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**ESCIRRU**  
Economic and Social Consequences  
of Industrial Restructuring in Russia and Ukraine



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## **Abstract**

This paper focuses on the labor force mobility in a broad sense, and analyses how changes in social security policy and the structure of the social safety net (SSN) in Ukraine and Russia affected different aspects of labor force mobility.

Expanding SSN in transition countries was generally meant to protect the most vulnerable groups in the population (the elderly, the poor, the unemployed) from the negative effects of transition. But fast and effective transition from the centrally managed economy requires a fast reallocation of resources, including the labor force, between the “traditional” and “modern” sectors of the economy, which also may imply a geographical reallocation of labor. Therefore, a stronger SSN may slow down the process of economic transformation

Our theoretical models and data analysis provide arguments that stronger social safety nets reduce the sectoral mobility of labour and mobility between employment and unemployment. Analyses also provide some statistical support to the arguments about the effect of a stronger SSN on geographical (regional) mobility and its effect on unemployment.



## 1. Introduction

The labor market situation and the design of social safety nets are strongly related. The strength of this relationship is growing due to population ageing and additionally due to the restructuring of economies. The latter factor is particularly worth analyzing in transition economies since they face restructuring processes that are caused by a combination of features universal for all countries, including developed economies, and unique issues caused by the transition shock. In transition economies, the large upheaval caused by these restructuring processes typically leads to using social safety nets as restructuring “buffers” that reduce current problems by pushing them into the future. The costs of such policies are high and growing over time.

Working on labor market and safety net issues in transition economies, researchers can develop knowledge that will be universally useful and that also can be applied to highly developed economies. Russia and Ukraine have recently taken substantial efforts to reform their social security systems. These efforts are to a large extent in line with theoretical approaches applied elsewhere. The reforms in both countries are at the initial stage and only limited research has taken place thus far which addresses the significant issues in connection with the reform of the social safety nets in the two countries.

This discussion paper looks deeply at the issue of labor force mobility in a broad sense, and analyses how changes in social security policy and the structure of the social safety net (SSN) affects different aspects of labor force mobility. The paper provides a theoretical framework for the SSN effect on labor mobility, and presents statistical evidence from Russia and Ukraine that illustrates this effect in the countries. This research compares findings for these two countries in transition with the dynamics observed in the “new” and the “old” countries of the European Union.

This paper is structured as follows: the next chapter provides an overview of the labor market and social safety net developments in Russian and Ukraine over the last decade, as well as discusses common features of these countries. The third chapter establishes theoretical models for different aspects of labor force mobility, discusses the availability of data on Russia and Ukraine to test these models, and provides a statistical analysis of the data. The next chapter discusses results of the statistical analysis. The final chapter discusses policy conclusions that

can be derived from comparison of the effect of the SSN on labor mobility in these two countries, and extends them to all countries in transition.

## **2. Developments and current labor mobility**

Labor markets in countries of transition face unique economic circumstances. The economic downturn at the beginning of transition decreased personal incomes and employment. In order to find employment and earn income, people of these countries had to move actively across industries, types of enterprises, and geographic locations. The downturn also affected social safety nets (SSN) by reducing the funding and effectiveness of the SSNs. Appropriate social services became available only to some segments of the population and only in selected geographical locations, which further increased labor mobility. Finally, economic recovery of the countries in transition in recent years allowed them to begin reforming SSNs. It led to further distortions in taxation and the quality of social protection across categories of the population and geographic locations. These disproportions further stimulated labor mobility in the countries of transition.

This chapter provides a brief description of economic changes over the last ten years. It discusses the effect of economic changes on social safety nets in Russia and Ukraine. Finally, the chapter describes various dimensions of labor force mobility in both countries, and provides some insight on common features of this process.

### **2.1 *Economic and SSN development in CIS***

By the end of the 1980s, countries of the “Soviet Block” (Central and Eastern European (CEE) countries and the Soviet Union) had social safety nets (SSN thereafter) with extensive coverage and costs. The SSN of the former Soviet Block countries provided free healthcare and education (including higher education) to everybody, and the costs of other services, such as childcare, vacations, etc. were greatly reduced by price equalization mechanisms. In his recent book, Milanovic (20) showed that social transfers constituted about 19% of personal income in a typical socialist economy, while they accounted for only 14% in a typical market economy. This difference may be even larger because some benefits provided in-kind or through discounts by

state enterprises to their workers cannot be captured by such a simple comparison. Also, pensions were generous in relation to other income and the retirement age was around 55 for females and 60 for males; in addition, retirees received a package of discounted or free services, such as housing and phone services. Due to full employment, unemployment benefits were small or non-existent in these countries. The cost of the SSN was huge, but was largely carried by state-owned enterprises and not by state budgets.

At the end of the 1980s and beginning of the 1990s, the republics of the Soviet Union began transitioning their economies from a planned system to the market economy system. They experienced an economic slowdown that lasted over six years and resulted in a cumulative decline in GDP of 60-80% (see 5 and 32). Due to this slowdown, the average tax revenues in the CIS countries fell from 28% of GDP in 1992 to 22% of GDP in 1998, and to as low as 15% of GDP in some countries (see 34). Most of the countries constantly ran significant budget deficits in order to finance government obligations.

The labor market transformation in current CIS countries took a different path from the transformation in countries of Eastern Europe (current new EU states). Despite massive drops in GDP, unemployment in CIS countries remained at relatively low levels. During the period 1990-1994, the average decline of GDP in the CIS countries was around -11%, while decline in employment was only -1% (compared to the -3% and -4% decline respectively in CEE countries) (see 7 and 25). During the periods 1994-1998 and 1998-2004, the figures were (-0.2%, -0.3%) and (+4.5%, +0.3%) respectively. The adjustment took the form of lower real wages, which dramatically dropped in the CIS region during the transition, and which still remain lower than in the pre-transition period. A more detailed discussion of the labor market transformation during this period can be found in Working Paper 1 of this package (see 7).

Because of the reluctance to decrease the extensive labor force during transitions in the CIS countries, unemployment was not a major precondition for falling into poverty in these countries. The low-income employees were the first to experience massive delays in the payment of wages, pensions and other benefits in these countries (see 34). The working poor accounted for about half of the poor population in Russia, where approximately 87% of the poor live in families where one or several members are working (see 26). In Ukraine, about 78% of poor families had at least one working member in 1999 (see 17).

The social welfare system in the CIS countries did not change significantly from the universal social welfare system that they inherited from the USSR. The system remains very poorly



oriented towards supporting the poor. Large parts of the social safety nets in most of the CIS countries are education and healthcare systems, since traditionally these countries declare the right to free education and healthcare in their constitutions. The countries spend large portions of their state budgets on these items, however, with time the financing for these parts of the social safety net have become lower than that which would be required to provide the service with adequate quality. The largest social welfare item outside the state budget in FSU countries is pensions, on which 7-15% of GDP is spent. Following the example of the CEE countries, the CIS countries started pension reform, introducing a multi-tier (mandatory and voluntary funds) pension system. However, they are just at the beginning of the process and the new systems are not expected to have an impact for 15-20 years.

The social assistance programs remain aimed at providing services or supplementary payments to certain groups of the population (elderly, children, and the disabled) and the task of reducing poverty is of least importance. Reacting to the dramatic change in the structure of expenditures, and in order to retain the Soviet-era system of special rates, the governments of the CIS countries introduced a large number of subsidies or discounts, often provided in-kind. For example, until 2005 Russia maintained 156 types of subsidies and social payments that were directed to 236 different population groups (see 4). Almost 70% of the Russian population were recipients of welfare benefits (see 4), and a similar situation existed in Ukraine (see 6). The number of beneficiaries for these assistance programs became enormously high, while the size of the benefits gradually decreased due to lack of financing. Despite the significant expenditures on subsidies and discounts, these programs were very severely underfinanced. It was estimated by the researchers at the Center of Strategic Research (Russia, see 4) that the financing needed for the subsidies established by federal law in Russia exceeds 15% of GDP in 1999.

The huge difference between the required expenditures and available revenues was partially resolved by a decrease in the real amounts of the payment due to high inflation. Until the beginning of the 21st century, the payments were not automatically indexed with inflation, but rather revised on an irregular basis. As a result, by 2003-2004, the welfare payment became symbolic in most of the countries. For example, the social benefits in Russia amounted to about 6% of the average wage, in Ukraine and Azerbaijan to about 3-4% of the average wage (see 31). However, the continued economic growth in Russia and Ukraine stabilized the budgets and has made reforms of the social safety net one of the top priorities in recent years. The major direction of the reforms is an increase in the amount of benefits provided by the SSN, which may make the social benefits comparable to the lowest wages in the countries in the near future.



Such an increase in the benefits will increase their influence on the employment choice of workers and their labor mobility.

Differences in labor market conditions, prosperity of citizens, and the influence of demographic factors already significantly contribute to labor migration in CIS countries. Countries with higher unemployment rates, relatively low wages, and high fertility rates resulting in a large labor supply are among those with net migration loss. Some countries, such as Tajikistan, still exercise wage growth controls with consumer price liberalisation, which, in conjunction with high unemployment rates, leads to very high emigration. The countries of Central Asia, as well as Azerbaijan and Armenia, are among the countries with the highest rates of migration (see 14). The most frequently cited reason for working abroad given by the respondents of surveys conducted in the countries with high negative migration is poor economic conditions in one's county leading to an inability to find a job and support oneself.

Russia and Ukraine are among the most popular destinations for migrant labor among CIS countries. The attractive features for migrants in these two countries include a lift of wage controls and labor relations, lack of manpower due to demographic conditions, higher standards of living, and a large shadow economy, reaching 45-51% of the total country GDP (see 13 and 29).

A large share of migrants usually takes up jobs in sectors with high labor demand such as construction, metallurgy, sale of fruits and vegetables, agriculture, and catering. A relatively high number of migrants take jobs in the underground economy since employment opportunities in the legal sector are limited, earnings are higher in the illegal sector, and working illegally allows them to avoid contact with corrupt state bodies.

