher in their old job, or if the alternative is certain unemployment.

The levels of new jobs reported in the previous tables using the RLMS are very close to those reported for 1996 using the ISITO survey. In both surveys, fewer women than men are in new jobs over the 1990s. The ISITO survey also allows measurement of flows into new jobs in the period immediately preceeding the break-up of the Soviet Union, that of *perestroika* (restructuring). Overall the fraction of individuals in new jobs in January 1991 is slightly lower than that in January, 1996 (12.4 vs 16.9%), but still substantial. At this time also, women appeared to be making slightly fewer transitions than men, but no statistically significant differences amongst education groups were found.

4.2 The sectoral composition of employment

Using the retrospective work history information from the ISITO survey it is possible to look at employment trends across sectors during the reform period. Figure 2 shows the fraction of employed individuals engaged in each sector of the labor market at January of each year since the beginning of economic transition. As expected, there is a substantial drop in the fraction of individuals employed in the government sector over time, to just over half of those employed in January 1998. Over the period in which the majority of state-run industrial enterprises were privatised, it is found that the fraction of those employed in privatised (formerly state owned) enterprises rose to just over 20% in January 1998. Growth in the fraction of employment in the *de novo* (post-Soviet private enterprise) sector and self-employment has been quicker than that in privatised enterprises over the period.

A note of caution relating to privatised enterprises is in order for interpreting figure 2. Individuals in the ISITO were asked to recall the sector of previous employment dating

back to 1987. As such, individuals can be expected to report the sector according to their enterprise's status at the end of the job spell. For this reason, it is not surprising to find that 13% of job spells underway in January 1992 were reported to be in privatised enterprises. It is likely that they were not privately owned in January 1992, but became so later in the individual's job spell. Another caveat to Figure 2 is that many individuals in Russia juggle several jobs, and that an individual's "official" job may bear little relation to an individual's every-day activity[2].

Individuals in the ISITO survey are asked to compare the skill level involved in their new jobs to the skill level in their last job. There appears not to be a large change over time in the fraction of individuals for whom a job change means a move to more skilled work. In 1988, 32% of individuals reporting direct job–to–job transitions reported that their new job was of higher skill, compared to 25% in 1996. For those with intermediate spells of non-employment, 24% reported improvements in their skill levels following a job change in 1988, compared to 23% in 1996. Individuals who report an intermediate spell of non–work between jobs do not seem to be less likely to move to more, or to less, skilled jobs than those who make direct job–to–job transitions. About one quarter of all job transitions are considered by individuals to have been moves to higher–skilled jobs.

Individuals are also asked to report whether or not a job change involved an improvement in wages. Amongst individuals making direct job–to–job transitions in 1988, only 51% report that their new job is better remunerated. This compares to 55% of individuals making direct job-to-job transitions in 1996. For both direct and indirect job transitions, the fraction of individuals whose pay decreased in their new job was constant over time at about 20%. This seems to indicate that factors other than wages play an important role in the decision to change jobs. This finding is consistent with that of Lehmann and Wadsworth (1999) using year–on–year evidence from the RLMS, who find that job tenure

[2]The interviewers are instructed

> "...to begin from the position occupied by the respondent in 1987 and to include all periods, including when he or she ... had no basic place of work."

In the Soviet times, each worker had a labor book that was held by the enterprise at which he or she was currently employed. When leaving an enterprise the individuals would collect the labor book. The period of employment and reason for leaving would be written in the book. This system is still the basis for official records on numbers of individuals employed at an enterprise. The ISITO work history question focuses on time-accounting, rather than on whether or not the respondent should report the employer at which the labor book was held, or the job at which the individual spent the most time. In practise, this work history accounting did not collect information on the durations of supplementary jobs. As well, it is not known whether jobs ended due to quits or layoffs.

has a weaker relation to wage levels in Russia than in the UK or Poland. Unfortunately, the job history section of the ISITO survey does not collect information on factors such as job security or ancilliary benefits, nor on reasons for leaving jobs.

The preceeding descriptive analysis has highlighted demographic and occupational differences in the rate of flows into new jobs, as well as the substantial overall level of flows into new jobs in Russia before and after the break–up of the Soviet Union. These serve as background to the estimation of models of transition between labor force states and employment sectors using the ISITO data. In the econometric analysis which follows, the effect of personal and household characteristics, local factors, and time trends on transition intensities to different sectors is assessed. The analysis is carried out using the ISITO survey data both for job spells underway in January 1991, and for the flow into jobs after that date. In the following section, the econometric frameworks and estimation procedures are described.

5 Econometric Analysis

A major empirical reason for undertaking separate analyses of job spells underway in the Soviet period and those begun afterwards is that these spells were begun in situations where basic rules governing employer-employee matches were vastly different. It can be considered that the processes governing job transitions changed drastically as a result of the complete labor market deregulation undertaken at the beginning of economic transition. In fact, this was certainly a major goal of deregulation. In what follows, multinomial logit and competing risks duration models are estimated for job spells underway in January 1991, and those begun post-January 1991, respectively.

The work history section of the ISITO April/May 1998 survey was the basis for the creation of spell files containing information to be used in the analysis. Individuals were asked to give start and end dates of all labor market spells since January 1987, as well as information on the sector in which the job was held. Respondents were asked to classify the sector of all reported job spells. Individuals may have reported that a job was in the government/budgetary sector, a privatised (formerly state owned) enterprise, a *de novo* firm (new private enterprise), or self-employment. In the duration analysis to follow, privatised former state firms and *de novo* enterprises are distinguished in the same manner.

