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# What Is Behind Stagnant Unemployment in Ukraine: The Role of the Informal Sector

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## ABSTRACT

### What is Behind Stagnant Unemployment in Ukraine: The Role of the Informal Sector\*

In recent years there has been much policy discussion of the impact of unemployment benefits and other factors on unemployment duration in developed and transition countries. This paper presents first evidence on the determinants of unemployment duration in Ukraine. Using individual-level data from the first wave of the Ukrainian Longitudinal Monitoring Survey (ULMS -2003), which cover the period 1997-2003, we find no significant effect of benefit receipt on exits from unemployment. However, our survival analysis confirms the hypothesis that income from casual activities or subsidiary farming has strong disincentive effect on the hazard of re-employment in Ukraine. The results also indicate that individual's age, marital status and gender, the level of education and place of residence are significantly related to the total time spent out of work. The estimates of the baseline hazard parameters do not suggest any marked negative duration dependence.

JEL Classification: J64, J68, P23

Keywords: unemployment duration, casual work, transition countries, semiparametric duration analysis

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## 1. Introduction

After more than ten years after the start of transition in the CEE and CIS countries, there is still considerable debate about the different labour market adjustment paths in the CEE versus CIS countries. Why, on the one hand, these countries with almost similar initial conditions can be characterized by roughly similar pattern of GDP with strong declines after the introduction of political and economic reforms and its gradual growth after the positive sign of recovery, while on the other hand, responsiveness of employment to output changes and unemployment dynamics are so much different?

A large body of both theoretical and empirical literature has been developed to suggest various explanations of these asymmetries in transition process between CEE and CIS countries. The OST (optimal speed of transition) literature attributes asymmetric labour market adjustment paths to differences in economic policies, particularly in the pace of the tightening of budget constraints of state enterprises (Blanchard, 1997). Boeri and Terrell (2002) and Boeri (2001) argue that differences in the adjustment of the labour market during transition may be partly explained by labour supply factors and the role played by non-employment benefits. As they point out, the CEE countries adopted social policies that created a wage floor implying relatively high labour costs. On the one hand, this wage floor forced to release unproductive resources for more productive activities (i.e. some Schumpeterian “creative destruction” according to Davis and Haltiwanger, 1999, p.2761) translated in the relatively large growth rates, but on the other hand, it resulted in the build-up of very stagnant unemployment pool due to low outflow rates from unemployment. In the CIS, on the contrary, the costs of labour are much lower because non-employment benefits are very low, and various specific adjustment mechanisms such as wage arrears, unpaid leave, reduced working week and payment in-kind are extensively used (as documented by Lehmann et al., 1999; Earle and Sabirianova, 2002). These low labour costs imply that labour hoarding is still existent in many enterprises, especially in the state sector, and that the reservation wage is also very low. So, while low labour costs impede “creative destruction”, they also mean that outflows from unemployment are expected to be relatively large and that unemployment pool is likely to be less stagnant.

However, the idea that there are large outflows from unemployment and dynamic unemployment in the CIS countries is an assertion that is based mainly on the evidence for Russia in the early period of transition (e.g Commander and Coricelli, 1994; Commander and Yemtsov, 1994; Foley, 1997b for 1992-93). Analysis of the data on Russian long-term unemployment during the recent years provided by Kapelyushnikov and Vishnevskaya (2003) shows that although the incidence of long-term unemployment in Russia (about 40%) does not seem critical compared to many other transition countries, unemployment in Russia during the last years appears to be stagnant.

Table 1 on the distribution of unemployment by duration in Ukraine in 2000-2003 reveals that Ukraine faces even more severe problem of long-term unemployment: more than half of all unemployed persons have been looking for a job for a year or longer. Hence, the picture of a large turnover in the pool of unemployment envisaged for CIS countries by Boeri and Terrell (2002) appears to be not accurate in the case of Ukraine. It seems that the labour market adjustment path in Ukraine may extend a number of puzzles of transition and so makes a particularly interesting case for investigation. On the one hand, low labour costs due to low non-employment benefits and high wage flexibility hinder fast effective labour reallocation like in Russia.<sup>1</sup> On the other hand, low unemployment benefits and social assistance have not resulted in the large outflows from unemployment – unemployment in Ukraine seems as stagnant as in many CEE countries.<sup>2</sup> Certainly, we are unable to explain this puzzle just in one study, given the lack of high-quality information on the Ukrainian labour market. However, we try to shed some light on the effect of some non-employment benefits, supply- and local demand-side factors on the exits from unemployment in Ukraine.

What are the factors that determine the probability of leaving unemployment in Ukraine? Does the Ukrainian unemployment insurance system discourage quick exits to employment or some other factors come into effect instead? These are the questions we attempt to answer in our study whereby filling gap in the literature on determinants of unemployment duration in Ukraine.<sup>3</sup> The main purpose of this study is, therefore, to examine factors which affect the probability of reemployment or withdrawing from the labour force after unemployment over the last years.

We use individual data from the first wave of the Ukrainian Longitudinal Monitoring Survey (ULMS), which contains rich information about the individual's labour market history, geographical mobility, history of studies and changes in marital status owing to its retrospective nature. These data provide accurate information on unemployment spell duration and other important characteristics for 1799 individuals over the period 1997-2003. Some of the unemployment entrants subsequently leave this labour market state to employment or inactivity within a few weeks, while others tend to remain unemployed during several years. Some persons experience unemployment only once during the observed period, while the others may have from two to five unemployment spells. There is, therefore, enormous variation in the duration of unemployment spells across individuals in our sample, which

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<sup>1</sup> Extensive analysis of unemployment in Russia and its comparison with other transition countries is provided in Kapelyushnikov and Vishnevskaya (2003).

<sup>2</sup> The difference in the rate of long-term unemployment between Russia and Ukraine can be partly attributed to the different patterns and magnitudes of job flows in these countries. Brown and Earle (2002) show that increases in job reallocation and in the productivity-enhancing consequences of the labour reallocation process appear to have been somewhat slower in Ukraine than in Russia, implying that a more aggressive reform strategy implemented in Russia has produced greater job reallocation, faster job creation, and less net employment decline, translated in higher intensity of flows into and out of unemployment and shorter unemployment duration.

<sup>3</sup> The only study in Ukraine that is related to this topic has been done by Stetsenko (2003). The author examines determinants of duration of the registered unemployment in Kiev City using the registered data from the Kiev Employment Service from 2001 to 2003 and employing Cox proportional hazards and piece-wise constant exponential models.

allows us to analyze the underlying causes of these striking differences. Competing risks of exits to employment and to inactivity are estimated by using the discrete-time complementary log-log model with a fully flexible nonparametric specification of the baseline hazard. This model along with other flexible duration models yields more robust results than those obtained from commonly used Weibull or other parametric models (Meyer, 1990; Han and Hausman, 1990). In our estimation we allow for gamma-distributed unobserved heterogeneity but it appears to be not important since explicitly modeling unobserved heterogeneity changes the covariates little.<sup>4</sup>

The paper is set up as follows. Section 2 provides an overview of unemployment insurance system and public employment service in Ukraine and the consequences of its failure to provide real assistance to the unemployed. Section 3 describes the conceptual framework and the econometric model to be used in the analysis. Section 4 gives the details of the data and variables used. Section 5 presents our estimation results and Section 6 offers concluding remarks.

## **2. Challenge for an Unemployed Person in Ukraine: Unemployment Insurance or Alternative Sources of Subsistence?**

Public employment service (PES) and unemployment benefit system have been established in Ukraine according to the Law on Employment in 1991 when Ukraine was one of the republics of the Soviet Union. So despite many amendments to the Law in independent Ukraine during 1991-2003, there are still many similarities in regulations connected with unemployment between Ukraine and other FSU countries.<sup>5</sup> In general, the PES in Ukraine as well as in any other country is supposed to perform two major functions: to assist unemployed workers in their job search and to provide income support during a period of unemployment.

But it is widely believed that the Ukrainian PES is not very successful in both of the tasks. Firstly, although firms are obliged to register all vacancies with the local employment center and to make use of it in recruitment, many firms fail to do this preferring other channels for recruitment due to weak law enforcement. Besides, sometimes PES provides training or retraining for the skills that are already in surplus in the local labour markets, and public works are usually of low skill level (Kupets, 2000). As a result, the probability of more effective matching and finding a good job with help of public employment center is small, while the transaction costs of registration and staying at the register are high.<sup>6</sup> Secondly, the level of unemployment benefit is too low: the ratio of the average unemployment

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<sup>4</sup> The empirical work of Meyer (1990) and of many other researchers suggests that failure to model distribution of unobserved heterogeneity explicitly does not seriously bias results if the baseline hazard is fully flexible.

<sup>5</sup> Main institutional characteristics of the unemployment insurance system in Ukraine can be found in Appendix 1.

<sup>6</sup> One of such transaction costs of staying at the register is a necessary visit (report) of unemployed to the local employment center once a month in the administrative center of their civil registration (new name of the old system of *propiska*). Since many people live far from administrative centers of their *propiska*, the above requirement demands too heavy expenses in terms of time and money.

benefit to the average wage in the economy is about 25-28%, while the ratio of the average unemployment benefit to the nationally established level of minimum wage fluctuates between 50 and 70% (Table 2, bottom lines). Moreover, because of the strict unemployment benefit eligibility criteria and high incidence of long-term unemployment, the coverage ratio (the ratio of those receiving unemployment benefit or unemployment assistance to the total number of registered unemployed) has been less than 70% during all years. Although the unemployment insurance system in Ukraine may seem better than in the CEE countries from the viewpoint of incentives/disincentives to work, it is certainly worse in terms of income support of jobless workers and prevention of their falling into poverty.

As a result, less than half of the actual jobless workers in Ukraine (defined according to the ILO unemployment criteria) bother to register as unemployed in the public employment offices (Table 2). Analysis of job search methods among unemployed in our sample (Table 3) indicates that people rely primarily on their direct contacts with employers, help of friends and relatives, or advertisements in the newspapers or Internet rather than on the assistance of the public employment offices.

This suggests that unemployment insurance system is not likely to play a significant role in determining duration of general unemployment in Ukraine.<sup>7</sup> However, another explanation originated from the weak enforcement of the Labour Code and other laws and high payroll taxes is called into play. As in many transition countries, there are many possibilities for informal activities and unregistered employment in Ukraine, often casual and very short-term.<sup>8</sup> As has been documented by Mel'ota and Gregory (2001), the informal activity in the household sector in Ukraine amounts to about 16% of the official GDP and presents the main source of the shadow economy in the country. Because of very low unemployment benefit accompanied with still relatively low labour demand, many people start some sort of self-employment just to survive, other leave the formal labour market preferring to find an informal activity or to rely on subsistence farming, and some persons withdraw from the labour market looking for additional sources of income like stipend, pension, child allowance, etc. Therefore, we suggest that there are likely individuals among long-term unemployed who search for regular job less intensively because they are occasionally engaged in unreported activities or subsistence farming.<sup>9</sup> Additionally, alternative income during the period of unemployment raises reservation wage of such individuals whereby lowering the probability of then accepting the job offer and the probability of re-employment as a whole. Various kinds of non-labour income during a period of unemployment including household income, state and private transfers, investments, savings, etc. are likely to have

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<sup>7</sup> Typically economists have seen unemployment benefit system as having a negative effect on unemployment duration, with high benefits and long entitlement periods causing the unemployed to be less willing to accept jobs. Extensive discussion of this topic is offered in Atkinson and Micklewright (1991).

<sup>8</sup> According to Vodopivec (1995) and Grogan and van den Berg (1999), informal employment among unemployed is also widespread phenomenon in Slovenia and Russia, respectively.

<sup>9</sup> Discussion of the definition of unemployment adopted in our study is offered in Section 4 on Data.



the same effect on duration of unemployment as casual labour income, reducing the probability of reemployment and thereby extending the periods of unemployment. Thus, we hypothesize that unemployment benefit is not a determinant factor of unemployment duration in Ukraine, while existence of alternative sources of subsistence during an unemployment spell significantly extends a period of unemployment.

Table 4 provides some evidence on the main sources of subsistence (aggregated to five main groups which will be used later in our analysis) during a period of joblessness among unemployed in our sample. Most frequent or noteworthy compositions of sources of subsistence are additionally reported in Kupets (2005) but not presented here for brevity. Income of parents, spouse or of other relatives plays the dominant role in the support of unemployed individuals – nearly 69% of the unemployed in our sample point to household income as the main source of subsistence. Unemployment benefit accounts only for 4.5% of the sample as the main source, and it is regularly combined with income of spouse, income of parents, support from relatives, income from casual work, income from sale of self-grown products and subsidiary farming for own needs. Also, it is worth noting, that only 27.5% of those who receive unemployment benefit along with other sources of subsistence in our sample consider it as their primary income source during unemployment, while the bulk of unemployment benefit recipients mostly rely on household income. Income from various casual activities or subsidiary farming constitutes the second largest group among the main sources of subsistence (13.7%); it may serve as the only source of subsistence as well as in conjunction with household income, unemployment benefit, pension, state transfers, or savings.