The CIS countries began to adopt western standards in controlling legal migration and issuing working permits to the foreign workers who entered countries legally. For example, in Ukraine, the employer is required to demonstrate that there are no qualified national laborers available before hiring a foreign worker. The number of the permits is capped and they are issued for a shorter period of time when compared to those issued by Western European countries and the US; also, a renewal of the permit is required every year in Ukraine and in Russia (see 12). Although this legislation was widely ignored in the past, enforcement of this legislation has increased in recent years.

Both Russia and Ukraine do not require short-term visit entry visas from citizens of some CIS countries. This visa-free regime created opportunities for illegal migration and transit of illegal



migrants (see 12), leading to migration for illegal employment within the countries. Migrants from CIS countries enter Russia and Ukraine legally, declaring their intention of a short-term trip, however, once permitted on the territory of the countries, some of these migrants either seek opportunities for illegal transit further to the countries of Western Europe or seek opportunities for work without registration. To combat these illegal migrant activities, both countries have been increasing their control of immigrants. Russia requires registration of all foreigners with Foreign Migration Services within three days of their entry to Russia. Ukraine requires registration of foreigners legally entering the country at the border only, and limits the time they are allowed to stay.

While migrants fill job vacancies available in the receiving countries, they also contribute to the expansion of the shadow economy and to changes in the structure of local labor markets and firms, as well as contributing to the expansion of some illegal activities related to the abuse of immigrants.

Labor migration also has a large unmeasured impact on the countries of origin. Apparently, migrant laborers constitute the most active and mobile part of the labor force, often with the most competitive set of skills. They reduce the pool of productive labor or potential entrepreneurs in the local economy. By its nature, labor migration in the CIS countries is unofficial. As a result of such migration, the SSNs experience a higher budget imbalance and increased utilization. A laborer often leaves behind less economically active members of the family (elderly, children, etc.). These members actively rely on social protection benefits since, in most cases, the laborer is officially unemployed in the home country.

The countries of origin of migrants benefit from labor remittances sent home. For example, according to the statistics of the National Bank of Ukraine (see 22 and 23), the amount of transfers from workers abroad almost tripled from 2002-2007, reaching about 94 million dollars a quarter in 2007. A study by the World Bank noticed that overall transfers from abroad accounted for up to 5% of GDP by 2003 (see 38). However, these benefits may not offset the losses of the local social protection systems and/or budget deficits resulting from the fact that the migrant workers do not pay taxes in their home countries, but their families use public goods (healthcare, education and other public services).

## 2.2 *Russia*

Similarly to other former USSR republics, in Russia, the first five years after the collapse of the Soviet Union were characterized by deep economic recession. On average, real GDP growth from 1992-1996 was -8.7%, with inflation reaching 2500% at the beginning of the period (see). However, researchers agree that the favourable world markets for Russia's natural resources (oil, natural gas, metals, and timber) helped the country to recover by 1997. After the short financial crisis in 1998, the country began to recover and experienced many years of growth, averaging 6.4% annually. Inflation was reduced to approximately 10% annually. High oil prices and a relatively cheap ruble were important drivers of the economic rebound in Russia. Since the beginning of the 21<sup>st</sup> century, real personal incomes increased over 12% a year on average and poverty has declined.

Since breakup of Soviet Union, Russia experienced a significant decline in population from approximately 150 million while it was part of the USSR to 142.9 million today, as a result of both natural growth dynamics and migration.. Although life expectancy has been steadily growing since 1996, the declining birth rate is one of the main factors contributing to the decrease in the Russian population in this century. Long-term demographic forecasts show that the population dynamics of Russia will result in a sharp decline in the proportion of the economically active population to the non-active population in the future. Currently, the relation of pensioners to workers is 1 to 1.4. , and the proportion of the elderly among the Russian population is increasing rapidly, implying huge financial problems for the pension system in the future, when this ratio approaches a 1 to 1 proportion. The development of the pension system in Russia is discussed in more detail in Working Paper 4 of this package (see 9).

The labor market development of Russia also followed an unusual pattern, during the recession after –independence, as discussed earlier. Despite a large decrease in real GDP, official unemployment remained low in the first half of the 1990s because workers were employed part-time (through informal agreements with employers), or were on long holidays, for example. (see Lehmann, 17) The SSN in the country (low benefits that were also difficult to collect, and significant requirements for enterprises to fire workers) was not suited for the market economy and was considered, among other reasons, to be the primary contributor to the development of this pattern. At the end of 1990s, however, the unemployment rate stabilized at about 13%, and has been slowly declining since that time (see).



Poverty was one of the main results of the crisis at the beginning of the 1990s. It is estimated that over 33% of the population in Russia lived in poverty from 1992-1996 (see). However, following the economic recovery in 2000, the poverty rates began to decline rapidly, and the current rate is 20% of the population living below the poverty line. According to a World Bank study (see 39), in 2002, 30.4% of the rural population was living in poverty in 2002, and 15.7% of the urban population was poor. Low levels of education and a large number of dependents (children) are the factors increasing ones probability of being poor. The poverty rates also vary dramatically between the regions, with some regions having over 50% of their population living in poverty in 2002.

The Russian government began to re-shape the SSN in order to respond to the challenge of increased poverty. A new regulatory framework was developed and implemented in the first half of the 1990s which changed the employment legislation in 1991, introduced new disability insurance and child benefits in 1995, and introduced mandatory pension insurance in 1996 and non-state pension funds in 1998. The pension reform continued with a complete overhaul of the pension system in 2001.

At the beginning of the 21<sup>st</sup> century, 70% of the Russian population were entitled to different social benefits. The current benefit payment mechanisms still have a limited ability to target the distribution of resources to those who need them most. Russia spent about 8% of GDP on retirement, disability, and numerous occupational privileges, and accumulated some debts in social payment. Researchers estimated that fulfilling all legal obligations of SSN federal law in Russia would require over 15% of GDP in 1999. Further forecasts indicate that without a reform those expenditures will have to increase to about 25% of GDP in 2050 (see Nies and Walcher, 24). In order to improve monitoring and targeting of these social benefits, Russia monetized the in-kind benefits in 2005. However, the monetization of the benefits triggered a strong negative social reaction and the reform of social benefits, in order to reduce their cost, did not begin.

The high level of social benefits put additional pressure on the budget resulting in a constant deficit of over 5% of GDP in the 1990s. Although large income from international trade allowed the government to increase budget revenues and run a budget surplus, since the beginning of the 21<sup>st</sup> century, tax collection has remained relatively poor. In order to stimulate tax compliance and increase tax incomes in the long-run, in 2001 Russia reduced the level of personal income tax from 30% (top marginal rate) to a flat rate of 13% for residents, and to a rate of 30% for non-residents on income from Russian sources. It also introduced a Unified Social Tax (UST) of



35.6%, which reformed collection and distribution of financial resources allocated for social payments (see 24). The UST consolidated several payroll taxes, simplified the tax system, and reduced the tax administration burden. About 78% of the funds collected from the Unified Social Tax went to the Pension Fund, 11% to the Social Insurance Fund, and about 10% percent to the Mandatory Health Insurance Fund.

Similarly to other FSU countries, the pension system is the largest part of the SSN in Russia. There are about 38.5 million pensioners in the country. The Soviet-style centrally managed pension fund was constantly in crisis from the beginning of the 1990s. Due to the problems with funding, the pension fund had to cut or even suspend pension payments, resulting in accumulation of pension arrears. The situation resulted in an overhaul of the pension system in 2004, and the introduction of the new pension system continues. The reformed pension system establishes a clear link between contribution and benefits, which is expected to increase tax compliance by about 2-5% (see 30). The introduction of the new pension system is expected to end in 2013.

The after-crises recovery and the economic and social security transformation were not equally successful in different parts of Russia. shows deviations from the national average of selected economic indicators in various regions, which equals to 100 in every year. We can see that gross regional product per capita is 5 times higher than the national average in some regions, while it is about 8 times lower than the national average in other regions. This difference results in even higher disparities in the level of unemployment in regions. At the same time, employment should be one of the main methods used to stay out of poverty, since the variation in the real wage between regions is significantly smaller, reaching only a 30% difference between the regions with the highest and lowest real wage.

The development of the economic and demographic situation in Russia, and the development of the social safety net is discussed in more detail in Discussion Paper 1 of this work package (see 7).

## **2.3 Ukraine**

The country started the process of transition to a market economy in 1992, which immediately triggered the necessity for social safety net reform. Ukraine followed the pattern common for CIS countries. After its independence, Ukraine suffered an economic downturn that continued for 6 years. In 1998, real GDP fell to 41% of GDP in 1990 (see). GDP began growing in 1999, and by



2004 accelerated to a pace of 12% growth per year. GDP growth slowed to 2.6% in 2005 primarily due to political instability and new social and fiscal policies that will be discussed later in this chapter.

Ukraine has experienced massive population decline since independence. Due to an increased death rate, decreased birth rate, and large emigration, the population decreased from 52 million in 1991 to 46.9 million in 2005 (see DP1 for more details, 7). Age demographics also changed significantly. Although the proportion of people of working age (considered to be from 15 to 70 years old) did not change, the proportion of younger people decreased. Also, the population became more economically active during the recession because most pensioners able to work had to look for some job to supplement their pension income. At the same time, the proportion of pensioners in the total population grew from 25% in 1991 to 30% of the total population in 2005.

Although the proportion of employed decreased from 47% in 1995 to 42% in 2005, similar to other CIS countries, the economic depression did not result in high unemployment in Ukraine. The highest unemployment since independence was around 12% in 1999-2000, and the unemployment rate decreased after that, partially due to a decrease in the proportion of the economically active population from 52% in 1998 to 47% in 2005 (see 7).