Together, estimates using these two samples and methods provide complementary pictures of the effect of economic transition on worker trajectories. Using the stock of individuals employed in January 1991 it is possible to capture the nature of the initial

large exit to non-employment and new jobs which occurred in Russia, and how individuals who left those Soviet jobs eventually fared in the labor market. The flow sample of spells begun post-January 1991 permits a more detailed analysis of the types of transitions across sectors that individuals made in the post-Soviet period, as well as a characterisation of the effects of duration dependence and calendar time on transition intensities.

In the multivariate analysis which follows, a substantial influence of city-specific factors on the hazard of exit to the five states considered is found. Sensitivity analyses were used to determine the extent to which the aggregate results hold true at the city level. It was found that, although the magnitude of coefficients varies considerably amongst the cities considered, the signs and significance of coefficients generally hold. These results support the treatment of local factors as fixed effects in the models presented. Given that the four cities in the ISITO survey have the common factor of being relatively economically dynamic, it might be expected that variation between communities is even greater at the national level.

5.1 Transitions from Soviet-era jobs

Given that unemployment was not yet legal in the Soviet Union in January 1991, it is not surprising that the stock of workers employed at that date includes 96.3% of the ISITO sample of working age. A multinomial logit model, (see for example Green (1996)) is estimated for the probability of being in one of three destination states: (*i.*) the same job, (*ii.*) a different job, or (*iii.*) non-employment, in January 1993, January 1995, and January 1998, respectively. Such a framework provides a preliminary picture of how worker flows have evolved over transition, and of which types of individuals have had more and less changes in their transition patterns during this time. This framework illuminates the immediate employment effects of deregulation on the trajectories of individuals, and permits characterization of the types of workers that have remained in their Soviet jobs throughout up until January 1998.

The results of the multinomial analysis are presented in tables 4 and 5. Individuals who made transitions to full–time education, the military, and retirement before January 1998 are excluded from the analysis. The reference state is that of being in the same job as in January 1991. Relative risk ratios are shown in table 3, in order to yield clear interpretation of the coefficients. For example, a coefficient of 1.5 on a *female* dummy variable can be interpreted as implying that, relative to males, females are 1.5 times as likely to be in this state as in Soviet–era jobs.

Table 7 suggests that there is substantial stability in the impact of observable characteristics on labor market status over the 1993-1998 period, with generally similar relative risk ratio coefficients for transition types across years. In 1993, relative risk of older workers being in a new job rather than their Soviet–era job is .78 of that of prime–age workers. In 1995, and 1998 they are also relatively unlikely to be in new jobs. In all three years females are significantly and subsantially less likely than males to be in new jobs rather than in non–employment or their January 1991 jobs. Perhaps surprisingly, the influence of education levels on the relative likelihood of being in a new job rather than a Soviet–era job is not statistically significant in any of the three years[3]. As with the trends for new jobs, trends during the 1990s for transitions to non-employment appear stable. Women and the young have high relative risk ratios in all three years, although by 1998 the difference across the sexes is no longer statistically significant. As with the transition to new jobs, educational differences do not appear to have strong impacts on relative risk ratios for entering non-employment in the post–Soviet era. Only in 1998 is the relative risk ratio for non–employment of the higher educated significantly different from that of those with less educational qualifications. It suggests that, by January 1998, those with higher educational qualifications were 1.25 as likely than those without to be in non–employment rather than Soviet–era jobs.

Table 5 presents predicted probabilities for each of the three states considered, for January 1993, January 1995, and January 1998, respectively, by sex, and educational attainment. These predictions underline the main trends of table 4: A greater tendancy of females to be found in the non-employment pool in each of the three years, and a slower exit of females than males from Soviet-era jobs. It appears that there has been a strong increase in non–employment rates across education and sex groups between 1995 and 1998.

5.2 Transitions from post–Soviet jobs

A key empirical question regarding the trajectories of individuals who remained in the workforce following the initial shock of transition is that of moves between employment sectors after the initial severance from Soviet-era employment. The multiple destination state duration model framework also allows examination of post-Soviet job transitions in a sector-specific way. Thus for individuals making job-to-job transitions after individual

[3]An F–test of the significance of the educational dummies fails to reject the null hypothesis that the coefficients are not jointly significantly different from zero.

property rights were granted and unemployment was legalized, it is possible to assess the determinants of exiting to a specific sector, as well as the extent to which the current sector of employment influences new sectoral choices. This is the primary goal of the estimation of a multiple destination state competing risks model using the post January 1991 flow sample.

At first glance, it is apparent that there are significant sectoral differences in lengths of completed job spells across the sectors. In the sample of jobs flowed into after January 1991, spells in the government sector are nearly twice as long as those observed in the new private sector, at 3.2 and 1.8 years mean respectively. The mean length of completed spells in the private sector is 2.5 years, while in self-employment it is 2.7 years.

Investigations of durations until exit time have long been popular in applied econometric work, and particularly in labor economics. Examinations of durations in a labor market state (unemployment, non-participation, or work for example) provide more information about the fluidity of the labor market than do cross-sectional analyses of the stock of individuals in a given state at a given point in time. As well, complete data on lengths of spells between interviews can provide more insights into underlying exit processes than can analyses of changes in an individual's labor market status from one year of a panel interview to the next. For an exposition of the duration model literature see for example van den Berg (1999).

The risk set $s \in 1...k$ is the set of k possible end types of a job spell i. In the case of the post-January 1991 flow sample, the k destination states in the risk set are $(i.)$ to government/budgetary sector jobs, $(ii.)$ to jobs in privatised enterprises, $(iii.)$ to jobs in *de novo* enterprises, $(iv.)$ to self-employment, and $(v.)$ to non-employment. It is also possible that no transition is observed (the spell is right censored)[4].