Undoubtedly, involvement of the unemployed into casual activities and subsidiary agriculture could not be considered as of primary importance in explaining the stagnancy of unemployment in Ukraine. Following Ham et al. (1998) and Arulampalam and Stewart (1995) we think that the labour demand factors are the dominant in an era of overall high unemployment. However, we should not forget that supply-side determinants can be also at play (Boeri, 2001), especially on the labour market with the growing incidence of structural unemployment. Great difficulties for some groups of unemployed to find a new regular job (so-called heterogeneity effect) accompanied with depreciation of human capital, erosion of work habits, discouragement and loss of motivation and other consequences of longer spells of unemployment leading to ever declining outflows from unemployment (so-called duration dependence effect) may lead to long unemployment durations before re-employment or to higher outflows to inactivity.<sup>10</sup>

### **3. Econometric Model**

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<sup>10</sup> Discussion of heterogeneity versus duration dependence effect and an overview of the literature which attempts to distinguish the hypotheses of unobserved heterogeneity from true duration dependence can be found in Machin and Manning (1999).

The typical framework used in the empirical analysis of unemployment duration is the job search theory introduced in Mortensen (1977) and updated in Mortensen and Pissarides (1999). The focus in modeling duration of unemployment is usually on the conditional probability of leaving unemployment, the hazard function.<sup>11</sup> The theoretical model of job search in a two-state labour market (employment and unemployment) implies that the hazard function can be viewed as the product of the probability of receiving a job offer (which could be further decomposed into a contact rate and an employer acceptance rate) and the probability then of accepting this job offer determined by individual's reservation wage. Thus, the expected length of an individual's unemployment spell depends on the factors that affect the individual's chances of finding a vacancy and being offered the job, factors that affect the acceptance probability, and income while unemployed and expected income in work.<sup>12</sup>

The econometric model adopted in our study is Cox proportional hazards model (Cox, 1972) of the following general form:

$$\lambda_i(t) = \exp(\beta'X_i)\lambda_o(t),$$

where  $X_i$  is a set of explanatory variables for individual  $i$ ,  $\beta$  is a vector of parameters to be estimated, and  $\lambda_o(t)$  is the baseline hazard at time  $t$ , which is unknown.<sup>13</sup> Explanatory variables may vary with unemployment duration  $t$  (classical examples are time-varying unemployment benefits and the time remaining until their expiration), with calendar time (e.g. local labour market conditions or some characteristics of unemployment insurance system because of policy changes) or may remain fixed over time (most personal characteristics). In our study, most variables are taken as time-invariant (except the regional unemployment rate in one of the specifications which varies with calendar time) given the limited data on time-varying characteristics of unemployment benefit system at our disposal and potential endogeneity of certain characteristics in the case of their varying with time in unemployment (e.g. marital status, number of kids, etc.).

If durations are measured in terms of whole months completed (interval-censored or grouped data), an observed duration of  $t$  whole months indicates duration on the continuous-time scale of between  $t$  and  $t+1$  months. According to Meyer (1990), if there are no time-varying variables or if the value of time-varying variables is constant between  $t$  and  $t+1$ , the probability of a spell being

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<sup>11</sup> See Kiefer (1988) or Lancaster (1990) for more details on duration models and hazard functions.

<sup>12</sup> It should be noted that we use a reduced form approach, which implies that the total effects of the variables on the probability of re-employment are estimated rather than separate effects on the probability of receiving a job offer and the probability of accepting this offer.

<sup>13</sup> The proportional hazards specification implies that the proportional effect of an explanatory variable on the hazard of leaving unemployment does not depend on duration (Kiefer, 1988; Lancaster, 1990). According to the conclusion made by Machin and Maning (1999, p. 3109), "...none of the explicit theoretical models of duration dependence would support the proportional hazards specification and its widespread use is explained primarily by its convenience".

completed by time  $t+1$  conditional on that it was still continuing at time  $t$ , the discrete-time or grouped hazard, can be written in the complementary log-log form as follows:

$$\lambda_i(t) = 1 - \exp[-\exp(\beta'X_i + \gamma(t))],$$

where

$$\gamma(t) = \ln \left[ \int_t^{t+1} \lambda_0(u) du \right] \quad (*)$$

is some functional form which summarizes the pattern of duration dependence in the discrete time hazard and is estimated for each observed completion length along with parameters  $\beta$  (by Maximum Likelihood). Thus we prefer a flexible specification of the baseline hazard since it allows for non-monotonic variation with duration, and therefore a wider range of possible effects of duration on the hazard rate can be captured (Meyer, 1990; Han and Hausman, 1990). The shape of the baseline hazard is estimated in our model on a month by month basis without any restrictions on how  $\gamma$  can vary from interval to interval.

In this study we distinguish between two destination states of exits out of unemployment (competing risks): unemployment can end with finding a regular job or with a spell of economic inactivity.<sup>14</sup> Following the assumption made by Narendrenathan and Stewart (1993) for interval-censored data, that exits from unemployment can only occur at the interval boundaries and that risks are independent, the overall independent competing risks model simplifies to two or more single-risk models analogous to that for continuous time data.<sup>15</sup> To estimate the two risks separately, exits from unemployment to inactivity are considered censored when estimating exits to employment, and vice versa.

Finally, to allow for unobserved heterogeneity we extend our model introducing a gamma-distributed random variable in each of the destination-specific hazard and assuming the independence across terms.<sup>16</sup>

#### 4. Data and Variables

The data employed to analyze the probability of leaving unemployment in Ukraine are taken from the first wave of the Ukrainian Longitudinal Monitoring Survey (ULMS-2003), a nationally representative random sample of households. It has information about 4056 households and 8641 individuals aged from 15 to 72. The ULMS data set is a unique one in Ukraine since it is the richest

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<sup>14</sup> The possible destination states which have been considered in the literature are employment (with distinctions sometimes made between exits to full-time and part-time employment, return to the same and different employers, exits to formal versus informal sector, transitions to different employment statuses), inactivity (which could be broken down into further subcategories, often retirement versus other states) and labour market programs. Retrospective data with a very long recall period, used in our study, restrict our choice to the two main destination states at the moment: exits to employment and exits to inactivity.

<sup>15</sup> An alternative assumption for the discrete-time competing risks model can be found in Han and Hausman (1990).

<sup>16</sup> See Meyer (1990) for a derivation of the likelihood function for the mixed proportional hazards model with a gamma-distributed unobserved heterogeneity in a single-risk framework.

data set available at the individual level and it allows making an analysis of the labour market flows and unemployment durations during more than five years owing to its retrospective nature.<sup>17</sup>

Our sub-sample consists of individuals with at least one unemployment spell between 1997 and 2003 who provided complete responses to the questions about the period of job search. As a result, we have 2122 unemployment spells experienced by 1799 individuals, with the average number of unemployment spells per person of 1.18 and its maximum number of 5. We distinguish the following three types of unemployment spells by destination states:

- *exit to employment* if a respondent has found a job (or started his business) after a period of job search,
- *exit to inactivity* if a respondent has stopped job search, and
- *right-censored* if a period of job search has been continuing at the date of an interview (in April-June 2003).

Our “dependent” variable is the length of an unemployment spell defined as the number of full months between the date of beginning of job search (month and year only) to the date of its end (or to the interview date in the case of right-censored spells).<sup>18</sup> In order to isolate the net effect of time out of work on the hazard of leaving unemployment we introduced a set of control variables which seemed appropriate on the theoretical grounds and on the basis of previous empirical findings in developed and transition countries (see Devine and Kiefer (1991) for review of some of them). The choice of variables was constrained by the data available in the retrospective part of the ULMS data set. To each unemployment spell experienced by a sample member we have attached a vector of demographic and other individual characteristics (including gender, age, marital status and number of small children, education level, previous labour market status, previous unemployment experience, etc.), the values for which are determined at the starting date of the unemployment spell to ensure their exogeneity.

To test our main hypotheses we use also dummy variables for various groups of sources of subsistence which reflect presence or absence of a certain type of income during non-employment period. Unfortunately, it is impossible to derive the level of income, received by the unemployed persons from various sources, from the retrospective information of the ULMS. Also, there is no direct information about calendar time and duration of receiving unemployment benefits or other alternative income, or time to benefit exhaustion which would portray a job-search period in the past. Owing to

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<sup>17</sup> It should be stressed also that the ULMS is one of the unique data sets in the CIS area which gives the possibility of the hazard analysis in a continuous-time framework because full individual’s labour market history over the period 1997-2003 is observed. Widely used Russian Longitudinal Monitoring Survey (RLMS) and other individual-level panel data sets have serious shortcomings as sources of information on unemployment durations. According to Kiefer (1988), the two main problems of such data sets are right-censoring (exclusive sampling of the current unemployed for information on unemployment duration) and length-biased sampling (underrepresentation of short spells). Problems connected with the retrospective ULMS data are discussed below.

<sup>18</sup> The minimum length of the periods fixed in the ULMS is one month. If, for instance, there was a period of less than a month between leaving one job and starting a new one, this period is usually not reflected in the questionnaire as a separate period of unemployment.

the lack of this information, we are unable to make a rigorous analysis of the effect of various features of the unemployment benefit system in Ukraine on the re-employment probabilities, which could probably provide valuable policy implications. However, we think that, given relatively small variation in the level of unemployment benefits and duration of their payment among benefit recipients together with low coverage of all general unemployed (as opposed to registered unemployed) by benefit payments, a dummy representing benefit receipt seems to be fairly enough to capture the expected effect on the duration of general unemployment in Ukraine.<sup>19</sup>

In addition to individual characteristics, we use variables to account for differences in local labour demand conditions. Differences in the local labour markets are proxied in our study by regional unemployment rate (accounting for between-region differences) and the type of settlement (accounting for within-region differences).<sup>20</sup> Consistency in methodology and completeness of information on registered unemployment at the regional level and at the quarterly (or even monthly) basis motivate us to employ regional registered unemployment rates rather than unemployment rates according to the LFS (ILO methodology). Nevertheless, we use ILO-type yearly regional unemployment rates instead of quarterly registered unemployment rates in one of our specifications for additional sensitivity control. In most models, we have attached the value of regional unemployment rate to each unemployment spell by the quarter (year for ILO-defined unemployment rate) of its starting date and by the region (24 oblasts, Kyiv City and Crimean Republic) where the person lived at the beginning of the corresponding unemployment spell. In one of the models, however, we use time-varying (quarterly) unemployment rate to take into account the possible changes of labour market conditions with calendar time while in unemployment.

Finally, we add the year and the quarter of entering into unemployment to control for changes in macroeconomic environment and possible seasonal effects. Since the Ukrainian economy exhibits significant growth starting from 2000, it is expected that the individuals who entered unemployment later during the observed period have significantly shorter unemployment spells than those who became unemployed earlier in the period. The definition of all variables is provided in Appendix 2.

Table 5 provides some descriptive statistics for the variables used in the unemployment duration analysis. It shows that one half of unemployment spells ends with a transition to employment, and

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<sup>19</sup> Hunt (1995) finds for Germany that dummy on receipt of UI is significant while the level of benefit receipt is insignificant. Addison and Portugal (2001) use a dummy on access to unemployment benefits and find it highly significant in Portugal, but they group individuals by age (seven elements of age regressor) so that to “mimic the stepped increases in benefit entitlement with age”.

<sup>20</sup> Regional unemployment rate is the most popular measure of the local labour demand conditions (*inter alia* Narendranathan and Stewart (1993) and Arulampalam and Stewart (1995) for the UK; Meyer (1990) for the US; Foley (1997a) for Russia). The alternative measures are local unemployment and vacancy rates for the individual’s education group, real value of regional per capita industrial production, and regional agricultural/industrial employment ratio (Ham et al., 1998) or Herfindahl-Hirschman Index of employment concentration in the local labour market (Denisova, 2002). We experimented with some other potential characteristics of the local labour market such as the stock of registered unemployed, stock of notified vacancies, and the number of registered unemployed per vacancy, but estimation results seem to be very close to those based on using the unemployment rate.

censored spells account for the next largest fraction of unemployment spells. The mean duration of completed unemployment spells is about 16 months, while the maximum duration is about 65 months. Distribution of unemployed persons with uncompleted spells by actual duration of their unemployment at the moment of interview shows that the share of long-term unemployed is 48% of all “currently” unemployed according to the ULMS data.<sup>21</sup> This suggests that long-term unemployment remains an important issue in Ukraine even in stronger labour market conditions after economy’s reversal and needs more careful investigation.