However, the rapid economic decline resulted in increased poverty. It was established that during the Soviet period only about 6% of the population of Ukraine lived below the national poverty level of 75 rubles, and this was primarily the rural population in depressed western regions. Poverty reached a maximum during the 1992-1996 recession period, when about 30% of the population lived below the national poverty level (see 38). Poverty decreased with the first signs of economic growth, but remained stable at 27% of the population below the national poverty level from 1999 till 2004. A comparison using international standards reveals that poverty was in fact declining: a World Bank study in 1999 found that 29.4% of the population lived on less than \$4.30 a day (see 35), and the latest 2005 study shows that poverty was only 22.2% in 2003 (see 38).

Although unemployment is not high in Ukraine, underemployment is considered to be significant. World Bank researchers found that underemployment increased from 8.4% of the population in 1999 to 9.2% in 2002. In this self-reporting survey, the underemployed are usually easily identified as people who reported to be unemployed and reported some wage income below minimum wage at the same time.

In order to survive, the poor population needed some social support delivered via the government. The social welfare system built over the years since independence currently provides about 21% of the income for poor families.

Prior to 1992, when the Soviet Union ceased to exist, the Republic of Ukraine had the same state-run social safety net common to all Soviet republics. The transition forced the government to take responsibility for the safety net expenditures that were previously a part of enterprise finances. During the initial years of transformation, the Soviet system was converted into a generous social protection system that consisted of social privileges, Chernobyl benefits, housing and utility allowances, and family benefits. More than 20 social privileges to different population groups existed until the beginning of this century. These were introduced by different laws and presidential decrees, and simulated privileges that existed during the Soviet Union. The Law on “State Assistance to Families with Children”, adopted in 1993, introduced about 11 types of different family allowances, most of which are distributed on a categorical bases, and only a limited number of the allowances are provided on the income-based means test basis. Chernobyl benefits were introduced in 1991 by the Law “On the Status and Social Protection of Citizens Who Suffered from the Chernobyl Catastrophe”, and are provided on a categorical basis to the people that resided close to the site of the disaster. Most benefits were provided in-kind. The government is supposed to provide reimbursement for the free services to the producers of such services, e.g. telecommunication or transportation companies. Despite attempts to fulfill its obligations, the government constantly failed to finance all obligations, increasing debts to service providers and to beneficiaries.

In order to shield families from the impact of the rapidly increasing energy and housing prices, in 1995 the government introduced the “Housing and Municipal Services Allowance Program”. This program increased government responsibilities and pressure on the budget. The allowances were financed from local budgets, and regions with weak revenue bases rapidly accumulated arrears.

Since the abovementioned programs were unable to eradicate poverty because they targeted such a wide portion of the population, in 2000, the Verkhovna Rada adopted the Law on “Targeted Social Assistance to Low Income Families”. This law provided families living below the subsistence level with compensating benefits up to 75% of the minimal subsistence level. The beneficiaries were restricted by asset test to people who did not possess a second apartment, a new car and did not make any substantial purchases over the previous 12 months. This was the





first law directly aimed at reducing poverty, and attempted to target the benefits to the people in need.

In order to finance new social welfare programs, the government introduced a 38% payroll tax to finance the Pension and Social Insurance Fund, a 12% payroll tax to finance the Chernobyl fund, and a 2% tax that went to the unemployment fund. Although only a small portion of these taxes were classed as employee taxes, as opposed to taxes on employers, since employers were responsible for collecting and reporting these taxes, the employer taxes on the wage fund (payroll taxes) effectively amounted to 52%.

Despite the high taxes, the government did not manage to collect revenues sufficient to finance its obligations and ran large budget deficits until 1998 (see). At the same time, the high taxes contributed to a reduction of the tax base and the escalation of shadow economic activity (see 19). Due to high inflation, the nominal wages of workers constantly appeared at the highest level of the progressive personal income tax scale and were taxed at a rate of 40%. In addition, employers had to pay 52% in payroll taxes, which made the cost of labor 2.5 times higher when compared to paying cash to a worker off the books. Taking into account that capital gains or interest on shares were taxed at about 15%, one of the cheaper schemes was to employ all workers at minimum wage, pay income tax at 0% plus some minimum payroll taxes, and pay the workers cash from the pocket of the owner, who in turn received the cash as interest or through some other scheme. It was estimated that the shadow economy in 1996 was the same size as the official economy (see 13) and shadow (off the books) employment was about 40% of total employment the same year (see 27).

The period 2004 – 2006 was characterized by increases in social benefits to pensioners and the poor, which resulted from political battles during that time. First, increases in social benefits were implemented in the second half of 2004. Minimum benefits of most welfare programs increased 3 to 12 times, average benefits increased 25-70%, and further increases were implemented in 2006 (see 21). As a result, social welfare expenditures (including pensions) increased from 11.9% of GDP in 2003 to 17.4% in 2005. The government also increased the minimum wage by 40% (about a 30% increase in real terms) in 2005, which resulted in an increase of the wages paid to employees in the public sector and increased budget expenditures on healthcare, education, and government employees.

The political situation also did not allow the government to increase tax rates and even demanded a decrease in some taxes. For example, the personal income tax law provided for a



13% flat tax rate for the period of two years that was to have been replaced by a permanent 15% flat tax rate in 2006. However, due to political pressures, the increase was postponed. Another example is simplified taxation of small businesses. The previous president issued a decree establishing a “simplified taxation for small businesses” in 2001. Businesses with turnover under \$100,000 a year and up to 10 employees may pay a flat tax (only 200 UAH, or \$40 a month in 2004-2005) instead of all taxes on their businesses, including payroll taxes. As a result, most employees of small businesses still do not make sizable contributions to pension or other social insurance funds. They are protected by some social insurances, but their contributions to the pension fund will not allow for providing them anything but a minimal pension when they retire.

Similarly to Russia, the after-crises recovery, economic and social security transformation was not equally successful in different parts of Ukraine demonstrates deviations from the national average of selected economic indicators in regions, which equals to 100 in every year. The disparity between regions of Ukraine is less pronounced than in Russia. We can see that gross regional product per capita is 3 times higher than national average in some regions, while about 2 times lower than the national average in other regions. At the same time, the difference in unemployment rates between the regions with the highest and lowest employment is only 3 times, with similar differences in the level of the real wage.

The development of the economic and demographic situation in Ukraine and the development of the social safety net are discussed in more detail in Discussion Paper 1 of this work package (see 7)

## **2.4      *Important common and distinct features***

There are several features in both countries that are important for the discussion of the effect of the SSN on labor force mobility in post-Soviet countries. Among the many common features, we should mention the following:

1. Both countries had similar economic structures and Social Safety Nets at the beginning of the transformation period. They experienced similar recessions and hyperinflation at the beginning of the 1990s, and effectively overcame the results of the recession by the beginning of the 21<sup>st</sup> century.



2. Both countries experienced problems funding their legal obligations associated with the SSN in the 1990s, and accumulated arrears in SSN payments by the mid-1990s that were successfully eliminated later.
3. Both countries started a deep transformation of the social safety net at the end of the 1990s, aiming to improve targeting, reduce the number of privileges, and reduce the tax burden on enterprises.
4. Both countries have large disparities in the economic and labor market conditions of the regions, and large labor migration within the countries and outside.
5. Both countries had large shadow economies and shadow employment in the 1990s, and relatively small official unemployment rates.

The following distinct features of economic and SSN development should allow for the observation of the effects of different SSN reforms on labor markets and labor force mobility in these countries:

1. Due to the favorable market conditions and successful trade of natural resources, Russia experienced lower pressure on the budget and was able to provide larger and more stable funding to the social safety net.
2. Russia is leading 2-3 years in the reforms of the social safety net compared to Ukraine. Budget conditions and better-developed securities markets allowed Russia to implement more radical changes of the social safety net and reduce taxes further than Ukraine.
3. Ukraine has smaller disparities in economic and labor market conditions between regions compared to Russia. Some regions of Russia are suffering from war (primarily the Chechnya region, which is excluded from consideration in this study), or strong economic specialization, such as some regions in Northern Siberia.
4. Russia is experiencing large immigration of legal and illegal workers from post-Soviet countries, while Ukraine is primarily experiencing emigration of the labor force to Western Europe and Russia.

### 3. Effects of social safety nets on labor mobility in Russia and Ukraine

Individuals often view social benefits as an alternative to labor income. The possibility to substitute part or all of one's labor income with income that does not require labor may increase labor force mobility in several dimensions. This could occur first through migration of the population from employment to unemployment, and to/from the active labor force. Second, migration of the labor force between sectors of the economy that provide different social protection and wage packages, including unofficial employment may occur. Finally, the social safety net may result in geographical labor mobility, when the labor force is moving to the regions with better social protection and wage packages.

This chapter provides simple economic models to describe the three dimensions of labor force mobility discussed above. Then we discuss the possibilities to test implications of these models on the data available for Russia and Ukraine. Where possible, we provide estimates for the labor mobility effects based on the microeconomic data for both countries. Finally, we discuss commonalities of the SSN effect on labor mobility in the two countries.

#### 3.1 *Social benefits individually perceived as an alternative to labor income*

In order to continue the analysis of the effect of social safety nets on labor force mobility, we introduce a simple economic model. Let us assume that we have an economy with  $N$  individuals, and:

- (1) Every individual in the country can consume either goods  $c$  or leisure  $l$ .
- (2) Every individual has the same concave and twice differentiable utility function  $U(c,l)$  that this individual tries to maximize.
- (3) Every individual has an income  $i$ , which consists of government transfers  $b$  and labor income, and is equal to the time the person works (*assumed to be total time in the day  $T$  minus the time that is spent on leisure*) multiplied by his/her wage  $w$ :  $i=b+w*(T-l)$ . The amount of government transfers is a positive number, and can be equal to zero for some

people. Sources of the benefits can be government savings, borrowings, taxes on enterprises, or taxes on individuals, as discussed below.<sup>1</sup>

- (4) Each individual maximizes his/her utility given this budget constraint. Assuming there is no savings and the entire income is consumed, the constraint is  $c=i$ . The general solution of this problem is to choose the level of work at the point where the marginal rate of substitution is equal to the wage rate. Assuming, for simplicity, that the utility is linear in consumption, the utility-maximizing amount of work is given by:  $\partial U(c,l)/\partial l = -w$ .
- (5) The individuals in the country have different abilities. For simplicity, we can assume that  $\lambda$  percent of population have high abilities able to earn wages  $a_H$  and  $(1-\lambda)$  have low abilities and wage  $a_L$ .
- (6) The individuals with low ability can not generate labor income sufficient to bring their consumption to some minimal social standard of consumption (minimal subsistence level)  $M$ . Therefore, the government has to step in and supplement the income of the low-ability individuals with the level  $Z$  (which may be equal or different from  $M$ , depending on the generosity of the system), developing a social safety net.
- (7) Finally, we assume that the government is interested in minimizing expenditures on the social safety net given the necessity to bring the income of all individuals in the country to a level at, or above,  $Z$ . We also assume that an individual does not consider this government goal when making his/her decision. In this case, the total cost of the SSN at the separating equilibrium is determined by the government's ability to monitor an individual's abilities and earnings.

