WHO MOVES:
A MICRO LEVEL STUDY
OF MIGRATION IN UKRAINE

by

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Abstract

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This paper aims to investigate internal migration in Ukraine during 1997-2002. Dealing with longitudinal data, it applies multilevel discrete-time event history logit model for estimating determinants of individual migration decisions. The empirical findings of this research regarding age, attained education, and employment status are in accordance with theoretical expectations. At the same time, the study reveals several Ukrainian specifics in migration decision making. In particular, it finds negative influence of being in marriage on migration probability of elder men only, but positive impact on probability of young people. The investigation also reveals the evidence of intense labour migration of matured married males. Related to the regional characteristics, interesting finding of this study is that people left big cities (with population over 500000) and moved into rural areas in 1997-2002. The estimated marginal effects of determinants can be used to compute migration propensities of all socio-economic cohorts, what is a basis for migration flows forecasting.

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GLOSSARY

Migration event – relocation to another place; in this study, migration events are both intraregional and interregional moves.

Out-migration – side of migration event, associated with departure of the place.

In-migration – side of migration event, associated with relocation into a new place.

Chapter 1

INTRODUCTION

Internal migration is an inevitable process in every country of the contemporary world. It covers all population cohorts in all regions so that none central or local government can avoid dealing with it. Brunson McKinley, Director General of International Organization for Migration, correctly points out that "the question is no longer whether to have migration, but rather how to manage it effectively so as to enhance its positive and reduce its negative impacts." With regard to this task, probably the first step the governing person has to do is answering the basic questions about migrants: who are they, why do they leave or move into a country or region, how many are they?

The State Committee of Statistics reports that 711785 persons (1,53% of the population) changed their places of living within Ukraine in 2007. In relative terms this is only slightly above the neighbouring countries level with internal migration rates of 1,26% in Poland (2006), 1,5% in Bulgaria (2006), 1,29% in Russia (2006), 1,26% in Romania (2005)[1], though the absolute number of migrants in the country is significant. They put additional pressure on the local infrastructure such as housing and rental apartments markets, utility services provision, transportation etc. in places of migration destinations. On the other hand, origins of migration may experience an excess in many public services: schooling, health care, local governance etc. that leads to wasting of local funds and painful delays of qualified specialists. Labour market problems associated with migration is equally important as infrastructural ones, since sustainable development requires neither excessive nor insufficient amount of workers.

[1] Data of Central Statistic Office of Poland, National Statistical Institute of Bulgaria, Federal State Statistics Service of Russian Federation, and National Institute of Statistics of Romania.

The official data tends to underestimate the real number of migrants due to the fact that it counts only for registered moves, while unregistered are beyond the scope of statisticians. Under such conditions we cannot assess the size of the issue, not even mention about studying the causes and determinants of migration. The only solution in this situation is to investigate internal migration based on individual and household surveys. They meet representativeness criteria, thus provide a necessary basis for correct estimations. Applying logit or probit techniques, scientists make accent on the composition of the migrant portraits and provision of corresponding migration propensities, from which the absolute amounts of movers can be obtained.

This approach is widely spread all around the world, though rarely used in Ukraine by now due to data absence. This is probably the first research that utilizes data of the Ukrainian Longitudinal Monitoring Survey (ULMS) for investigating internal mobility in Ukraine (before only Danzer and Hindrich (2007) used the ULMS for studying international labour emigration). Therefore, we expect to do the first step on the way of thorough examining of migration in Ukraine on the basis of survey data, filing thus existing gap in this research area.

The main purpose of this study is to (i) estimate the determinants of migration decisions in Ukraine during the transition period and (ii) show how the migration flows forecasts for different socioeconomic cohorts can be assessed.

The theoretical importance of the current research is to provide the basis for comparison of determinants' impacts in developed and transition countries. Empirical results of this study can be used for measuring migration propensities and, thus, predicting migration flows for different age, gender, marital, employment and other cohorts. These findings, in turn, could be utilized for forecasting of infrastructure demand and elaborating

social policy, which will control and adjust those flows to the needs of Ukrainian oblasts.

The paper is organized as follows. Chapter 2 provides extensive literature review on the topic after which two chapters are devoted to the description of issues with methodology and data. Chapter 5 presents empirical findings, while conclusion concentrates on their discussion and outlining further investigations of internal mobility at the micro level in Ukraine.

Chapter 2

LITERATURE REVIEW

The purpose of this section is to provide theoretical and empirical background for the current research. It covers problems of measurement unit for investigation, applied methodology, theoretical expectations and empirical findings about determinants of migration decisions, and specifics of mobility in transition period.

Migration is a multidimensional, complex socio-economic process that can be studied at different levels – macro and micro – and under different viewpoints: immigration, emigration, internal migration. Though this paper is entirely devoted to the micro level analysis of internal migration, one may choose different measurement units of investigation: persons or households (families). Mincer (1978) argues that major determinants of migration affects both family and personal decisions in the similar way and the main distinction between them is that decisions are made based on the net household, not individual gain from relocation. However, this simple difference substantially complicates the analysis of migration decisions in practice. In particular, it requires dealing with situations when not the whole family but only one member moves and others stay at home. Is this conscious family and selfish individual migration decisions and how can they be distinguished? In this case, should a relocation of every family member be treated in a different way (for example, migration of parents and children)? These simple questions determine methodological approach and further interpretation of the results of the entire investigation. Another obvious problem is weights of every family member in the common household welfare or dependence of migration decisions upon the head of the household. This is additional to the personal source of heterogeneity the researcher faces and has to deal with when she analyzes family migration.

With regard to above difficulties, Mincer proposes to study very narrow problems related to the family migration such as effects of relocation on the wives and unemployed spouses, migration decisions in the two-earner families, marriage stability and divorces as a result of move (recent studies of Nivalainen, 2005; Jans, 2005; Carletto et al. 2005; Muszynska and Kulu, 2006; Swein and Garasky, 2007). These are very specific questions about migration decisions and their consequences, while the aim of this research is to give first general picture of migration determinants in Ukraine.

Investigation of migration on the personal level eliminates mentioned above complications, since individual can be only in two states – migrant or non-migrant (no transition or intermediate states as in the family case) and personal heterogeneity can easily be dealt with by the estimation technique. The advantage of the personal level is that it incorporates different level factors in one model, including family related variables. In such a way, the family ties can be taken into account and the general picture of migration determinants can be obtain (Finnie, 2004; Kulu and Billari, 2004; Reed et al., 2006). Summarizing, investigation of migration on the personal level better fits the stated aim of the research and avoids additional complications in comparison with the family level. Therefore, we conclude on individuals as a measurement unit for our study.

The main modelling approach for this kind of research always was logit or probit technique. During the last decades, it underwent some important specification changes and improvements and now appears to be the thorough model for estimating determinants of migration decisions at the micro level. Observing the development of the model, we may distinguish several main stages in this process (Kulu and Billari, 2004). At the first phase (1960 – early 1980s) scientists worked only with the personal characteristics (Sandell, 1977; Bartel, 1979; Kahn and Morimune, 1979; Spitze, 1984; Hughes and McCormick, 1985). The next generation of migration decisions

models incorporated contextual variables: starting from 1980s destination characteristics and since late 1980s general macroeconomic conditions (Findley, 1987; Root and De Jong, 1991). Despite the substantial development of the migration decisions model in the economic sense, all these studies apply cross-section logit for estimating probability to migrate, though all of them use longitudinal data. This means applied econometric techniques did not change much during that period of time.

The problem with those researches is that the information about migration events is taken for the whole period under study, while explanatory factors are recorded at the beginning or at the end of the period (Kulu and Billari, 2004). This, of course, is a reason of biased estimation results, since many characteristics of the individual are not stable: they change over time provoking, thus, migration decisions. Therefore, the panel data logit models should be applied for estimations of determinants whenever the longitudinal data is used. Recent studies by Finnie (2004), Kulu and Billari (2004), and Reed et al. (2006) substantiate the advantages of panel data logit in the fields of unbiased estimations and possibility to incorporate general economic conditions in analysis.

Development of logit models of multiple choices enriched methodological approaches to investigating migration decisions. In particular, multinomial logit can be applied for analysis of migration duration – temporal vs. permanent (Carletto et al. 2005), migration directions – to rural or urban areas (Nivalainen, 2004; Carletto et al. 2005) and other peculiarities of migration decisions. Conditional logit is a powerful instrument for studying place to place migration (Davies et al., 2001; Day and Winer, 2006). We use the results of these and other investigations with described above techniques but do not apply them the in current research.

Until now, we have discussed units of analysis and general modelling frameworks. The underlying theory of migration decisions and choice of

explanatory variables is a subject for the next subsection of the current chapter. Here we want to pay attention to the preceding empirical findings on the migration determinants and describe the channels, through which they influence individuals' decisions.

Sjaastad (1962) made the first general theoretical foundation of migration decisions. He proposed to "treat migration as an investment into human capital" which has its benefits and costs. An individual decides to move from the place *i* to place *j* if the net present value of benefits associated with migration is greater than costs. Sjaastad counts for monetary and non-monetary benefits and costs. Monetary benefits include differentials in individual earnings, changes in prices, and costs of employment between region *i* and *j*, while monetary costs encompass expenditures on transportation, lodging, and other necessities that arise in the process of relocation. Non-monetary benefits comprise preferences about climate, settlement type, environment etc., whereas non-monetary costs involve lost opportunities, broken relations with family and friends, the change in environment. Sjaastad points out the fact that non-monetary benefits and costs may exceed monetary ones; consequently, they are of great importance in the study of migration decisions though are difficult to measure. Another remark of non-monetary benefits and costs is that they influence different demographic groups in different ways.

The Sjaastad basic theory implies several conclusions about migration. First, the younger a person is the more likely he/she is to move because of the higher discounted benefits. Second, the income motive (higher wages and lower prices) positively influences the probability of migration. Third, since the transportation costs increase with the distance of the move, people tend to relocate over shorter distances than over longer ones. Fourth, person's preferences reflected by non-monetary benefits and costs definitely influence migration decisions.

Greenwood (1975) summarizes preceding literature on personal characteristics. He presents empirical findings on how age, education, information, distance and income of relocation influence individual migration probability. As it was expected, younger people are more likely to migrate because of higher net present benefits. Greenwood cites Wertheimer (1970) who estimated that the net benefits of migration are 50% less for US males who move at 30 years old, in comparison with those who move at 20 (assuming a 10% interest rate). Age hypothesis is supported in all recent studies such as De Jong et al. (2000), Finnie (2004), Kulu and Billari (2004), Reed et al. (2006).

The effect of distances on migration was discovered by using gravity models (e.g. Isserman et al, 1985). Indeed, ceteris paribus, an individual prefers to move on shorter distances because of higher transportation costs and because the lack of information about new places increases with distance. As illustration, De Jong et al. (1983) find both money and information to be essential in realization of migration decisions of Philippine peasants. These factors were almost equally important for prospective migrants in the case of the move to Manila, but information appeared to be much more crucial in case of a move to Hawaii. However, Shwartz (1973) reveals that better-educated people disregard the distance as a binding factor in migration. Even more, the relocation distances increase with schooling. The explanation is that first, better-educated people have more information about jobs and state of affairs in remote locations. Second, they are more nationally oriented in search of occupation place since a local job market is not always able to offer them an appropriate work. Thus, education is the factor that increases probability of migration.

The income motive refers to expected change in wages. According to the theories of Sjaastad and later to Harris and Todaro (1970) wage differentials is a key factor of migration decisions. Greenwood (1975), however, does not

find clear evidence in preceding literature that supports this hypothesis: some researches show increase in wages after migration takes place, while other do not. As Greenwood remarks, such results may arise from data limitations in some studies. Analyzing the migration decisions in the context of job mobility, Bartel (1979) makes inferences into this problem and argues that on average only young people enjoy a rise of wages after migration. Another finding by Bartel in this sphere is that all migrants have increase in wages if the migration decision was provoked by the change of workplace within the same company/employer. This latter result can be seen as a compensation of worker's relocation costs. A recent study by Basile and Rim (2006) supports this idea in broader sense. Their research on migration between US metropolitan areas reveals that an individual does not move until the wage differential between two places gets over some threshold. After that, the probability of migration increases exponentially with the rise in wage differentials. Thus, the latter paper can be considered as strong evidence that the wage differentials are an important factor in migration decision making.

Considering migration decisions, we cannot omit influence of relocation costs on the probability of migration. They depend not only on the distance but also on the family related aspects of the move. Empirical findings show that first, married people are less like to migrate than single ones; second, the number of children negatively affects the probability of move (e.g. Kulu and Billari, 2004; Finnie, 2004). Non-monetary costs represent losses from the separation from the family, friends, and native places. Scientists associate severance losses with psychic costs of migration: the person who grieves for relatives and friends is more likely to visit them often, thus increasing his or her expenses on transportation. Obviously, this category of people migrates infrequently. Conversely, those who feel themselves slightly tied with family, friends and native places move much often. The last hypothesis has been empirically supported. For example, Findley (1987) and

Root and De Jong (1991) show that people with preceding migration experience are more likely to change again their places of living.

A new stage in the development of migration decisions investigations began with incorporation in the models of contextual variables, which affect the people behaviour. It was hypothesised that environment had to influence an individual's out-migration decisions, while the migration preferences like desirable climate, state of ecology, settlement type, etc. underlie in-migration destinations. Desbarats (1983) confirms the latter assumption on the example of British students' migration to universities; the former hypothesis is supported e.g. by Brown and Goetz (1987) who find contextual characteristics to be very important for Venezuelan out-migrants. The set of contextual factors may include regional scores (indexes) or differentials in wages, unemployment rates, productivity, infrastructural development, climate and environment, population, etc. Their composition constitutes regional attractiveness; however, we may disaggregate influence each of them if these characteristic are measurable.

Among the difficultly measured contextual characteristics living amenities, e.g. climate, natural environment, and availability of public services are the most important[2]. Cromartie and Nord (1997) clearly prove that people prefer to live in pleasant conditions what provokes migration in the warm and clean regions. On the other hand, Goetz (1999) points out that public services such as schools, medical centres, roads, culture institutions, business infrastructure etc. attract people to big metropolitan areas. Choosing a new place of living, an individual certainly compares availability and absence of desired living amenities in several alternatives. People also ought to take into account the disutility from poor environment, lack of safety, and other adverse factors. Thus, the finite choice of the migration destination reflects two things: first, individual's preferences to the set of

[2] Peeters (2006) uses the Herfindahl index of industry concentration as a proxy for living amenities study.

amenities; second, the relative migration attractiveness of region and settlement among the group of alternatives (Finnie, 2004).

Continuing on the development of migration decision models, we now turn to the analysis of the general socio-economic conditions and their impacts upon the people propensity to move. Jackman and Savouri (1992), Milne (1993) and recently Coulombe (2006) and Saks and Wozniak (2007) convincingly show that during booming years number of people who relocate increase, while during stagnations rates of moves reduce. Time variables reflect this pattern in the panel studies. For example, Kulu and Billari (2004) in the study of regional migration in Estonia argue that year dummies perfectly reflect economic changes in 1989-1994: migration activity coincides with economic transformation (lower migration at the beginning of transition reforms and higher after their implementation). Moreover, all year dummies are statistically significant, what is the evidence of relationship between migration and socio-economic situation within the country.

Majority of empirical studies about migration decisions were carried out for the developed Western countries, mainly in Northern America and Western Europe. Using these studies as the background for our research, we should take into account the possibility that the above theoretical expectations may not to be realized in the current investigation. The reason is that economic and socio-cultural conditions in Ukraine and Western countries differ significantly. Except Estonia, there are no other studies of migration at micro level in transition countries, especially in those where transformation process was very long and painful. Therefore, based on the level of economic situation, we expect that migration patterns in Ukraine will be more similar to developing rather then to developed countries (De Jong, 2000; Reed et al., 2006). The results will answer the question about place of

Ukrainian migration during transition period economy among the other types of economies.

Summarizing, the review of literature on the topic of migration at the micro level provides firm theoretical underpinning and practical guide for the current research. Numerous investigations in the field and their discussion make us sure in avoidance of methodological mistakes. Previous empirical estimations of migration determinants give the understanding of not only directions of influences on personal decisions but also the mechanisms of their realization. Far in the study we will refer to the mentioned in the literature review papers in the more specific questions, providing argumentations for our statements and actions.

Chapter 3

METHODOLOGY

Modeling approach to the migration determinants estimation is the logistic regression:

$$P[y = 1 | X] = \Lambda(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_k x_k), \quad (1)$$

where X is the set of independent variables and Λ(z) is the logistic cumulative distribution function:

$$\Lambda(z) = \frac{\exp(z)}{1+\exp(z)} = \frac{1}{1+\exp(-z)}. \quad (2)$$

Use of longitudinal data in the study implies applying the multilevel discrete-time event history logit model. It estimates probability of migration (event) in discrete periods of time (year) as a function of personal and regional characteristics as well as general economic and social conditions in the country (multilevel analysis) and returns results relatively to the chosen baseline (on the log-odds scale):

$$\log\left(\frac{p_{ijt}}{1-p_{ijt}}\right) = \alpha + X_{it}\beta_{it} + Y_{jt}\varphi_{jt} + Z_t\gamma_t. \quad (3)$$

In this model, p_{ijt} is the conditional probability to out-migrate for the person i = 1..N from the region j = 1..26 at the period t = 1997 – 2002; α is the intercept; X_{it} is the set of personal characteristics in the period t; Y_{jt} is the set of regional characteristics, where the person out-migrate from in the period t; Z_t is the set of year dummies that represents general economic and social conditions in Ukraine.