Before turning to discussion of the results, several important points of the methodological meaning should be noted. First, there can be some difficulties connected with definition, measurement of unemployment and further comparison of unemployment measures from various sources. Although we follow the ILO guidelines on defining the unemployed as persons without work, looking for work and available for it during a given period of time (ILO, 2004), the definition of unemployment accepted in our study differs from the standard ILO definition due to retrospective nature of the data with a long recall period:

- since labour market states are measured in relation to a long reference period such as several years rather than to a short period such as one week or one day as in most longitudinal surveys, definition of the three labour market states employed in our study refers to the “usually” employed, unemployed or economically inactive rather than to the “currently” employed, unemployed or economically inactive individuals;
- according to the standard ILO unemployment criteria individuals who engage in casual work or casual business activities can not be classified as unemployed. In our study, however, we do not exclude individuals on the basis of their engagement in irregular businesses from the sample of unemployed if: 1) a person answered that he/she didn’t have a job (including entrepreneurship, business activities, individual work, work in a family enterprise or on a farm, and freelance work) at some time period in the past; 2) a person gave the reason of not having a job and answered that he/she was seeking and available for work for any time during that period; 3) there is no overlapping in time between the period of employment and the period of non-employment according to respondent’s answers (if there was such overlapping we reclassified a person as employed); and 4) a person pointed to income from casual work or business activities, production and sale of products from own land plot, or subsidiary farming for own needs as one of the sources

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<sup>21</sup> For comparison, according to the LFS data (second quarter in 2003), the share of unemployed with duration of non-employment of more than 12 months is 61% of all unemployed previously employed, and the share of unemployed with duration of job search of more than 12 months is 54% of all unemployed who were looking for job during the preceding four weeks.

of subsistence at that time of non-employment.<sup>22</sup> Unfortunately, the ULMS doesn't let to capture accurately the extent and the nature of such irregular, usually short-term, activities within a long period of non-employment. It is impossible to know for sure whether casual work or business activities in this case are really short-term and sporadic or they have systematic character; whether persons without formal job attachment have chosen these informal activities in view of formal sector opportunities, or they have been forced to engage in casual work activities or subsidiary farming just to survive; whether engagement in such activities is a cause of lengthening of an unemployment spell, or long-term unemployment drives intensified search of any kind of economic activity including casual activities or subsidiary farming for own consumption. The last issue raises the problem of potential endogeneity of casual activities and subsidiary farming, which is extremely difficult to address in duration models;

- we didn't put any restrictions on age of individuals in the sample as it is usually done using the retirement age as a threshold (e.g. Foley, 1997a; Grogan and van den Berg, 1999, among others). We think that due to low retirement age (55 for women and 60 for men) accompanied with very low pension (less than 30% of average wage) in Ukraine persons aged above retirement age have almost the same work incentives as those in pre-retirement age group. Moreover, according to the ILO guidelines, pensioners, students and others mainly engaged in non-economic activities during the reference period, who at the same time were in paid employment or self-employment should be considered as employed on the same basis as other categories of employed persons, and persons who satisfy the basic criteria of unemployment should be classified as unemployed. We control for those who receive any kind of pension (not only for years of service or retirement age but also for disability and loss of provider) during a period of unemployment by including a separate dummy for such persons in one of the specifications.

According to Poterba and Summers (1995), although some categories of individuals classified as "out of the labour force" are conceptually distinct from "unemployed" (e.g. disable or retired in the US), substantial portion of those reporting themselves as economically inactive may be reclassified as unemployed, and vice versa. Therefore, some allowance for spurious events that result from classification error should be made when analyzing unemployment duration and dynamics.

Second, we might expect that the problem of classification error may aggravate as we go further back in time asking about unemployment periods.<sup>23</sup> Our analysis based on the retrospective data over more than five years is certainly subject to reliability problems and recall bias (see Sudman and Bradburn, 1973; Morgenstern and Burrett, 1974; Akerlof and Yellen, 1985; Dex and McCulloch,

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<sup>22</sup> Sabirianova (1998) has estimated that unemployment rate in Russia according to the standard ILO definition should be corrected (increased) for 1-2% if the unemployment sample is augmented with the number of non-employed individuals having casual income during a period of job search.

<sup>23</sup> Paull (2002) argues that time in unemployment is less likely to be recalled correctly than periods of employment and inactivity, and so the spell of unemployment may be reclassified as the spell of inactivity rather than forgotten at all.

1998; Paull, 2002, among many others). Nevertheless, we believe that relatively low labour market mobility of the majority of Ukrainians, salience and social undesirability of unemployment spell for most of individuals, and the careful design of the questionnaire minimize this problem.

To test our hypothesis about significant differences in unemployment durations between those usually unemployed who receive some income from casual work or subsidiary farming (see broader definition of the variable on casual work in Appendix 2) and their counterparts, we split our total sample discussed above to the two subsamples on the basis of getting income from casual work activities during a job-search period. Table 6 reports some characteristics of unemployed individuals with and without some income from casual work. It shows that the majority of the spells are experienced by unemployed without income from casual work (1525 spells or 72%) implying that the total sample gives a disproportionate weighting to such job-seekers. As expected, the mean unemployment durations of completed and censored spells among individuals with such income (call them “casual workers”) are about 3.5 months higher than among those without it, and the corresponding difference in the incidence of the long-term unemployment is about 9-10 percentage points. As in the total sample, majority of the unemployment spells end with exit to employment and about one fifth-one sixth of the spells end with exit to inactivity, but the proportion of spells terminating with inactivity is larger among so-called “casual workers”. Also, there are much more males and married persons with general secondary/ vocational or lower level of education, who were previously employed, in the subsample of “casual workers” than in the total sample or in the second subsample. It is worth noting that in contrast to the total sample of unemployed or its subsample without casual work, proportion of unemployment spells experienced by unemployed with some casual work increases with age till 55. Not surprisingly, the bulk of those involved in some kind of casual work or subsidiary farming live in villages or small towns (about 61%). Comparison of the sample compositions according to individual’s geographic location suggests that they are very similar, yet with relatively fewer “casual workers” from the Western part of Ukraine and relatively more individuals from the South.<sup>24</sup> Overall, examined characteristics of casual workers among usually unemployed suggest that jobless individuals involve in casual work activities because of their poorer opportunities, greater financial pressure, and generally worse job prospects. In other words, they have been forced to take these unconventional measures just to survive.

## 5. Estimation Results

To assess the joint effect of various individual and local labour market characteristics on the probability of exit from unemployment we employ several specifications with flexible baseline hazard

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<sup>24</sup> Both Western and Southern parts of Ukraine are considered to be less industrially developed than Eastern or Central parts. The West is predominantly agricultural, while the Southern oblasts have relatively diversified economy with developed service sector.



in a competing-risk framework distinguishing between exits to employment and exits to economic inactivity for the total sample (Tables 7-9) and then for two subsamples of unemployed depending on their involvement in casual work activities (Tables 10-11).<sup>25</sup> At the first stage of our empirical work we experimented also with parametric models with Weibull, log-normal and log-logistic specifications of the baseline hazard comparing to the Cox specification but the assessment of the overall model fit based on the analysis of Cox-Snell residuals has shown that Cox proportional hazards model produces the better fit than parametric ones. The figures reported in Tables 7, 8 and 10 are the estimated coefficients. The proportionate impact of each variable on the state-specific hazard can be calculated by taking the exponent of the corresponding coefficient.

To account for the possible correlation between spells experienced by one person (serial correlation) for the individuals with multiple spells of unemployment we fit all our models with the robust standard errors adjusted for clustering on the individual identification and include variable on the number of previous unemployment spells to the estimation model. Furthermore, we have also estimated the models using a subsample of individuals who experienced only one unemployment spell during the observation period. The estimates appear to be in complete agreement with those based on a multiple-spells sample. Thus, we can suggest that serial correlation does not seem problematic implying that the behavioural model for the persons with several unemployment spells does not differ considerably from those without previous unemployment experience.

Table 7 presents the estimates of the coefficients on the explanatory variables for the hazard of re-employment. We start by comparing the hazard estimates in a continuous-time (model 1) and discrete-time framework (model 2) with no unobserved heterogeneity. The statistical significance, signs and magnitudes of the estimated coefficients in these models are almost identical. We therefore base further specifications and interpretation of results on the discrete-time model with nonparametric baseline hazard (model 2), given the grouped nature of the duration data. Next, we allow for a gamma distributed unobserved heterogeneity. The variance of heterogeneity is not significantly different from zero (the same has been also found for hazards to inactivity) implying that no unobserved heterogeneity is found in our case.<sup>26</sup> Given these findings, the further estimation results are reported

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<sup>25</sup> Here presented only results of the multivariate semiparametric duration analysis. Results of the univariate non-parametric analysis (using Kaplan-Meier product limit estimators) can be found in Kupets (2005). Graphs of the empirical survival and hazard functions by destination states are provided in Appendix 3, Figures A1-A2. The survival function are rather smooth without springs, while the hazard functions initially rise until about 12 months, after slight decline they remain relatively stable and after 4 years sharply increase with the peak at 64 months. If the initial period of positive duration dependence can be explained by more intensive job search during the first year of unemployment spell and then by discouragement after a year of unsuccessful job seeking, the second increase of the hazard can be attributed to relatively few observations with durations beyond four years and may be considered spurious. The second increase of the hazard function may be also attributed to the fact that some respondents with very long spells of unemployment feel stigmatized and lie about their exit from unemployment to employment or inactivity. We have examined such persons which exited from unemployment in 2003, and it appears that this explanation is not the case.

<sup>26</sup> Not significant unobserved heterogeneity has been also found in Stetsenko (2003) for Ukraine and Grogan and van den Berg (1999) and Foley (1997a, for exits to employment) for Russia. Our result is also in line with a common perception

with no unobserved heterogeneity. Specification (4) is the same as specification (2) with the only difference that time-varying registered regional unemployment rate (namely, quarterly-varying) is used here instead of unemployment rate fixed at the beginning of an unemployment spell which is employed in other specifications. The difference between the base specification (2) and specification (5) is again in the data on local unemployment rates: specification (5) uses average yearly regional unemployment rates from the LFSs (according to the ILO methodology) corresponding to the year of entering into unemployment, while all other models use quarterly regional administrative data from unemployment registry. Column (6) lists estimates which control for the log of previous earnings. Finally, column (7) contains the estimates from a specification where those who receive pension are separated from those who receive other kinds of state transfers. As mentioned before, all models include yearly and quarterly dummies corresponding to the starting date of an unemployment spell. We have also estimated the specifications including variable on religion, nationality, health status, the number of dependants younger than 15 or older than 75 in the household, previous employment status, sector of previous employment, last occupation before unemployment spell, and the national unemployment rate, but these factors appear to be not significant, and our main results are robust to their inclusion.

The coefficient estimates on gender (Female) and marital status (Married and Married Female) suggest that married males tend to have higher hazards of re-employment while there is virtual absence of any marriage effect for females and no significant difference in re-employment probability between single males and females. The simplest explanation of this result is that married men as household heads are under greater financial pressure to return to work; they may have higher opportunity cost of staying unemployed and greater job search intensity. This suggests that historically established pattern of family responsibilities in Ukraine is an important factor in the labour supply decisions. Surprisingly, the number of small children has no significant effect on the duration of unemployment of either females or males. This finding may be partly attributed to the well functioning system of pre-school and out-of-school education developed under the Soviet Union with the aim of promoting female labour force participation.

The individual's age is negatively associated with the probability of re-employment implying that older workers are at a disadvantage in a rapidly changing economic environment. Generally, difficulties which older workers face in finding work could be attributed to the restrictive hiring standards of employers (especially in the emerging private sector) as a result of both objective and discriminatory factors, obsolete skills acquired under the Soviet era, health problems (which from employer's viewpoint are usually associated not only with a lower productivity of workers but also

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that the use of a mixing distribution to account for unobserved heterogeneity does not appear to affect either the regression coefficients or the shape of the baseline hazard function in the case of a fully flexible specification for the duration distribution (Meyer, 1990; Han and Hausman, 1990; Narendranathan and Stewart, 1993).

with a heavy burden of sickness benefits), loss of motivation and discouragement. All these factors may in turn cause the reduced arrival rate of job offers. The estimates in model (2) imply that at each survival time the hazard rate is approximately halved for persons aged between 40 and 54 comparing to the youngest persons, whereas the hazard for those who are 55 or older is about three times smaller than the corresponding hazard for aged 24 or under, *ceteris paribus*. These results are consistent with job search theory and empirical evidence for many transition countries (e.g. Foley, 1997a; Nivorozhkina et al., 2002; Stetsenko, 2003) but they contrast to the findings of many studies for the early period of transition which have found longer durations of unemployment among young persons (e.g. Earle and Pauna, 1996).