Most economic studies (see Coate and Besley 2, for example) agree that even if the government is able to perfectly observe the level of wage earnings, but is not able to observe abilities, the high-ability individuals may modify their work behavior in order to receive the benefit  $Z - a_L^*(T - l(a_L))$ . Since the high-ability people are more productive, it will take them less time to work for the wage-income generated by low-ability people, (only  $a_L^*(T - l(a_L)) / a_H$  hours). The high ability people will alter their income if their utility working less with total income at level  $Z$  will be higher than their utility from higher consumption and higher work  $U(Z, [(a_H - 1)T + l(a_L)] / a_H) \geq U(a_H^*(T - l(a_H)), l(a_H))$ .

<sup>1</sup> Expected value of a net transfer per individual is zero unless government increases debt per individual.

Most countries finance their social security programs by payroll taxes or other taxes on wage income. Such a tax as the source of funding for the SSN can be introduced into the model. Under the assumptions of the model, it would make sense to tax the income of high-ability individuals only, because the social system will have to return to the low-ability individuals all the taxes that they paid. It also does not matter if the tax is a payroll tax (tax on an enterprise) or income tax (tax on a person), because in any case, in a competitive labor market, the tax will result in decreased wage income of the workers.

If the government imposes the tax of  $\tau$  on the income of high ability people, the wage that they receive will become  $(1 - \tau) a_H$ . Given the concave utility function, the high ability people will work less and their wage income will become  $(1 - \tau) a_H^*(T - I((1 - \tau) a_H))$ . According to the model, in this case the total expenditures of the welfare system will increase.

If the welfare system is fully financed by the taxes on wages it faces additional constraints, in terms of our model. The total expenditures of the system can not exceed the total amount of taxes collected  $E = N(1 - \lambda) \tau a_H (T - I((1 - \tau) a_H))$ , and the tax rate must be limited so that the condition  $U(Z, R) < U(a_H (T - I((1 - \tau) a_H)), T - I((1 - \tau) a_H))$  holds, otherwise, the high-ability people will exit the labor market. The highest benefit that can be offered to poor people in this case can not exceed  $(1 - \lambda) \tau a_H (T - I((1 - \tau) a_H)) / \lambda$ , and this benefit will not alter the behavior of high-ability people only if a “workfare” system is used in the country.

This simple model can be used to describe three types of labor force mobility induced by the social safety nets through changes in two major parameters: the wage/labor/benefit packages available to a worker, and the level of taxes required to finance the SSN.

### **3.1.1 Effect on mobility between employment, unemployment, and economic activity**

The social safety net may affect labor mobility between employment and unemployment through two channels. The first channel is through the behavioral response to the increased social benefits for an individual, which may result in the decision to become unemployed or to prolong their unemployment. The second channel is through the response to the increased taxes needed to finance the SSN.

The microeconomic model above implies that the larger the benefit  $b$  available to an individual, the less he/she will work since he/she can afford larger consumption of both goods and leisure.

This effect also leads to the change in behavior for some people, who prefer to work less (or completely cease working) in order to qualify for the benefit. These effects are widely observed and well documented in the individual level data from developing countries, including Russia and Ukraine.

A larger effect on labor supply and employment is observed when the government imposes or increases taxes on wages in order to finance the social benefits. The microeconomic model implies that a decrease in wages as the result of a tax will have two effects: it will decrease the income of the person, and stimulate him/her to work more in order to achieve their pre-tax consumption level; and it will decrease the “price of leisure”, causing the person to consume more leisure in order to increase the level of utility. If the income effect dominates the substitution effect, the workers will work more after the increase in the tax rate. However, the imperial estimates suggest that the substitution effect likely dominates the income effect, and the elasticity of labor supply to an increase in taxes is negative. A report of the Congressional Budget Office of the US in 1996 (see 3) reviewed a number of studies and concluded that labor supply elasticity to a change in wages ranges from 0 to 0.3 for the whole population.

An increase in taxes on wages does not necessarily result in a change of the net-of-tax wage or is not fully translated into such a change. The effect of taxes on wages is better observed at the macroeconomic level. For the macroeconomic analysis, individual labor preferences are aggregated into the labor supply function. The enterprise’s demand for labor is also aggregated into the labor demand function. The conventional market economy model suggests that employment and wages are set by the intersection of these two curves. The tax on workers’ wages shifts the labor supply curve (LS) up (to LS(T)) , and the market equilibrium shifts from point A to point B. The new wage is larger than at the previous equilibrium, meaning that some portion of the tax shifted to the enterprise. If the tax is imposed on an enterprise, it shifts the labor demand (LD) curve down (to LD(T)), resulting in a lower equilibrium wage, and shifting some portion of the tax to the workers. In this simple framework, the shift of the labor demand and labor supply curves, as a result of the same tax, produce equivalent results on labor supply (see 8).

The possibility to shift taxes to employees (in the form of reduced post-tax wages) depends on the elasticity of labor supply. A less elastic labor supply allows for wages to decrease without a significant loss in hours worked and a perfectly inelastic supply of labor allows shifting payroll taxes to employees. Kugler in his 2003 paper (see 15), and then Góra et al. in 2006 (see 8),



argued that blue-collar (low-income) workers have a higher elasticity of wage than white-collar (high-income) workers, and show empirical evidence that a decrease of payroll taxes caused a larger employment gain for low-paid workers than for high-paid workers. The high elasticity of labor supply of low-paid workers in the country where this effect was studied was attributed by the authors to the high and binding minimum wages.

By design, the social security contributions (payroll taxes) are social insurance for the workers, and can be viewed as savings. If workers believe in the system, then they have to treat their payroll taxes as part of their income (possibly with some discount), and be indifferent between packages of higher wages and no-taxes, and lower wages with payroll taxes. In this case, any change in payroll taxes could be passed through to employees without change in employment (see 10). However, there is little evidence of this inter-temporal substitution effect (see 11 and 8).

Instead, a number of studies find a significant effect of a change in payroll taxes on employment. Kugler estimated that a 10% increase of payroll taxes resulted in a 4-5% reduction in employment in Columbia (see 15), Gora et al. (see 8) found that the same increase will result in a 5% reduction of employment in Poland, and Gwartney et al. (see 11) suggest that a 10% increase in after-tax wages will result in a 3% increase in employment in US.

There are also a number of studies that document the effect of an increased social safety net, in particular unemployment benefits, on duration of unemployment spells and economic activity of the population (see 16, for example).

The main feature of the research reviewed for this study is that it studies the labor force mobility resulting from an increase in SSN benefits. The uniqueness of the transitioning economies such as Russia and Ukraine is in the deep economic downturn and resulting decrease of social benefits in these countries. This allows us to observe the opposite effect of the SSN on labor force mobility. As the SSN deteriorated in these countries, the SSN income of large population groups living on SSN benefits was reduced below poverty level. According to the model outlined above, these people would choose to increase their labor activity and start working in order to increase their utility. Therefore, we may expect to observe increasing mobility back to the labor





force for such population groups as pensioners, partially disabled, or people who care for disabled or small children<sup>2</sup>.

### **3.1.2 Effect on mobility between different sectors of economy**

We can further extend our theoretical model and introduce two sectors of the economy in the country by incorporating the Lewis model of economic growth in a country as the basic model for economic growth. The Lewis model assumes that an economy consists of two sectors. The first sector is the “traditional” economy with low productivity and an excessive supply of labor. The second sector is the “modern” economy with high productivity of labor. The model assumes that the “modern” sector has higher economic productivity, and is able to grow by investing generated profits. The model assumes that there is a significant difference in wages between the “traditional” and “modern” economies. The labor force has strong incentives to work in the “modern” sector. Economic growth in the model is achieved by transition of the excess labor from the “traditional” to a “modern” economy, which allows further expansion of the “modern” economy.

The traditional Lewis model can be depicted by diagrams presented in. Lewis argued that because of constrained resources (the original model assumed that the “traditional” economy is agriculture, and land is a limited resource) there is excess labor in the “traditional” economy with zero marginal productivity. This labor force was the resource that could be transferred to the “modern” economy and with other resources (equipment) produce new products. Since the marginal productivity of labor in the “modern” sector is not zero, there is always stimulus to re-invest profits received in the “modern” sector to increase the other resources (equipment). Therefore, the “modern” sector has a tendency to grow. In order to attract labor, the “modern” economy must pay wages slightly higher than per-capita income in the “traditional” economy. The migration of labor from the “traditional” to the “modern” sector of the economy will continue until the shortage of labor in the “traditional” economy will not drive wages in this sector to the level of wages in the “modern” economy. This traditional Lewis model of economic growth was later extended on economies that do not necessarily consist of only agriculture and industrial sectors.

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<sup>2</sup> SSN provided income for people in these categories to stay out of work for extended periods of time.

Let us assume that because of the transition, the population of the country may be divided into three categories: low-ability people, who receive wage of  $a_L$ ; the high-ability people whose abilities are sufficient to work in the “modern” sector of the economy and generate income  $a_H$ ; and the high-ability people who do not have skills to find employment in the “modern” sector of the economy, and are able to work at high-skill jobs of the “traditional” economy, generating wage  $a_M$ .