Let the conditioning event for making a transition to state k is the probability of survival to t and eventual departure to k. This is the *transition intensity*, $\theta^k(t|x, v^k, \tau^k)$. Here x denotes individual–specific observables, v_k denotes individual–specific unobservables, and τ^k represents calendar–time effects.

The hazard of making a transition at a given time in the elapsed duration of a spell is simply the sum of the of the transition intensities at t over the risk set s:

[4]As well, individuals in the data may have transited to work in the military, to retirement, or to student status. This was a very small fraction of individuals, and as such is not considered here. In this econometric framework these individuals may be treated as having censored spells

$$\theta(t|x, v^k, \tau k) = \sum_{s=1}^{k} \theta^k(t|x, v^k, \tau^k) \tag{1}$$

The probability of a spell i ending in a transition to state k at t, given x, τ^k, and v^k, is then:

$$\frac{\theta^k(t|x, v^k, \tau^k)}{\theta(t|x, v^k, \tau^k)} \tag{2}$$

The partial likelihood of a transition of type k at elapsed duration t is then the product of the individual probabilities of making a transition to k.

In a partial likelihood framework, the individual failure times for transition types may be treated as independent if it is assumed that all differences between individuals may be completely described by x,τ^k, and v^k. This is a common assumption made in the estimation of competing risks models with multiple duration states. Maximising partial likelihoods is then equivalent to maximising the joint likelihood of the model (see Lancaster (1990)). In the following estimation,the partial likelihood is maximised separately for each of the k destination states defining the ownership type of a sector to which a transition is made.

A mixed proportional hazard (MPH) specification is reported here (see Lancaster (1990) for a detailed discussion of these models). Piece-wise constant hazards are used. This specification is attractive because of its flexibility in fitting the data and tractability in the computation of expected durations of job tenure. All spells begun by individuals in the post-January 1991 period are used.

Transition intensities are of the MPH form:

$$\theta(t|x, v^k, \tau^k) = \lambda_k(t) exp(x^{'} \beta^k + \tau^k \kappa + v^k) \tag{3}$$

The baseline hazards , $\lambda_k(t)$, reported here are piecewise constant within elapsed durations of 0-2 years, and beyond two years, respectively. Unfortunately, due to the small number of observed transitions to the *de novo* sector and to self–employment, it was not possible to allow for more flexibility in the baseline.

It is assumed that the v^k terms are independent of observed characteristics. In the specification reported, these unobserved individual–specific characteristics are assumed

to have state-specific impacts[5].

In the reported specification, each v^k follows a discrete distribution with two points of support, v_a^k and v_b^k.

In principle it is also possible to allow for, or to impose, correlation in the v^k values of individuals across different states in the risk set s[6]. However, at k levels beyond two, the implied covariance structure becomes very complex, and would be very difficult to identify with these sample sizes.

In the estimation results presented, the τ^k calendar time effects are specified as dummy variables relating to the start date of the spell. While such a specification imposes constancy of calendar-time effects within the periods spanned by a dummy, it allows for more flexibility of these effects over the whole period than would a linear trend. This simple specification of the calendar time effect allows identification of the importance of aspects of employment which are independent of person-specific attributes and the elapsed duration of spell, but which impact the transition intensities to another job or to non-employment [7]. Examples of such features would be changes in the macroeconomic conditions governing the arrival rate of new job offers or the job destruction process.

5.3 Results for the 1991 flow sample

This section presents the results of estimation of a multiple destination state job duration model for the flow sample using a piecewise constant hazard specification and a partial likelihood approach. The following subsections summarise the results of the estimation for the flow sample. These results are reported in table 6.

[5]While more elegant methods exist for accounting for unobserved heterogeneity in multiple destination state models, such methods introduce different problems for the analysis. Stratified partial likelihood estimation (SPLE) (see for example Ridder and Tunali (1997), Lindeboom and Kerkhofs (1998)) eliminates some of the potential problems due to correlations between individual–specific unobservables in multiple spell data. However, in the SPLE approach, it is necessary to assume that these unobservables are individual-specific fixed effects in order to be able to cancel them from the likelihood. As in all fixed-effect models, the effects of time-invariant regressors cannot be estimated. As time-invariant covariates are of primary interest in this analysis, this makes the approach unattractive for the present purposes.

[6]This type of model can be found in van der Klaauw (2000) for the case of $k = 2$.

[7]As mentioned previously, due to the fact that the ISITO survey is collected at a single point in time, it is anticipated that there is recall error. These possible errors in reported dates and types of transitions is likely to be worse for periods further from the interview date. However, it is not possible to model a calendar-time dependent measurement error term due to the fact that this cannot be distinguished from changes in pure calendar time effects on transition intensities. As such, the specification of calendar time is kept simple

5.4 Personal characteristics

It is found that younger individuals have relatively high hazards of exiting their jobs to new jobs in the government/budgetary sector, and to non-employment. Workers who are 40 or more years old are relatively unlikely to make transitions into the *de novo* sector, and are more likely to make transitions to non–employment.

Women are more likely than men to exit jobs to non–employment in the flow sample. Note that this was not the case in the stock sample of Soviet era jobs. Women are less likely than men to flow into jobs in government/budgetary, privatised, or into self-employment from jobs they began after January 1991. These results are consistent with the descriptive statistics from the RLMS presented previously, as well as those from the multinomial logit estimation of the previous subsection, which suggest that women make relatively few transitions into new jobs.

Higher educated individuals appear to have very different employment trajectories to those with lesser qualifications. In comparison with those with high-school equivalent education, those with higher educational qualifications are relatively unlikely to flow into jobs in privatised and *de novo* enterprises, and relatively likely to enter self-employment. Those with no educational qualifications are relatively likely to exit their job for a job in a *de novo* enterprise.