The exit rate to employment increases with level of education, though only the coefficient on higher education is statistically significant: persons with completed higher education have the 45% higher hazard rate of exit to employment than individuals with lower level of education, *ceteris paribus*. Higher exit rates among educated persons can be explained by their greater efficiency of job search due to easier access to information, higher opportunity cost of unemployment, greater flexibility and wider range of alternatives for future employment. Whereas higher educated persons are able to compete for jobs that require less years of schooling the reverse is not generally the case. This issue appears to be extremely important during the economic transition in the former centrally-planned economies. Sabirianova (2002) in her study of occupational mobility in Russia has found that the transition period accompanied with negative demand shocks does bring about more downward unconventional switches on the schooling ladder (so-called downward occupational mobility) with higher intensity among more educated persons.<sup>27</sup> However, our finding of positive effect of education on the re-employment probability of general unemployed is in conflict with the effect of education on exits from registered unemployment in Ukraine found by Stetsenko (2003). We attribute this discrepancy to the difference in the composition of vacancies notified at the public employment service and those advertised in the newspapers and private employment agencies in Ukraine with the former heavily represented by vacancies for less educated persons with lower skills (Kupets, 2000).

The estimate of the variable on receipt of unemployment benefits provides support for our hypothesis of insignificant effect of unemployment benefits on unemployment duration before re-employment implying that the existing unemployment benefit system on average is not contributing to longer unemployment spells. However, existence of other sources of subsistence during a period of unemployment including income from casual work activities and subsidiary farming, household income and state transfers significantly lowers the probability of re-employment almost by the same amount. This effect is consistent with job search theory, with a longer search duration implied by the

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<sup>27</sup> The classical examples of such downward occupational switches in Ukraine are transitions from engineer, technician, discharged armed forces serviceman to a taxi driver, builder or a guard for males and from practically any female profession corresponding to the higher level of education to a seller, babysitter or housekeeper for females.

higher reservation wages and lower job search intensity cause by alternative sources of subsistence. However, a note of caution about state transfers is required here given that their estimated effect on the exit rate from unemployment could inform about wrong policy decisions. The point is that in most presented models pension is combined with stipend and various kinds of social assistance in one category State Transfers, but as has been discussed earlier it is preferable to control for behaviour of unemployed pensioners separating them from the other recipients of state transfers. Once we use two dummies Pension and Other State Transfers instead of a dummy State Transfers (Model 7), it appears that only the coefficient on Pension is highly significant and larger by the magnitude while the coefficient on Other State Transfers is not significant. This finding presumably picks up the expected difference in the behaviour of job seekers between unemployed pensioners and their counterparts. Returning to Boeri's hypothesis about the negative role of non-employment benefits for the outflows from unemployment (Boeri, 2001), we conclude that our results do not support it: scanty unemployment benefits as well as social assistance measures are not significant determinants of re-employment probability in Ukraine. Surprisingly, people relying on income from dividends, rents, interests, savings, etc. tend to have significantly shorter unemployment spells before employment. The established positive effect supposedly captures the effect of observable or unobserved factors of stronger attachment of such individuals to the labour market (e.g. age, marital status, education, importance of employment status and fear of being unemployed and without money, etc.).

The local labour demand variables proxied in our model by the regional unemployment rate and the type of settlement have the expected signs. In model (2), the implied effect of a one percentage point increase in the registered local unemployment rate in the beginning quarter of an unemployment spell is a 7.3 percent reduction in the hazard to job, all things equal. Response of the hazard to a one percentage increase in local unemployment rate is found to be smaller if time-varying registered unemployment rate (model 5) or fixed over time but ILO-defined unemployment rate (model 6) are used. The residents of large cities (more than 500 thousands of inhabitants) are likely to have higher exits to jobs than those living in the rural area or very small towns. These effects presumably reflect the poorer opportunities facing people in depressed areas with relatively low labor market activity and less diversified economy. This suggests that local labour market conditions are important determinants of exit to jobs and that unemployment duration in a country might be lower if fewer barriers for people to move to the regions with more favourable labour market conditions existed. Such barriers include system of civil registration (just a new name for the old system of *propiska*), high transportation and housing expenses, shortage of information about vacancies and living costs throughout the country.

Previous wage incorporated in model (6) seems to have no effect on unemployment duration, but we would not rely on these results to a large extent since we have information on wages only for half

of our sample. Moreover, it comes from the retrospective part and so is subject to significant reliability problems (Sudman and Bradburn, 1973).

Other surprising result from our study is that previous labour market state before unemployment (as well as a sector of previous employment and employment status) and previous unemployment experience do not alter the probability of leaving unemployment to jobs with the only exception of the experience of three or more prior unemployment spells the coefficient on which is positive and marginally significant at the 10% level. Our interpretation for this finding from the individuals' side is that individuals with many unemployment spells are more mobile on the labour market and can find the next job relatively easy. It appears difficult to interpret these results from the employers' side, but we think that employers use other information as a signal of worker's productivity and reliability but not his/her labour market history. This may be attributed to specific conditions of the transition process in Ukraine when new private firms have short horizon over their existence and when workers with long tenure do not necessarily have higher productivity than individuals with several spells of employment interrupted by non-employment periods.

Finally, all specifications for the exits from unemployment to employment (Table 7) reveal that macroeconomic environment (proxied by the year of entering unemployment) and the starting season of unemployment seem to be not important for the determining unemployment duration before re-employment. Only those who became unemployed in 2002 have significantly higher hazards of exit to jobs compared to the reference group (those who entered unemployment in 1997). One potential explanation for non-response of the unemployment duration to economic growth in Ukraine over the last years is that there might be serious barriers between long-term unemployed and emerging job opportunities due to considerable structural changes in the economy, labour market rigidities and other factors (OECD, 1993). Another potential explanation is that, like in the CEE countries during the 90-s, employment growth in the old sector absorbs first of all "hidden" unemployed who remain formally attached to a work place, while for the jobs created in the new sector unemployed have to compete with those still employed in the old sector (Blanchard, 1997).

When we turn to the multivariate analysis of the factors affecting exits from unemployment to economic inactivity (Table 8), several primary results emerge. There is no significant difference by education, gender, marital and family status, regional unemployment rate, and previous unemployment experience.

As expected, older workers have a significantly higher hazard rates to inactivity than both prime-age or older individuals. This result may be attributed to the stronger effect of discouragement and loss of motivation among older individuals, higher possibility of retirement and stopping job search process, health problems and some other attributes.

Persons relying on household income and pension during unemployment are more likely to leave the labour force than persons without alternative income support since the former have less financial incentives to actively search for job and work at all. Significant effect of presence of income from casual work activities with respect to the exit to employment accompanied with its insignificant impact with respect to the exit to inactivity probably indicates that various casual work activities and subsidiary farming can be considered as simply survival measures taken by those who would prefer the stability of a formal regular job but with a reasonable remuneration.

We observe significantly longer unemployment durations before withdrawing from the labour force for the residents of small to medium towns compared to the residents of rural area or very small towns, and no significant difference in unemployment durations between residents of cities and the latter. One of the possible explanations is that the residents of rural area can move to self-employment (primarily in subsidiary agriculture) as a last resort or withdraw from the labour market in the case of unsuccessful search of paid employment, whereas residents of small to medium towns stay unemployed longer hoping to find a regular job subject to the limited number of alternative activities.

Individuals entering unemployment after employment appear to search longer before withdrawing from the labour force than those who came from inactivity. The simplest rationale for this is higher importance of work and more negative attributes associated with not having a work and being idle for previously employed. Also they may anticipate their relative advantage in finding a job and are not willing to leave the labour market.

Year and quarter coefficients imply that the hazard of exit from unemployment to inactivity increases with moving to the later year of starting unemployment and that those who enter unemployment in the second quarter tend to withdraw from the labour market faster than those who start unemployment in the first quarter. However, we think that this result is likely to be more related to the disadvantages of the retrospective data and classification errors rather than to some changes in macro environment inducing increased outflows to inactivity during the recent years.

Table 9 presents the value of the baseline hazard parameters defined in equation (\*) and reported for the base specification (2). Hazard to inactivity is rather smooth and very close to zero, while hazard to employment has several spikes at 2, 12, 23, 30, 33, 39, 43, 47 and is relatively high after 4 years, though few spells last sufficiently long to be affected by this sudden increase in the hazard. These spikes may reflect some arrangements made by unemployed to find a new job but it is difficult to find a plausible explanation of the spikes at exactly these points. Meyer (1990, p.776) concludes that “whatever the source of the spikes in the hazard, the baseline hazard parameters have identified an important feature of the data that would have been missed if a simple parametric baseline has been estimated. Anomalies in the hazard that remain after including covariates suggest variables to add or data problems to examine”. Overall, after controlling for the set of observed characteristics, our results

show little evidence of “true” duration dependence for the hazards of leaving unemployment to jobs or inactivity.

To complete the econometric analysis we test the possibility that the determinants of exits from unemployment may differ between the samples of those who reported about having income from casual work or subsistence farming during job search period (first subsample) and those who didn’t (second subsample). Separate regressions there run for each of them and the resulting coefficients on the explanatory variables are reported in Table 10.

The first striking difference is in the effect of gender and marital status on the hazard to job. In the sample of “casual workers”, single (married) females have significantly higher (lower) exit rates to employment than the omitted category of single males, while there is no effect of marriage for males. In the sample of unemployed without income from casual work, on the contrary, married males and females are likely to leave unemployment for employment faster than single males, whereas single females might experience longer unemployment spells before employment. This finding probably reflects the different labour market positions of females versus males to the extent that females are coming from different industries and segments of the labour market than males. Perhaps, it is the case also that casual work activities for single females (with children or no) transform to regular employment in the secondary labour market more often than for males or married females due to little hope of requiring primary-sector jobs coupled with great financial pressure.<sup>28</sup>

As in the total sample, the position of unemployed with respect to the exit to employment deteriorates with the individual’s age in both subsamples. However, the differences for prime-age workers are less marked in the subsample of “casual workers”. Also, the higher level of education, previously significant dummies on household income and pension and the regional unemployment rate appear to be statistically insignificant in this subsample, as opposed to the second one. Evidently, the over-representation of persons without income from casual work among unemployed in the total sample leads to an overstatement of the influence of variables which have more pronounced effect in the second subsample (e.g. higher education, regional unemployment rate, household income, pension, marriage for males). As illustrated by the lower hazards of exits into employment (Table 11), jobseekers with some income from casual work experience greater difficulties in leaving unemployment to jobs relative to their counterparts from the rest of the sample at each survival time. This negative effect is so strong that despite the relatively small share of casual workers in the full sample it has been captured in the general model when a dummy variable on casual work is used (see again Table 7).

## 6. Conclusions

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<sup>28</sup> See Ehrenberg and Smith (2003) for discussion of the dual labour market hypothesis.

This paper presents the results of an econometric analysis of the determinants of individual unemployment durations in Ukraine, for the sample of individuals entering general (not necessarily registered) unemployment during 1997-2003. Given the absence of an effective system of public employment services and unemployment insurance in Ukraine, this study tries to identify other potential determinants of unemployment duration. In view of scanty unemployment benefits and inadequate assistance in finding work by public employment centers accompanied with still relatively low labour demand many usually unemployed people, especially from disadvantaged groups at the labour market, are forced to engage in informal casual work activities or subsidiary farming. Alternative income during a long period of unemployment is likely to raise reservation wage of such persons, lower their search intensity and cause the loss of motivation, whereby lowering the probability of re-employment and extending the general length of joblessness. Therefore, the possibility of having different casual work, business activities or subsidiary farming can be considered as one of the potential causes of stagnant unemployment in Ukraine.

We test our main hypotheses using the data from the first wave of the Ukrainian Longitudinal Monitoring Survey (ULMS) and estimating the discrete-time complementary log-log model with a fully flexible nonparametric specification of the baseline hazard and competing risks of exits to employment and to inactivity. We have also experimented a lot estimating the base model with accounting for unobserved heterogeneity and controlling for a set of additional or alternative explanatory variables.

We get empirical support to our hypotheses. Individuals receiving unemployment benefits or various types of social assistance do not have significantly different unemployment durations. Therefore, our results suggest that on average low non-employment benefits in Ukraine cannot be considered as a significant determinant of unemployment duration in contrast to the Boeri's hypothesis (Boeri, 2001). At the same time, those usually unemployed who have income from casual work activities and subsidiary farming or rely on household income or pension tend to remain unemployed considerably longer before finding a regular job. The negative effect of casual work activities is so strong that despite the relatively small share of casual workers in the full sample it has been captured in the general model when a dummy variable on casual work is used. Controlling for observed and unobserved heterogeneity, the estimation results report also some evidence for the existence of disadvantaged groups of unemployed with respect to the probability of re-employment. They include older, less educated individuals, living in small towns or rural area in the regions with relatively high unemployment rates.

Analysis of the determinants of unemployment duration before withdrawing from the labor force suggests that individuals over the age of 40 are more likely to leave unemployment for inactivity; those who rely on household income or pension have higher exit rates into inactivity; residents of small to



medium towns and those who enter unemployment after employment tend to have longer unemployment spells before withdrawing from the labor force; and those who entered unemployment relatively recently tend to have significantly shorter unemployment spells than those who became unemployed in earlier years.