Dealing with panel data puts a question of choice between cross-section, fixed effects (FE), and random effects (RE) logit estimations. On the first stage, we are going to choose between FE and RE and after that discuss appropriateness of the cross-section logit estimation. Set of oblast and year dummies is expected to absorb regional and time heterogeneity in our sample; thus, individuals are the only remaining possible source of heterogeneity. Unfortunately, FE estimation technically is not applicable in this regression since persons who did not changed place of living in the studied period of 1997-2002 are dropped in the process of estimating. This means that the estimated subsample is non-random drawing from the representative sample. Therefore, FE estimates are biased due to the sample selection problem.

Important is Kennedy's (1998, p. 227) argument in favor of RE logit estimation of our model. He points out that RE is appropriate whenever we want to make inferences about large population based on representatively selected sample. The current study is based on the survey data that is a random sample out of the whole population of Ukraine. Therefore, RE estimation is reasonable here. Working with randomly drawn samples, Kulu and Billari (2004) and Finnie (2004) also apply RE logit as estimation procedure. However, RE requires strong assumption of uncorrelated individual time-invariant unobserved terms and independent variables. Thus, RE logit is run under assumption of independence of individual time-invariant unobserved terms and explanatory variables.

If individuals are not heterogeneous both cross-section and RE logits provide correct estimations. In the opposite case cross-section logit estimations are biased. Heterogeneity can be tested with the following likelihood ratio test. Assume

$$\varepsilon_{it} = v_{it} + u_i \qquad (4)$$

to be both iid under normal distribution such that

$$Var(\varepsilon_{it}) = \sigma_v^2 + \sigma_u^2 = 1 + \sigma_u^2$$
$$Corr(\varepsilon_{it}, \varepsilon_{is}) = \rho = \frac{\sigma_u^2}{1 + \sigma_u^2} \quad (5)$$

If the null hypothesis $\rho = 0$ (correspondingly, $\sigma_u^2 = 0$) is not rejected than there is no heterogeneity and we choose cross-section logit as the estimation procedure. However, if $\rho = 0$ is rejected we decide on RE logit. This test automatically carries out in Stata whenever the RE logit is estimated. Therefore, initially we run the RE logit and simultaneously check for heterogeneity. The following model is estimated:

$$\log\left(\frac{p_{ijt}}{1 - p_{ijt}}\right) = \alpha + X_{it}\beta_{it} + Y_{jt}\varphi_{jt} + Z_t\gamma_t + u_i . \quad (6)$$

Essentially, this is the model (3) augmented with u_i – the individual level random residual, which is assumed to be independently and identically normally distributed:

$$u_i \sim N[0, \sigma_u] \;\; i = 1..N . \quad (7)$$

The likelihood function of the RE logit is estimated by adaptive Gauss-Hermite quadrature. Computation time is roughly proportional to the number of points used for the quadrature.

Every migration event can be split into two subevents: out-migration and in-migration. This division is made from the viewpoint of migration places, namely origins and destinations, which together constitute regional migration attractiveness. The question is what contributes to this attractiveness and how should it be assessed? In order to estimate it we

examine two regressions that have the same functional form and differ only in the set of regional characteristics. The first regression is (6) and the second is its slight modification:

$$\log\left(\frac{p_{ikt}}{1-p_{ikt}}\right) = \alpha + X_{it}\beta_{it} + Y_{kt}\varphi_{kt} + Z_t\gamma_t + u_i \qquad (8)$$

where p_{ikt} is the conditional probability to in-migrate for the person i = 1..N into the region k = 1..26 in the period t = 1997..2002; Y_{kt} is the set of regional characteristics where the person in-migrate in the period t. Terms α, X_{it}, and u_i remain the same as in the model (6).

Estimation of both out- and in-migration regional coefficients (two-side analysis) is reasonable because behind two sides of one migration event different regional factors stand for. For example, high unemployment increases the probability to leave the region but decreases the probability to move in. The interpretation of the regional factors for out- and in-migration models will be considered separately. Personal characteristics on the moment of relocation are the same in both models and affect the migration decision in a similar way. Therefore, we expect the coefficients near personal factors to be very close in out-migration and the in-migration models.

In order to make inferences in the nature of migration we consider three models in terms of the described above modeling framework. The first is basic model that includes majority of different level factors (see the next chapter). In addition to the basic model, the second one incorporates into analysis personal income, while the third involves new regional characteristics. The purpose of the personal income and regional characteristics augmented models is to test influence of these specific factors on migration probability separately from the basic. The reason for

the separate estimation of the personal income augmented model is almost three times smaller number of observations of monthly wages in comparison with the rest of variables (see the Data Description part), that leads to undesirable reduction of the sample. The regional characteristics augmented model is run to decompose regional attractiveness by the cause.

Regression analysis is done separately for men and women and finally for the joint sample. These detached estimations intend to make inference in the migration behaviour and preferences of sexes, to identify the most likely moving groups and find out the major underlying reasons of migration.

Chapter 4

DATA DESCRIPTION

A. ULMS 2003

The study uses data of the Ukrainian Longitudinal Monitoring Survey (ULMS) 2003. The survey was held in 24 oblasts of Ukraine, Autonomic Republic of Crimea (including the city of Sevastopol), and in the capital city of Kyiv in April-June 2003. It was carried out among 8641 people of age 15-72 on the date of interviewing. Methodologically, the ULMS 2003 was arranged to gather individual event histories in the major spheres of human activity. It contains data on a person's major jobs and non-employment (1986, 1991, 1997, and 1998-2003), changes in residence (1986-2003), as well as individual and household characteristics, studies and skills, etc. The set of data is exhaustive enough to reconstruct a person's life completely for the period of January 1997 – December 2002.

The original sample contained 51846 observations: six year observations for 8641 individuals. Children under 15 years (3339 person per year records) and persons with missing values of some variables (total 3438 person per year observations) were excluded from the original sample, shortening the number of observations to 45069 and persons to 8313. The final sample contains 1173 migration events what corresponds to average migration rate of 2,6% over the period. At the same time, the State Committee of Statistics reports year migration rates varying between 1,5% and 1,6% in 1997-2002, what is much less the actual figure[3]. In our opinion, the migration rate in the sample under study is reasonably greater, since the officials count only the registered changes of residence, while the ULMS 2003 provides data about both registered and unregistered moves.

[3] The Statistical Yearbooks of Ukraine 1997-2002, the State Committee of Statistics of Ukraine.

The data has one important limitation that affects methodological approach of estimation procedure. The ULMS 2003 systematically does not provide the people's places of living (origins) in December 1986, while the migration destinations are recorded carefully and without major gaps. If a person did not move then origins and destinations are approximated from her place of living in 2003. Destinations are approximated for all migrants in the similar way. However, because of systematic underreporting, only part of migrants has records about migration origins. These origins were obtained mainly from the information about migration destinations during previous changes of living places; also a small share of observations still have records about origins in December 1986. Thus, most of the movers with information about origins migrated at least twice in the period of December 1986 – December 2002.

Table 4.1. Limited and Representative Samples Description

Variable	Limited sample		Representative sample	
	Obs	%	Obs	%
Migration events	612	1.38	1173	2.60
Non-migration events	43896	98.62	43896	97.40
Migrants	496	6.04	975	11.73
Non-migrants	7695	93.96	7338	88.27
Total events	44508	100.00	45069	100.00
Total persons	8191	100.00	8313	100.00

Given this data limitation, it is reasonable to separate two samples. The first of them contains records with information about both individual origins and destinations and essentially is limited, since it includes only part of migrants. The second sample comprises all individuals (45069 observations) with records about destinations only. It is fairly representative and properly reflects the share of movers in the country. Both of the samples are used to make inferences in the nature of migration in this study. As it is seen from the Table 4.1, the different numbers of migration events (612 and 1173) solely determine numbers of observations in the limited and representative

samples, since quantities of non-migration events are the same in both samples (43896).

The ULMS 2003 defines migration event as a change of living place independently the on the distance of relocation. This includes both intraregional and interregional migration. Due to the mentioned above data limitation it is difficult to separate relocations within one region and moves between two different regions. Therefore, they are pooled under the one dependent variable – migration event.

The next part of this chapter concentrates on the description and comparison of two samples. It analyzes the distributions of variables and proves that both limited and representative samples are random drawings from the population. The methodology chapter justifies and explicitly explains importance of the samples separation for the estimation procedure and correct results interpretation.

B. VARIABLES AND HYPOTHESES

The migration probability is dependent on different factors: personal, regional, and overall economic and social characteristics. Some of variables influence the migration decision in a similar manner across all countries, while others reflect transition period and/or solely Ukrainian specificities. Their estimation gives understanding of driving forces of migration and highlights resemblances and distinctions of migration processes in Ukraine and other countries. The following factors (variables) are included in the model.

1) Age. People in our sample are divided into three age cohorts: youth (15-29 years), matured (30-45 years), and elders (46-72 years). The distribution across age cohorts does not differ tremendously in the limited and representative sample (see Table 4.2), though one may see that after adding

560 migrants without information about origins the share of young people in the representative sample has increased the most. The expectation regarding age is such that migration probability decreases over life; therefore, the most intense migration activity is expected in the first cohort, moderate in the second group, and the lowest activity in the third group.

Table 4.2. Descriptive Statistics of Personal Characteristics

Variable	Limited sample		Representative sample	
	Obs	%*	Obs	%*
Age 15-29	11044	24.81	11377	25.24
Age 30-45	13798	31.00	13936	30.92
Age 46-72	19666	44.19	19756	43.84
Males	18752	42.13	19007	42.17
Females	25756	57.87	26062	57.83
Basic education	11892	26.72	12025	26.68
Secondary education	11020	24.76	11168	24.78
Professional education	15159	34.06	15357	34.07
Higher education	6437	14.46	6519	14.47
Married	31520	70.82	31867	70.71
Non-married	12989	29.18	13202	29.29
Number of children under 15	17461	0.58**	17768	0.58**
Ukrainian language	21378	48.03	21617	47.96
Russian language	18027	40.50	18288	40.58
Mixed Ukrainian and Russian	5103	11.47	5164	11.46
Salary	16422	241.28**	16624	241.07**
Employed	25442	57.17	25766	57.17
Unemployed	4699	10.56	4817	10.69
Inactive (out of labour force)	18280	41.07	18533	41.12
New work started	2733	6.14	2831	6.28
Migration experience	9704	21.80	9766	21.67
Tenancy (out-migration)	2285	5.13	2328	5.17

* Percents of observation are obtained as a mean of dummy variable multiplied by 100.
** Mean of number of children in the family.
*** Mean of reported salary (UAH).

2) Gender. The State Committee of Statistics reports 46.2% of men in the population, while in all three samples men's share is slightly above 42%. The difference can be explained by exclusion from the sample of children under 15 (the only age category where males dominate) and, probably, higher labour out-migration rate from Ukraine among males. Empirical studies in Western countries (for instance, Nivalainen, 2004, Finland; Finnie, 2004, Canada; Kulu and Billari, 2004, Estonia) show that males and females are either equally likely to change a place of living or the difference in propensities is not statistically significant. Therefore, the null hypothesis about gender migration is males and females migrate equally. However, the under-representation of men in the sample, economy transition and country specific socio-cultural norms put the competing hypothesis about different migration propensities of sexes in Ukraine in 1997-2002.

3) Marital status. In this analysis, married people are those who were married at least one month in a year; single and divorced are those who were not in marriage during the whole year. According to this definition, the shares of married people are around 71% in the both samples that is reasonable for given age range and shares of age cohorts. Obviously, relocation costs for single persons are much less than for married ones. Therefore, married people are expected to be less likely to migrate.

4) Number of children under 15. The number of young children per observation is 0.58. Such a small figure is not a strange result since the children over 15 are already in the sample. The relocation costs of bigger family (household) are higher. Therefore, the family with greater number of children is less likely to migrate.

5) Education. The whole sample was divided into four educational cohorts according to the highest achieved education level: basic (up to 9 classes of school), secondary (11 classes of school), professional (completed professional and vocational courses, incomplete higher education – up to 3

years), and higher (bachelor, specialist, master, candidate or doctor of science). The expectation about this factor is that mobility increases with increasing level of education. However, given high unemployment rates and small wages in all industries, people from different educational cohorts may be equally probable to change a place of living.

6) Language spoken in the family. It reflects differences in mobility for major language groups in Ukraine: Ukrainian, Russian, and mixed Ukrainian and Russian. These variables are proxies for major socio-cultural groups in the country, which may differ significantly in their preferences, manners, and migration activity as well (for example, Trovato and Halli, 1983).

7) Monthly salary at the main work. This is a proxy for personal income in 1997-2002. The average salary is 241 UAH in the given subsample that is slightly above the average over years regional wage 233 UAH, presented in the Table 4.3. As it can be seen from the Table 4.2, only 16422 individuals in the limited and 16624 in the representative has reported their salaries (the rest of respondents were either unemployed or inactive). This is slightly above the one third of the whole population and, therefore, there is no sense to include this variable in the basic model. The separate personal income augmented model will involve salary and salary squared. Salary squared is included to count for nonlinear relationship between income and migration probability: people tend to stay in high-income places, though their migration opportunities increase with earnings. Specifically, we expect negative sign near salary and positive near salary squared.

8) Employment status. Three states are distinguished: employed, unemployed (job seekers) and inactive (out of labour force). Constructing these variables, we asked whether a person was employed, unemployed, or inactive during a year. By such a construction these events are not mutually exclusive and a person might be in all three employment states in the same year (there were no other possibility to make three employment states

mutually exclusive but working with monthly, not year data). Therefore, the sum of corresponding percentages in the Table 4.2 exceeds one hundred and we include all three corresponding dummy variables into the model, leaving no reference employment state. This affects only economic interpretation of the results but does not harm relations between employment states and migration probabilities. According to the standard approach in the migration theory, non-employed people are more mobile when they are looking for a job. Therefore, higher migration probabilities are expected for unemployed and inactive in comparison with employed.

9) Start of a new job. Change of the work is often associated with the relocation to the new place of living whether it is inter-company transfer or finding a job in different region. Consequently, starting a new job positively affects migration probability.

10) Previous migration experience. This dummy variable indicates whether a person has changed a place of living in period December 1986 – December 2001. Empirical findings (Findley, 1987; Root and De Jong, 1991) suggest that previous movers are more likely to migrate one more time.

11) Apartment (house) ownership type. This is a dummy, which assigns zero if a person (his/her family) owns apartments and one if a person rents. Reasonably, the renters are more mobile, while the owners are much tied to their places and less likely to migrate.

The above variables constitute the set of personal characteristics affecting mobility. Except gender, all of them are time varying. Their values vary across the years but are designed to be constant over a particular year. Oppositely, set of regional characteristics incorporates changes that have happened within a year. Changes in regional characteristics occur only if an individual migrates. We track a person's relocation from origin to

destination and record associated with them regional characteristics. Separation of origins and destinations is intended to accomplish two-side analysis (out- and in-migration estimations) of regional attractiveness, described in details in the methodology part. Technically this separation was achieved by constructing two parallel sets of variables: the first set contains information about the old place of living, while the second about the new place. The limited sample contains both sets of regional characteristics, while the representative sample only the second one. Obviously, records in the sets of regional characteristics differ only if a person migrates and are the same if a person stays at the same place. The following regional characteristics are included in these sets.

The first factor is language minority status. Oblasts of Ukraine were divided into three categories according to the spoken language dominance: Ukrainian mainly, mixed Ukrainian and Russian mainly, and Russian mainly. The language minority status are assigned only to the persons who speak Ukrainian in the mainly Russian-speaking regions or Russian in the mainly Ukrainian-speaking regions. Finnie (2004) finds the strong evidence of much intensive migration among the language minorities. The same relation is expected in Ukraine: people who speak different then regional language are more likely to out-migrate; at the same time, people tend not to relocate into the regions with other dominating language. Table 4.3 suggests that the number of Ukrainian speaking minorities (6.6-6.7%) is a bit greater than Russian speaking ones (4.08-4.09%). Therefore, we may expect more migration events for Ukrainian speaking minorities in absolute terms.

The second factor is a type of settlement where the person lives before and after relocation. We distinguish four settlement types: rural area (including urban villages, since their infrastructural development and overwhelming activity in the primary sector make them much similar to villages than to

towns in Ukraine), town (10000-99999 inhabitants), city (100000-499999 inhabitants), and large city (more 500000 inhabitants).