Individuals with higher education are generally less likely to exit to the unemployment pool than those with high school equivalent education, while those with no qualifications have higher hazards of making such exits. Grogan and van den Berg (2001) find that higher educated individuals exit unemployment in Russia relatively quickly. Together these findings imply that employment is relatively stable for those with higher education and that non-employment is relatively short and infrequent.

In general unobserved heterogeneity is found not to be a significant factor in governing the transitions of the risk set[8].

5.5 Sectoral characteristics

The likelihood of entering a government/budgetary sector job is strongly influenced by the individual's current sector of employment. Individuals currently engaged in the government/budgetary sector are far more likely than those in privatised enterprises, *de novo*

[8]Estimation of the model without controls for unobserved heterogeneity, with three mass points, and with the assumptions of a continuous (gamma) distribution of person–specific unobservables yielded similar signs and significance of coefficients.

enterprises, or self-employment to take another job in this sector. This result may reflect the fact that the government/budgetary sector includes teachers and health care professionals, who have little opportunity to continue these professions in the private sector. However, some individuals may prefer the relative security of government sector employment, and be prepared to forgo opportunities for lucrative, but insecure, *de novo* sector work.

Individuals in *de novo* enterprises are far more likely than those in government enterprises to move to other *de novo* enterprises. This may reflect a preference of managers of *de novo* enterprises for individuals with *de novo* sector experience. However, those who have experienced working in *de novo* enterprises may be reluctant to go back to the pay and conditions of privatised or government/budgetary sector employment.

Individuals in privatised enterprises are less likely than those in the government/budgetary sector to make transitions to *de novo* enterprises. Those who have job spells in privatised enterprises are more likely than those in the government/budgetary sector to transit to jobs in the private sector, and those in the private sector are relatively unlikely to make transitions to government/budgetary sector jobs.

Over the sample period individuals in privatised enterprises and self–employment are significantly less likely than individuals in the government/budgetary sector to transit from their job to the non-employment pool. It seems that privatised enterprises offer relatively secure employment for those that were hired post January 1991.

Those in *de novo* enterprises have higher hazards of exit to the non-employment pool than those in the government sector. This result most likely reflects the high frequency of bankruptcy and sensitivity to macroeconomic conditions of the small firms which characterize this sector.

The current sector of an individual's employment does not appear to have a statistically significant impact on the likelihood of this person making a transition to self-employment, but this is likely related to the small number of observations of this transition type. Those without qualifications are relatively unlikely to make transitions to self–employment, and those in the government/budgetary sector are more likely than those in other sectors to do so.

5.6 Calendar time effects

The hazard of exit to non-employment from jobs begun post-January 1995 is higher than for jobs begun soon after the collapse of the Soviet Union. This seems to suggest that

employment stability has been declining over time. Transition hazards to jobs in the four sectors of the risk set do not appear to be significantly affected by the start date of an individual's current job, thus suggesting that the relative hazards of making the different type of job–to–job transitions considered have not altered substantially over the period.

6 Conclusions

This paper makes use of the first longitudinal work history data available for Russia, and the RLMS to investigate job transition patterns from Soviet and post-Soviet employment. These two data sources show that during the 1990s workers continued to flow into huge old Soviet enterprises, into jobs from which they experienced non-payment and payment in the form of goods, and into government/budgetary sector firms. Worker flows into new jobs rose after the break–up of the Soviet Union, and were at comparable levels to those in Western European countries in the mid–1990s, as were employment rates.

While the prediction in the early 1990s was that labor would be shed from unprofitable enterprises, flow through the unemployment pool, and then reallocate itself into the emerging private sector, it appears that a large fraction of Russians make direct job-to-job transitions. Although the four cities of the ISITO survey cannot be considered representative of Russia as a whole, the findings of the paper generally concur with the studies of Commander et al. (1995), Lehmann and Wadsworth (1999), and Gimpelson and Lippoldt (1999), which have looked at worker turnover using larger surveys with incomplete data on worker transitions. In the ISITO data, direct job-to-job transitions from the January 1991 stock outnumber job-to-non-employment transitions by a factor of two to one. As well, more than half of those who exited to non-employment after January 1991 had not returned to employment at the time of the spring 1998 ISITO survey. While the ISITO does not distinguish between unemployment and non–participation, the data does not suggest that the unemployment pool is the key part of the labor reallocation mechanism that economists had predicted it would become.

It appears that the effects of educational attainment on labour market trajectories are not clear–cut. The analysis of transitions made by individuals employed in January 1991 suggests that by 1998 the higher educated were relatively prevalent in the non–employment pool. Duration analysis of jobs begun in the post–Soviet period shows that the higher educated were less likely than those with lower qualifications to exit these jobs to non–employment. Evidence from post–Soviet jobs suggests that individuals with no qualifications are relatively likely to transit to the non–employment pool.

The retrospective evidence provided by the ISITO survey suggests that women were more likely than men to be non–employed in both January 1993 and January 1995, and to enter non-employment from jobs begun after January 1991. Substantial differences between the sexes in other aspects of labor force behaviour are apparent. Women have much lower rates of job-to-job transitions than men in both the stock and flow samples of the ISITO, and are particularly unlikely to flow into self-employment. Several studies published in the early years of Russian economic transition proclaimed a 'female face of Russian unemployment', based on the observation that there were more women than men officially registered as unemployed (see for example Mesnetseva (1996)). However, despite the higher tendancy of females to exit post–Soviet jobs to non–employment, by January 1998 females do not appear to be more likely to be non–employmed than males. Grogan and van den Berg (2001) find that females have relatively short unemployment durations in the 1994–1996 period, thus suggesting that the situation for women on the labor market may have improved over time.