We unfortunately lack empirical evidence in order to establish what factors are of the primary importance in stagnancy of unemployment in Ukraine but it seems that labour demand conditions have the same or even lower importance now than the supply-side effects. According to our estimation results economic upturn in Ukraine during the last years appears to influence the unemployment duration only marginally implying that a temporary shock in the early 90-s has brought long-lasting effects in terms of persistent and stagnant unemployment. As far as duration dependence is concerned, our results show little evidence of “true” duration dependence for both hazards of leaving unemployment to jobs and inactivity. Hazard to inactivity is rather smooth and very close to zero, while hazard to jobs has several spikes which are difficult to interpret.

Therefore, our study shows that long-term unemployment remains an important issue in Ukraine even in stronger labor market conditions after economy’s reversal, and that it is very unevenly distributed among various subgroups of population. We are not claiming that most of our findings are original, but in the course of our study we have identified a number of important contributions to understanding specificity of transition process in Ukraine. At the same time, there remains a lot of work to be done at both the theoretical and the empirical level.

**Table 1. Duration of Unemployment in Ukraine**

	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
Number of unemployed, who were searching for a job or were planning to start business, thds.	2628.7	2431.3	2204.3	1965.3
Percentage of those searching for a job or planning to start business by duration of their job search				
less than 1 month	3.1	3.0	2.7	3.1
1–3 months	10.1	11.0	12.4	13.8
4–6 months	11.0	11.0	11.6	12.8
7–9 months	12.2	10.1	10.0	10.5
10–12 months	13.1	10.1	9.8	9.5
more than 12 months	50.5	54.8	53.5	50.3
Average duration of job search, months	10	10	10	9
Average duration of non-employment, months	23	23	22	22
Average duration of registered unemployment, months	11	9	8	7

*Source:* Derzhkomstat (Ukraine's State Committee of Statistics), LFS (except for information on duration of registered unemployment)

**Table 2.** Unemployment dynamics and unemployment benefits in Ukraine

	1997	1998	1999	2000	2001	2002	2003
<b>Registered unemployment</b>							
Number of registered unemployed, thds.	637.1	1003.2	1174.5	1155.2	1008.1	1034.2	988.9
Registered unemployment rate, % of working-age able-bodied population	2.33	3.69	4.3	4.22	3.68	3.80	3.6
Fraction of registered unemployed receiving unemployment benefits, %	56.8	53.1	52.8	54.3	62	66.7	69.1
<b>ILO-defined unemployment</b>							
Number of unemployed according to LFS, thds.	2330.1	2937.1	2698.8	2707.6	2516.9	2301.0	2059.5
Unemployment rate according to LFS, % of labour force aged from 15 to 70	8.9	11.3	11.9	11.7	11.1	10.1	9.1
<b>Wages and UB</b>							
Average nominal wage, UHA	143	153	178	230	311	376	462
Average UB, UHA	NA	38.5	49.8	59.39	85.23	105.98	118.32
Ratio of average UB to minimum wage, %	NA	70	67.3	50.3	72.2	64.2	57.7
Ratio of average UB to average wage, %	NA	25.1	28	25.8	27.4	28.1	25.6

*Note:* Registered unemployment characteristics correspond to the end of years, while characteristics according to the Labour Force Survey (LFS) are presented for the fourth quarters in 1995-1998 (yearly surveys) and on average for 1999-2003 (quarterly surveys). UHA (Ukrainian Hryvnia) is the national currency. Average official exchange rate in 2003 is 5.3327 UHA/USD. NA stands for "not available information".

*Source:* Derzhkomstat

**Table 3. Job Search Strategies among Unemployed**

Job search strategy	Percent
Asked relatives or friends	29.55
Responded to job advertisements	18.09
Placed job advertisements	1.93
Watched job advertisements	17.93
Contacted employers directly	16.06
Went to a job interview, took an exam or a test	1.83
Sought job through the State Employment Service	10.53
Sought job through private employment agency	1.59
Applied to register own enterprise/farm, for activity license or loan	0.32
Sought for land, rooms, equipment, employees, etc. to start an enterprise/farm	0.09
Waited for an answer to a job application	0.59
Waited for an answer from the State Employment Service	1.41
Waited for an earlier contracted job to start	0.07
Number of observations (unemployment spells)	2122
Number of responses	5584

Source: ULMS-2003, our sample (1997-2003), author's calculations

**Table 4.** Main Source of Subsistence during a Period of Unemployment

Source of Subsistence	Frequency	%
<i>Unemployment benefits</i>	96	4.52
Income from casual work	147	6.93
Income from sale of products from own land plot	64	3.02
Income from casual business activities	28	1.32
Subsidiary farming for own needs	51	2.4
<i>Total for Casual Work</i>	290	13.67
Income of spouse	608	28.65
Income of parents	659	31.06
Support from relatives	190	8.95
<i>Total for Household Income</i>	1457	68.66
Pension	137	6.46
Child allowance	12	0.57
Alimony	6	0.28
Social benefits, subsistence allowance	12	0.57
Supported by state or municipal institution	15	0.71
<i>Total for State Transfers</i>	182	8.59
Sale of property	4	0.19
Income from rent, interests, dividends	3	0.14
Loans	2	0.09
Savings	62	2.92
<i>Total for Other Sources of Subsistence</i>	71	3.34
Number of observations	2122	100

Source: ULMS-2003, our sample (1997-2003), author's calculations

**Table 5. Descriptive Statistics**

Characteristic	Mean	Std. Dev.	Min	Max
Duration of completed spells, in months (N=1468)	16.43	15.25	0.89	65
Duration of censored spells, in months (N=654)	18.21	17.15	0.13	66
<i>Type of unemployment spell by destination state</i>				
Exit to employment	0.517	0.500	0	1
Exit to inactivity	0.173	0.379	0	1
Right-censored	0.308	0.462	0	1
<i>Duration group (completed spells, N=1468)</i>				
<1 month	0.016	0.127	0	1
1-3 months	0.170	0.375	0	1
4-6 months	0.160	0.367	0	1
7-9 months	0.104	0.305	0	1
10-12 months	0.093	0.291	0	1
>12 months	0.457	0.498	0	1
<i>Duration group (censored spells, N=654)</i>				
<1 month	0.041	0.199	0	1
1-3 months	0.136	0.343	0	1
4-6 months	0.156	0.363	0	1
7-9 months	0.098	0.293	0	1
10-12 months	0.087	0.287	0	1
>12 months	0.482	0.500	0	1
Female	0.508	0.500	0	1
Married	0.555	0.497	0	1
Female*Married	0.292	0.455	0	1
Number of children up to 15 years old	0.686	0.833	0	4
Female*Number of Children up to 15 years old	0.384	0.711	0	4
<i>Age group</i>				
≤24	0.334	0.472	0	1
25-39	0.341	0.474	0	1
40-54	0.284	0.451	0	1
≥55	0.041	0.199	0	1
Age	32.971	12.206	15	67
<i>Education</i>				
Primary or unfinished secondary	0.140	0.347	0	1
General secondary or vocational	0.511	0.500	0	1
Professional secondary or unfinished higher	0.225	0.418	0	1
Higher	0.123	0.329	0	1
<i>Sources of subsistence</i>				
Unemployment benefits or stipend during training	0.180	0.384	0	1
Casual Work	0.281	0.450	0	1
Income from casual work	0.165	0.371	0	1
Income from sale of products from own land plot	0.069	0.253	0	1
Income from casual business activities	0.028	0.166	0	1
Subsidiary farming for own needs	0.048	0.213	0	1
Household Income	0.808	0.394	0	1
Income of spouse	0.371	0.483	0	1
Income of parents	0.401	0.490	0	1
Support from relatives	0.200	0.400	0	1
State Transfers	0.201	0.401	0	1
Pension	0.092	0.289	0	1
Stipend or study loan	0.026	0.160	0	1
Other Sources of Subsistence	0.061	0.239	0	1
Savings	0.050	0.219	0	1
Loans	0.009	0.942	0	1

**Table 5.** Descriptive Statistics (cont.)

Characteristic	Mean	Std. Dev.	Min	Max
<i>Previous state</i>				
Inactive	0.424	0.494	0	1
Employee	0.544	0.498	0	1
Self-employed, employer, or entrepreneur	0.023	0.149	0	1
Member of cooperative	0.010	0.099	0	1
<i>Sector of previous employment (N=1210)</i>				
Agriculture	0.133	0.340	0	1
Manufacturing and mining	0.281	0.450	0	1
Electricity, gas and water supply	0.013	0.114	0	1
Construction	0.088	0.284	0	1
Trade, hotels and restaurants	0.183	0.387	0	1
Transport, storage and communication	0.065	0.247	0	1
Financial, real estate, renting and business activities	0.026	0.161	0	1
Public administration and defense	0.031	0.174	0	1
Education, health and social work	0.084	0.278	0	1
Other community, social and personal service activities	0.088	0.284	0	1
Other activities	0.006	0.076	0	1
<i>Year of entering unemployment</i>				
1997	0.161	0.368	0	1
1998	0.136	0.343	0	1
1999	0.130	0.336	0	1
2000	0.139	0.347	0	1
2001	0.131	0.338	0	1
2002	0.187	0.390	0	1
2003	0.115	0.319	0	1
<i>Quarter of entering unemployment</i>				
I	0.242	0.429	0	1
II	0.238	0.426	0	1
III	0.191	0.393	0	1
IV	0.329	0.470	0	1
<i>Type of settlement</i>				
Village or small town (less than 20 thds. inhabitants)	0.456	0.498	0	1
Town (from 20 to 500 thds.)	0.320	0.467	0	1
Large city (more than 500 thds.)	0.223	0.417	0	1
<i>Local labour market characteristics</i>				
Regional registered unemployment rate	3.639	1.658	0.47	8.09
Number of registered unemployed per vacancy	20.825	24.859	0.53	324.55
<i>Previous unemployment</i>				
No previous unemployment	0.848	0.359	0	1
One prior unemployment spell	0.130	0.336	0	1
Two prior unemployment spells	0.018	0.133	0	1
Three and more prior unemployment spells	0.005	0.069	0	1

Note: N=2122. Variables are measured at the beginning of the unemployment spell except for the local labour market characteristics which are measured here at the end of the quarter corresponding to the starting date of the unemployment spell.

**Table 6.** Characteristics of Unemployed with Some Income from Casual Work versus the Other Unemployed\*

	Unemployed with some income from casual work	Unemployed without any income from casual work
Mean duration of completed spells, in months	18.95	15.43
Mean duration of censored spells, in months	20.68	17.27
<i>Type of unemployment spell by destination state</i>		
% Exit to employment	49.58	52.66
% Exit to inactivity	20.44	16.2
% Right-censored	29.98	31.14
<i>Duration group (completed spells)</i>		
% <1 month	0.96	1.9
% 1-3 months	12.44	18.76
% 4-6 months	15.79	16.1
% 7-9 months	10.29	10.38
% 10-12 months	8.37	9.71
% >12 months	52.15	43.14
<i>Duration group (censored spells)</i>		
% <1 month	2.79	4.63
% 1-3 months	12.29	14.11
% 4-6 months	12.29	16.84
% 7-9 months	7.82	10.53
% 10-12 months	9.5	8.42
% >12 months	55.31	45.47
% Female	36.85	56.26
% Married	58.96	54.1
<i>Age group</i>		
% ≤24	24.12	36.98
% 25-39	35.34	33.64
% 40-54	37.35	24.85
% ≥55	3.18	4.52
<i>Education</i>		
% Primary or unfinished secondary	14.24	13.9
% General secondary or vocational	58.46	48.26
% Professional secondary or unfinished higher	18.93	23.93
% Higher	8.38	13.9
% Previously employed	64.66	56.59
<i>Geographic location</i>		
% West	19.1	23.67
% Center and North	28.14	29.38
% East	35.51	33.05
% South	17.25	13.9
<i>Type of settlement</i>		
% Village or small town	60.64	39.74
% Town	21.11	36.33
% Large city	18.26	23.93
Number of spells	597	1525

*Note:* \*Broad meaning of casual work used here and throughout the paper is offered in Appendix 2. *West* stands for Chernivets'ka, Ivano-Frankivs'ka, Khmel'nyts'ka, L'vivs'ka, Rivnens'ka, Ternopil's'ka, Volyns'ka, Zakarpats'ka oblasts, *Center and North* consists of Kiev City, Vinnyts'ka, Zhytomys'ka, Kyivs'ka, Kirovohrads'ka, Poltavs'ka, Sums'ka, Cherkas'ka and Chernihivs'ka oblasts, *East* includes Dnipropetrovs'ka, Donetsk, Zaporiz'ka, Luhans'ka and Kharkivs'ka oblasts, and *South* consists of Crimean AR and Sevastopol', Mykolayivs'ka, Odes'ka and Khersons'ka oblasts.