Table 4.3. Descriptive Statistics of Regional Characteristics

Variable	Limited sample		Representative sample	
	Obs	%*	Obs	%*
Language minority: Ukrainian speakers in Russian speaking regions (out-migration)	2980	6.70	-	-
Language minority: Russian speakers in Ukrainian speaking regions (out-migration)	1817	4.08	-	-
Language minority: Ukrainian speakers in Russian speaking regions (in-migration)	2955	6.64	2987	6.63
Language minority: Russian speakers in Ukrainian speaking regions (in-migration)	1816	4.08	1842	4.09
Rural area (out-migration)	19970	44.87	-	-
Town (out-migration)	6748	15.16	-	-
City (out-migration)	8955	20.12	-	-
Big city (out-migration)	8835	19.85	-	-
Rural area (in-migration)	20025	44.99	20216	44.85
Town (in-migration)	6721	15.10	6815	15.12
City (in-migration)	8954	20.12	9107	20.21
Big city (in-migration)	8808	19.79	8931	19.82
Average regional wage, UAH	44508	232.94**	45069	232.98**
Regional rate of unemployment, %	44508	10.98**	45069	10.98**
Number of universities	44508	15.92**	45069	15.90**
Air pollution emissions from the stationary sources, thousand tons	44508	297.55**	45069	298.10**

* Percents of observation are obtained as a mean of dummy variable multiplied by 100.
** Mean of regional characteristics

Hypothetically, the possibility to find a job and get higher wage is greater in urban areas; moreover, it increases with the size of the settlement. Therefore, it is expected lower out- and higher in-migration form the big

cities and cities in comparison with towns and rural areas. However, as it is seen from the limited sample, population increased only in the rural areas, while in the urban areas it decreased during the studied period. Based on this fact, we can expect that migration directions were from urban to rural areas. The reasons for this might be purely economic: high costs of living and absence of job in the urban areas.

The choice of regional wage (UAH), unemployment rate (percents), number of universities in a region and the level of air pollution emissions from the stationary sources (thousand tons) is based on the study by Martynenko (2004). She found them to be the most robust regional determinants of migration in 1999-2002, that corresponds to our period of investigation. Expectations about given factors are the following. Average regional wage and number of universities negative influence of the out-migration and positive the in-migration. Unemployment rate and pollution emissions have the opposite effect on the regional migration: people leave oblasts with higher unemployment and worse ecology and move in the regions with better employment possibilities and ecology conditions.

The last regional variables are oblast dummies. Given the ULMS 2003 classification of regions, twenty-four oblasts of Ukraine, AR Crimea (including the city of Sevastopol), and the capital city of Kyiv (total 26 regions) are chosen to be the migration origins and destinations. The corresponding dummies absorb all unobserved and unmeasured regional characteristics that may affect migration activity. Therefore, after controlling personal and other regional characteristics, the coefficients near these dummies have to reflect the regional migration attractiveness due to unobserved factors.

In the model of out-migration, the regional coefficients reflect the desires to leave regions. Thus, their positive values signal about tendency to move out, while negative – about tendency to stay in a region. Respectively, the

positive regional coefficients in the in-migration model mean that the corresponding oblasts are preferred migration destinations, while the negative ones mean that these oblasts are undesired destinations.

Table 4.4. Distribution of Region Origins and Destinations

Region	Origins		Destinations			
	Limited sample		Limited sample		Representative sample	
	Obs	%*	Obs	%*	Obs	%*
AR Crimea**	1979	4.45	1969	4.42	1988	4.41
Vinnytsya	1795	4.03	1794	4.03	1836	4.07
Volyn	829	1.86	828	1.86	840	1.86
Dnipropetrovsk	2628	5.90	2631	5.91	2696	5.98
Donetsk	4859	10.92	4860	10.92	4915	10.91
Zhytomyr	1232	2.77	1227	2.76	1233	2.74
Zakarpattya	1161	2.61	1157	2.60	1169	2.59
Zaporizhzhya	1658	3.73	1659	3.73	1684	3.74
Ivano-Frankivsk	1286	2.89	1294	2.91	1315	2.92
Kyiv	1384	3.11	1386	3.11	1400	3.11
Kirovograd	1129	2.54	1132	2.54	1155	2.56
Luhansk	2322	5.22	2328	5.23	2369	5.26
Lviv	2578	5.79	2568	5.77	2595	5.76
Mykolaiv	1544	3.47	1546	3.47	1566	3.47
Odesa	2103	4.73	2102	4.72	2126	4.72
Poltava	1419	3.19	1420	3.19	1429	3.17
Rivne	963	2.16	965	2.17	972	2.16
Sumy	1412	3.17	1414	3.18	1426	3.16
Ternopil	1250	2.81	1253	2.82	1264	2.80
Kharkiv	3130	7.03	3124	7.02	3145	6.98
Kherson	1229	2.76	1229	2.76	1246	2.76
Khmelnytsky	1321	2.97	1321	2.97	1333	2.96
Cherkasy	1216	2.73	1215	2.73	1235	2.74
Chernivtsi	425	0.95	427	0.96	432	0.96
Chernigiv	1337	3.00	1337	3.00	1352	3.00
City of Kyiv	2310	5.19	2306	5.18	2340	5.19

* Percents of observation are obtained as a mean of dummy variable multiplied by 100.
** Including city of Sevastopol

Table 4.4 shows that both limited and representative samples mimic the real distribution of population across oblasts in Ukraine. This allows to state that

the estimation will not be biased due to unrepresentative sample in terms regions. The range of population shares varies from the 10.9% in Donetsk oblast to 0.9 in Chernivtsi oblast. Important thing is that the distribution of population does not differ in the limited and representative samples for both region origins and destinations. This provides basis for comparability of estimated results. Observing number of inhabitants in the origin and destination oblasts in the limited sample, we do not find pronounced outflow or inflow of migrants in any of the regions. Thus, migration attractiveness of Ukrainian oblasts has to be determined by intensity of relocations in the region. We cannot make the same conclusion for the representative sample, but the similar picture may be expected.

Table 4.5. Distribution of Years

	Limited sample		Representative sample	
Year	Obs	%*	Obs	%*
1997	6568	14.76	6663	14.78
1998	7038	15.81	7105	15.76
1999	7265	16.32	7379	16.37
2000	7591	17.06	7670	17.02
2001	7879	17.70	7962	17.67
2002	8167	18.35	8290	18.39

* Percents of observation are obtained as a mean of dummy variable multiplied by 100.

The last factor included into analysis is general social and economic conditions in the country that are represented by year dummies. Investigated period is 1997-2002, during which the Ukrainian transition stopped stagnation and started to grow (since 2000). These year dummies allow to answer the question how changing economic situation affected migration activity across the country. Expected, that during stagnation intensity of relocations should decrease, while during booming years relocations should become more often. Table 4.5 shows that number of observations increases from year to year. The main reason for this is gradual inclusion of growing

up children that were excluded from the sample in the previous years due to the age criterion.

Summarizing on the data and explanatory variables, we may admit that besides the systematic underreporting of migration origins there is no other problems with data. Distribution of all variables shows that both limited and representative samples are random and reflect distribution of the population in Ukraine in many aspects. This is a necessary basis for unbiased estimations and correct explanations of migration determinants and patterns.

Chapter 5

ESTIMATION RESULTS

The choice between RE and cross-section logit estimation procedure is based on the result of the likelihood ration test with null hypothesis $\rho = 0$ (see methodology part). For all run regressions the null hypothesis has been rejected. Therefore, the RE logit has been left as the only correct estimation procedure. In Appendices, tables with regression results contain estimated values of ρ and results of likelihood ratio tests. We begin our analysis from the basic model and later will discuss findings for the personal income and regional characteristics augmented models.

A. BASIC MODEL

Analysis of estimation results starts from the personal factors. Table 1 (Appendix 1) provides findings for personal characteristics influences on migration probability. The first thing to what we want to attract attention is similarity of estimated coefficients in the limited sample models. The reason of this resemblance is that personal factors explain the major part of variation in the conditional probability to migrate. Therefore, replacement of migration origins with migration destinations does not change coefficients of personal factors tremendously.

Importance of this finding is that we may draw conclusions about influence of personal characteristics on migration probability based either on the in-migration or out-migration model only. It is particularly important for this investigation since the representative sample is available only for the in-migration model. The following analysis of individual factors uses only the last in-migration model with estimations for men, women and joint sample (Table 5.1, detailed results in Table 1a in Appendix 1). Further investigation of regional characteristics involves both limited and representative samples.

Table 5.1. Panel Logit Estimation of Probability to Migrate. Personal Characteristics

Variable	Men	Women	Joint sample
Age (base: Elders 46-72)			
Young 15-29	1.6271***	1.9808***	1.8214***
Matured 30-45	0.6163***	0.6979***	0.6610***
Gender (base: Female)			
Male	-	-	0.1454**
Marital status (base: Non-married)			
Married	0.0748	0.3774***	0.2615***
Number of children under 15	0.1669**	0.0937	0.1304**
Education (base Basic education)			
Secondary education	0.2503	0.3000**	0.2817***
Professional education	0.3138**	0.181	0.2485**
Higher education	0.4258**	0.3529**	0.4071***
Language spoken in the family (base: Ukrainian)			
Russian language	0.1297	0.0171	0.0928
Mixed Ukrainian and Russian	-0.0781	0.1396	0.0618
Employment status			
Employed	0.3719**	0.4049**	0.3805***
Unemployed	0.9528***	0.6199***	0.7946***
Inactive (out of labour force)	0.5750***	0.8263***	0.7283***
New work started	0.6171***	0.6635***	0.6283***
Migration experience	-0.4759***	-0.5376***	-0.4961***
Tenant	1.8332***	1.2623***	1.5364***

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5.1 provides estimated personal characteristics coefficients. As it was expected, the migration probability decreases with age. Young and matured people change a place of living much often than elders (1% level of significance for men, women, and joint sample). As it is seen from the separate regressions for males and females, the migration activity of women decreases with age at slightly faster path than of men. This finding suggests

that women become more tied to their places with age then men do. Seemingly, it is the evidence of traditional family role of women as housekeepers who, being married, are more likely to stay at home in the case, when one of a couple has to migrate due to some reasons.

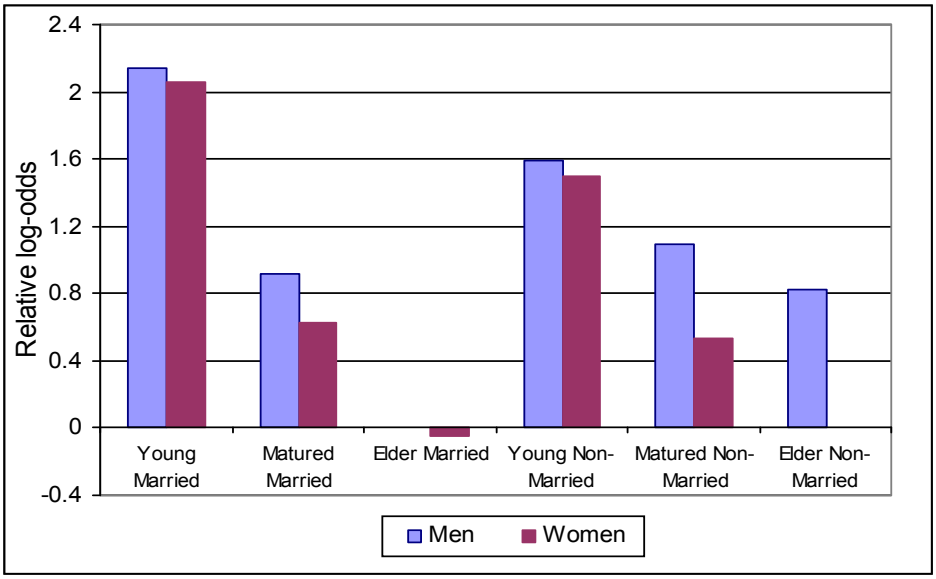
Further analysis of personal factors shows that men are a bit more likely to migrate over the life. The corresponding coefficient is relatively small 0.1454, but it is statistically significant at 5% percent level. This rejects the theory-based hypothesis of equal propensities to migrate for men and women but it is in accordance with the above idea of different age-related migration behaviour of sexes. However, the following finding concerned with marital status breaks down this idea completely. In contrast to the theoretical expectations, regressions in the Table 5.1 clearly show that being in marriage positively affects migration probability for women (coefficient is 0.3774, 1% level of significance) and does not influence men's probability. In other words, in families, men, not women, stay at home if one of a couple has to migrate due to some reasons.

In order to solve this contradiction, the auxiliary regression with interaction terms is run (see Table 2 in Appendix 2). Double and triple interactions of age, sex, and marital status are included in that model. The aim is to compute and compare migration probabilities for different age, sex, and marital status cohorts. The group of elder non-married women is chosen as a baseline. Estimated results are not obvious enough to conclude about migration probabilities by eye. Therefore, corresponding to each cohort coefficients are summed up and presented in the Figure 5.1.

The first conclusion from the above graph is that men indeed migrate more often then women do. For each age-marital status cohort men's coefficients are somewhat greater than women's are, especially for groups of non-married matured and elders (statistically significant differences at 10% and 5% respectively see Appendix 3). Non-married females of these two age

cohorts are as probable to change a place of living as married are (no statistically significant difference), while only elder non-married males migrate more intensively then their married counterparts (1% level of significance).

Figure 5.1. Migration Behaviour of Married and Non-married Men and Women by Age

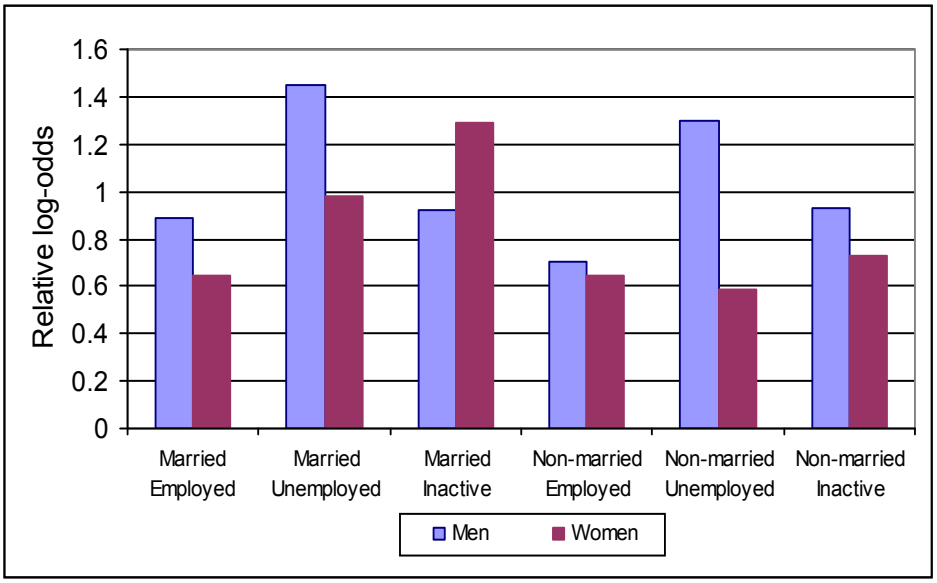


This implies the second conclusion that being in marriage negatively affects migration probability only for elder men. Third, pairwise migration probabilities for married men and women are almost equal for each specific age group (though, difference for matured is statistically significant at 10%). It means that married people tend to migrate with their families, what is quite logical. Interesting fact is that married young persons relocate much often then non-married of the same age (1% level significant difference). The only reasonable explanation of this issue is that some migration decisions for this group are directly related to the event of getting married.

Another important finding of this research is referred the employment status and family migration decisions. Regressions in the Table 5.1 reveal the different influence of being unemployed and inactive (out of labour force)

on men and women migration decisions. Specifically, males relocate more often when they are unemployed, while females are more likely to change the place of living when they are inactive. In order to explain this issue, we run two auxiliary regressions with interaction terms. The first regression with interactions of age, sex, and employment status (not reported here) shows that inactive women in all age cohorts migrate more intensively than unemployed do. In other words, this tendency is distinctive for females independently on age. Unlike the first regression, the second one with interactions of sex, marital, and employment statuses reveals much interesting finding with results reported in the Table 2 (Appendix 2) and presented in the Figure 5.2.

Figure 5.2. Migration Behaviour of Married and Non-married Men and Women by Employment Status



Briefly, the conclusions drawn from the Figure 5.2 are the following. Both married and non-married men migrate more intensively when they are unemployed (statistically significant difference at 10% and 5% respectively, see Appendix 3). Women, however, relocate the most often when they are married and inactive (statistically significant differences at 1% with employed and at 10% with unemployed married females). A notable point is

that non-married females are almost equally likely to change a place of living at different employment statuses (no statistically significant differences between coefficients).

The analysis of age, gender, and marital status differentials in migration probability (Figure 5.1) shows that married people tend to relocate with families. Applying this result to the marital and employment status differentials, one may suppose that the most probable reasons for family migration are husbands' unemployment and wives' inactivity. However, wives' being out of labour force seems unlikely to provoke family relocating to another place. Often women are inactive in the families when they take care for little children or just keep the household. A more reasonable explanation of the high migration probability for married inactive females is just a coincidence with husbands' periods of unemployment, when the whole family migrates after the husband finds a new job at a new place.