The substantial fraction of individuals making transitions into less skilled and lesser paid jobs in the ISITO data may indicate that that unobserved factors such as perceived job security, promptness of wage payments and fringe benefits may be of considerable importance in governing transition behavior of workers. Clarke (1999) finds that well-paying *denovo* enterprises prefer to recruit workers from other jobs, suggesting that workers may prefer to have even non-paying jobs that give them access to this lucrative section of the labor market.

Both the analyses of Soviet and post–Soviet jobs suggest that exit rates from jobs to non–employment are substantially higher for jobs begun relatively recently. Without being able to distinguish between quits and fires, it is difficult to know whether or not this result is suggestive of growing strength of a 'first in, first out' policy of firms. It was found that more movement from Soviet–era jobs occurred between January 1995 and January 1998 than between January 1993 and January 1995, and that flows into new jobs increased after January 1991. These results suggest that the post–transition dynamics of flows in these four Russian cities share some features with other transition economies. Davis and Haltiwanger (1999) find that in Estonia and Poland there were sharp jumps in hiring and firing associated with transition. Thus, while the ISITO data conflates worker and job flow effects, it does suggest similar patterns of worker mobility to those found elsewhere in Eastern Europe.

It would be of empirical interest to examine the extent to which observed increases in aggregate worker flow rates in Russia and other Eastern European countries can be

explained by the shedding of older workers from workforces, given the fact that younger workers typically make more transitions, and the finding of this study that older workers are relatively likely to make transitions to non–employment.

7 Appendix A: Data description

7.1 RLMS

During the initial phase of the RLMS project, in 1992-94, four rounds of data were collected. The first of the four rounds was collected between July and October 1992, and the last between October 1993 and January 1994. In the second phase of the RLMS survey, a new panel was drawn. In the 1994 survey, 4718 households took part, and individual interviews were conducted with as many adult members of each household as possible. The household response rate was above 80% in the first wave (1994). These households were re–interviewed in 1995, 1996, and 1998. Information about individual characteristics and working lives was gathered for all household members aged 18 or older.

The individual-level RLMS survey contains information about ISCO-88 occupational codes, gender, education levels and type, owed wages, unpaid leave, and income from secondary jobs. For working individuals, information is available on job tenure, wages, hours of work, firm size and ownership structure. The descriptive analysis of worker flows contained in the following section is based on individual data of the second RLMS panel.

7.2 The ISITO April/May 1998 household survey

Information is collected on demographic characteristics, education and training, jobs and entrepreneurial activities, remuneration, and satisfaction with life. As well, adults are asked to complete a work history questionnaire covering the January 1987-April 1998 period. For each labor market spell, ISITO interviewers record beginning and end dates, employment status, the sector (for job spells), the level of skill of the work, and how well the job was paid relative to previous employment. This complete working life history allows analysis of transitions made from job spells underway at the end of the Soviet period, and those which began after the end of the Soviet period.

The response rate of households ranges from 53 to 79 percent amongst the four cities included in the ISITO survey. Within responding households, the response rate to the individual level questions ranged from 88 to 92%.

The RLMS and ISITO surveys differ fundamentally in their sampling frames. Whereas the RLMS is designed to be representative of Russian households, the ISITO survey is designed to be representative at the local level of each of the four cities. The RLMS does not contain a full record of individual labor market transitions between subsequent interviews. Given these differences, it is important to have an idea of how similar or different is the sample composition across the two surveys.

A more important caveat to the ISITO data is that they are drawn at a single point in time. In addition to the known problems of recall error there is the problem that time-varying characteristics (such as those relating to household composition) may well have changed between the time of a labor market spell and the interview date. As well, at least some of the participation changes may be the result of household compositional changes. Because the ISITO was drawn at a single point in time, it must effectively be assumed that observed personal characteristics are time-invariant.

Still, there is some information on household composition available in the ISITO. Individuals in the ISITO survey are described according to their relation to a head of the household in which they reside at the time of interview. In the multi-state analysis of job transitions I assign the dummy variable "head" to heads of households.

The ISITO survey contains less detailed information on occupational status and work-seeking activities than does the RLMS. It contains information on the sector of industry of jobs held since 1987, but no variable relating to marital status, nor wage data for completed job spells. The omission of a marital status indicator may be an important problem, particularly given evidence that being married lowers the hazard of exit for females from the unemployment pool, while raising the hazard of exit for males (see, for example, Grogan and van den Berg (2001)).

7.3 Defining employment

Given the complex nature of employment relations in Russia, it is important to be clear about how work status is defined in each of the surveys. Interviewers for the ISITO survey administered different individual-level questionnaires to individuals who self-reported that they were working than to those who reported that they were not working. Individuals who reported that they were working were allowed to have been absent from their main jobs in the month prior to the ISITO interview for the following reasons: maternity leave, self-requested holiday without pay, unpaid or partially-paid administrative leave, sick leave, other work commitments, or normal holidays. Thus the principal definition of working in

the ISITO questionnaire is having a formal employment relationship with an enterprise.

In the RLMS, individuals are asked to qualify their labor force status at three points in the questionnaire. The first question of the interview, "Tell me please, do you work now?", can be answered with "yes", " maternity leave or leave for caring for a child under three", "other paid leave", "unpaid leave" or "no". This is the question used to determine if an individual is officially working. As well, individuals are asked in the middle of the questionnaire if they are "currently working", and at the end to describe their primary occupation. The initial work status question from the RLMS is used because it corresponds most closely to the work status question in the ISITO survey.

The work status questions in the two surveys result in similar summary statistics. Paid work participation rates in the ISITO survey are close to those observed in the RLMS. As in the RLMS, in the ISITO survey higher educated individuals of both sexes are more likely than individuals with no qualifications or those with only secondary education to be in paid employment in April/May 1998. Amongst prime age females (those age 30–39), 85.3% are at work at the ISITO interview in comparison with 50% of those without a highschool education. For prime-age men, the employment rate is 94.7% for the higher educated, versus 77.3% for those with no qualifications. These sample statistics compare well to those from the 1998 RLMS and Russian Statistical Agency, *Goskomstat*, statistics.