**Table 7.** Estimation Results for the Total Sample, Exits to Employment

Variable	Cox PH		Cloglog with nonparametric baseline			
	(1)		(2) <sup>a</sup>		(3)	
Female	-0.084	(0.095)	-0.087	(0.096)	-0.087	(0.097)
Married	0.295**	(0.104)	0.297**	(0.104)	0.297**	(0.106)
Female* Married	-0.294*	(0.134)	-0.292*	(0.134)	-0.292*	(0.136)
Number of children	-0.079	(0.066)	-0.078	(0.066)	-0.078	(0.066)
Female* children	0.109	(0.084)	0.107	(0.084)	0.107	(0.083)
<i>Age</i>						
25-39	-0.413**	(0.089)	-0.419**	(0.089)	-0.419**	(0.089)
40-54	-0.617**	(0.097)	-0.627**	(0.097)	-0.627**	(0.098)
≥55	-1.116**	(0.213)	-1.123**	(0.215)	-1.123**	(0.213)
<i>Education</i>						
General secondary or vocational	0.057	(0.094)	0.047	(0.094)	0.047	(0.096)
Professional secondary or unfinished higher	0.142	(0.107)	0.139	(0.107)	0.139	(0.108)
Higher	0.379**	(0.123)	0.375**	(0.124)	0.375**	(0.119)
<i>Sources of Subsistence</i>						
Unemployment Benefits	0.030	(0.079)	0.029	(0.080)	0.029	(0.086)
Casual Work	-0.276**	(0.075)	-0.269**	(0.075)	-0.269**	(0.076)
Household Income	-0.250**	(0.090)	-0.249**	(0.091)	-0.249**	(0.090)
State Transfers	-0.280**	(0.087)	-0.276**	(0.088)	-0.276**	(0.088)
Other SS	0.336**	(0.144)	0.329*	(0.145)	0.329**	(0.126)
Regional UR <sup>b</sup>	-0.073**	(0.023)	-0.073**	(0.023)	-0.073**	(0.023)
<i>Type of settlement</i>						
Town	0.083	(0.072)	0.086	(0.073)	0.086	(0.074)
Large city	0.262**	(0.091)	0.267**	(0.091)	0.267**	(0.089)
<i>Previous unemployment</i>						
1 prior spell	0.105	(0.106)	0.110	(0.107)	0.110	(0.108)
2 prior spells	-0.099	(0.341)	-0.127	(0.343)	-0.127	(0.324)
3 or more prior spells	0.614	(0.346)	0.618	(0.367)	0.618	(0.459)
Previously employed	-0.096	(0.082)	-0.103	(0.082)	-0.103	(0.081)
<i>Year</i>						
1998	-0.066	(0.129)	-0.100	(0.129)	-0.100	(0.131)
1999	0.124	(0.133)	0.102	(0.134)	0.102	(0.135)
2000	0.195	(0.133)	0.165	(0.133)	0.165	(0.137)
2001	0.241	(0.142)	0.198	(0.143)	0.198	(0.145)
2002	0.388**	(0.148)	0.298*	(0.149)	0.298*	(0.149)
2003	0.454	(0.259)	0.038	(0.255)	0.038	(0.250)
<i>Quarter</i>						
II	-0.105	(0.107)	-0.114	(0.107)	-0.114	(0.100)
III	-0.057	(0.100)	-0.058	(0.100)	-0.058	(0.099)
IV	0.090	(0.106)	0.079	(0.107)	0.079	(0.105)
Gamma distributed unobserved heterogeneity	No		No		Yes (Gamma variance is 9.539e-06)	
N	2122 spells		36397 spell-months		36397 spell-months	
Log-likelihood	-7347.208		-4736.961		-4736.961	

**Table 7.** Estimation Results for the Total Sample, Exits to Employment (cont.)

Variable	Cloglog with nonparametric baseline							
	(4)		(5)		(6)		(7)	
Female	-0.088	(0.096)	-0.100	(0.097)	0.063	(0.167)	-0.081	(0.096)
Married	0.304**	(0.104)	0.290**	(0.105)	0.215	(0.162)	0.304**	(0.104)
Female* Married	-0.303*	(0.134)	-0.295*	(0.135)	-0.469*	(0.212)	-0.300*	(0.134)
Number of children	-0.085	(0.066)	-0.096	(0.067)	-0.032	(0.109)	-0.081	(0.066)
Female* children	0.119	(0.084)	0.130	(0.085)	0.116	(0.134)	0.091	(0.085)
<i>Age</i>								
25-39	-0.416**	(0.089)	-0.399**	(0.089)	-0.445**	(0.141)	-0.400**	(0.090)
40-54	-0.630**	(0.098)	-0.610**	(0.098)	-0.682**	(0.145)	-0.586**	(0.099)
≥55	-1.119**	(0.214)	-1.094**	(0.213)	-0.982**	(0.313)	-0.952**	(0.225)
<i>Education</i>								
General secondary or vocational	0.041	(0.094)	0.030	(0.094)	-0.080	(0.154)	0.060	(0.093)
Professional secondary or unfinished higher	0.134	(0.107)	0.131	(0.107)	0.127	(0.165)	0.153	(0.107)
Higher	0.377**	(0.124)	0.373**	(0.124)	0.421**	(0.181)	0.376**	(0.123)
<i>Sources of Subsistence</i>								
Unemployment Benefits	0.016	(0.080)	0.013	(0.080)	-0.091	(0.115)	0.017	(0.080)
Casual Work	-0.268**	(0.075)	-0.266**	(0.075)	-0.196	(0.112)	-0.292**	(0.076)
Household Income	-0.250**	(0.091)	-0.247**	(0.091)	-0.320*	(0.128)	-0.294**	(0.091)
State Transfers	-0.285**	(0.088)	-0.287**	(0.087)	-0.454**	(0.141)	–	
Pension	–		–		–		-0.553**	(0.140)
Other State Transfers	–		–		–		-0.105	(0.104)
Other SS	0.321*	(0.145)	0.337*	(0.144)	0.288	(0.196)	0.315*	(0.145)
Regional UR <sup>b</sup>	-0.050*	(0.022)	-0.036**	(0.014)	-0.083*	(0.037)	-0.077**	(0.023)
<i>Type of settlement</i>								
Town	0.091	(0.073)	0.083	(0.074)	0.163	(0.117)	0.094	(0.073)
Large city	0.302**	(0.090)	0.360**	(0.084)	0.400**	(0.144)	0.269**	(0.091)
<i>Previous unemployment</i>								
1 prior spell	0.108	(0.107)	0.122	(0.107)	-0.026	(0.136)	0.123	(0.108)
2 prior spells	-0.120	(0.344)	-0.105	(0.339)	-0.543	(0.482)	-0.102	(0.346)
3 or more prior spells	0.598	(0.376)	0.582	(0.367)	0.612**	(0.193)	0.610	(0.345)
Previously employed	-0.098	(0.082)	-0.098	(0.082)	-0.099	(0.207)	-0.108	(0.083)
Log (Real Last Wage)	–		–		-0.027	(0.070)	–	
Gamma distributed unobserved heterogeneity	No		No		No		No	
N (spell-months)	36397		36397		17611		36397	
Log-likelihood	-4739.15		-4738.794		-2138.306		-4733.626	

*Note:* Number of failures is 1099. Figures reported are the estimated coefficients. Robust standard errors adjusted for clustering on individual identifier in parentheses. \*\* and \* denote significance at the 1% and 5% levels, respectively. <sup>a</sup> Baseline hazard parameters are reported in Table 6c. All models include year and quarter dummies. <sup>b</sup> Quarterly registered unemployment rate for 24 oblasts, Crimean Republic and Kiev City in specifications (1)-(3), (6)-(7) and average yearly ILO-type unemployment rate in specification (5) correspond to the starting quarter/year of an unemployment spell, while in specification (4) quarterly registered regional unemployment rate is varying with time in unemployment. Exits to inactivity are considered censored when estimating exits to employment, and vice versa.

**Table 8.** Estimation Results for the Total Sample, Exits to Inactivity

Variable	Cox PH		Cloglog with nonparametric baseline			
	(1)		(2) <sup>a</sup>		(3)	
Female	0.138	(0.179)	0.151	(0.182)	0.151	(0.228)
Married	-0.023	(0.194)	0.001	(0.196)	0.001	(0.214)
Female* Married	0.037	(0.238)	0.024	(0.241)	0.024	(0.292)
Number of children	-0.275	(0.145)	-0.274	(0.146)	-0.274*	(0.139)
Female* children	0.213	(0.167)	0.217	(0.168)	0.217	(0.156)
<i>Age</i>						
25-39	-0.057	(0.173)	-0.071	(0.173)	-0.071	(0.194)
40-54	0.505**	(0.165)	0.491**	(0.167)	0.491*	(0.209)
≥55	1.137**	(0.236)	1.137**	(0.237)	1.137**	(0.324)
<i>Education</i>						
General secondary or vocational	0.056	(0.155)	0.046	(0.157)	0.046	(0.194)
Professional secondary or unfinished higher	0.154	(0.166)	0.146	(0.168)	0.146	(0.202)
Higher	0.023	(0.211)	0.009	(0.212)	0.009	(0.234)
<i>Sources of Subsistence</i>						
Unemployment Benefits	0.124	(0.142)	0.131	(0.144)	0.131	(0.143)
Casual Work	0.149	(0.122)	0.156	(0.123)	0.156	(0.163)
Household Income	0.359*	(0.149)	0.360*	(0.152)	0.360	(0.285)
State Transfers	0.194	(0.135)	0.209	(0.137)	0.209	(0.147)
Other SS	-0.174	(0.292)	-0.182	(0.292)	-0.182	(0.291)
Regional UR <sup>b</sup>	-0.055	(0.037)	-0.054	(0.037)	-0.054	(0.046)
<i>Type of settlement</i>						
Town	-0.347**	(0.131)	-0.345**	(0.132)	-0.345*	(0.153)
Large city	-0.255	(0.172)	-0.256	(0.173)	-0.256	(0.184)
<i>Previous unemployment</i>						
1 prior spell	0.067	(0.197)	0.081	(0.200)	0.081	(0.185)
2 prior spells	0.383	(0.515)	0.312	(0.521)	0.312	(0.467)
3 or more prior spells	1.018	(0.799)	0.996	(0.844)	0.996	(0.727)
Previously employed	-0.589**	(0.134)	-0.597**	(0.137)	-0.597**	(0.144)
<i>Year</i>						
1998	0.530*	(0.234)	0.501*	(0.236)	0.501	(0.371)
1999	0.848**	(0.260)	0.812**	(0.262)	0.812*	(0.374)
2000	1.087**	(0.257)	1.029**	(0.257)	1.029**	(0.388)
2001	1.315**	(0.293)	1.240**	(0.291)	1.240**	(0.420)
2002	2.076**	(0.320)	1.920**	(0.313)	1.921**	(0.445)
2003	3.674**	(0.417)	3.120**	(0.399)	3.120**	(0.619)
<i>Quarter</i>						
II	0.421*	(0.169)	0.348*	(0.165)	0.348	(0.208)
III	0.277	(0.181)	0.236	(0.178)	0.236	(0.232)
IV	0.398*	(0.193)	0.343	(0.190)	0.343	(0.342)
Gamma distributed unobserved heterogeneity	No		No		Yes (Gamma variance is 1.277e-06)	
N	2122 spells		35838 spell-months		35838 spell-months	
Log-likelihood	-2289.269		-1869.557		-1869.557	