The last empirical finding related to the marital status is discovered for people with children under 15. It reveals positive relation between number of children and migration probability for men, while women are not affected at all. Estimated coefficient is low at absolute value (0.1669 in the sample of men), but statistically significant at 5% level. Obtained results contribute to the explanation of existing small gap in migration probability between married men and women. In families, husbands are indeed more likely to relocate if one of the couple has to migrate in search of a job (as it is seen from the Figure 5.1). As the heads of households, they have to maintain their families. What is more, Danzer and Hindrich (2007) show that in the Ukrainian female-headed households labour migration of men is even more likely than in the male-headed. The bigger the family is the higher are living costs of households and higher probability to migrate in search of a job.

The remaining personal characteristics have straightforward interpretation and do not require in-depth analysis with interaction terms. In particular,

education influences individual migration decisions in the standard and foreknown manner: the probability increases with higher attained level of education. This relation is stronger for men and somewhat weaker for women. In particular, males' coefficients consecutively grow stage by stage from the secondary school (insignificant) through professional education (0.3138, 5% level of statistical significance) up to higher education (0.4258, 5% level of significance). Among females the most active migrants are those with secondary (0.3, 5% level of significance) and higher education (0.3529, 5% level of significance).

The language spoken does not determine migration activity of Ukrainian citizens. No statistically significant difference in migration probability for Ukrainian, Russian, and mixed Ukrainian and Russian speaking people is found. It means that the major socio-cultural groups in Ukraine are very similar in their migration behaviour. Starting a new job is tightly related with migration decisions. The estimated coefficients are almost equal for men and women (0.6171 and 0.6635 respectively) and statistically significant at 1% level.

Previous migration experience negatively affects migration probability (coefficient is -0.4961 for the joint sample; 1% level of significance). This finding contradicts with expectations but it has quite logical explanation. Once the person had changed a place of living, he or she tries to stay for a longer period at that place. The reason is that relocation is costly and difficult process to repeat it again and again. This is particularly important in the situation, when the observable period under study is not long. In the current research, it covers 11-17 years (from 1986 to 1997-2003). Probably, in the case of longer observable history of relocations the results might be in accordance with theoretical expectations.

The last personal factor that affects migration is tenancy. In most cases renters are temporary inhabitants, they are much mobile than the rest of

society. Therefore, economically and statistically (at 1% level) significant coefficients of 1.8332 for men and 1.2623 for women are expected. Even more, it appears to be the most influential factor of migration for males and the second one for females.

So far, affects of the personal characteristics were discussed. The following section is devoted to the regional characteristics. As it was mentioned earlier, this section involves both limited and representative samples. The limited sample is used in cautious attempt to draw some conclusions from the out-migration model and, thus, restore the regional migration patterns in Ukraine. The empirical findings for the regional characteristics are presented in the Table 5.2 (see Table 1 in Appendix 1 for details).

Estimates in the limited sample out-migration model provide the following finding. Ukrainian speaking individuals try to move out from the mainly Russian speaking regions (coefficient is 0.7568 at 5% level of significance), while Russian speakers do not move out from the mainly Ukrainian speaking regions (0.1918, insignificant). The most active movers among Ukrainian speaking minorities are women (1.0502, 1% level of significance); Ukrainian speaking men do not treat language minority status as valid reason to change a place of living.

Estimated coefficients in the in-migration model do not allow making conclusion about influence of the language minority status on migration probability due to their insignificance. In other words, people disregard the dominant language in the region as an important factor, when they choose a destination place. Probably, in the case of bigger sample the standard deviations might be lower as one can see from comparison of estimated regressions for men, women, and joint sample. Consequently, some of the estimated coefficients might become statistically significant. At least, there exist such probabilities for the Russian speakers in the mainly Ukrainian regions, whose corresponding coefficients are very close to being significant.

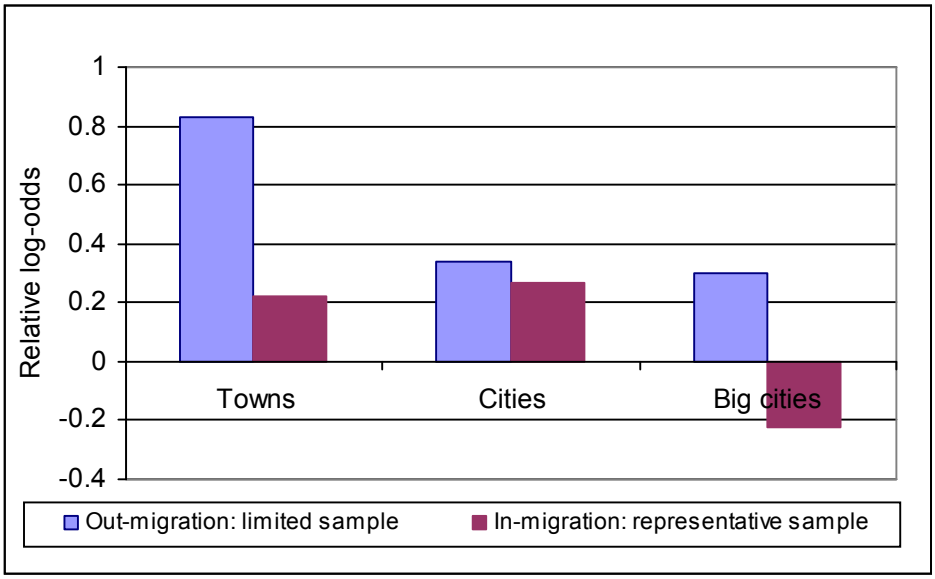
Table 5.2. Panel Logit Estimation of Probability to Migrate. Regional Characteristics

	Limited sample: Out-migration			Limited sample: In-migration			Representative sample: In-migration		
Variables	Men	Women	Joint sample	Men	Women	Joint sample	Men	Women	Joint sample
Language minority									
Ukrainian speakers in Russian speaking regions	0.4143	1.0502***	0.7568***	-0.6503	-0.3991	-0.5098*	-0.2596	-0.2032	-0.2195
Russian speakers in Ukrainian speaking regions	0.3285	0.0281	0.1918	0.7713*	-0.1238	0.4268	0.5292	-0.5056	0.1141
Settlement Type (base: Rural Area)									
Town (10000-99999)	0.6923***	0.9539***	0.8321***	0.109	0.1485	0.1071	0.3058*	0.1908	0.2223**
City (100000-499999)	0.1912	0.4581**	0.3371**	-0.1122	0.2036	0.0368	0.2905*	0.2906**	0.2705***
Big city (500000 and more)	-0.0925	0.6362***	0.3029*	-0.8011***	-0.2144	-0.4852***	-0.4879**	-0.0236	-0.2243*

* significant at 10%; ** significant at 5%; *** significant at 1%

Settlement type (size) where an individual lives plays an important role in the migration decision making. This regards both out-migration and in-migration, since all estimated coefficients are statistically significant. The analysis starts from the limited sample out-migration model. In general, during the studied period people left urban areas (rural areas – the reference group). The intensity of outflow from the urban centres drops with the size of settlement: towns (coefficient is 0.8321, 1% level of significance), cities (0.3371, 5% level of significance), and big cities (0.3029, 10% level of significance). Though these findings are based on the limited sample, the significance levels and absolute values (at least for towns) leave no doubt in the correctness of this conclusion. The explanation of this issue is very simple: towns were affected by transition in a greater extent than cities and big cities. Often those towns depended on one-two big enterprises; after their closure many people lost their works (especially in Donbas).

Figure 5.3. Migration Attractiveness of Settlements



Cities and big cities had more diversified employment possibilities and, therefore, were less affected by transition in that sense. Beside this, emerging of the private service sectors such as banking, retail, transport, etc.

has began in the cities and big cities and relatively recently spread to towns and rural areas. Therefore, the great outflow from towns due to lower employment possibilities (in comparison with cities and big cities) is absolutely predictable in 1997-2002.

The settlement type coefficients in the in-migration model present the following picture: the most attractive destinations were cities (coefficient is 0.2705, 1% level of significance) and towns (0.2223, 5% level of significance). Big cities did not attract people during that period, even more, the tendency was to avoid relocating into big cities (-0.2243, 10% level of significance). The underlying reason of the latter result is, probably, the cost of living. In terms of high unemployment rates (9.6-11.6%[4]) and low wages (143-376 UAH[5]), the cost of living might be an important factor that influenced the choice of settlement type. The rural areas that always are the cheapest place for living were migration destinations for many migrants in 1997-2002. This conclusion is drawn from the analysis of the estimated results. Note, the gap between rural and urban areas is deeper in the out-migration model than in the in-migration (see Figure 5.3). People were unlikely to move from the rural areas, but they were comparatively more likely to move in. Additional argument in favor of this hypothesis is the fact that many of the Ukrainian urban dwellers have origins in the rural areas. Tenants and unemployed were the most probable of them who might come back home in the period of transition.

Interesting results are obtained for the region origins and destinations (see Table 1 in Appendix 1). Only five out of 25 regions differ significantly from the base line of Autonomic Republic of Crimea in the out-migration model. These regions are Vinnytsya, Volyn, Kyiv, Lviv, and Cherkasy oblasts. All of

[4] Data of the International Labour Organization. http://laboursta.ilo.org/
[5] Average year wage in Ukraine in 1997-2002. The State Committee of Statistics. http://ukrstat.gov.ua/control/uk/localfiles/display/operativ/operativ2006/gdn/prc_rik/prc_rik_u/dszpR_u2005.html

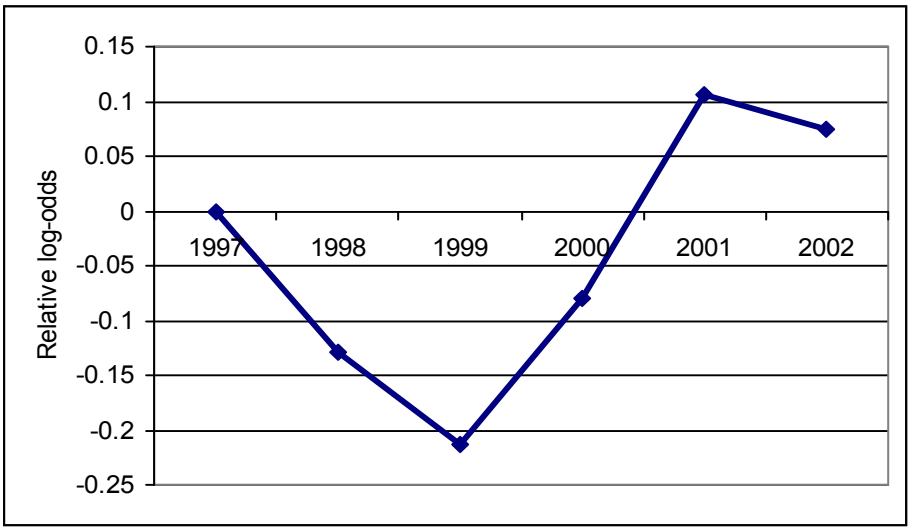
them positively affect migration activity of their inhabitants. Four of them are depressed with high rate of unemployment and low average wages: Vinnytsya, Volyn, Lviv, and Cherkasy. Only Kyiv oblast can be treated as economically developed, mainly because it surrounds city of Kyiv with its huge economic potential. Other depressed regions such as Ternopil, Khmelnytsky, Zhytomyr, Chernigiv and other oblasts do not affect migration decisions significantly different from the base line and, basically, from the major part of Ukraine. The same regards to the economically flourishing oblasts: neither Donetsk nor Kharkiv oblasts are different from the base. Therefore, at this stage, given results do not allow us to conclude about any regional out-migration patterns: people move neither from the depressed regions (doe to lower wages and higher unemployment) nor from the booming regions (due to higher migration possibilities).

In-migration attractiveness of the Ukrainian oblasts is more evident. Among the group of attractive for the in-migration regions, it may be separated economically developed (Dnipropetrovsk, Zaporizhzhya, Kyiv, Luganska, and Odesa) and depressed oblasts (Vinnytsya, Volyn, Kirovograd, Kherson, and Cherkasy). Combining the current and above findings for in- and out-migration, we may state that the only reason for positive and significant estimates of depressed regions is high rate of intraregional relocations, for example, looking for a job within oblast borders. Donetsk, Kharkiv oblasts, and especially city of Kyiv did not appear to be attractive as migration destinations. Seemingly, significant costs of living overweighed high employment possibilities and wages in those regions during the studied period. Another explanation of their insignificance may be the fact that the intense migration of workers in those regions have begun only since 2001-2002 after starting of economic recovery in Ukraine.

The year dummies were supposed to reflect the influence of changing socio-economic conditions on the migration activity of Ukrainians. At a baseline

of 1997, the intensity of moves does not change much during the studied period and all estimated coefficients except 1999 (-0.2132, 10% level of significance) are insignificant. In the 1999 the lowest point of transition was achieved and since 2000 the economy has started to grow. As it can be seen from the Figure 5.5, there exists U-shape curve of migration intensity that mimics performance of the Ukrainian economy during studied period. Probably, if a much broader period of transition was considered, say 1994-2006, the positive relationship between general socioeconomic conditions and migration would be even more evident.

Figure 5.4. Migration by Year



Summarizing on the basic model of our investigation we can admit the following feature: despite the fact that many factors affect migration probability in the different from expected and suggested by the theory directions, the reasonable and comprehensive explanations for these issues were still found. Now on we continue examining influences of other factors on the conditional probability to migrate. Further, the personal earnings augmented and regional characteristics augmented models are considered.

B. PERSONAL INCOME AUGMENTED MODEL

Personal income augmented model provides quite similar results for the major part of personal and regional factors (see Table 3 in Appendix 4). Subject of interest for us are coefficients near salary and squared salary. None of them in all estimated regressions is statistically significant, what contradicts to our predictions, unfortunately. How does this outcome have to be treated: income does not determine migration activity or there are some issues with salary concept? Probably, the second option is the case in our regressions and the arguments supporting this idea are the following. First, all the persons in the sample are employed and thus, less likely to relocate independently on the level of salary. Second, salary may be a weak proxy for income in Ukraine in that time. During the studied period, the important sources of family (household) income were pensions as well as yields from the self-employment activity, which are not included. Third, more appropriate measure is the income per family (household) member. The point is that people tend to migrate with the whole families. Therefore, two workers with the same salary, one of which is single and the other has a family of five members, are not equally probable to migrate. These above-mentioned problems cannot be eliminated a priori due to the data limitations. Therefore, we do not consider obtained results as a theory or methodology failure, but rather as a question that requires additional attention in terms of the ULMS data.

C. REGIONAL CHARACTERISTICS AUGMENTED MODEL

Regional characteristics augmented model includes four additional to the basic model factors that may be important for potential movers, as they are making migration decisions. They are regional average wage, unemployment rate, number of universities (as a proxy for socio-cultural development), and air pollution emissions from the stationary sources. The estimation results are presented in the Table 5.3 (see details in Table 4 Appendix 5). The first

thing to which we want to draw attention is that inclusion of additional factors did not change personal characteristics, language minority status, and settlement type: values and significance of the coefficients were preserved. However, regional dummies and year effects were affected considerably, what, in turn, is the subject for discussion about regional aspects of migration.