In comparing year–on–year tendancies to be employed amongst those in the ISITO with that reported by Foley (1997) using the RLMS, some differences are apparent. Between January 1992 and January 1993 in the ISITO, 97% of employed individuals remained in employment, while in the RLMS only 91% did. Between January 1995 and January 1996, 94% of those employed remained employed, while in the RLMS the figure was only 88%. To a certain extent these differences, and the apparently stronger stability of employment in the ISITO may be attributable to the fact that the cities represented in the survey are relatively prosperous centres. However, it is also likely that the retrospective nature of the ISITO survey leads to a systematic tendancy for some transitions to go unreported. Despite this caveat, the ISITO matches the RLMS data for the 1990s well in terms of employment rates, and trends in employment by sector, as well as by demographic composition.

For more on the representativeness of the ISITO sample, the reader is referred to Clarke (1999).

Table 1: Labour force participation by country, percentages

	males			females		
	E	U	N	E	U	N
Western Europe						
UK, 1989	89.6	6.3	4.1	68.7	4.8	26.6
France, 1997	86.9	7.8	5.3	68.8	8.9	22.4
Eastern Europe						
Russia, 1992 (RLMS)	93.3	4.4	2.3	87.8	5.1	7.1
Russia, 1995 (RLMS)	86.4	6.7	6.9	81.3	6.3	12.4
Russia, 1998 (RLMS)	79.3	10.4	10.3	77.2	8.6	14.2
Czech Republic, 1994	96.6	2.6	.8	89.4	3.9	6.7
Slovakia, 1997	88.6	10.7	0.7	77.0	11.3	11.7
Poland, 1994	77.8	9.3	12.9	66.7	10.7	22.7
Slovenia, 1994	89.1	7.2	3.7	83.6	5.7	10.7

Source: author's calculations using national labour force surveys and household panel surveys (RLMS). E=employed, U=unemployed, N=non-participant. An ILO–style definition of unemployment is used. Individuals aged 23–local retirement age are included.

Table 2: Percentages of individuals in new jobs amongst employed respondents in national labour force surveys

	UK	France	Poland	Czech R.	Slovenia	Slovakia	Russia
	1989	1997	1994	1994	1993	1995	1996
age group							
age 18-24	28.8	50.1	31.7	29.3	46.9	29.0	37.1
age 25-29	25.4	29.0	21.9	24.6	32.6	22.2	21.9
age 30-39	20.0	15.0	14.8	19.5	15.6	14.7	20.8
age 40-49	14.1	10.8	11.1	14.8	11.8	9.8	16.1
age 50-retir.	8.9	8.5	7.2	14.0	14.2	8.5	7.5
sex							
males	14.1	13.2	15.5	18.0	17.5	14.9	20.3
females	21.3	18.0	12.1	17.3	18.5	11.5	16.2

Source: author's calculations using spring labour force surveys in the Luxembourg Employment Survey database at CEPS/INSTEAD. For Russia data is from the 1996 RLMS. The self-employed are excluded.

Table 3: Percentages of individuals receiving incomplete payments in primary jobs, new jobs compared to full sample

	1994		1995		1996	
	new	all	new	all	new	all
owed money from enterprise	35.1	45.2	38.1	46.0	52.0	63.3
goods as pay in previous month	9.1	10.3	9.2	9.4	13.2	13.0
no. obs.	473	2902	473	2571	425	2733

Source: author's calculations using the RLMS 1994-1996. Results refer to the respective interview dates in each wave.

Table 4: Multinomial logit model for labour force states occupied by those working in the January 1991 stock

	Jan. 1993 job status				Jan. 1995 job status				Jan. 1998 job status			
Jan. 1991 job is	new job		non-employed		new job		non-employed		new job		non-employed	
reference state	rrr.	s.e.	rrr.	s.e.	rrr.	s.e.	rrr.	s.e.	rrr.	s.e.	rrr.	s.e.
age groups (aged 30-39 is reference)												
age 18–24	1.129	0.16	0.999	0.29	1.263	0.16	1.251	0.27	1.491 ***	0.20	1.616 ***	0.28
age 25–29	1.099	0.15	1.111	0.31	1.204 *	0.14	1.313	0.26	1.594 ***	0.19	1.707 ***	0.27
age 40–ret.	0.779 ***	0.09	0.708	0.18	0.789 ***	0.07	1.248	0.19	0.828 ***	0.07	1.930 ***	0.21
female	0.742 ***	0.08	2.010 ***	0.49	0.704 ***	0.06	1.731 ***	0.26	0.625 ***	0.05	1.129	0.12
h.h.head	0.976	0.10	1.290	0.30	1.015	0.09	1.023	0.15	1.117	0.09	0.943	0.10
higher ed.	1.079	0.12	1.190	0.28	1.092	0.10	1.072	0.16	0.976	0.09	1.258 ***	0.14
no qual.	1.007	0.12	1.118	0.29	0.914	0.09	0.982	0.17	0.862 **	0.08	1.049	0.13
city of residence (Samara is reference)												
city native	1.002	0.09	0.843	0.17	1.001	0.08	1.016	0.13	0.955	0.07	0.984	0.09
Kemerovo	1.338 ***	0.15	1.067	0.25	1.360 ***	0.13	0.955	0.16	1.166 **	0.11	1.105	0.13
Lyubertsy	1.143	0.14	0.707	0.21	1.262 **	0.13	0.921	0.16	1.135	0.11	0.846	0.11
Syktyvkar	0.859	0.11	0.570 ***	0.17	1.008	0.10	1.044	0.18	1.029	0.10	1.009	0.13
calendar time effects (reference is jobs begun between Jan. 84 and Jan.89)												
before Jan. 1959	0.121 ***	0.09	0.417	0.43	0.088 ***	0.05	1.066	0.41	0.231 ***	0.09	1.258	0.33
Jan.1959-Jan. 1969	0.214 ***	0.06	0.187 ***	0.14	0.300 ***	0.06	0.348 ***	0.11	0.369 ***	0.06	0.539 ***	0.09
Jan.1969-Jan. 1979	0.426 ***	0.06	0.250 ***	0.10	0.425 ***	0.05	0.546 ***	0.11	0.468 ***	0.05	0.555 ***	0.07
Jan.1979- Jan. 1984	0.568 ***	0.08	0.676	0.20	0.590 ***	0.07	0.814	0.16	0.668 ***	0.07	0.714 ***	0.10
Jan.1989- Jan. 1991	0.900	0.10	1.410 *	0.33	0.957	0.09	1.400 ***	0.23	1.044	0.11	1.005	0.13
LL	-2159.93				-3275.9				-4099.5			
LR $\chi^2(32)$	219.23				318.16				373.9			
Prob> χ^2	0				0				0			
no.obs	4112											