We further assume that the low-ability individuals cannot generate income on their own, and receive social benefits in the amount of  $Z$ . The workers of the “traditional” economy are able to generate some low-income; however, in the new economic reality, it is difficult to observe their abilities compared to the low-ability individuals. Therefore, according to our previous model, the government will have to pay such individuals some social benefit  $B$  such that  $U(B, [(a_M - 1)T + I(a_L)]/a_M) \geq U(a_M^*(T - I(a_M)), I(a_M))$ . Finally, we assume that the employees of the “modern” sector of the economy have significantly higher wages compared to the low and medium-ability people, and they will now alter their behavior in response to an increase in social benefits. However, these people will be the main source of taxes to finance the SSN. A significant increase in wage taxes for these people may force them to change their behavior and apply for the positions occupied by medium-ability individuals. At the same time, being the main supporters of the SSN and not being interested in use of the system, the high-ability people will prefer occupations that allow further increases in wages by decreasing the amount of the wage (payroll) taxes.

We can assume that before the transition in both countries, Russia and Ukraine, the medium and high-ability individuals were equally distributed between sectors of the economy and types of ownership (because there was only one owner: the government). After transition, the government-owned enterprises traditionally provided a better social protection package, but paid lower wages. They constitute the largest part of the “traditional” economy in terms of our model. A similar package of benefits is provided by the large private enterprises that are under the strong influence of labor unions. On the other hand, newly formed small and medium enterprises tend to provide higher wages, but lower social protection. In extreme cases, these enterprises provide large salaries with no contributions to pension funds and no social protection at all. The most extreme case of such behavior is the shadow economy, which is discussed in more detail in other papers of this work package. Another extreme case is private entrepreneurs acting under special laws. For example, in Ukraine, private entrepreneurs pay a small flat-rate tax on every employee. The tax is smaller than the amount of the payroll taxes paid for a similar



employee by a large enterprise, and does not accumulate any pensions or other social benefits for the employees. This allows small entrepreneurs to pay employees larger wages.

Based on these assumptions, we have to observe that the weaker the SSN in the country is at the moment, the larger is the segregation between the “modern” and “traditional” sectors of the economy in wages and skills of employees in these two sectors. If this is correct, then empirical evidence should demonstrate that the probability of working at a government enterprise increases with the increase in SSN benefits and taxes. At the same time, the probability to work at a small firm or with individual entrepreneurs decreases with the increase in social benefits and decrease in payroll taxes.

### **3.1.3 Effect on geographical mobility of labor force**

The traditional understanding of labor mobility is geographic mobility of laborers. The main driving factors for such mobility traditionally are wage differentials and differences in labor demand between geographic regions. If the social safety net is established by the government and is uniform for all regions in the country, it should not impact the direction of the geographic labor mobility. However, even if social security is uniform across the regions, according to our model above, decreased social benefits will increase employment activity. Household income from social security programs acts as a cushion that allows the worker to stay in the region with low labor demand or low wage income. If this cushion is removed, the pressure on working members of a family to find a better job increases, and therefore, we have to observe an increase in the probability of moving to a new geographic location.

Because population mobility is traditionally low in Ukraine and Russia due to the non-labor market constraints, such as underdeveloped real estate market and bureaucratic restrictions, labor force mobility may be disassociated with household mobility. It is common to observe that one working member of the family is temporarily moving to a new location with better income opportunities, while other family members remain in the previous location. The study of poverty in Ukraine (see 38), for example, showed that transfers from family members working abroad provide a significant fraction of family income for Ukrainian households.

Given the ability to identify the individuals who have moved or are working away from home in our statistical data, we should observe that the probability of working away significantly increases with the decrease in the SSN income available to the family.



### **3.2 Available data**

In order to conduct a statistical analysis of the effects of the SSN on labor force mobility, we must have data that:

1. Clearly identifies the dependent variable of our choice, mobility, and there is observed variation in the dependent variable.
2. Contains explanatory variables of interest characterizing the SSN, and there is identified and observable variation in the explanatory variable.

The analysis can be done at two levels: the macro-level and micro-level discussed above. At the macro-level, we can observe and analyse regional mobility of labor. Ideally, we would like to observe in the data labor mobility for each region of the country before and after major changes in the SSN in Russia or Ukraine. In order to isolate the effect of the SSN on mobility, we will also need to be able to observe other major factors that effect mobility in a particular region, such as the socio-economic characteristics of the region.

At the micro-level, we can test the hypothesis of the effect of the SSN on labor force mobility (regional, employment, and sector mobility) described above if we appropriate micro-level data for both countries. The main requirements for this data can be specified as follows:

1. The data must contain details of the employment status of an individual, socio-economic characteristics of the individual and household, as well as wage and social security income of the individual and/or household.
2. The data must cover the period of time when the SSN in the country had changed significantly in order to identify the effect of these changes on labor mobility.
3. The data must contain information that allows for identifying the mobility of individuals. For the purpose of this paper, it is necessary for the data to contain information about personal labor participation and activity, information about the industry in which an individual is employed, and an indicator that the individual is working outside of the location where he/she resides.

The ideal data will contain multiple observations for an individual and household over several periods of time with different SSN policies. However, because of the underdeveloped statistical

system in the countries of our interest, we may have to use cross-sectional instead of longitudinal data for the study. Below we describe sources of data available for both countries.

### **3.2.1 Russia**

As mentioned earlier, major changes to the SSN took place in 2001 and, for Russia, there is regional level data available several years before and after this reform year. For this study we used region-level data published by Rosstat in regional annual statistics books in 2000-2007 (see 28). There are observations for 78 regions of Russia included in our dataset. The dataset excludes regions with poor data quality, such as Chechnya and Ingushetia, and does not include “avtonomnye okruga” (autonomous regions) as separate entities.

Our variable of interest, labor migration, is not directly observed in Russia. Instead, Rosstat provides information on the total migration balance for each region. In our dataset, migration is defined as the difference between migration into a particular region (both interregional and international) and migration out of the region. In order to compare the migration between regions, we define the variable as number of migrants per 10,000 of the total regional population. Rosstat also provides figures for the gross regional product per capita and the average wage in regions.

The execution of the social funds budget and budget deficit was not equal between regions of Russia. The social budget deficits and possible delays in payment of social benefits provide another variation in the SSN between Russian regions, and can be a significant factor influencing the regional mobility of labor. Rosstat provides information about revenues and expenditures of social funds in regions of Russia. Based on this data, we constructed a variable reflecting the deficit of the social funds in a region. The variable is equal to the difference between the total revenue of social funds minus total expenditures of social funds, divided by total revenue. A negative value of this variable suggests a deficit, and positive value suggests a surplus of the social funds. The data on the revenues and expenditures of the social funds is available for the period 1998-2005, which limits our period of analysis. In addition, there is a slight inconsistency in the data reporting. Before the year 2000, revenues and expenditures were reported for each social fund separately, but later reports provide a combined figure.

### **3.2.2 Ukraine**

As we discussed in earlier sections, the main reforms in the social safety net of Ukraine were implemented in 2002-2004. Unfortunately, the results of these reforms are not observable with the available data. However, similar to Russia, there was a significant difference in the financial capacity of regions in the country, which resulted in arrears in SSN payments. We can use these arrears as observable instrumental variables for the changes in the SSN system.

The pension fund of Ukraine provides information on arrears in payment of unemployment benefits in the regions in 2000-2003 (see 21). Based on the average unemployment benefits in each region and the number of registered unemployment, we calculate the total amount of monthly unemployment benefits paid in a region. The two figures allowed us to define unemployment arrears as the ratio of nominal unemployment arrears in the region to the total nominal monthly payments of unemployment benefits. The resulting index showed significant variation in the level of benefits between regions, with a common trend reducing these arrears by 2003.

The Committee of Statistics of Ukraine also provides important regional-level data for the same period. The data includes gross regional product per capita and the average wage in each region. We also constructed an index of regional migration (migration balance per 1000 of the regions' total population) as a sum of the indexes for interregional and international migration from each region. A negative value of the index suggests a net outflow of population from the region. There are 27 regions in Ukraine, however, the resulting dataset does not include the city of Sevastopol as a separate region since data for this region were inconsistent.

In recent years, Ukraine developed several sources of reliable micro-level data that allows us to conduct a micro-level analysis of social security expenditures including the Labor Force Survey, the Ukrainian Longitudinal Monitoring Survey, and the Ukrainian Household Expenditures Survey.

The Labor Force Survey was established with the assistance of international organizations, such as the International Labor Organization (ILO), and presents information about work, personal characteristics, and the wages of workers. Due to the fact that the survey is limited to working people, it cannot be used for the micro-level analysis of the social transfer programs.

The Ukrainian Longitudinal Monitoring Survey (ULMS) is a household panel of approximately 8,600 respondents surveyed twice a year since 2003. The survey sample and questionnaire resemble the Russian Longitudinal Monitoring Survey (RLMS) and American Panel Study of Income Dynamics (PSID) (see 37). The survey presents opportunities for analysing the



dynamics of social security expenditures at the micro-level. Unfortunately, at the moment of this study the data collected during the survey was not available to the public.

The Ukrainian Household Expenditures Survey (UHES) is a household expenditures survey implemented by the Committee of Statistics of Ukraine with the assistance of the World Bank. The survey is conducted on a quarterly basis, and the sample includes approximately 9,000 households in every round, with 25% of the sample changing every quarter. The first round of the survey was conducted in the fourth quarter of 1999, and it continues on an ongoing bases. In addition to household data, the survey collects data on individual members of a household, and provides information about employment status, income, unemployment and other benefits collected by an individual. The high-frequency change of the sample makes it difficult to use the UHES for a dynamic micro simulation model. At the same time, since the data has detailed information on income from current welfare programs, the data is suitable for a static microeconomic model. The latest data available for this research was first quarter 2005 data, which contains 26,780 observations for individuals and 10,584 observations for households. It has already been used to establish a Ukrainian poverty profile and determine factors of labor force participation (see 38). This data is also widely used by the State Committee for Statistics of Ukraine to establish household income and expenditure profiles. It is also used together with the reports of social insurance funds to establish a broad range of social security utilization statistics in Ukraine.