The estimation reveals that we can distinguish some patterns of regional migration only in the out-migration model. At least, only the out-migration model has statistically significant estimates that allow to conclude about regional tendencies in migration. The first tendency is that people move from the regions with higher unemployment rates and availability of workplaces in the oblast or specific area is a key determinant in favor of staying at home (coefficient is 0.0566; 10% level of significance). The average wage that also reflects the level of economic development of the region does not play an important role here. The same refers to the ecology conditions in the region: people, probably, disregard ecology or adapt themselves to it paying no attention to possible adverse influence for their health. However, the most striking result of current estimation is that people move out from the regions with more developed socio-cultural infrastructure, in our case, regions with greater number of universities (coefficient 0.1394; 1% level of significance). The situation is strange in the sense that it is out-migration, not just relocation from place to place within the same regions, since in both in-migration models corresponding coefficients are insignificant. Seemingly, the reason for this issue is the competition between university graduates on the job market. In terms of difficult economic conditions and little demand for skilled labour, better educated people had to migrate for longer distances in the search of appropriate job places. Another possible explanation of this situation may be that the number of universities is not only a good proxy for socio-economic development but also reflects the concentration of former

Table 5.3. Panel Logit Estimation of Probability to Migrate. Augmented Regional Characteristics

	Limited sample: Out-migration			Limited sample: In-migration			Representative sample: In-migration		
Variables	Men	Women	Joint sample	Men	Women	Joint sample	Men	Women	Joint sample
Language minority									
Ukrainian speakers in Russian speaking regions	0.3371	1.0535***	0.7318***	-0.5623	-0.2458	-0.3841	-0.2543	-0.2035	-0.2178
Russian speakers in Ukrainian speaking regions	0.4218	0.0337	0.2324	0.6893	-0.314	0.288	0.5224	-0.505	0.1124
Settlement Type									
(base: Rural Area)									
Town (10000-99999)	0.6996***	0.9635***	0.8377***	0.0934	0.1581	0.1036	0.3088**	0.1926	0.2234**
City (100000-499999)	0.2193	0.4607**	0.3479**	-0.1109	0.2356	0.0551	0.2912*	0.2912**	0.2714***
Big city (500000 and more)	-0.0766	0.6357***	0.3113*	-0.8031***	-0.2914	-0.5338***	-0.4899**	-0.0246	-0.2242*
Average regional wage	0.0028	-0.0032	-	0.0572	-0.0089	0.0238	0.025	-0.0118	0.0064
Regional unemployment	0.0923*	0.0136	0.0566*	0.0008	-0.0033	-0.0011	0.0001	-0.0016	-0.0008
Number of universities	0.1453**	0.1433**	0.1394***	0.0278	0.039	0.0289	-0.018	0.0179	0.0028
Air pollution emissions	0.0036	-0.0019	0.0005	0.0036	-0.0016	0.0007	0.002	-0.0026	-0.0006

* significant at 10%; ** significant at 5%; *** significant at 1%

- coefficient is below meaningful value

high-tech and military enterprises in the region (universities and institutes were supposed to produced skilled personal). Since that kind of enterprises suffered the most during transition, the outflow from the regions with higher number of universities does not seem to be a strange process any more

After inclusion of several regional characteristics in the model, the regional dummies are supposed to absorb the rest of regional factors that affect migration. These factors may be general price level, criminogenic situation, and, especially, future expectations and perspectives. Comparing regional coefficients in the basic and current out-migration models one should notice significant changes in them. In particular, regional characteristics augmented model shows that city of Kyiv and Kharkiv oblast were the only two regions in Ukraine from which people did not want to move out in 1997-2002 (coefficients are negative and statistically significant), though the basic model does not find them to be attractive for living. A second finding is that inhabitants want to leave from the most of depressed regions such as Vinnytsya, Volyn, Zhytomyr, Zakarpattya, etc. probably due to the future expectations and perspectives (see Table 4 in Appendix 4; statistically significant positive coefficients).

Combining estimation results of the in-migration and out-migration models suggests that in four out of six attractive for in-migrating regions the intense intraregional takes place or people prefer to relocate within oblast borders. These regions are Vinnytsya, Volyn, Kirovograd, and Cherkasy since they are have both positive and statistically significant coefficients in both in- and out-migration models. The remaining two oblasts – Zaporizhzhya and Odesa – seem to be the only two regions in Ukraine that attract people due to their non-economic factors.

D. PREDICTING MIGRATION PROBABILITIES

So far we discussed determinants of migration decisions, trying to clarify not only directions of their impacts but also to understand the underlying reasons and mechanisms of their influences. Now we turn to the practical applications of our research, because the single understanding of migration determinants is not enough for making policy related decisions. Here we will try to predict intensities of relocations in the regions for different socio-economic groups. This is rather an example of mobility forecasting, since it would be difficult to produce the whole picture of migration flows in Ukraine because of groups' multidimensionality. However, it is important in terms of applied technique and vivid results.

For our example, we have chosen young non-married (no children, respectively) Ukrainian speaking males and females with higher education that were owners or coowners of the apartments and moved into oblast centre (approximated from the biggest city in the region). We distinguish between three employment statuses and compute corresponding probabilities to migrate. The whole analysis is based on the separate for men and women basic in-migration model estimations for the representative sample (see Table 1 in Appendix 1).

First we compute marginal effects of migration determinants at zero number of children. Estimated effects are presented in Table 5 Appendix 6. For the rest of factors, which are dummies, estimated marginal effects show the change in migration probability for discrete change of explanatory variable from 0 to 1. Thus, in order to compute migration propensity of a particular socio-economic group of people it is needed simply to add corresponding marginal effects. Results are presented in Table 5.5 and can be interpreted as probability to move into a particular oblast centre. All propensities are tested for statistical significance with the Wald test of linear

combination of the marginal effects. Admittedly, all of them are statistically significant even at 0.1% level.

Table 5.4. Migration Probabilities for Young Men and Women to Move into Oblast Centre in 2002

	Men			Women		
Oblast	Employed	Unemployed	Inactive	Employed	Unemployed	Inactive
AR Crimea*	4.60	5.65	4.86	4.99	5.33	5.55
Vinnytsya	6.28	7.34	6.55	6.48	6.83	6.88
Volyn	6.22	7.28	6.49	6.19	6.54	6.59
Dnipropetrovsk**	6.50	7.55	6.76	6.21	6.56	6.61
Donetsk	4.01	5.06	4.27	4.74	5.08	5.13
Zhytomyr	4.52	5.58	4.79	4.61	4.96	5.00
Zakarpattya	5.32	6.37	5.58	5.16	5.51	5.56
Zaporizhzhya	4.19	5.24	4.45	6.17	6.52	6.57
Ivano-Frankivsk	5.54	6.60	5.81	5.52	5.87	5.92
Kyiv***	5.88	6.93	6.15	5.65	6.00	6.05
Kirovograd	6.81	7.87	7.08	6.79	7.14	7.19
Luhansk****	5.15	6.20	5.41	6.11	6.45	6.50
Lviv	4.49	5.54	4.75	5.11	5.46	5.50
Mykolaiv	5.31	6.36	5.57	5.05	5.40	5.45
Odesa	4.69	5.75	4.96	5.45	5.80	5.85
Poltava*****	4.52	5.57	4.78	4.77	5.11	5.16
Rivne	4.08	5.14	4.35	5.31	5.66	5.71
Sumy	5.16	6.21	5.43	5.17	5.52	5.57
Ternopil	4.93	5.99	5.20	5.02	5.37	5.42
Kharkiv	4.38	5.43	4.64	4.62	4.97	5.01
Kherson	5.66	6.71	5.92	5.49	5.83	5.88
Khmelnytsky	5.46	6.52	5.73	5.22	5.56	5.61
Cherkasy	6.08	7.13	6.34	5.98	6.33	6.38
Chernivtsi	4.29	5.35	4.56	5.58	5.93	5.98
Chernigiv	4.76	5.81	5.03	5.01	5.35	5.40
City of Kyiv	4.94	6.00	5.21	4.99	5.33	5.39

* Three cities (100000-500000) in the region: Simferopol, Sevastopol, Kerch
** Two big cities in the region (above 500000): Dnipropetrovsk and Kryvyy Rih
*** Bila Tserkva is treated as regional centre
**** Five cities (100000-500000) in the region: Luhansk, Alchevsk, Severodonetsk, Krasny Luch, Lysychansk
***** Two cities (100000-500000) in the region: Poltava and Kremenchuk

Having computed propensities to migrate, one can estimate the absolute number of movers into oblast centre. For instance, the model predicts that additional 4.94% to the current number of young non-married employed Ukrainian speaking apartment owners men of Kyiv moved in the capital city in 2002. From our dataset we have found that the share of this group in the Kyiv population of age 15-72 is 0.21%. Taking into account Kyiv population 2073500 of age 15-72 in 2002[6], the number of in-migrants with the same characteristics would be 215. The similar procedure can be repeated for the rest of socio-economic cohorts in all regions. Obviously, this approach produces highly precise predictions of future in-migration flows. Unfortunately, we cannot estimate the similar predictions for the out-migration model, since it is based on the limited sample only. The combination of the out-migration and in-migration predictions would give the net migration flows in the region.

[6] Calculations are based on the Statistic Yearbook 2002 of City of Kyiv.

Chapter 6

CONCLUSIONS

This study is the first attempt to estimate determinants of migration decisions in Ukraine. The empirical findings are mainly in accordance with theoretical expectations though some of factors demonstrate presence of Ukrainian specifics in migration decision making.

In particular, it was found that migration probability decreases with age but increases with the level of attained education and in the periods of non-employment. Furthermore, people are more likely to change a place of living if they start new work and rent apartments; previous migration experience, however, negatively affects probability of moving. Review of papers on migration decisions shows that above findings are common for both developed and developing countries: Finnie (2004) for Canada, Nivalainen (2004) for Finland, Kulu and Billari (2004) for Estonia, De Jong (2000) for Thailand, Reed et al. (2006) for Ghana.

Findings that reflect Ukrainian specificity of transition period are those concerned with marital status and family. We revealed that being in marriage negatively influences migration activity only for elder men but has positive impact on mobility of both young males and females. Married people, in general, tend to relocate together with their families; however, matured married males migrate more intensively than their wives. This can be explained with the need to maintain the family. Positive relation between number of children under 15 in the family and probability to migrate for males also supports the above hypothesis. Therefore, we may state existence of labour migration of married men during transition period and classify it as specifics that is common rather for developing, not developed countries: Root and De Jong (1991) for Philippines, De Jong (2000) for Thailand.

The in-migration model has not discovered any pattern in the regional characteristics, while the out-migration one has distinguished several tendencies. Though with caution (due to the limited sample), we may admit that Ukrainian speaking minorities tend to abandon the mainly Russian speaking regions, while Russian speaking minorities do not show the similar tendency. Another finding is that people left oblasts with high unemployment (common evidence from developed and developing countries) and with greater number of universities (due to tighter competition on the labour market and closure of soviet high-tech enterprises). It was also revealed the evidence of out-migration from the big cities and in-migration into the rural areas during 1997-2002. Above findings can be treated as Ukrainian specifics of transition period. Also the hypothesis about relationship between general socio-economic conditions and migration was supported: mobility increases in booming years and decreases in the periods of stagnation.

Besides empirical findings, the interesting approach for migration flows forecasting has been suggested. It produces predictions of out-migrants and in-migrants into a region based on the population distribution from the working dataset, computed marginal effects and official statistics about regional population. The most important advantage of this method is the possibility to forecast migration flows for different socio-economic cohorts, specify corresponding demands for public services and, therefore, foresee it with high precision.

Despite the fact that the current research provides good understanding of migration determinants and decision making mechanisms, it can be continued and extended in several directions. This study cannot cover these directions because of two reasons: (i) dataset is available for the period of 1997-2002 only, (ii) the out-migration sample of which is limited. Mentioned here further investigations are possible only for the newer dataset of the

ULMS 2007 (united with the ULMS 2004) that currently is under processing.

The following research can be done in the field:

- First, structural breaks in the determinants of migration decisions are the subject for testing. During 2003-2007 new tendencies in internal migration arose in Ukraine, especially increase of labour mobility to the city of Kyiv. Therefore, we may expect changes in migration determinants at all levels, in particular, at regional one.
- Second, the out-migration model should be estimated based on the representative sample. The new datasets of ULMS 2004 and 2007 have to report respondents' origins; at least, they can be tracked from the ULMS 2003. It would not only check our assumption of similarity of personal characteristics' impacts in both out- and in-migration models but provide more precise picture of regional factors' impacts on migration decisions.
- Third, having both individuals' origins and destinations, the interregional and intraregional migrations can be distinguished and studied separately. This would be a nice opportunity to compare both types of internal migration and compose corresponding portraits of migrants.
- The last, fourth direction, is combining of the out- and in-migration models for the net migration flows forecasting. Produced calculations could be a good basis for policy recommendations, predictions of public services demand and supply.

In conclusion, the study provides the first empirical estimation of migration decision making determinants and their extensive analysis. It is the starting point for further investigations of internal mobility at micro level in Ukraine.

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APPENDIX 1

Table 1. Basic Model. Personal Characteristics

Variable	Limited sample: Out-migration			Limited sample: In-migration			Representative sample: In-migration		
	Men	Women	Joint sample	Men	Women	Joint sample	Men	Women	Joint sample
Age 15-29	0.8628***	1.1905***	1.0611***	0.8426***	1.1883***	1.0465***	1.6271***	1.9808***	1.8214***
	[0.2243]	[0.1873]	[0.1414]	[0.2240]	[0.1865]	[0.1411]	[0.1743]	[0.1463]	[0.1105]
Age 30-45	0.2436	0.335	0.3120**	0.2447	0.3139	0.2978*	0.6163***	0.6979***	0.6610***
	[0.2390]	[0.2118]	[0.1571]	[0.2389]	[0.2114]	[0.1568]	[0.1811]	[0.1625]	[0.1201]
Male			0.1314			0.1253			0.1454**
			[0.0939]			[0.0937]			[0.0734]
Married	-0.3056*	0.1942	-0.0152	-0.2838	0.163	-0.0333	0.0748	0.3774***	0.2615***
	[0.1843]	[0.1494]	[0.1135]	[0.1838]	[0.1495]	[0.1134]	[0.1471]	[0.1184]	[0.0907]
Number of children under 15	0.154	0.097	0.1205*	0.123	0.0604	0.0854	0.1669**	0.0937	0.1304**
	[0.1034]	[0.0893]	[0.0661]	[0.1031]	[0.0883]	[0.0655]	[0.0813]	[0.0708]	[0.0526]
Secondary education	0.2043	0.3302*	0.2985**	0.197	0.3777**	0.3108**	0.2503	0.3000**	0.2817***
	[0.2106]	[0.1894]	[0.1393]	[0.2110]	[0.1894]	[0.1394]	[0.1589]	[0.1426]	[0.1051]
Professional education	0.2334	0.1545	0.2229*	0.2305	0.2282	0.2592*	0.3138**	0.181	0.2485**
	[0.2039]	[0.1847]	[0.1353]	[0.2042]	[0.1844]	[0.1353]	[0.1571]	[0.1394]	[0.1033]
Higher education	0.2245	0.309	0.2913*	0.2474	0.3780*	0.3564**	0.4258**	0.3529**	0.4071***
	[0.2504]	[0.2204]	[0.1643]	[0.2513]	[0.2207]	[0.1643]	[0.1925]	[0.1698]	[0.1262]
Russian language	0.0661	0.2086	0.1557	-0.3418	-0.3424	-0.3179	0.1297	0.0171	0.0928
	[0.3299]	[0.2845]	[0.2150]	[0.3342]	[0.2967]	[0.2201]	[0.2542]	[0.2203]	[0.1654]
Mixed Ukrainian and Russian	0.0708	0.7006**	0.4237**	-0.384	0.0573	-0.1116	-0.0781	0.1396	0.0618
	[0.3030]	[0.2813]	[0.2038]	[0.3087]	[0.2877]	[0.2079]	[0.2371]	[0.2173]	[0.1592]
Employed	0.6684***	0.2188	0.4474***	0.6642***	0.22	0.4485***	0.3719**	0.4049**	0.3805***
	[0.2237]	[0.2210]	[0.1543]	[0.2229]	[0.2199]	[0.1537]	[0.1715]	[0.1619]	[0.1167]
Unemployed	1.0506***	0.2687	0.6889***	1.0837***	0.2374	0.6963***	0.9528***	0.6199***	0.7946***
	[0.1803]	[0.2005]	[0.1316]	[0.1804]	[0.1999]	[0.1312]	[0.1423]	[0.1479]	[0.1015]
Inactive (out of labour force)	0.8528***	0.6959***	0.8286***	0.8449***	0.6947***	0.8167***	0.5750***	0.8263***	0.7283***
	[0.2086]	[0.2027]	[0.1418]	[0.2088]	[0.2015]	[0.1413]	[0.1634]	[0.1515]	[0.1092]
New work started	0.3434*	1.0404***	0.6527***	0.3856*	1.0442***	0.6693***	0.6171***	0.6635***	0.6283***
	[0.2022]	[0.2088]	[0.1438]	[0.2025]	[0.2092]	[0.1439]	[0.1494]	[0.1637]	[0.1099]
Migration experience	1.3268***	1.2535***	1.2824***	1.2491***	1.1609***	1.2060***	-0.4759***	-0.5376***	-0.4961***
	[0.1708]	[0.1505]	[0.1120]	[0.1700]	[0.1499]	[0.1116]	[0.1463]	[0.1328]	[0.0976]
Tenant	1.5132***	0.8610***	1.1788***	1.7300***	1.0094***	1.3409***	1.8332***	1.2623***	1.5364***
	[0.1816]	[0.1735]	[0.1231]	[0.1797]	[0.1716]	[0.1218]	[0.1775]	[0.1717]	[0.1219]

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 1 (continued). Basic Model. Regional Characteristics