**Table 8.** Estimation Results for the Total Sample, Exits to Inactivity (cont.)

Variable	Cloglog with nonparametric baseline					
	(4)		(5)		(6)	
Female	0.155	(0.181)	0.146	(0.182)	0.141	(0.181)
Married	0.008	(0.196)	0.004	(0.196)	-0.005	(0.196)
Female* Married	0.008	(0.240)	0.016	(0.241)	0.029	(0.241)
Number of children	-0.283	(0.145)	-0.287	(0.145)	-0.275	(0.146)
Female* children	0.231	(0.167)	0.236	(0.167)	0.237	(0.169)
<i>Age</i>						
25-39	-0.067	(0.173)	-0.063	(0.173)	-0.086	(0.174)
40-54	0.497**	(0.167)	0.503**	(0.167)	0.459**	(0.169)
≥55	1.146**	(0.237)	1.160**	(0.237)	1.040**	(0.254)
<i>Education</i>						
General secondary or vocational	0.038	(0.157)	0.034	(0.156)	0.043	(0.158)
Professional secondary or unfinished higher	0.142	(0.168)	0.141	(0.167)	0.135	(0.170)
Higher	0.012	(0.212)	0.017	(0.212)	0.012	(0.213)
<i>Sources of Subsistence</i>						
Unemployment Benefits	0.112	(0.142)	0.111	(0.143)	0.137	(0.144)
Casual Work	0.156	(0.124)	0.156	(0.124)	0.166	(0.123)
Household Income	0.362*	(0.152)	0.366*	(0.151)	0.395*	(0.155)
State Transfers	0.200	(0.136)	0.198	(0.135)	–	
Pension	–		–		0.342*	(0.173)
Other State Transfers	–		–		0.060	(0.171)
Other SS	-0.181	(0.291)	-0.181	(0.290)	-0.172	(0.292)
Regional UR <sup>b</sup>	-0.026	(0.039)	-0.018	(0.023)	-0.050	(0.037)
<i>Type of settlement</i>						
Town	-0.337*	(0.133)	-0.339*	(0.134)	-0.351**	(0.133)
Large city	-0.208	(0.171)	-0.179	(0.158)	-0.256	(0.174)
<i>Previous unemployment</i>						
1 prior spell	0.088	(0.200)	0.092	(0.200)	0.070	(0.201)
2 prior spells	0.324	(0.517)	0.323	(0.518)	0.284	(0.521)
3 or more prior spells	0.975	(0.844)	0.964	(0.846)	0.989	(0.845)
Previously employed	-0.588**	(0.136)	-0.592**	(0.136)	-0.587**	(0.137)
Gamma distributed unobserved heterogeneity	No		No		No	
N (spell-months)	35838		35838		35838	
Log-likelihood	-1870.066		-1870.263		-1868.983	

*Note:* Number of failures is 369. Figures reported are the estimated coefficients. Robust standard errors adjusted for clustering on individual identifier in parentheses. \*\* and \* denote significance at the 1% and 5% levels, respectively. <sup>a</sup> Baseline hazard parameters are reported in Table 6c. All models include year and quarter dummies. <sup>b</sup> Quarterly registered unemployment rate for 24 oblasts, Crimean Republic and Kiev City in specifications (1)-(3), (6) and average yearly ILO-type unemployment rate in specification (5) correspond to the starting quarter/year of an unemployment spell, while in specification (4) quarterly registered regional unemployment rate is varying with time in unemployment. Exits to inactivity are considered censored when estimating exits to employment, and vice versa.

**Table 9.** Baseline Hazard Estimates for the Total Sample

Month	Exits to employment (Model 2, Table 7)		Exits to inactivity (Model 2, Table 8)		Month	Exits to employment (Model 2, Table 7)		Exits to inactivity (Model 2, Table 8)	
	Hazard	Std.Error	Hazard	Std.Error		Hazard	Std.Error	Hazard	Std.Error
1	0.016	(0.005)	0.000	(0.000)	34	0.044	(0.019)	0.003	(0.002)
2	0.100	(0.023)	0.001	(0.001)	35	0.059	(0.023)	0.011	(0.005)
3	0.094	(0.022)	0.002	(0.001)	36	0.043	(0.019)	0.011	(0.005)
4	0.080	(0.019)	0.003	(0.001)	37	0.046	(0.021)	0.009	(0.005)
5	0.066	(0.016)	0.002	(0.001)	38	0.066	(0.027)	0.006	(0.004)
6	0.074	(0.018)	0.002	(0.001)	39	0.088	(0.033)	–	
7	0.070	(0.017)	0.003	(0.001)	40	0.084	(0.032)	0.004	(0.003)
8	0.050	(0.013)	0.001	(0.001)	41	0.069	(0.030)	0.004	(0.003)
9	0.052	(0.014)	0.002	(0.001)	42	0.073	(0.031)	0.002	(0.002)
10	0.052	(0.014)	0.002	(0.001)	43	0.090	(0.037)	0.006	(0.004)
11	0.051	(0.014)	0.004	(0.002)	44	0.037	(0.022)	0.009	(0.005)
12	0.076	(0.020)	0.003	(0.001)	45	0.026	(0.019)	0.005	(0.004)
13	0.068	(0.018)	0.010	(0.004)	46	0.056	(0.030)	0.005	(0.004)
14	0.049	(0.014)	0.002	(0.001)	47	0.075	(0.037)	–	
15	0.051	(0.015)	0.002	(0.001)	48	0.064	(0.035)	0.009	(0.006)
16	0.034	(0.012)	0.002	(0.001)	49	0.069	(0.037)	0.013	(0.008)
17	0.053	(0.016)	0.003	(0.001)	50	0.095	(0.046)	0.014	(0.009)
18	0.048	(0.015)	0.001	(0.001)	51	0.089	(0.047)	0.013	(0.009)
19	0.042	(0.014)	0.001	(0.001)	52	0.049	(0.036)	0.009	(0.007)
20	0.046	(0.015)	0.001	(0.001)	53	0.103	(0.056)	0.016	(0.011)
21	0.052	(0.016)	0.002	(0.001)	54	0.085	(0.052)	0.024	(0.015)
22	0.063	(0.019)	0.002	(0.001)	55	0.158	(0.077)	0.014	(0.011)
23	0.081	(0.023)	0.002	(0.001)	56	0.111	(0.068)	–	
24	0.043	(0.015)	0.004	(0.002)	57	0.040	(0.040)	0.009	(0.009)
25	0.042	(0.015)	0.006	(0.003)	58	0.087	(0.063)	0.019	(0.015)
26	0.040	(0.015)	0.004	(0.002)	59	0.250	(0.120)	–	
27	0.042	(0.016)	0.003	(0.002)	60	0.185	(0.114)	0.029	(0.023)
28	0.048	(0.017)	0.002	(0.002)	61	–		0.063	(0.042)
29	0.051	(0.019)	0.003	(0.002)	62	0.307	(0.186)	–	
30	0.055	(0.020)	0.002	(0.001)	63	0.271	(0.200)	–	
31	0.031	(0.014)	0.005	(0.003)	64	0.662	(0.356)	0.085	(0.067)
32	0.033	(0.015)	0.005	(0.003)	65	0.800	(0.583)	0.223	(0.188)
33	0.065	(0.023)	0.005	(0.003)	66	–		–	

*Note:* Figures reported are the hazard ratio estimates and the corresponding robust standard errors adjusted for clustering on individual identifier in parentheses.

**Table 10.** Estimation Results for the Sample of Unemployed with Some Income from Casual Work versus the Other Unemployed

Variable	Exits to employment				Exits to inactivity			
	Unemployed with some income from casual work		Unemployed without any income from casual work		Unemployed with some income from casual work		Unemployed without any income from casual work	
Female	0.592**	(0.190)	-0.222*	(0.110)	-0.038	(0.393)	0.124	(0.218)
Married	0.167	(0.174)	0.463**	(0.133)	-0.200	(0.324)	-0.021	(0.270)
Female* Married	-0.788**	(0.258)	-0.295	(0.161)	0.354	(0.470)	0.064	(0.306)
Number of children	0.082	(0.103)	-0.169	(0.088)	-0.123	(0.205)	-0.475*	(0.218)
Female* children	0.038	(0.141)	0.134	(0.107)	0.057	(0.273)	0.469*	(0.239)
<i>Age</i>								
25-39	-0.294	(0.162)	-0.487**	(0.110)	0.111	(0.310)	-0.209	(0.223)
40-54	-0.353*	(0.169)	-0.743**	(0.126)	0.718*	(0.311)	0.293	(0.231)
≥55	-1.436*	(0.667)	-0.947**	(0.255)	1.612**	(0.462)	0.715*	(0.331)
<i>Education</i>								
General secondary or vocational	0.102	(0.169)	0.047	(0.113)	0.257	(0.251)	-0.076	(0.209)
Professional secondary or unfinished higher	0.105	(0.207)	0.169	(0.127)	0.309	(0.293)	0.049	(0.222)
Higher	0.303	(0.322)	0.397**	(0.138)	0.062	(0.378)	-0.084	(0.267)
<i>Sources of Subsistence</i>								
Unemployment Benefits	0.196	(0.162)	-0.080	(0.096)	0.150	(0.271)	0.255	(0.177)
Household Income	-0.028	(0.137)	-0.500**	(0.128)	0.574*	(0.232)	0.256	(0.220)
Pension	-0.468	(0.435)	-0.710**	(0.161)	0.284	(0.272)	0.409	(0.226)
Other State Transfers	-0.148	(0.204)	-0.135	(0.123)	-0.036	(0.405)	0.093	(0.188)
Other SS	0.549*	(0.262)	0.222	(0.171)	dropped		-0.147	(0.339)
Regional UR	-0.067	(0.050)	-0.088**	(0.028)	0.016	(0.071)	-0.070	(0.048)
<i>Type of settlement</i>								
Town	0.131	(0.157)	0.082	(0.084)	-0.335	(0.250)	-0.353*	(0.160)
Large city	0.346*	(0.173)	0.227*	(0.112)	-0.258	(0.357)	-0.277	(0.213)
<i>Previous unemployment</i>								
1 prior spell	-0.015	(0.205)	0.138	(0.129)	-0.355	(0.372)	0.359	(0.251)
2 prior spells	0.111	(0.597)	-0.315	(0.453)	-0.921	(1.183)	0.730	(0.610)
3 or more prior spells	0.447	(1.090)	0.618*	(0.315)	2.407**	(0.613)	dropped	
Previously employed	-0.163	(0.170)	-0.090	(0.099)	-0.140	(0.257)	-0.736**	(0.175)
N (spell-months)	11180		24476		9146		24295	
Log-likelihood	-1285.121		-3376.366		-582.510		-1238.506	

*Note:* Figures reported are the estimated coefficients. Robust standard errors adjusted for clustering on individual identifier in parentheses. \*\* and \* denote significance at the 1% and 5% levels, respectively. All models include year and quarter dummies. Quarterly registered unemployment rate for 24 oblasts, Crimean Republic and Kiev City corresponds to the starting quarter of an unemployment spell. Exits to inactivity are considered censored when estimating exits to employment, and vice versa.

**Table 11.** Baseline Hazard Estimates for Exits to Employment, Sample of Unemployed with Some Income from Casual Work versus the Other Unemployed

Month	Unemployed with some income from casual work		Unemployed without any income from casual work		Month	Unemployed with some income from casual work		Unemployed without any income from casual work	
	Hazard	Std.Error	Hazard	Std.Error		Hazard	Std.Error	Hazard	Std.Error
1	0.005	(0.003)	0.026	(0.009)	34	0.041	(0.024)	0.028	(0.021)
2	0.040	(0.018)	0.150	(0.041)	35	0.017	(0.014)	0.105	(0.047)
3	0.019	(0.009)	0.169	(0.045)	36	–		0.097	(0.046)
4	0.034	(0.014)	0.118	(0.033)	37	0.010	(0.010)	0.090	(0.046)
5	0.021	(0.010)	0.109	(0.032)	38	0.041	(0.025)	0.076	(0.042)
6	0.028	(0.013)	0.115	(0.033)	39	0.022	(0.017)	0.163	(0.070)
7	0.022	(0.011)	0.116	(0.034)	40	0.023	(0.018)	0.152	(0.067)
8	0.015	(0.008)	0.084	(0.026)	41	0.035	(0.024)	0.093	(0.052)
9	0.018	(0.009)	0.082	(0.026)	42	0.037	(0.025)	0.100	(0.055)
10	0.015	(0.008)	0.088	(0.028)	43	0.027	(0.021)	0.159	(0.077)
11	0.018	(0.009)	0.082	(0.026)	44	–		0.087	(0.054)
12	0.022	(0.011)	0.129	(0.039)	45	0.033	(0.026)	–	
13	0.032	(0.015)	0.097	(0.031)	46	0.053	(0.035)	0.032	(0.033)
14	0.023	(0.012)	0.071	(0.026)	47	0.039	(0.030)	0.103	(0.064)
15	0.027	(0.014)	0.069	(0.025)	48	–		0.148	(0.083)
16	0.004	(0.004)	0.068	(0.025)	49	0.043	(0.034)	0.080	(0.060)
17	0.026	(0.013)	0.076	(0.027)	50	0.075	(0.051)	0.087	(0.064)
18	0.024	(0.013)	0.069	(0.026)	51	–		0.213	(0.114)
19	0.012	(0.008)	0.072	(0.027)	52	0.057	(0.045)	–	
20	0.017	(0.010)	0.075	(0.028)	53	0.060	(0.049)	0.125	(0.094)
21	0.009	(0.007)	0.099	(0.035)	54	0.069	(0.055)	0.068	(0.069)
22	0.044	(0.021)	0.069	(0.028)	55	–		0.374	(0.188)
23	0.043	(0.020)	0.109	(0.039)	56	0.087	(0.069)	0.088	(0.090)
24	0.015	(0.010)	0.071	(0.030)	57	–		0.099	(0.099)
25	0.021	(0.013)	0.058	(0.026)	58	–		0.224	(0.166)
26	0.028	(0.016)	0.044	(0.022)	59	0.202	(0.121)	0.133	(0.137)
27	0.024	(0.015)	0.055	(0.026)	60	0.224	(0.154)	–	
28	0.013	(0.010)	0.086	(0.035)	61	–		–	
29	0.034	(0.019)	0.061	(0.029)	62	–		0.802	(0.486)
30	0.007	(0.008)	0.110	(0.044)	63	0.122	(0.131)	0.430	(0.442)
31	–		0.071	(0.034)	64	0.301	(0.242)	1.055	(0.775)
32	0.015	(0.012)	0.050	(0.027)	65	0.655	(0.451)	–	
33	0.024	(0.016)	0.107	(0.046)	66	–		–	

*Note:* Figures reported are the hazard ratio estimates and the corresponding robust standard errors adjusted for clustering on individual identifier in parentheses.