### **3.3 Do social safety nets reduce mobility?**

At the beginning of this chapter we outlined the micro-level models that demonstrate how the social safety net can reduce labor mobility between employment and unemployment, sectors of the economy (government and non-government), and geographical regions. Below we present simple estimates of the relations outlined in the theoretical models based on the data available for Russia and Ukraine.

Since regional labor mobility is not observed in the micro-level datasets that are available, we analyse regional mobility using the regional level data. We also provide a micro-level analysis based on the UHES data. Finally, since there were a number of small changes introduced in the SSN in both countries in different years during the period of time covered by the data, we cannot clearly observe a single change in the SSN. Instead, we use the deficits of social funds and

resulting delays in payment of social benefits as a proxy for individual expectations about the level of social protection in a particular region and at a particular point in time.

### 3.3.1 Data Analysis, Case of Russia

Based on the available data, we are exploring the relations between an index of regional migration (dependent variable) and the level of the social funds deficit (primary explanatory variable). Due to the limited number of observations, we can only fit the reduced model with this data. In order to account for other major factors that might influence labor mobility, we also include GRP per capita and the average wage in the region.

Since we have reason to believe that the reduced form model left behind factors that are common within regions and factors that are characterising the socio-economic situation during each year, we estimate a fixed-effects model on our data panel (78 regions by 8 years).

Results of the regression are presented in Table 3. Results suggest that the deficit of social funds in the regions is a statistically significant explanatory variable for migration to the region. The coefficient is positive, suggesting that a larger *surplus* of the social funds leads to a larger net inflow of migrants to the region. Although we are able to establish strong relations between the deficit of social funds and migration from a region, this simple regression does not allow us to establish causality of the relations or exact size of the deficits' effect on migration (because we are leaving out too many factors that can be correlated to the deficit of social funds in the region).

The available data also covers the periods before and after the major changes in the social system in Russia that took place in 2001. We defined a dummy variable equal to zero in the years before 2000, and one after 2000. The results of the fixed-effect estimation of the reduced model including this variable are presented in.

The results suggest that there is a statistically significant relationship between migration and the dummy variable. The inclusion of the dummy variable also increased the statistical significance of the estimated relations between migration and the deficit of social funds in a region. The reduced form model does not allow us to attribute the estimated effect of the dummy variable only to the SSN reform implemented during this time period. However, a statistically significant coefficient for this dummy suggests that there was a significant structural change in the factors influencing migration after 2001.



### 3.3.2 Data Analysis, Case of Ukraine

The data available for Ukraine allows us to estimate a reduced form model for the effect of the SSN on migration. The dependent variable in the model is the migration index discussed above, and the main explanatory variable is the level of arrears in payments of social benefits as a proxy for the inequality of the SSN between regions. Similarly to the regressions for Russia, in order to account for other major factors that might influence labor mobility, we also include GRP per capita and average wage in the region.

Since we have reason to believe that the reduced form model does not include factors that are common within regions and factors characterising the socio-economic situation during each year, we estimate a fixed-effects model on our data panel (26 regions by 3 years).

Results of the regression are presented in Table 5. Results suggest that arrears in payment of unemployment benefits are correlated with migration in the region, however, the coefficient is not significantly different from zero. In addition, the coefficient is positive, suggesting that larger arrears lead to a larger net inflow of migrants to the region, which is a counter-intuitive result. However, these results can be used to support one of the suggestions derived from the theoretical model: it may suggest that the populations in regions with higher arrears are less mobile, therefore, out-migration from the regions is low and we observe a positive migration balance because there is only incoming migration in the region.

The results of the regional level analysis are inconclusive at this point, and it is possible that more detailed data could allow for an expansion of the reduced-form model and provide better insight about regional labor migration and the SSN in Ukraine. The micro-level data available for the country does not allow for estimating these relations at the micro-level because we do not observe regional migration of the population in this data.

However, we use the micro-level data to test two other relations implied by theoretical models outlined above. First, we run a regression to explore if the arrears in payment of social benefits in a region where the person lives impacts their probability of being unemployed (or labor force mobility between employment and unemployment). We run a probit regression, where the dependent variable is unemployment status (1 indicates that the person is unemployed, 0 indicates that the person is employed or is engaged in some other form of money-earning activity). The main explanatory variable of interest is the level of arrears in payment of unemployment benefits described above. In order to account for other factors that are commonly

suggested in the literature to influence the employment decision, we included in our regression personal characteristics of the person (age, sex, marital status, level of education, number of children and elderly in the household).

We use UHES data for three years (2000-2003). The sample is limited to the individuals of working age (15 to 70 years old), and we have over 10,000 individual observations each year. However, the data is not panel data since due to the quarterly rotation of the UHES sample, each individual is presented in the data only in one year. Therefore, we cannot run a standard panel regression. However, we expect that there are strong common factors influencing individuals during a single year, and also strong common factors in each region. In order to capture these effects, we defined regional and annual dummy variables that are included in the model specification.

Results of the probit regression for the probability of being unemployed are presented in. The baseline individual, defined by omitted dummy variables, is a single male with secondary education living in a town in the Kievskaya oblast. The regression suggests a statistically significant effect of arrears in unemployment benefits in a region on the probability of being unemployed: the larger the unemployment arrears the lower is the probability a person is unemployed. This result supports the findings of the theoretical models above.

The theoretical models also implied that the SSN might also influence labor migration between “old” and “new” sectors of the economy, represented by government and non-government enterprises in the case of Ukraine. The data allows testing this theory because we are able to construct an indicator that a person is working at a government-owned enterprise or organization. We limit our sample to the individuals who indicated their status as employed for a salary during the observation period. For this limited sample, we run a probit regression for probability of working in a government-owned enterprise or organization. The specifications of the regression are similar to the specifications for the probability of unemployment in the model described above.

The results of the model are presented in Table 7. The results of the estimation are not sufficient to confirm our theoretical model. Although the estimated effect of the arrears has the expected sign (suggesting that larger unemployment arrears, meaning a weaker SSN, reduce the probability of staying in the “old” economy), we cannot reject the hypothesis that the coefficient is zero. These weak results suggest that the theoretical model might be confirmed if we find a

better instrument for measuring the individual expectations of the weakness of the SSN (rather than unemployment payment arrears).

#### **4. Results of the model**

The analysis of the data at the macro (regional) level produced interesting results although none of the models allow us, with certainty, to confirm the hypothesis that stronger social safety nets reduce inter-regional mobility of labor. The analysis suggests that there are strong relations between the social safety net and inter-regional mobility in Russia, possibly because it has a larger territory, greater variation between regions, and other restrictions on informal (unregistered) inter-regional labor mobility. The same relations are not that significant in Ukraine, which has a smaller territory and fewer other restrictions for workers to live and work in two different regions of the country. However, these results could also be attributed to the problems with the data and specifications of the models and, therefore, are inconclusive.

One of the largest problems arises because of the inability to find direct measures for both the dependent and independent variables:

1. The data on labor/worker mobility between regions is not collected. Instead, we used data on overall population mobility, and assumed that the number of people moving in and out of region is directly related or proportional to labor mobility. However, this assumption could be violated if: (a) the size of migrating families is significantly different between regions, and if in one region all family members are workers, or the ratio of workers to non-workers in families is high. In this case, the proportion of labor migrants in two regions of a country will significantly differ from the proportion of observed population migration; (b) the statistics generally do not capture temporary migration of workers. We mentioned earlier that the sizes of the shadow economies approach 40% of the total economy in Russia and 50% of the total economy in Ukraine. Workers moving to work in the shadow economy most probably would not be registered in official migration statistics.
2. We also did not directly observe differences in available social protection between regions. The SSN legislation is universal for all regions in both countries. However, we argued that there is regional difference due to the local execution of the SSN legislation:



delays in payment of social benefits can be considered as a lower level of benefits from the point of view of the individual. There is significant variation in the social budget deficits and arrears in SSN payments between regions in Russia and Ukraine. However, since the main variable of interest is not directly observed, we cannot establish clear statistical relations between the variable of interest and our proxy/instrumental variables.

As a result, our estimates for Russia show significant relations between the SSN budget deficit and population outflow from a region. However, it is difficult to establish the causality of the relations: it is possible to argue that the outflow of workers from a region reduces the regional budget revenues and causes the deficit.

Our estimates for Ukraine have another problem. We observe only a deficit in the payment of one type of SSN payment: unemployment benefits. Although unemployment benefits are important, they are paid during a relatively short period of time. Therefore, we can argue that unemployment benefits may be insufficient to influence one's decision about moving to another region. More importantly, this may affect expectations about pension benefits; however, we did not have the information about variations in the payments of pensions in the regions of Ukraine. One of the reasons for this is that the regional pension funds are part of a central pension fund that is subsidized from the budget, and there were no delays with pension payments over the last several years in Ukraine.

Additional restrictions to the interpretation of the result of the regional-level analysis arise because of the possible countrywide factors influencing mobility that were not included in the model specifications. First, since the time of the Soviet Union, it is required that people register in both countries, creating significant bureaucratic barriers to official migration. Second, both countries experienced housing supply shortages and a rigid housing market, which prevents extensive migration between regions. The inability to find appropriate housing for a family may limit interregional migration of families (which is an observed variable), and force a worker to migrate to another region temporarily (it is easier to rent an apartment or room for a single worker than for the family). Finally, there is the problem of unobserved labor migration between regions of the country that we discussed earlier.