Variable	Limited sample: Out-migration			Limited sample: In-migration			Representative sample: In-migration		
	Men	Women	Joint sample	Men	Women	Joint sample	Men	Women	Joint sample
Language minority: Ukrainian speakers in Russian speaking regions (out-migration)	0.4143	1.0502***	0.7568***						
	[0.4116]	[0.3442]	[0.2635]						
Language minority Russian speakers in Ukrainian speaking regions (out-migration)	0.3285	0.0281	0.1918						
	[0.4122]	[0.4314]	[0.2909]						
Language minority Ukrainian speakers in Russian speaking regions (in-migration)				-0.6503	-0.3991	-0.5098*	-0.2596	-0.2032	-0.2195
				[0.4487]	[0.3818]	[0.2883]	[0.3522]	[0.2926]	[0.2237]
Language minority Russian speakers in Ukrainian speaking regions (in-migration)				0.7713*	-0.1238	0.4268	0.5292	-0.5056	0.1141
				[0.4353]	[0.4936]	[0.3125]	[0.3350]	[0.3684]	[0.2383]
Town (out-migration)	0.6923***	0.9539***	0.8321***						
	[0.1952]	[0.1853]	[0.1329]						
City (out-migration)	0.1912	0.4581**	0.3371**						
	[0.2064]	[0.1888]	[0.1378]						
Big city (out-migration)	-0.0925	0.6362***	0.3029*						
	[0.2421]	[0.2176]	[0.1598]						
Town (in-migration)				0.109	0.1485	0.1071	0.3058*	0.1908	0.2223**
				[0.1991]	[0.1949]	[0.1377]	[0.1569]	[0.1512]	[0.1081]
City (in-migration)				-0.1122	0.2036	0.0368	0.2905*	0.2906**	0.2705***
				[0.2017]	[0.1780]	[0.1320]	[0.1506]	[0.1390]	[0.1014]
Big city (in-migration)				-0.8011***	-0.2144	-0.4852***	-0.4879**	-0.0236	-0.2243*
				[0.2578]	[0.2176]	[0.1644]	[0.2054]	[0.1724]	[0.1309]

Standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 1 (continued). Basic Model. Regional Characteristics

Oblast	Limited sample: Out-migration			Limited sample: In-migration			Representative sample: In-migration		
	Men	Women	Joint sample	Men	Women	Joint sample	Men	Women	Joint sample
Vinnytsya	0.3939	0.6938	0.5894*	-0.0782	0.1193	0.054	0.9283**	0.9452**	0.9604***
	[0.5374]	[0.4671]	[0.3526]	[0.5343]	[0.4669]	[0.3508]	[0.4153]	[0.3805]	[0.2794]
Volyn	0.9167*	0.6439	0.8245**	0.0141	0.1322	0.1317	0.8875*	0.7882*	0.8911***
	[0.5447]	[0.5295]	[0.3776]	[0.5845]	[0.5182]	[0.3862]	[0.4805]	[0.4489]	[0.3258]
Dnipropetrovsk	0.6582	-0.0597	0.329	0.9103**	0.5575	0.7605***	1.3666***	1.0503***	1.2156***
	[0.4191]	[0.3913]	[0.2853]	[0.4147]	[0.3687]	[0.2749]	[0.3357]	[0.3161]	[0.2294]
Donetsk	0.1462	-0.2453	-0.0389	0.0557	-0.2976	-0.108	0.1465	0.0571	0.1169
	[0.4050]	[0.3712]	[0.2742]	[0.4014]	[0.3685]	[0.2714]	[0.3164]	[0.3012]	[0.2180]
Zhytomyr	0.2089	0.0157	0.156	-0.7706	-0.8599	-0.7907	-0.3663	-0.9084	-0.6198
	[0.6877]	[0.6274]	[0.4632]	[0.7585]	[0.6575]	[0.4966]	[0.5592]	[0.5557]	[0.3920]
Zakarpattya	0.1802	0.7089	0.5523	-0.1529	-0.5533	-0.2934	0.401	0.013	0.2417
	[0.6585]	[0.5359]	[0.4130]	[0.6119]	[0.5928]	[0.4225]	[0.4923]	[0.4592]	[0.3341]
Zaporizhzhya	0.3316	-0.0407	0.2196	0.0718	0.5666	0.5038	0.2933	1.0167***	0.8084***
	[0.4923]	[0.4319]	[0.3223]	[0.5241]	[0.3983]	[0.3108]	[0.4212]	[0.3392]	[0.2583]
Ivano-Frankivsk	0.1273	-0.2534	-0.0189	0.1589	-0.6842	-0.1787	0.5453	0.3461	0.4878
	[0.6181]	[0.5789]	[0.4216]	[0.5619]	[0.5594]	[0.3896]	[0.4575]	[0.4226]	[0.3091]
Kyiv	0.9323*	0.4584	0.7413**	0.4786	0.272	0.4211	0.7316*	0.4488	0.6540**
	[0.5463]	[0.5114]	[0.3721]	[0.5514]	[0.4890]	[0.3643]	[0.4426]	[0.4215]	[0.3029]
Kirovograd	0.5636	0.2385	0.3711	0.6035	0.2921	0.4244	1.1256***	1.0718***	1.1047***
	[0.5442]	[0.4883]	[0.3641]	[0.5141]	[0.4575]	[0.3411]	[0.4121]	[0.3790]	[0.2776]
Luganska	-0.3294	-0.0059	-0.1112	-0.172	0.2754	0.1164	0.4498	0.8484***	0.6856***
	[0.4614]	[0.3916]	[0.2975]	[0.4384]	[0.3691]	[0.2809]	[0.3370]	[0.3132]	[0.2289]
Lviv	0.767	0.4848	0.6822**	0.0369	-0.0662	0.0505	0.3309	0.2504	0.3546
	[0.4985]	[0.4655]	[0.3392]	[0.5092]	[0.4631]	[0.3410]	[0.4175]	[0.3836]	[0.2808]
Mykolaiv	-0.6844	-0.6242	-0.5744	-0.5073	-0.8115	-0.5925	0.3973	-0.1204	0.1953
	[0.5878]	[0.5403]	[0.3972]	[0.5357]	[0.5375]	[0.3774]	[0.4026]	[0.4123]	[0.2857]
Odesa	0.5262	-0.527	-0.0043	0.6924	0.0853	0.3733	0.6224	0.6426*	0.6710**
	[0.4709]	[0.4533]	[0.3255]	[0.4804]	[0.4329]	[0.3208]	[0.4091]	[0.3550]	[0.2657]
Poltava	0.0977	-1.9710*	-0.5828	-0.7026	-1.0504	-0.8910*	-0.3697	-0.5611	-0.4453
	[0.6172]	[1.0840]	[0.4904]	[0.6786]	[0.7026]	[0.4847]	[0.5118]	[0.5161]	[0.3603]
Rivne	-0.2237	-0.2619	-0.1572	-1.0516	-0.2744	-0.4878	-1.2799*	0.1681	-0.2059
	[0.6842]	[0.6093]	[0.4536]	[0.7245]	[0.5444]	[0.4314]	[0.6849]	[0.4458]	[0.3589]
Sumy	0.1354	-0.7453	-0.2656	0.1745	-0.7804	-0.2425	0.2896	0.0197	0.1821
	[0.5428]	[0.5848]	[0.3915]	[0.5143]	[0.5511]	[0.3666]	[0.4396]	[0.4246]	[0.3040]
Ternopil	-0.308	0.0716	-0.0387	-0.3384	-0.5096	-0.3587	0.0931	-0.1591	0.0113
	[0.7019]	[0.5851]	[0.4478]	[0.6180]	[0.5733]	[0.4182]	[0.4880]	[0.4704]	[0.3369]

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 1 (continued). Basic Model. Regional Characteristics and Year Effects

Oblast, Year	Limited sample: Out-migration			Limited sample: In-migration			Representative sample: In-migration		
	Men	Women	Joint sample	Men	Women	Joint sample	Men	Women	Joint sample
Kharkiv	0.4431	-0.1683	0.1431	0.6652	0.0581	0.3514	0.4257	-0.0797	0.1658
	[0.4293]	[0.3951]	[0.2908]	[0.4151]	[0.3873]	[0.2829]	[0.3542]	[0.3375]	[0.2437]
Kherson	0.3927	0.4756	0.462	0.3499	-0.1045	0.1245	0.6197	0.329	0.4950*
	[0.5565]	[0.4883]	[0.3674]	[0.5149]	[0.5130]	[0.3625]	[0.4075]	[0.4042]	[0.2861]
Khmelnytsky	0.1656	0.7914	0.5919	-0.1822	0.0012	-0.014	0.5082	0.0731	0.3257
	[0.6251]	[0.4964]	[0.3840]	[0.6058]	[0.5019]	[0.3842]	[0.4732]	[0.4354]	[0.3189]
Cherkasy	1.2636**	0.4818	0.8748**	0.6258	-0.3772	0.1442	0.8254*	0.6725	0.7574**
	[0.5398]	[0.5412]	[0.3808]	[0.5446]	[0.5639]	[0.3857]	[0.4513]	[0.4223]	[0.3074]
Chernivtsi	-0.0238	-0.2261	-0.0572	-1.1441	-0.294	-0.6112	-0.752	0.4009	-0.0123
	[0.7964]	[0.8712]	[0.5809]	[0.9321]	[0.7583]	[0.5852]	[0.7925]	[0.5762]	[0.4565]
Chernigiv	-0.1904	-0.956	-0.495	-0.9819	-0.8619	-0.8771*	-0.0806	-0.1844	-0.1468
	[0.6660]	[0.7066]	[0.4719]	[0.7237]	[0.6389]	[0.4765]	[0.4922]	[0.4571]	[0.3327]
City of Kyiv	0.2665	-0.499	-0.1087	0.1536	-0.3602	-0.083	0.6287	0.1478	0.3842
	[0.5022]	[0.4719]	[0.3435]	[0.5351]	[0.4829]	[0.3573]	[0.4060]	[0.3739]	[0.2733]
1998	0.6767**	-0.1334	0.229	0.6764**	-0.1433	0.2281	0.1637	-0.3690**	-0.1282
	[0.2653]	[0.2321]	[0.1717]	[0.2643]	[0.2312]	[0.1709]	[0.1822]	[0.1608]	[0.1194]
1999	-0.0143	-1.0112***	-0.5372***	-0.0536	-1.0151***	-0.5519***	0.0498	-0.4326***	-0.2132*
	[0.2949]	[0.2893]	[0.2005]	[0.2946]	[0.2883]	[0.2000]	[0.1842]	[0.1615]	[0.1204]
2000	0.4984*	0.2529	0.3427**	0.4543*	0.2274	0.3173*	0.1311	-0.2552*	-0.0805
	[0.2680]	[0.2133]	[0.1662]	[0.2680]	[0.2125]	[0.1657]	[0.1801]	[0.1544]	[0.1163]
2001	0.8132***	0.4883**	0.6136***	0.7641***	0.4408**	0.5719***	0.2636	-0.0175	0.1062
	[0.2584]	[0.2062]	[0.1604]	[0.2580]	[0.2055]	[0.1599]	[0.1766]	[0.1476]	[0.1127]
2002	0.5648**	0.2811	0.3836**	0.5099*	0.2375	0.3436**	0.1409	0.0137	0.0745
	[0.2634]	[0.2107]	[0.1636]	[0.2632]	[0.2099]	[0.1631]	[0.1773]	[0.1454]	[0.1119]
Constant	-7.8000***	-7.5529***	-7.8137***	-7.0017***	-6.6177***	-6.9258***	-6.6739***	-6.6744***	-6.7911***
	[0.5962]	[0.5193]	[0.3905]	[0.5856]	[0.5079]	[0.3826]	[0.4519]	[0.4059]	[0.3020]
rho	0.1389	0.153	0.1514	0.1405	0.1552	0.1529	0.259	0.2541	0.2578
	[0.0286]	[0.0192]	[0.0149]	[0.0277]	[0.0185]	[0.0145]	[0.0186]	[0.0165]	[0.0122]
Likelihood-ratio test of rho=0:	9.3444	20.4988	35.2645	10.199	22.7908	38.0573	67.3107	77.2209	153.6602
Prob rho=0	[0.0001]	[0.0000]	[0.0000]	[0.0001]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
Observations	18752	25756	44508	18752	25756	44508	19007	26062	45069
Number of person	3489	4702	8191	3489	4702	8191	3540	4773	8313

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

APPENDIX 2

Table 2. Auxiliary Regressions

Variable	Interaction between sex, age, and marital status	Interaction between sex, marital and employment statuses
Age 15-29	1.4985***	1.8364***
	[0.2323]	[0.1139]
Age 30-45	0.5343*	0.6769***
	[0.2980]	[0.1226]
Male	0.8238**	0.4876
	[0.3478]	[0.3249]
Married	-0.0496	0.3715
	[0.2399]	[0.3007]
Male*Married	-0.7678**	-0.5608
	[0.3881]	[0.4312]
Age 15-29*Male	-0.7275*	
	[0.3720]	
Age 30-45*Male	-0.264	
	[0.4543]	
Age 15-29*Married	0.6045**	
	[0.2785]	
Age 30-45*Married	0.1414	
	[0.3306]	
Age 15-29*Male*Married	0.7637*	
	[0.4369]	
Age 30-45*Male*Married	0.4944	
	[0.5066]	
Secondary education	0.2494**	0.2627**
	[0.1057]	[0.1063]
Professional education	0.2179**	0.2300**
	[0.1040]	[0.1047]
Higher education	0.3823***	0.4013***
	[0.1265]	[0.1269]
Number of children under 15	0.0837	0.1168**
	[0.0543]	[0.0532]
Russian language	0.0848	0.0874
	[0.1660]	[0.1660]
Mixed Ukrainian and Russian	0.0651	0.0479
	[0.1594]	[0.1595]
Employed	0.3727***	0.6469***
	[0.1167]	[0.2287]
Unemployed	0.7894***	0.5849***
	[0.1017]	[0.2195]
Inactive (out of labour force)	0.7470***	0.7311***
	[0.1099]	[0.2321]

Table 2 (continued). Auxiliary Regressions

Variable	Interaction between sex, age, and marital status	Interaction between sex, marital and employment statuses
Employed*Male		-0.4267
		[0.2864]
Unemployed*Male		0.229
		[0.2871]
Inactive*Male		-0.2926
		[0.3036]
Married*Employed		-0.3713
		[0.2678]
Married*Unemployed		0.0273
		[0.2728]
Married*Inactive		0.1866
		[0.2782]
Married*Employed*Male		0.7377*
		[0.3897]
Married*Unemployed*Male		0.3065
		[0.3741]
Married*Inactive*Male		-0.0013
		[0.4052]
New work started	0.6375***	0.6144***
	[0.1099]	[0.1108]
Migration experience	-0.5285***	-0.5023***
	[0.0982]	[0.0978]
Tenant	1.5485***	1.5353***
	[0.1223]	[0.1221]
Language minority: Ukrainian speakers in Russian speaking regions (out-migration)	-0.2522	-0.2407
	[0.2245]	[0.2242]
Language minority Russian speakers in Ukrainian speaking regions (out-migration)	0.0936	0.1152
	[0.2390]	[0.2390]
rho	0.2583	0.2583
	0.0121	0.0121
Likelihood-ratio test of rho=0:	154.5176	153.7578
	[0.0000]	[0.0000]
Observations	45069	45069
Number of person	8313	8313