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## **Appendix 1. Unemployment Insurance System in Ukraine: Regulatory Framework**

The main principles of unemployment benefit (insurance from 2001) system in Ukraine are set forth in the Law on Employment (came into effect in 1991), the Law on Compulsory State Social Unemployment Insurance (came into effect in 2001) and some auxiliary elements of the law which regulate relations connected with unemployment insurance. According to the Law on Compulsory State Social Unemployment Insurance only those individuals who are officially registered as unemployed with a local employment center can be eligible for unemployment benefits.

Under the Law of Ukraine on Employment the unemployed are working-age, able-bodied persons who are without work and earnings, are registered with state employment center as looking for a job, able and ready to start a suitable job (Article 2). The unemployment status is granted on the eighth day after applying to the local employment center. The unemployed status is denied to persons under sixteen (with exception of those who worked before and were laid off), to persons looking for their first job if they had no profession or skill and if they refused an offer of vocational training or of gainful employment, to persons eligible for pension according to the legislation, and to persons who within 7 days after registration with a local employment center as looking for a job rejected two offers of suitable job.

The unemployment benefit is paid from the eighth day after the date of registration in the PES till re-employment but duration of unemployment benefit payment is limited to 360 days during two years for the majority of the unemployed, to 720 days for people of pre-retirement age (men of 58 or older and women of 53 or older), and to 180 days for uninsured individuals with unemployment status looking for their first work and for some categories of dismissed military employees. If a person is registered as unemployed for a second time during two years, duration of unemployment benefit payment during the second unemployment spell is calculated as the residual from the maximum specified duration during two years and actual duration of unemployment benefit payment during the first unemployment spell.

To remain in the register and to receive unemployment benefits without suspension or reductions up to 90 days an unemployed must report to the local employment center once a month, follow recommendations of the employment center aimed at encouraging employment, not refuse two offers of a suitable job or an offer of training/retraining, not refuse a job offer with new qualifications after retraining, not leave training/retraining courses without valid reason, and not conceal information about temporary employment while receiving unemployment benefits. If a person voluntarily quitted a job without strong reasons or he/she was dismissed for disciplinary reasons, payment of unemployment benefits begins from the 91<sup>st</sup> day after registration. Benefits are also postponed up to 3 months to individuals receiving severance payment and other payments after lay-offs. Unemployment benefits can be paid as a lump sum to unemployed individuals older than 18 who intend to start their

own business after approving their business-plans by the special committee of the employment center and their registration as a subject of entrepreneurial activity (physical or juridical entity) in the State Tax Administration.

According to the Law on Compulsory State Social Unemployment Insurance size of unemployment benefit depends on the reason of unemployment, length of unemployment insurance payment (equal to sum of work experience before 2001 and length of actual unemployment insurance payment from 2001), average wage at the previous work and duration of unemployment.<sup>29</sup>

1) If an insured person worked (including various forms of employment) and paid unemployment insurance contributions for at least 26 weeks during the last 12 months before the unemployment period, was laid off by independent of him reasons, is registered on general conditions and is entitled to unemployment benefits, the size of his unemployment benefit is calculated as a percentage of his average wage at the previous work depending on the length of unemployment insurance payment according to the following scheme:

Length of unemployment insurance payment	Intermediate size of unemployment benefits as a percentage of average wage (IUB)
less than 2 years	50%
from 2 to 6 years	55%
from 6 to 10 years	60%
more than 10 years	70%

Then, depending on duration of unemployment spell the final size of benefits is defined as a percentage of the specified amount IUB: 100% during first 90 days, 80% during the following 90 days, and 70% afterwards. As a result, pattern of defining the size of unemployment benefits as a percentage of the average wage at the previous work can be expressed as shown in the table below:

Length of unemployment insurance payment	Duration of unemployment	Size of unemployment benefits as a percentage of average wage
less than 2 years	first 90 days	50%
	following 90 days	40%
	the rest	35%
from 2 to 6 years	first 90 days	55%
	following 90 days	44%
	the rest	38.5%
from 6 to 10 years	first 90 days	60%
	following 90 days	48%
	the rest	42%
more than 10 years	first 90 days	70%
	following 90 days	56%
	the rest	49%

<sup>29</sup> Before the Law on Compulsory State Social Unemployment Insurance came into effect in 2001, size of unemployment benefit depended on the reason of unemployment (the same categories as now), average wage at the previous work and duration of unemployment (only for laid-off persons for economic reasons), but not on the length of actual unemployment insurance payment (or, in other words, work experience). So if persons were laid-off by economic reasons and worked for at least 26 weeks during the last 12 months before the unemployment period, replacement rate was 100% during first 60 days, 75% during the following 90 days and 50% during 210 days; if persons worked less than 26 weeks they were eligible to unemployment benefits of no less than 50% of their previous wage; and all other persons were eligible for the established minimum level of unemployment benefits.

However, unemployment benefits cannot exceed the regional average wage in the previous month and cannot be lower than the subsistence minimum.

2) If an insured person worked (including various forms of employment) and paid unemployment insurance contributions for at least 26 weeks during the last 12 months before the unemployment period, has quitted a job without strong reasons, is registered on general conditions and is entitled to unemployment benefits, the size of his unemployment benefit is calculated by the same scheme as in p.1) but payment of unemployment benefits starts from the 91<sup>st</sup> day at the amount of 80% of the specified amount IUB.

3) The size of benefits paid to all other categories (insured as well as uninsured, including those who were dismissed for disciplinary reasons; those who worked or paid unemployment insurance contributions for less than 26 weeks in the last 12 months before becoming unemployed; those who are willing to reenter employment after a long (more than six months) break; those who worked or were engaging in entrepreneurial activity at least 26 weeks in the last 12 months before becoming unemployed, didn't pay unemployment insurance contributions but have work experience (equated to insurance experience) or insurance experience acquired before; those who are seeking for a job for the first time and have no insurance experience; some categories of dismissed military employees, etc.) doesn't depend on the length of unemployment insurance payment and is set at the level of the subsistence minimum established by the law.

4) Persons who worked or were engaging in entrepreneurial activity at least 26 weeks in the last 12 months before becoming unemployed, didn't pay unemployment insurance contributions and don't have work experience (equated to insurance experience) or insurance experience acquired before are not eligible for unemployment benefits.

If unemployed persons attend training or retraining courses, they are eligible for a stipend at the level of unemployment benefit calculated according to the above rules but the size of their stipend can not be changed during training course depending on the duration of unemployment spell and is equal to the size defined at the beginning of training program. Duration of stipend payment is scored up to the general duration of unemployment benefits payment and cannot exceed it.

If unemployed workers have less than one and a half years until legal retirement age, they may be provided with a regular pension instead of unemployment benefits at the expense of the Unemployment Insurance Fund.

Persons registered as unemployed who have already exhausted their unemployment insurance benefits are entitled to unemployment assistance if the average per capita income in their families does not exceed the level of the subsistence minimum established by the law. Unemployment assistance to the unemployed is paid at the monthly level of 75% of the subsistence minimum during 180 days.

Persons who have already exhausted their unemployment benefits and unemployment assistance or

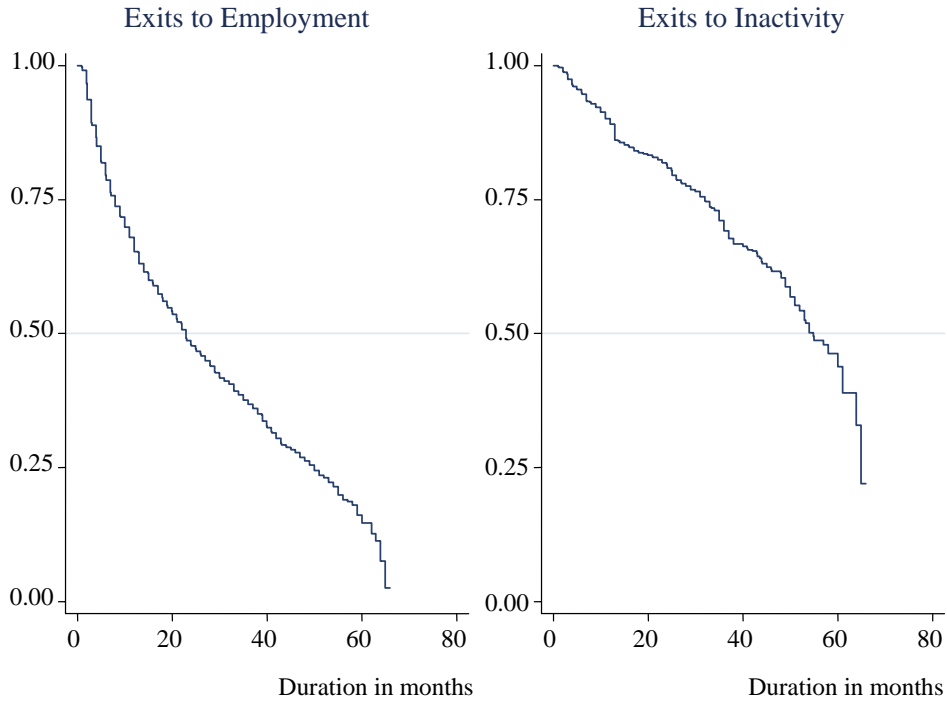
their non working-able dependants can be eligible to one-off cash payment at the level of 50% of the subsistence minimum. In the case of death of an unemployed person or his/her dependant, the funeral assistance in the amount of one subsistence minimum is given to his/her relatives.

## Appendix 2. Definition of Variables

Variable	Definition
Duration of unemployment (in months)	The length of time elapsed between the months of inflow into and outflow from unemployment, defined from the dates of beginning and end of job search for completed spells and interview date for right-censored spells
Female	=1 if Female
Married	=1 if legally married or cohabiting (i.e. in non-registered marriage), =0 otherwise (never married, divorced, widowed or separated)
Number of children	=Integer number from 0 to 4, number of small children aged 15 or less
Age	Three dummy variables for the corresponding age group: from 25 to 39, from 40 to 54, and 55 or older; reference age group is full 24 years and under
Education	Three dummy variables for the corresponding level of education: general secondary or vocational (diploma of high-school or PTU); professional secondary or unfinished higher (diploma of college or at least 3 years of study at the institute/university); higher (diploma of institute/university, any degree); reference education group is primary or unfinished secondary
Unemployment Benefits	= 1 if received unemployment benefits or training allowance during an unemployment spell
Casual Work	= 1 if received income from casual work, production and sale of products from own land plot, from casual business activities or engaged in subsidiary farming for own needs
Household Income	= 1 if lived on income of spouse or parents or support from relatives during a period of unemployment
State Transfers	= 1 if lived on pension, stipend or study loan, child allowance, alimony, social benefits, subsistence allowance, or support by state or municipal institution during a period of unemployment (also, Pension = 1 if pension)
Other sources of subsistence	= 1 if lived on income from sale of property or rent, dividends, loans or savings
Regional UR	Quarterly registered oblast-level unemployment rate (24 oblasts, Kyiv City and Crimean Republic) corresponding to the starting quarter of an unemployment spell in specifications (1)-(3), (6)-(7) and average yearly ILO-defined oblast-level unemployment rate corresponding to the starting year of an unemployment spell in specification (5). In specification (4) quarterly registered regional unemployment rate is varying with time in unemployment.
Type of settlement	Two dummy variables for the corresponding type of settlement where an individual lived at the beginning of an unemployment spell: town (from 20 to 500 thds. inhabitants), large city (more than 500 thds. inhabitants); reference is village or very small town (up to 20 thds. inhabitants)
Previous labour market state	=1 if employed prior to the start of unemployment, = 0 if previously inactive for more than 1 month
Net wage in the last job before becoming unemployed Log (Real Last Wage)	The logarithm of last net contractual monthly wage deflated by the national monthly CPI (January 1997=100)

### Appendix 3. Empirical Survival and Hazard Functions

**Figure A1.** Empirical Survival Functions – Exits from Unemployment by Destination State



**Figure A2.** Empirical Hazard Functions – Exits from Unemployment by Destination State