We see several possible ways to improve the results of the macro-level analysis of the effects of the SSN on geographical labor migration in CIS countries in the future. First, cooperate with local and country authorities to find or establish better statistical data. An extension of this



method can be the introduction of a longitudinal labor force survey that specifically tracks labor migration. Second, we can analyse a wider range of FSU countries. We mentioned earlier that all FSU countries had a common SSN system during the Soviet Union, but the development of the SSNs was different after the collapse of the Soviet Union. Therefore, we should be able to observe greater variation in the SSNs on a sample of FSU countries. However, the challenge for this approach will be the availability of compatible data, especially for the period close to the beginning of transition. During the 1990s, the national statistical systems in the new independent states were not sufficiently developed, and it is hard to find quality statistical data.

The micro-level analysis was conducted only for Ukraine. The analysis found strong relations between the probability to be unemployed and our instrumental variable for the quality of the social safety net. However, because of our choice of the instrumental variable, the extension of this result beyond the relation with the instrumental variable may be problematic. Our instrumental variable was arrears in payments of unemployment benefits. It is not surprising to find statistically significant relations between the arrears and the probability of being unemployed: we found that larger arrears led to a decrease in the probability of being unemployed. This relation is expected because the unemployment benefits are a “payment” for the decision to be unemployed, and the lower is the “payment”, the lower should be the desire to become unemployed. However, payments (receipt) of other social benefits are not necessarily a direct consequence of unemployment. It is especially true for the largest and longest paid benefit: the pension. For a person younger than pension age, the pension is not paid in case of the decision to become unemployed, however, the pension remains the largest and longest expected benefit of the SSN. However, because of the unique direct relationship between unemployment benefits and the unemployment decision, it is hard to extend this result on pensions and other benefits.

A similar argument could be made about the results for the estimated effect of the SSN on the decision to work in the government or modern economy. Our theoretical model suggested that the stronger is the SSN in the country (the larger is the expected amount of social transfers), the stronger should be the incentive to work in the “traditional” (government) sector of the economy (that promises more social security) than in the “modern” sector of the economy (which is the main contributor of the SSN through tax payments). However, currently, unemployment insurance is one of the lowest expected payments of the social security system, because it is related to the official salary of an employee, which is low in both government and non-government sectors. On the other side, the amount of payroll taxes going to unemployment



insurance is also at least ten times smaller than the amount of taxes going to pension funds. Therefore, the inconclusive result of our statistical analysis of the relation between the probability to work in the government sector of the economy and the amount (arrears) of unemployment benefits may be not representative of the total effect of SSN benefits. We can argue that expected pension benefits should have a significantly stronger effect on the decision to work in the government vs. “modern” economy since the amount of expected benefits is significantly larger.

One of the possibilities to improve the quality of the results of the micro-level analysis may be to find another instrumental variable for the inequality of SSN protection, especially between the workers in the “traditional” and “modern” economies. Such differences are hardly observed in the past because a large portion of incomes in the “modern” sector was not taxed (because it was paid under the table), and the largest social security payments were not directly linked to the amount of contributions. However, currently the tax discipline and tax enforcement in both Russia and Ukraine are increasing and, therefore, we can expect to clearly observe larger social security contributions of employees in the “modern” economy than in the “traditional” economy. At the same time, because social security systems continue to struggle from a financial imbalance, we can expect that the amount of payments will continue to be weakly related to the amount of contributions. If observed, these linkages will allow us to test the above-mentioned theoretical model statistically.

## **5. Policy lessons and conclusions**

Theoretical models and data analysis provide arguments that stronger social safety nets reduce the mobility of labor between regions of the economy, between employment and unemployment, and between different sectors of the economy. It also provides some statistical support to the arguments about the effect of a stronger SSN on geographical (regional) mobility and its effect on unemployment.

These theoretical and practical arguments may have significant implications for the design of reforms in the countries of transition. The general argument for a stronger SSN is to protect the most vulnerable parts of the population (the elderly, the poor, and the unemployed) from the negative effects of transition. At the same time, a fast transition requires a fast reallocation of

resources, including the labor force, between the “traditional” and “modern” sectors of the economy, which also may imply a geographical reallocation of labor. Therefore, a stronger SSN may slow down the process of economic transformation:

1. A stronger SSN increases the expected benefit of staying in the “traditional” economy because workers in the “traditional” economy are net receivers of the benefits, while workers in the “modern” economy are payers if the tax system is functioning properly.
2. A stronger SSN decreases inter-regional migration because it reduces the “cost” of staying in the current location, and, therefore, the overall benefit of moving to another region is lower. This result is more pronounced in countries with larger disparities between regions (as demonstrated in Russia). Therefore, if geographical concentration of the “modern” economy is different from the concentration of the “traditional” economy, by decreasing inter-regional migration, a stronger SSN will also reduce growth of the new sectors of economy.

At the same time, the discussed results may provide decision-makers with opportunities for improving labor and regional policies:

1. We demonstrated that stronger unemployment benefits in countries like Ukraine increase the probability of the decision to become unemployed. Therefore, increasing short-term unemployment benefits can make the labor market more flexible and foster transformation. We mentioned at the beginning of this paper that the uniqueness of transition in FSU countries is that the sharp drop in GDP levels was not reflected in an adequate drop of employment. One of the most popular explanations for this phenomenon is that, traditionally, in FSU countries enterprises face significant charges for firing employees, and employees do not want to leave enterprises in order to retain some sense of income security. The increased unemployment benefit can provide the necessary level of security and encourage a reduction of the excess labor force, especially from the enterprises in the “traditional” sector.
2. The negative effect of stronger social policies on regional mobility discussed may also play a positive role in regional policies. The reality of a modern service-oriented economy is that many of the modern sectors of the economy do not require significant natural resources and, therefore, have a low dependence on the geographical characteristics of a region (for example, the computer software industry depends only on proper infrastructure, but does not require resources except human capital and electricity).



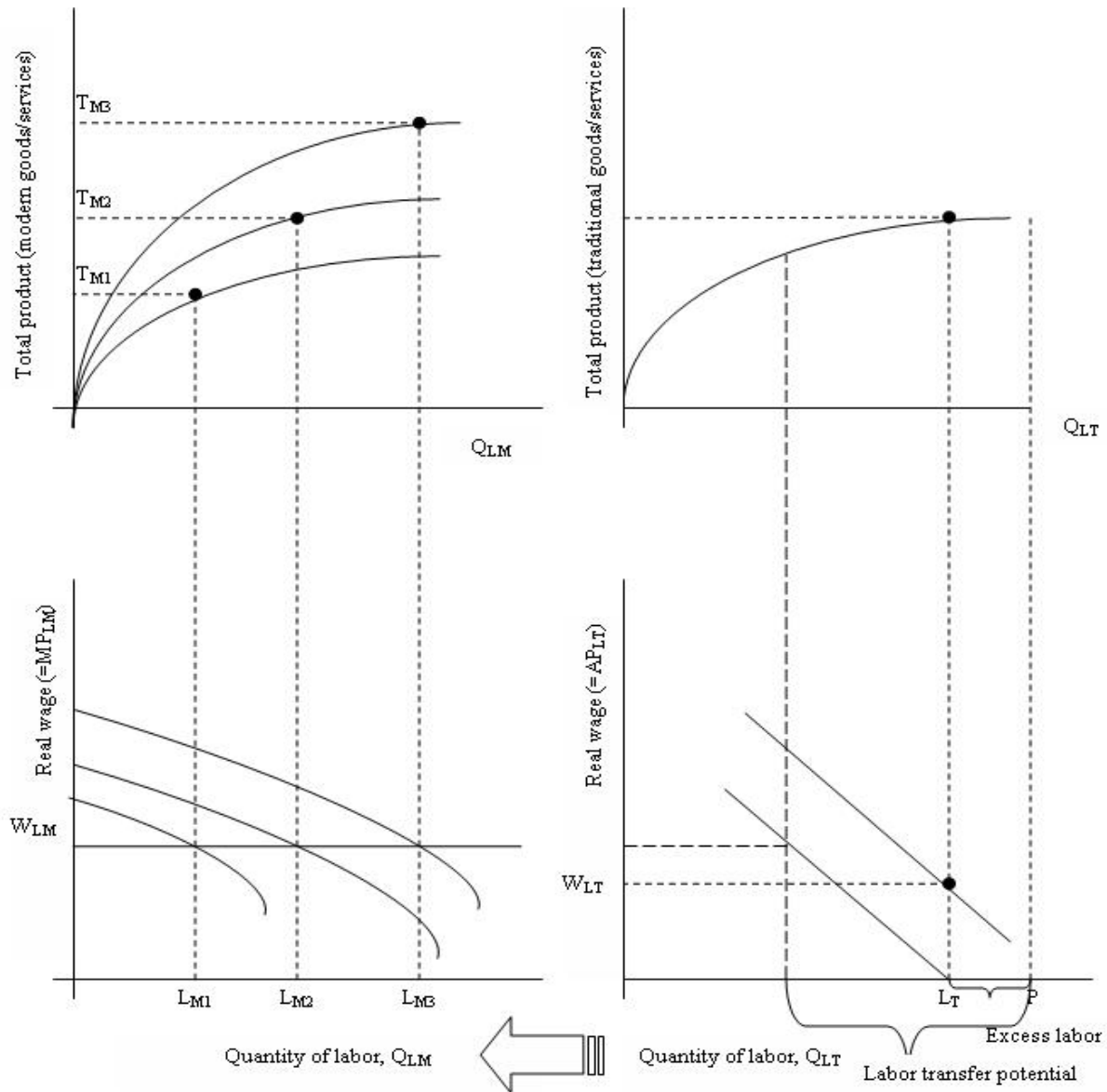
Therefore, in order to foster proportional development of the regions, a government may want to reduce migration of qualified labor between regions and provide incentives for employers to move to the regions in order to access the labor force. According to the arguments in this paper, increasing social protection can be one of the instruments that governments can use to implement such a policy.

However, using the increases in SSN protection, the decision-makers should strongly consider budget constraints of the SSN in the countries of transition. The discussed effects of the SSN on labor mobility between regions and sectors of economy are much smaller than the possible negative effects of a fiscal imbalance on the economic growth of a country in transition, as it was demonstrated in Russia, Ukraine, and other FSU countries at the beginning of the 1990s.