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

APPENDIX 3

TESTS

Wald tests of linear hypotheses about the parameters

1. First Auxiliary Regression. Testing Statistical Significance between Age-Marital Status Cohorts of Men and Women:

a) Young Married Man = Young Married Woman

chi2(1) = 0.34

Prob > chi2 = 0.5589

b) Matured Married Man = Matured Married Woman

chi2(1) = 3.81

Prob > chi2 = 0.0511

c) Elder Married Man = Elder Married Woman

chi2(1) = 0.10

Prob > chi2 = 0.7477

e) Young Non-married Man = Young non-married Woman

chi2(1) = 0.52

Prob > chi2 = 0.4713

d) Matured Non-married Man = Matured Non-married Woman

chi2(1) = 3.54

Prob > chi2 = 0.0600

f) Elder Non-married Man = Elder Non-married Woman

chi2(1) = 5.61

Prob > chi2 = 0.0178

g) Young Married Man = Young Non-married Man

chi2(1) = 11.24

Prob > chi2 = 0.0008

h) Matured Married Man = Matured Non-married Man

chi2(1) = 0.57

Prob > chi2 = 0.4522

i) Elder Married Man = Elder Non-married Man

chi2(1) = 7.13

Prob > chi2 = 0.0076

j) Young Married Woman = Young Non-married Woman

chi2(1) = 15.13

Prob > chi2 = 0.0001

k) Matured Married Woman = Matured Non-married Woman

chi2(1) = 0.16

Prob > chi2 = 0.6896

l) Elder Married Woman = Elder Non-married Woman

chi2(1) = 0.04

Prob > chi2 = 0.8361

2. Second Auxiliary Regression. Testing Statistical Significance between Language Minority-Marital Status Cohorts of Men and Women:

a) Married Employed Man = Married Employed Woman

chi2(1) = 3.64

Prob > chi2 = 0.0564

b) Married Unemployed Man = Married Unemployed Woman

chi2(1) = 2.96

Prob > chi2 = 0.0853

c) Married Inactive Man = Married Inactive Woman

chi2(1) = 3.63

Prob > chi2 = 0.0566

e) Non-married Employed Man = Non-married Employed Woman

chi2(1) = 0.09

Prob > chi2 = 0.7595

d) Non-married Unemployed Man = Non-married Unemployed Woman

chi2(1) = 4.78

Prob > chi2 = 0.0287

f) Non-married Inactive Man = Non-married Inactive Woman

chi2(1) = 1.36

Prob > chi2 = 0.2440

g) Married Employed Man = Non-married Employed Man

chi2(1) = 1.09

Prob > chi2 = 0.2965

h) Married Unemployed Man = Married Employed Man

chi2(1) = 6.40

Prob > chi2 = 0.0114

i) Married Unemployed Man = Married Inactive Man

chi2(1) = 4.94

Prob > chi2 = 0.0262

j) Married Employed Man = Married Inactive Man

chi2(1) = 0.04

Prob > chi2 = 0.8463

k) Non-married Employed Man = Non-married Unemployed Man

chi2(1) = 5.97

Prob > chi2 = 0.0146

l) Non-married Inactive Man = Non-married Unemployed Man

chi2(1) = 2.78

Prob > chi2 = 0.0952

m) Married Employed Woman = Married Inactive Woman

chi2(1) = 24.13

Prob > chi2 = 0.0000

n) Married Unemployed Woman = Married Inactive Woman

chi2(1) = 2.71

Prob > chi2 = 0.0999

Table 3. Personal Income Augmented Model. Personal Characteristics

Variable	Limited sample: Out-migration			Representative sample: In-migration		
	Men	Women	Joint sample	Men	Women	Joint sample
Age 15-29	1.0010***	0.9806***	0.9822***	1.6811***	1.5694***	1.5791***
	[0.3698]	[0.2998]	[0.2261]	[0.2797]	[0.2206]	[0.1696]
Age 30-45	0.293	0.4957	0.4220*	0.7458**	0.5180**	0.6245***
	[0.3927]	[0.3341]	[0.2496]	[0.2939]	[0.2445]	[0.1849]
Male			0.0067			0.0504
			[0.1511]			[0.1119]
Married	-0.2532	0.0739	-0.1114	-0.1257	0.2309	0.0756
	[0.2925]	[0.2374]	[0.1777]	[0.2265]	[0.1814]	[0.1376]
Number of children under 15	0.1672	0.1363	0.1449	0.2663**	0.0596	0.1450*
	[0.1662]	[0.1455]	[0.1064]	[0.1212]	[0.1104]	[0.0799]
Secondary education	0.4771	0.1813	0.34	0.8376***	0.372	0.5178***
	[0.3781]	[0.3191]	[0.2347]	[0.2749]	[0.2273]	[0.1692]
Professional education	0.4289	0.1657	0.2867	0.7153***	0.2836	0.4154**
	[0.3721]	[0.2979]	[0.2269]	[0.2774]	[0.2163]	[0.1668]
Higher education	0.5685	0.2927	0.3565	1.0978***	0.415	0.6215***
	[0.4302]	[0.3449]	[0.2637]	[0.3175]	[0.2555]	[0.1950]
Russian language	-0.4093	0.3252	0.0687	0.4686	-0.1363	0.0476
	[0.5700]	[0.4229]	[0.3363]	[0.4312]	[0.3195]	[0.2510]
Mixed Ukrainian and Russian	-0.1905	1.1482**	0.5616*	0.0655	0.2929	0.1563
	[0.5602]	[0.4522]	[0.3391]	[0.4074]	[0.3311]	[0.2513]
Employed	0.9514***	0.1211	0.5289**	0.4990*	0.6356**	0.5833***
	[0.3501]	[0.3552]	[0.2420]	[0.2647]	[0.2531]	[0.1805]
Unemployed	1.5663***	0.2264	0.9059***	1.0335***	0.4529*	0.7693***
	[0.2870]	[0.3186]	[0.2028]	[0.2212]	[0.2363]	[0.1564]
Inactive (out of labour force)	1.0867***	0.7148**	0.9234***	0.8130***	0.9773***	0.8837***
	[0.3363]	[0.3199]	[0.2218]	[0.2536]	[0.2331]	[0.1670]
New work started	-0.182	1.3285***	0.5941***	0.1704	0.7774***	0.4637***
	[0.3493]	[0.3216]	[0.2284]	[0.2530]	[0.2474]	[0.1740]
Salary	0.0003	-0.0001	0.0002	-0.0001	-0.0003	-0.0002
	[0.0006]	[0.0007]	[0.0004]	[0.0005]	[0.0005]	[0.0004]
Salary squared	0	0	0	0	0	0
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
Migration experience	1.6536***	1.6066***	1.6271***	-0.1095	-0.004	-0.0156
	[0.2906]	[0.2426]	[0.1834]	[0.2226]	[0.1940]	[0.1443]
Tenant	1.2620***	1.1019***	1.1805***	1.5359***	1.2542***	1.3798***
	[0.2875]	[0.2655]	[0.1888]	[0.2606]	[0.2456]	[0.1749]

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3 (continued). Personal Income Augmented Model. Regional Characteristics

Variable	Limited sample: Out-migration			Representative sample: In-migration		
	Men	Women	Joint sample	Men	Women	Joint sample
Language minority: Ukrainian speakers in Russian speaking regions (out-migration)	0.3135	1.4997***	1.0062**			
	[0.6916]	[0.5046]	[0.4031]			
Language minority Russian speakers in Ukrainian speaking regions (out-migration)	0.8507	0.6476	0.5535			
	[0.6903]	[0.6460]	[0.4520]			
Language minority Ukrainian speakers in Russian speaking regions (in-migration)				0.401	-0.3056	-0.1198
				[0.5528]	[0.4446]	[0.3373]
Language minority Russian speakers in Ukrainian speaking regions (in-migration)				0.4333	0.024	0.3893
				[0.5363]	[0.5118]	[0.3526]
Town (out-migration)	0.5394*	1.1324***	0.8914***			
	[0.3138]	[0.2991]	[0.2120]			
City (out-migration)	0.2709	0.7452**	0.5957***			
	[0.3404]	[0.3139]	[0.2249]			
Big city (out-migration)	0.3619	0.8450**	0.5509**			
	[0.3799]	[0.3484]	[0.2516]			
Town (in-migration)				0.1482	0.5915***	0.3458**
				[0.2343]	[0.2205]	[0.1584]
City (in-migration)				-0.0578	0.2719	0.1212
				[0.2368]	[0.2210]	[0.1600]
Big city (in-migration)				-0.6859**	-0.1207	-0.3947*
				[0.3263]	[0.2770]	[0.2081]

Standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3 (continued). Personal Income Augmented Model. Regional Characteristics

Oblast	Limited sample: Out-migration			Representative sample: In-migration		
	Men	Women	Joint sample	Men	Women	Joint sample
Vinnytsya	-0.7705	0.6594	0.2006	0.9293	0.3965	0.5203
	[0.9236]	[0.6913]	[0.5494]	[0.6666]	[0.5293]	[0.4091]
Volyn	0.1694	-0.2035	0.1143	0.8425	0.2154	0.4244
	[0.8638]	[0.7734]	[0.5620]	[0.7318]	[0.5786]	[0.4486]
Dnipropetrovsk	0.2139	-0.4506	-0.0319	1.1132**	0.4939	0.7978**
	[0.6329]	[0.5704]	[0.4162]	[0.5130]	[0.4370]	[0.3291]
Donetsk	0.0331	-0.6663	-0.2801	-0.2574	-0.3196	-0.2591
	[0.6468]	[0.5944]	[0.4296]	[0.5317]	[0.4296]	[0.3321]
Zhytomyr	-23.1812	-0.5076	-0.9766	-0.7853	-1.4561*	-1.2228**
	[52,637.7698]	[1.0286]	[0.8956]	[0.9606]	[0.7737]	[0.5971]
Zakarpattya	-0.4422	0.661	0.3013	-0.1235	-1.5864*	-0.9716*
	[0.9913]	[0.7960]	[0.6188]	[0.8468]	[0.8618]	[0.5851]
Zaporizhzhya	-0.31	-0.5533	-0.3301	-0.2055	0.3613	0.2193
	[0.8076]	[0.7286]	[0.5343]	[0.7145]	[0.5249]	[0.4178]
Ivano-Frankivsk	-0.4976	-1.0166	-0.4622	1.0665	-0.2881	0.3607
	[1.0002]	[1.1815]	[0.7045]	[0.6950]	[0.6087]	[0.4431]
Kyiv	0.0974	0.6171	0.5249	0.2782	0.0154	0.1217
	[0.9309]	[0.7775]	[0.5852]	[0.7662]	[0.5873]	[0.4617]
Kirovograd	-0.359	0.3177	0.0592	0.8627	0.4212	0.5268
	[0.9275]	[0.6949]	[0.5565]	[0.6762]	[0.5234]	[0.4102]
Luganska	-1.1528	-0.6297	-0.7947	0.5042	-0.0987	0.1962
	[0.9064]	[0.6423]	[0.5176]	[0.5286]	[0.4725]	[0.3482]
Lviv	-0.2955	0.4365	0.2828	0.3479	-0.2917	-0.0483
	[0.8339]	[0.6934]	[0.5230]	[0.6678]	[0.5410]	[0.4135]
Mykolaiv	-0.0575	-0.4075	-0.1719	0.6436	-0.5203	-0.0059
	[0.8306]	[0.7084]	[0.5331]	[0.6359]	[0.5671]	[0.4194]
Odesa	-0.2937	-0.9235	-0.5598	0.3716	-0.6301	-0.1432
	[0.7840]	[0.7346]	[0.5320]	[0.6313]	[0.6156]	[0.4316]
Poltava	-1.0707	-23.1505	-1.6693*	-1.684	-1.0495	-1.3038**
	[1.0625]	[39,247.5666]	[0.8799]	[1.1838]	[0.7630]	[0.6310]
Rivne	-0.7611	0.2953	0.0702	-0.4154	-0.0594	-0.1526
	[1.0242]	[0.8409]	[0.6418]	[0.8870]	[0.6318]	[0.5090]
Sumy	-0.694	-0.6728	-0.5702	0.5069	-0.7394	-0.1836
	[0.9147]	[0.7905]	[0.5911]	[0.6775]	[0.6342]	[0.4506]
Ternopil	-0.2533	-21.1388	-0.2759	0.6255	-1.4123	-0.2382
	[0.9450]	[30,168.8732]	[0.7190]	[0.7105]	[0.8693]	[0.4907]
Kharkiv	0.3874	-0.1289	0.1756	0.5487	-0.3615	0.0791
	[0.6534]	[0.5733]	[0.4263]	[0.5311]	[0.4629]	[0.3453]
Kherson	-1.0099	0.6973	0.3069	0.0345	-0.069	-0.029
	[1.1831]	[0.6595]	[0.5493]	[0.6699]	[0.5376]	[0.4176]
Khmelnytsky	-1.0673	0.5188	-0.0414	0.7931	-0.3743	0.0986
	[1.0602]	[0.7448]	[0.6020]	[0.7276]	[0.6220]	[0.4647]
Cherkasy	-0.7481	-0.1924	-0.5171	0.9535	0.0456	0.4315
	[1.0307]	[0.9554]	[0.7018]	[0.6903]	[0.6046]	[0.4444]
Chernivtsi	-0.9716	-23.3457	-1.3136	-0.1008	-0.8997	-0.6073
	[1.1639]	[52,115.5700]	[0.9286]	[0.9477]	[0.9008]	[0.6325]
Chernigiv	-0.6683	-22.0051	-1.0662	-0.0682	-1.1324	-0.7369
	[1.0219]	[26,697.7291]	[0.7606]	[0.8007]	[0.7428]	[0.5317]
City of Kyiv	-2.1190**	-0.5996	-0.9789*	-0.3392	0.1376	0.0347
	[0.9935]	[0.6813]	[0.5447]	[0.6881]	[0.5136]	[0.4050]

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1

Table 3 (continued). Personal Income Augmented Model. Year Effects

Year	Limited sample: Out-migration			Representative sample: In-migration		
	Men	Women	Joint sample	Men	Women	Joint sample
1998	0.6194	0.0696	0.3061	0.0745	-0.3034	-0.1427
	[0.4595]	[0.3580]	[0.2777]	[0.3074]	[0.2491]	[0.1916]
1999	0.2001	-1.1858**	-0.4625	0.2011	-0.7037**	-0.2737
	[0.4860]	[0.5005]	[0.3255]	[0.2985]	[0.2747]	[0.1962]
2000	0.6519	0.0839	0.338	0.2187	-0.3956	-0.1122
	[0.4496]	[0.3670]	[0.2764]	[0.2946]	[0.2555]	[0.1889]
2001	0.8477*	0.5594*	0.6511**	0.3097	-0.1525	0.0486
	[0.4399]	[0.3361]	[0.2633]	[0.2903]	[0.2403]	[0.1825]
2002	0.4998	0.4004	0.3927	0.0719	0.0937	0.0899
	[0.4527]	[0.3378]	[0.2670]	[0.2959]	[0.2266]	[0.1784]
Constant	-7.9042***	-7.6898***	-7.9151***	-7.1448***	-5.8812***	-6.3036***
	[1.0162]	[0.8211]	[0.6210]	[0.7594]	[0.5912]	[0.4597]
rho	0.1362	0.1358	0.1435	0.1618	0.1581	0.1625
	0.0442	0.0374	0.024	0.0272	0.0241	0.0171
Likelihood-ratio test of rho=0:	3.0957	3.8839	10.5804	11.3166	12.7329	28.1534
Prob rho=0	[0.043]	[0.024]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
Observations	6943	9479	16422	7036	9588	16624
Number of person	1887	2600	4487	1911	2634	4545

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

APPENDIX 5

Table 4. Regional Factors Augmented Model. Personal Characteristics

Variable	Limited sample: Out-migration			Limited sample: In-migration			Representative sample: In-migration		
	Men	Women	Joint sample	Men	Women	Joint sample	Men	Women	Joint sample
Age 15-29	0.8515***	1.1904***	1.0572***	0.9049***	1.1775***	1.0659***	1.6267***	1.9770***	1.8199***
	[0.2248]	[0.1871]	[0.1415]	[0.2268]	[0.1870]	[0.1420]	[0.1743]	[0.1463]	[0.1105]
Age 30-45	0.2357	0.3331	0.3123**	0.3193	0.3237	0.3369**	0.6177***	0.6935***	0.6591***
	[0.2393]	[0.2121]	[0.1573]	[0.2414]	[0.2118]	[0.1576]	[0.1811]	[0.1625]	[0.1201]
Male			0.128			0.1284			0.1451**
			[0.0940]			[0.0941]			[0.0734]
Married	-0.3136*	0.186	-0.0234	-0.2787	0.1776	-0.026	0.074	0.3742***	0.2602***
	[0.1848]	[0.1494]	[0.1136]	[0.1848]	[0.1505]	[0.1140]	[0.1471]	[0.1184]	[0.0907]
Number of children under 15	0.1592	0.0974	0.1215*	0.1151	0.0651	0.0828	0.1673**	0.0952	0.1314**
	[0.1033]	[0.0893]	[0.0661]	[0.1037]	[0.0885]	[0.0657]	[0.0813]	[0.0708]	[0.0526]
Secondary education	0.2075	0.3359*	0.2989**	0.177	0.3680*	0.2967**	0.2483	0.3013**	0.2808***
	[0.2108]	[0.1896]	[0.1395]	[0.2116]	[0.1904]	[0.1400]	[0.1589]	[0.1427]	[0.1051]
Professional education	0.2362	0.152	0.2219	0.2048	0.2293	0.2512*	0.3123**	0.1824	0.2484**
	[0.2040]	[0.1848]	[0.1354]	[0.2049]	[0.1852]	[0.1358]	[0.1571]	[0.1395]	[0.1033]
Higher education	0.2097	0.3076	0.2826*	0.2379	0.3586	0.3387**	0.4219**	0.3516**	0.4058***
	[0.2512]	[0.2204]	[0.1645]	[0.2515]	[0.2219]	[0.1649]	[0.1926]	[0.1698]	[0.1262]
Russian language	-0.0222	0.2127	0.1229	-0.2477	-0.1363	-0.1636	0.1358	0.0186	0.0949
	[0.3337]	[0.2844]	[0.2157]	[0.3373]	[0.2999]	[0.2225]	[0.2543]	[0.2204]	[0.1655]
Mixed Ukrainian and Russian	0.0248	0.6995**	0.4062**	-0.321	0.1842	-0.0171	-0.0761	0.1383	0.0623
	[0.3048]	[0.2814]	[0.2043]	[0.3091]	[0.2880]	[0.2083]	[0.2371]	[0.2173]	[0.1592]
Employed	0.6661***	0.2109	0.4429***	0.7008***	0.2345	0.4695***	0.3746**	0.4059**	0.3824***
	[0.2241]	[0.2215]	[0.1545]	[0.2238]	[0.2213]	[0.1544]	[0.1715]	[0.1620]	[0.1168]
Unemployed	1.0599***	0.2678	0.6928***	1.1125***	0.239	0.7095***	0.9542***	0.6224***	0.7961***
	[0.1804]	[0.2011]	[0.1317]	[0.1814]	[0.2022]	[0.1321]	[0.1424]	[0.1480]	[0.1015]
Inactive (out of labour force)	0.8611***	0.6871***	0.8292***	0.8927***	0.7178***	0.8513***	0.5775***	0.8239***	0.7292***
	[0.2089]	[0.2030]	[0.1420]	[0.2102]	[0.2035]	[0.1423]	[0.1635]	[0.1516]	[0.1093]
New work started	0.3344*	1.0364***	0.6481***	0.2979	0.9796***	0.6000***	0.6159***	0.6601***	0.6267***
	[0.2027]	[0.2091]	[0.1440]	[0.2064]	[0.2126]	[0.1462]	[0.1495]	[0.1639]	[0.1099]
Migration experience	1.3412***	1.2583***	1.2900***	1.2203***	1.1297***	1.1766***	-0.4758***	-0.5359***	-0.4965***
	[0.1711]	[0.1505]	[0.1121]	[0.1709]	[0.1507]	[0.1122]	[0.1464]	[0.1328]	[0.0976]
Tenant	1.4975***	0.8603***	1.1726***	1.7400***	1.0523***	1.3692***	1.8367***	1.2617***	1.5378***
	[0.1818]	[0.1735]	[0.1232]	[0.1812]	[0.1729]	[0.1227]	[0.1776]	[0.1717]	[0.1220]