Source: author's calculation using the ISITO April/May 1998 household survey. Age groups refer to age in January 1991. In the ISITO non–employment is distinct from retirement. ** significant at 5% level, * significant at 10% level.

Table 5: Predicted fractions of individuals in each destination state, multinomial logit model

	January 1993			**January 1995**			**January 1998**		
	same job	new job	non–emp.	same job	new job	non–emp.	same job	new job	non–emp.
all	81.8	15.4	2.8	64.0	28.7	7.3	41.9	38.8	18.4
sex									
males	80.5	17.9	1.7	61.7	33.2	5.1	38.3	45.4	16.2
females	83.0	13.3	3.8	65.9	24.9	9.2	44.8	35.0	20.1
education									
higher ed.	80.9	16.0	3.1	62.0	30.3	7.7	39.9	38.9	21.2
secondary/voc.	82.2	15.2	2.6	64.2	28.6	7.2	42.1	40.8	17.1
no qualification	81.8	15.2	3.0	65.7	27.0	7.2	43.5	37.5	19.0

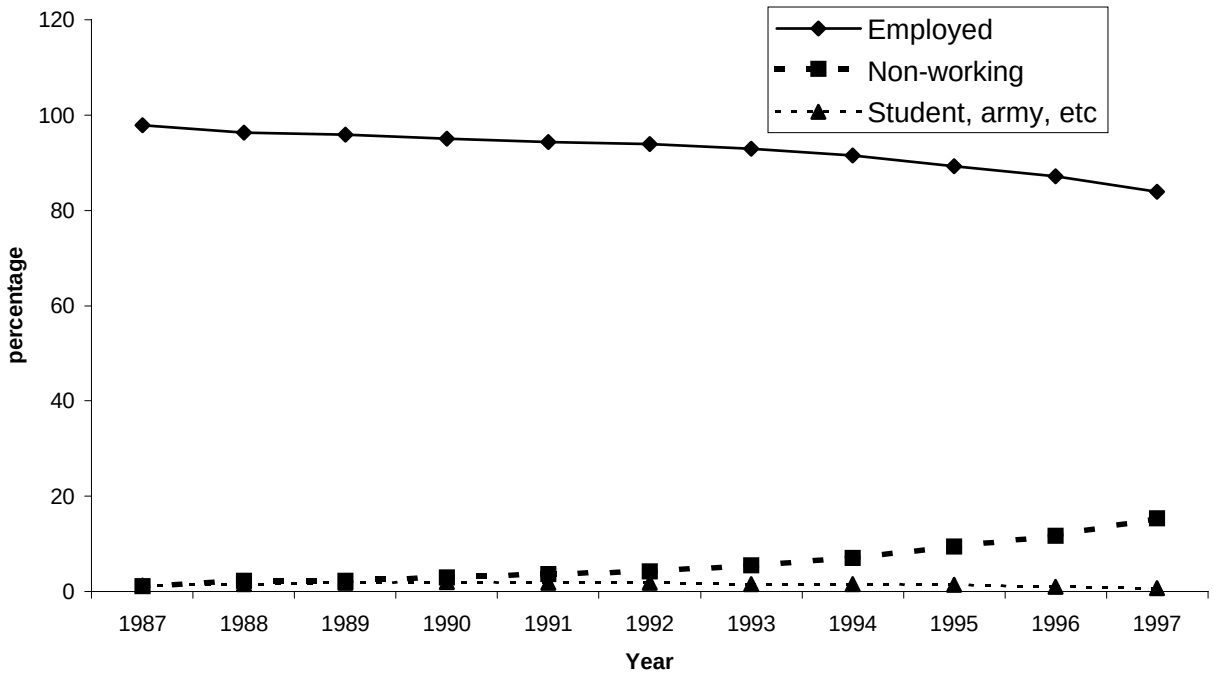
Source: author's calculations using the January 1991 stock of employed individuals in the ISITO survey.