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4 (continued). Regional Factors Augmented Model. Regional Characteristics

Variable	Limited sample: Out-migration			Limited sample: In-migration			Representative sample: In-migration		
	Men	Women	Joint sample	Men	Women	Joint sample	Men	Women	Joint sample
Language minority: Ukrainian speakers in Russian speaking regions (out-migration)	0.3371	1.0535***	0.7318***						
	[0.4143]	[0.3439]	[0.2640]						
Language minority Russian speakers in Ukrainian speaking regions (out-migration)	0.4218	0.0337	0.2324						
	[0.4151]	[0.4314]	[0.2911]						
Language minority Ukrainian speakers in Russian speaking regions (in-migration)				-0.5623	-0.2458	-0.3841	-0.2543	-0.2035	-0.2178
				[0.4507]	[0.3823]	[0.2895]	[0.3523]	[0.2927]	[0.2237]
Language minority Russian speakers in Ukrainian speaking regions (in-migration)				0.6893	-0.314	0.288	0.5224	-0.505	0.1124
				[0.4366]	[0.4942]	[0.3132]	[0.3351]	[0.3685]	[0.2383]
Town (out-migration)	0.6996***	0.9635***	0.8377***						
	[0.1956]	[0.1854]	[0.1330]						
City (out-migration)	0.2193	0.4607**	0.3479**						
	[0.2063]	[0.1888]	[0.1378]						
Big city (out-migration)	-0.0766	0.6357***	0.3113*						
	[0.2426]	[0.2177]	[0.1600]						
Town (in-migration)				0.0934	0.1581	0.1036	0.3088**	0.1926	0.2234**
				[0.2004]	[0.1952]	[0.1382]	[0.1569]	[0.1513]	[0.1081]
City (in-migration)				-0.1109	0.2356	0.0551	0.2912*	0.2912**	0.2714***
				[0.2031]	[0.1784]	[0.1324]	[0.1506]	[0.1390]	[0.1014]
Big city (in-migration)				-0.8031***	-0.2914	-0.5338***	-0.4899**	-0.0246	-0.2242*
				[0.2579]	[0.2193]	[0.1653]	[0.2055]	[0.1724]	[0.1309]
Average regional wage	0.0028	-0.0032	0.0000	0.0572	-0.0089	0.0238	0.025	-0.0118	0.0064
	[0.0034]	[0.0032]	[0.0023]	[0.0483]	[0.0457]	[0.0329]	[0.0364]	[0.0328]	[0.0243]
Regional rate of unemployment	0.0923*	0.0136	0.0566*	0.0008	-0.0033	-0.0011	0.0001	-0.0016	-0.0008
	[0.0496]	[0.0469]	[0.0339]	[0.0036]	[0.0033]	[0.0024]	[0.0025]	[0.0023]	[0.0017]
Number of universities in a region	0.1453**	0.1433**	0.1394***	0.0278	0.039	0.0289	-0.018	0.0179	0.0028
	[0.0671]	[0.0678]	[0.0472]	[0.0739]	[0.0617]	[0.0470]	[0.0494]	[0.0419]	[0.0318]
Air pollution emissions in a region	0.0036	-0.0019	0.0005	0.0036	-0.0016	0.0007	0.002	-0.0026	-0.0006
	[0.0038]	[0.0031]	[0.0024]	[0.0037]	[0.0031]	[0.0024]	[0.0024]	[0.0021]	[0.0016]

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4 (continued). Regional Factors Augmented Model. Regional Characteristics

Oblast	Limited sample: Out-migration			Limited sample: In-migration			Representative sample: In-migration		
	Men	Women	Joint sample	Men	Women	Joint sample	Men	Women	Joint sample
Vinnytsya	1.9548**	2.3916**	2.2004***	0.555	0.9574	0.7581	0.7219	1.2215**	1.0357**
	[0.9169]	[0.9388]	[0.6498]	[1.0272]	[0.8765]	[0.6616]	[0.7012]	[0.6164]	[0.4603]
Volyn	2.8261***	2.4437**	2.6295***	0.8736	0.9175	0.8952	0.7323	0.9327	0.9102*
	[1.0071]	[1.0878]	[0.7343]	[1.1698]	[1.0007]	[0.7544]	[0.8070]	[0.7151]	[0.5315]
Dnipropetrovsk	-2.9736	1.356	-0.5101	-1.8141	2.3422	0.5436	-0.1304	3.2400*	1.8073
	[3.0463]	[2.5495]	[1.9449]	[3.0041]	[2.5072]	[1.9105]	[1.9267]	[1.7395]	[1.2859]
Donetsk	-7.0337	1.8665	-2.0075	-5.5067	2.4838	-0.9828	-2.8034	4.131	1.156
	[5.9796]	[5.0127]	[3.8212]	[5.9080]	[4.9156]	[3.7516]	[3.7809]	[3.4010]	[2.5186]
Zhytomyr	1.5890*	1.5752	1.5694**	-0.1372	-0.0734	-0.1335	-0.5379	-0.733	-0.5985
	[0.9572]	[1.0308]	[0.6988]	[1.1519]	[0.9900]	[0.7459]	[0.7844]	[0.7332]	[0.5313]
Zakarpattya	1.6841*	2.3984**	2.0828***	0.4809	0.2969	0.3927	0.2013	0.2018	0.2576
	[1.0217]	[1.0304]	[0.7142]	[1.1179]	[0.9959]	[0.7350]	[0.7740]	[0.6926]	[0.5128]
Zaporizhzhya	-0.1978	1.3231	0.6477	-0.4035	1.7192**	0.872	-0.1982	1.8336***	1.0508**
	[0.9784]	[0.8939]	[0.6501]	[1.0099]	[0.8748]	[0.6497]	[0.7094]	[0.6239]	[0.4623]
Ivano-Frankivsk	0.9207	1.5799	1.2862*	0.2593	0.4106	0.4153	0.0804	0.9277	0.6149
	[0.9996]	[1.0041]	[0.7011]	[1.0571]	[0.9500]	[0.6954]	[0.7458]	[0.6660]	[0.4936]
Kyiv	2.2818**	2.7090**	2.4889***	0.9109	1.505	1.2077	0.392	0.9579	0.7961
	[1.0788]	[1.1326]	[0.7744]	[1.2194]	[1.0578]	[0.7902]	[0.8459]	[0.7527]	[0.5577]
Kirovograd	1.6841**	1.7037*	1.6072***	0.9935	1.0512	0.9588	0.8783	1.3283**	1.1384***
	[0.8478]	[0.8818]	[0.6062]	[0.9292]	[0.8094]	[0.6050]	[0.6405]	[0.5700]	[0.4232]
Luganska	-0.761	2.3467	0.9191	-1.2528	1.7637	0.3994	-0.5898	2.2568**	1.0307
	[1.7070]	[1.4884]	[1.1084]	[1.6874]	[1.4523]	[1.0889]	[1.1249]	[1.0189]	[0.7511]
Lviv	-0.0962	0.5256	0.2928	-0.0546	0.5542	0.3414	0.1683	0.5263	0.4331
	[0.6047]	[0.5656]	[0.4103]	[0.6257]	[0.5801]	[0.4224]	[0.4718]	[0.4357]	[0.3183]
Mykolaiv	0.6682	1.4101	1.0491	-0.0848	0.1898	0.0423	0.1748	0.1932	0.2756
	[1.1248]	[1.1331]	[0.7890]	[1.2128]	[1.0652]	[0.7920]	[0.8123]	[0.7324]	[0.5386]
Odesa	-0.1402	-0.9243*	-0.5321	0.9098*	0.3674	0.6294*	0.7715*	0.6531*	0.7353***
	[0.5142]	[0.4927]	[0.3543]	[0.5529]	[0.4920]	[0.3662]	[0.4402]	[0.3798]	[0.2851]
Poltava	1.0564	-0.4821	0.6151	-0.2503	-0.1445	-0.2402	-0.5521	-0.2269	-0.3347
	[0.8598]	[1.2742]	[0.6614]	[0.9968]	[0.9413]	[0.6752]	[0.6985]	[0.6596]	[0.4743]
Rivne	1.1015	1.3316	1.2467*	-0.4314	0.5892	0.2009	-1.4599*	0.3704	-0.1718
	[0.9838]	[1.0154]	[0.6997]	[1.1231]	[0.9200]	[0.7027]	[0.8791]	[0.6548]	[0.5077]
Sumy	1.2363	0.7547	0.9721	0.624	0.0264	0.341	0.0718	0.2594	0.2205
	[0.8655]	[0.9580]	[0.6374]	[0.9554]	[0.8853]	[0.6357]	[0.6769]	[0.6158]	[0.4524]
Ternopil	0.5453	0.9913	0.8152	0.1464	0.0736	0.1525	-0.034	-0.0905	-0.0065
	[0.8520]	[0.8140]	[0.5795]	[0.8596]	[0.7740]	[0.5705]	[0.6091]	[0.5702]	[0.4136]

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4 (continued). Regional Factors Augmented Model. Regional Characteristics And Year Effects

Oblast, Year	Limited sample: Out-migration			Limited sample: In-migration			Representative sample: In-migration		
	Men	Women	Joint sample	Men	Women	Joint sample	Men	Women	Joint sample
Kharkiv	-3.4486**	-2.9118*	-3.0518***	-0.1973	-0.1412	-0.0522	0.5792	-0.0186	0.2518
	[1.6431]	[1.5857]	[1.1322]	[1.7657]	[1.4626]	[1.1191]	[1.1848]	[1.0169]	[0.7677]
Kherson	1.7322**	1.8981**	1.7664***	0.8816	0.5667	0.6718	0.4423	0.4983	0.5096
	[0.8781]	[0.8969]	[0.6210]	[0.9541]	[0.8544]	[0.6294]	[0.6501]	[0.5965]	[0.4363]
Khmelnytsky	0.9463	1.6665**	1.3953***	0.3102	0.5837	0.4962	0.398	0.1611	0.3277
	[0.7480]	[0.7050]	[0.5004]	[0.8093]	[0.6837]	[0.5177]	[0.5741]	[0.5208]	[0.3835]
Cherkasy	2.4764***	1.8605**	2.1321***	1.2379	0.3656	0.7804	0.6855	0.8527	0.7989*
	[0.7961]	[0.8828]	[0.5888]	[0.9232]	[0.8497]	[0.6145]	[0.6515]	[0.5873]	[0.4338]
Chernivtsi	0.6449	1.3811	0.9944	-0.6574	0.5226	-0.0245	-1.027	0.5995	-0.0279
	[1.1389]	[1.2405]	[0.8351]	[1.3225]	[1.1007]	[0.8387]	[0.9939]	[0.7760]	[0.6005]
Chernigiv	1.467	0.8003	1.1584	-0.258	-0.0608	-0.1735	-0.2428	0.0279	-0.0958
	[1.0387]	[1.1312]	[0.7545]	[1.1910]	[1.0233]	[0.7693]	[0.7809]	[0.6932]	[0.5147]
City of Kyiv	-7.2920**	-6.5005**	-6.7005***	-0.9255	-1.0225	-0.7794	1.5407	-0.278	0.5017
	[3.0900]	[3.0667]	[2.1584]	[3.2869]	[2.7042]	[2.0760]	[2.1400]	[1.8098]	[1.3751]
1998	0.3589	-0.2883	-0.0184	0.6130*	-0.1548	0.1831	0.1577	-0.4192**	-0.1663
	[0.3099]	[0.2768]	[0.2036]	[0.3137]	[0.2774]	[0.2044]	[0.2217]	[0.1950]	[0.1450]
1999	-0.4293	-1.1467***	-0.8250***	-0.1775	-1.0223***	-0.6256**	0.0577	-0.4439**	-0.2264
	[0.3707]	[0.3572]	[0.2515]	[0.3799]	[0.3623]	[0.2558]	[0.2530]	[0.2209]	[0.1650]
2000	-0.0952	0.1946	-0.013	0.3321	0.406	0.3235	0.1526	-0.202	-0.0552
	[0.4351]	[0.3970]	[0.2899]	[0.4544]	[0.4052]	[0.2991]	[0.3219]	[0.2819]	[0.2107]
2001	-0.0151	0.646	0.2349	0.5659	0.8784	0.6623	0.2836	0.1661	0.2005
	[0.6182]	[0.5803]	[0.4183]	[0.6444]	[0.5919]	[0.4318]	[0.4605]	[0.4073]	[0.3036]
2002	-0.4243	0.6123	0.0018	0.3009	0.8487	0.5016	0.1753	0.2966	0.2291
	[0.7907]	[0.7410]	[0.5350]	[0.8133]	[0.7549]	[0.5484]	[0.5796]	[0.5171]	[0.3839]
Constant	-11.0226***	-9.4000***	-10.3049***	-8.5179***	-7.1326***	-7.8606***	-6.7560***	-6.5435***	-6.7744***
	[1.3752]	[1.3527]	[0.9554]	[1.4519]	[1.2327]	[0.9334]	[0.9794]	[0.8536]	[0.6409]
rho	0.1388***	0.1532***	0.1515***	0.1376***	0.1552***	0.152***	0.2574***	0.253***	0.2567***
	[0.0288]	[0.0192]	[0.0149]	[0.0292]	[0.0185]	[0.0147]	[0.0189]	[0.0167]	[0.0123]
Likelihood-ratio test of rho=0:	9.1543***	20.6218***	35.2379***	9.1897***	22.6153***	36.5568***	64.9503***	74.4366***	148.4059***
Prob rho=0	[0.0010]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
Observations	18752	25756	44508	18752	25756	44508	19007	26062	45069
Number of person	3489	4702	8191	3489	4702	8191	3540	4773	8313

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

APPENDIX 6

Table 5. Marginal Effects

Variable	Males	Females
Predicted probability	0.0101	0.0089
Age 30-45	0.0257	0.0331
Age 46-72	0.0070	0.0072
Secondary education	0.0022	0.0025
Professional education	0.0026	0.0010
Higher education	0.0042	0.0029
Married	0.0008	0.0032
Number of children under 15	0.0017	0.0009
Russian language	0.0014	0.0002
Mixed Ukrainian and Russian	-0.0007	0.0013
Employed	0.0036	0.0037
Unemployed	0.0142	0.0071
Inactive (out of labour force)	0.0063	0.0076
New work started	0.0081	0.0080
Migration experience	-0.0042	-0.0041
Tenancy (out-migration)	0.0452	0.0205
Language minority: Ukrainian speakers in Russian speaking regions (in-migration)	-0.0023	-0.0016
Language minority: Russian speakers in Ukrainian speaking regions (in-migration)	0.0068	-0.0036
Town (in-migration)	0.0034	0.0018
City (in-migration)	0.0032	0.0028
Big city (in-migration)	-0.0042	-0.0002

Table 5 (continued). Marginal Effects

Variable	Males	Females
Vinnytsya	0.0146	0.0133
Volyn	0.0140	0.0104
Dnipropetrovsk	0.0264	0.0153
Donetsk	0.0015	0.0005
Zhytomyr	-0.0030	-0.0054
Zakarpattya	0.0049	0.0001
Zaporizhzhya	0.0033	0.0149
Ivano-Frankivsk	0.0072	0.0037
Kyiv	0.0105	0.0050
Kirovograd	0.0199	0.0164
Luhansk	0.0055	0.0112
Lviv	0.0040	0.0026
Mykolaiv	0.0048	-0.0010
Odesa	0.0084	0.0077
Poltava	-0.0031	-0.0038
Rivne	-0.0074	0.0016
Sumy	0.0033	0.0002
Ternopil	0.0011	-0.0013
Kharkiv	0.0052	-0.0006
Kherson	0.0083	0.0034
Khmelnytsky	0.0064	0.0007
Cherkasy	0.0125	0.0083
Chernivtsi	-0.0053	0.0043
Chernigiv	-0.0007	-0.0014
City of Kyiv	0.0086	0.0014
1998	0.0017	-0.0029
1999	0.0005	-0.0033
2000	0.0014	-0.0021
2001	0.0028	-0.0002
2002	0.0014	0.0001
Computed probability		