Table 6: Mixed proportional hazard model of transitions from jobs, with controls for unobserved heterogeneity, jobs beginning in period 1991-1998

destination	non–emp.		gov't/budget.		privatised		*de novo*		self-emp.	
	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.
age groups (aged 30-39 is reference)										
age 18-24	.0558	(.10)	.248***	(.11)	-.070	(.18)	.0515	(.12)	.158	(.36)
age 25-29	.195**	(.12)	.249**	(.13)	-.262	(.26)	.0140	(.15)	-.600	(.57)
age 40-retir.	.197**	(.10)	-.100	(.13)	-.108	(.18)	−.464***	(.15)	-.035	(.42)
female	.131*	(.08)	−.285***	(.10)	−.863**	(.17)	−.139	(.12)	−2.18**	(.46)
h.h. head	-.014	(.09)	-.067	(.10)	−.266**	(.16)	-.116	(.12)	.375	(.33)
education groups (completed highschool/technical training is reference)										
higher	−.555***	(.11)	-.075	(.10)	−.781***	(.261)	−.200**	(.12)	-.0768	(.36)
no qual.	.580***	(.13)	.030	(.19)	-.450**	(.28)	.317*	(.20)	-1.17	(1.02)
sector of current work (government/budgetary sector is reference)										
private	−.241***	(.10)	−1.27***	(.17)	.443***	(.16)	-.321**	(.17)	-.0955	(.39)
de novo	.209***	(.09)	−.470***	(.13)	-.168	(.19)	1.11***	(.11)	-.237	(.44)
self-emp.	−.554***	(.26)	−.874***	(.29)	-.686*	(.47)	.165	(.26)	-.157	(.74)
city of residence (Samara is reference)										
city native	.0936	(.08)	-.026	(.09)	.048	(.18)	.178	(.15)	-.0116	(.32)
Kemerovo	.296***	(.09)	.289***	(.12)	.286**	(.17)	-.126	(.12)	-.242	(.38)
Lyubertsy	−.187*	(.12)	.379***	(.14)	.052	(.21)	-.027	(.13)	-1.27**	(.53)
Syktyvkar	.103	(.11)	.450***	(.13)	-.083	(.22)	−.625***	(.16)	.0144	(.38)
calendar time effects (reference is jobs begun after Jan. 1995), κ_j										
κ_1, job start <Jan. 1993	−.563***	(.10)	.094	(.12)	-.127	(.19)	.028	(.13)	.121	(.33)
κ_2, Jan.1993–Jan. 1995	−.349***	(.08)	.023	(.12)	.197	(.18)	.116	(.12)	.0027	(.33)
piece-wise constant baseline hazards, λ										
λ_1, 0-2 years	.058***	(.001)	.040***	(.001)	.023***	(.0010)	.024***	(.0007)	.006	(.0004)
λ_2, >2 years	.055***	(.004)	.020***	(.001)	.015***	(.001)	.021***	(.003)	.005	(.0008)
unobserved heterogeneity effects										
prob.	.94	.06	.92	.08	.93	.07	.92	.08	.90	.10
v_a, v_b	-2.1	-16	-.5	-7.1	-.75	-6.2	-6.3	-5.6	-2.3	-11
	(.19)	(4.2)	(.10)	(3.1)	(0.9)	(4.1)	(3.2)	2.7	1.1	4.7
LL	-5955.9		-4105.3		-1752.6		-3261.4		-507.6	
no. fails	782		536		288		438		46	
no. obs.	4818		4818		4818		4818		4818	

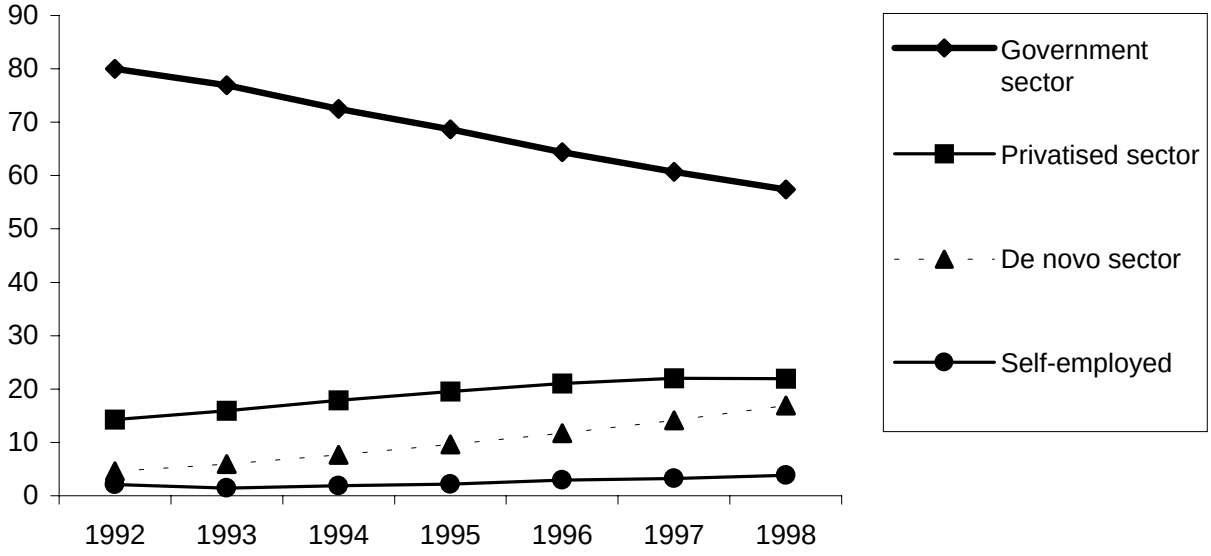
Source: author's calculation using the ISITO April/May 1998 household survey. Note: age groups refer to age at the start date of the spell. In the ISITO non–employment is distinct from retirement. ** significant at 5% level, * significant at 10% level.

Figure 1: Percentages of individuals in each labour market state, 1987-1998



Source: author's calculations using the ISITO April/May 1998 household survey.

Figure 2: Percentages of employed individuals engaged in each sector, 1992-1998



Source: author's calculations using the ISITO April/May 1998 work history survey.

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