## Tables and figures

Figure 1. Lewis model of economic growth



(a) Modern sector of economy

(b) Traditional sector of economy

**Table 1. Main socio-economic indicators in Russia and Ukraine**

	Average 1992- 1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<b>Russia</b>										
Real annual GDP growth (%)	-8.7	1.4	-5.3	6.4	10	5.1	4.7	7.3	7.2	6.4
CPI inflation, Dec. to Dec.	max: 2508 min: 21.8	11	84.4	36.5	20.2	18.6	15.1	12	11.7	10.9
Consolidated budget as % of GDP										
Revenues	28.7	30.4	26.1	25.2	28.7	30	32.5	31.3	32	39.7
Expenditures	33.9	35.8	32	26.1	26.8	27.1	31.6	29.9	27.5	31.6
Deficit	5.2	-5.5	-5.9	-0.9	1.9	3	0.9	1.3	4.5	8.1
Pension fund expenditures, % of GDP	5.78	7.4	6.4	5.6	4.7	5.8	7.3	6.1	5.8	6
Unemployment, % of active population 15-70 y.o.**	9.6	11.8	13.2	12.6	9.8	8.8	8.5	7.8	7.9	7.1
Poverty, % population below national poverty line	33.5	Average 23.3		28.3	28.9	27.3	Average 20.8			
<b>Ukraine</b>										
Real GDP growth	-13.8	-3.0	-1.9	-0.2	5.9	9.2	5.2	9.6	12.1	2.6
CPI inflation, Dec. to Dec.	max: 2000 min: 39.7	10.1	20	19.2	25.8	6.1	-0.6	8.2	12.3	10.3
Consolidated budget as % of GDP*										
Revenues	35.3	30.1	28.2	25.2	28.9	26.9	27.4	28.2	26.5	31.6
Expenditures	43.1	36.7	30.4	26.7	28.3	27.2	26.7	28.4	29.7	33.4
Deficit	7.8	-6.6	-2.2	-1.5	0.6	-0.3	0.7	-0.2	-3.2	-1.8
Pension fund expenditures	8.2	10.2	9.3	9.5	8.4	8.8	10.1	9.1	11.4	14.6
Unemployment, % of active population 15-70 y.o.**	6.6	8.9	11.3	11.9	11.6	11.1	9.6	9.1	8.6	7.2
Poverty, % population below national poverty line	29.5	Average 28.5		27.8	26.4	27.2	Average 27.2			

Sources: Committee for Statistics of Ukraine, [www.ukrstat.gov.ua](http://www.ukrstat.gov.ua), Bulletins of the Pension Fund, [www.pension.kiev.ua](http://www.pension.kiev.ua); Rosstat (2006) Social Situation and Living Standards of Russian Population; Rosstat (2003) Russian Statistical Yearbook; Authors' calculations

\* Note that the official figures are different from reported in World Bank databases due to the difference in methodologies

\*\* The Unemployment rates in 1992-1996 are based on end-of-period information available

**Table 2. Regional variation from country average (average = 100)**

	1995/ 1996*	2000	2001	2002	2003	2004	2005
<b>Russia**</b>							
<b>Real Wage</b>							
Min	72.22	75.68			85.90	89.17	87.03
Max	140.42	125.81			104.88	108.08	117.12
Variation (Min/Max)	0.51	0.60			0.82	0.82	0.74
<b>Regional Product per Capita</b>							
Min	17.07	16.87	16.17	12.79	13.45	13.26	12.32
Max	341.76	447.53	469.40	454.74	454.97	476.01	533.42
Variation (Min/Max)	0.05	0.04	0.03	0.03	0.03	0.03	0.02
<b>Unemployment rate</b>							
Min	57.45	36.79	23.33	17.72	15.85	20.51	11.11
Max	451.06	285.85	371.11	553.16	678.05	593.59	901.39
Variation (Min/Max)	0.13	0.13	0.06	0.03	0.02	0.03	0.01
<b>Ukraine</b>							
<b>Real Wage</b>							
Min		58.70	61.09	63.03	65.80	65.76	68.61
Max		176.09	176.53	171.01	164.72	163.90	163.03
Variation (Min/Max)		0.33	0.35	0.37	0.40	0.40	0.42
<b>Regional Product per Capita</b>							
Min	53.32		50.61	53.51	54.56		
Max	142.85		213.95	317.15	317.43		
Variation (Min/Max)	0.37		0.24	0.17	0.17		
<b>Unemployment rate***</b>							
Min	20.00	72.65	54.95	55.45	52.75		
Max	300.00	147.86	165.77	158.42	146.15		
Variation (Min/Max)	0.07	0.49	0.33	0.35	0.36		

Sources: Rosstat ([www.gks.ru/bgd/regl/B07\\_14p/Main.htm](http://www.gks.ru/bgd/regl/B07_14p/Main.htm)); Committee of Statistics of Ukraine ([www.ukrstat.gov.ua](http://www.ukrstat.gov.ua))

\* Due to the limitations of the data, the 1995 figures were used for Russia and 1996 figures were used for Ukraine

\*\* Chechnya was not included in the analysis because of the lack of data

\*\*\* Registered unemployment used for 1996, and MOP unemployment in other years



**Table 3. Russia: Fixed-effects regression, regional level data 1998-2005**

R-sq: within	0.0567	Number of obs	595
between	0.4574	Number of groups	77
overall	0.052	Obs per group (aver):	7.7
		F(3,515)	10.32
corr(u_i, Xb)	-0.3787	Prob > F	0.00

migration	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
deficit	36.25858	13.93113	2.6	0.010	8.88975	63.62742
grp	-0.00017	0.00008	-2.2	0.028	-0.00033	-0.00002
wage	0.00474	0.00118	4.02	0.000	0.00242	0.00705
_cons	-18.98263	2.56412	-7.4	0.000	-24.02006	-13.94521

sigma\_u 65.55117  
 sigma\_e 32.67502  
 rho 0.800982 (fraction of variance due to u\_i)  
 F test that all u\_i=0: F(76, 515) = 24.69 Prob > F = 0.0000

**Table 4. Russia: Fixed-effects regression with reform dummy, regional level data 1998-2005**

R-sq: within	0.1693	Number of obs	595
between	0.5226	Number of groups	77
overall	0.1215	Obs per group (aver):	7.7
		F(3,514)	26.19
corr(u_i, Xb)	-0.5956	Prob > F	0.00

migration	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
deficit	36.84802	13.08622	2.82	0.005	11.13897	62.55707
grp	-0.00037	0.00008	-4.76	0.000	-0.00052	-0.00022
wage	0.01323	0.00150	8.8	0.000	0.01028	0.01619
reform	-36.22731	4.34036	-8.35	0.000	-44.75433	-27.70029
_cons	-23.46473	2.46771	-9.51	0.000	-28.31277	-18.61669

sigma\_u 73.16704  
 sigma\_e 30.69286  
 rho 0.85036 (fraction of variance due to u\_i)  
 F test that all u\_i=0: F(76, 514) = 26.55 Prob > F = 0.0000



**Table 5. Ukraine: Panel (Fixed-effects) regression, regional level data 2000-2002**

R-sq: within	0.0456	Number of obs	78
between	0.0100	Number of groups	26
overall	0.0138	Obs per group:	3
corr(u_i, Xb)	-0.123	F(3,49)	0.780
		Prob > F	0.511

migration	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
grp	-0.00011	0.00019	-0.59	0.561	-0.00049	0.00027
arrears	0.12147	0.13894	0.87	0.386	-0.15773	0.40067
wage	0.00500	0.00363	1.38	0.175	-0.00230	0.01230
_cons	-2.26293	0.93695	-2.42	0.020	-4.14580	-0.38006

sigma\_u 1.462311

sigma\_e 0.785767

F test that all u\_i=0: F(25, 49) = 4.67 Prob > F = 0.0000

**Table 6. Ukraine: Probit regression, probability to be unemployed**

Probit estimates				Number of obs		44487	
				LRchi2(45)		3920.51	
				Prob > chi2		0	
Log likelihood		-15584.1		Pseudo R2		0.1117	
esunemp	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]		
grp	0.000020	0.000022	0.94	0.35	-0.000022	0.000063	
arrears	-0.022875	0.012276	-1.86	0.06	-0.046935	0.001185	
wage	-0.002106	0.000752	-2.80	0.01	-0.003579	-0.000633	
y_2001	0.142026	0.047787	2.97	0.00	0.048366	0.235685	
y_2002	0.240097	0.083307	2.88	0.00	0.076820	0.403375	
age	0.008214	0.001628	5.04	0.00	0.005022	0.011406	
female	-0.299754	0.016277	-18.42	0.00	-0.331657	-0.267851	
yearswor	-0.037236	0.001734	-21.47	0.00	-0.040634	-0.033837	
married	-0.095087	0.019337	-4.92	0.00	-0.132987	-0.057187	
higheduc	-0.489687	0.030633	-15.99	0.00	-0.549727	-0.429647	
inchied	-0.314101	0.077120	-4.07	0.00	-0.465252	-0.162949	
college	-0.215214	0.035962	-5.98	0.00	-0.285699	-0.144730	
voctrsch	-0.038024	0.025374	-1.50	0.13	-0.087757	0.011708	
voctrain	-0.127709	0.025298	-5.05	0.00	-0.177292	-0.078126	
inseeduc	-0.129557	0.036585	-3.54	0.00	-0.201261	-0.057853	
primeduc	-0.730511	0.087743	-8.33	0.00	-0.902484	-0.558537	
noeduc	-0.885331	0.429753	-2.06	0.04	-1.727631	-0.043032	
h_ch	0.001976	0.009815	0.20	0.84	-0.017262	0.021213	
h_elder	-0.190741	0.012765	-14.94	0.00	-0.215761	-0.165721	
city	-0.089190	0.021349	-4.18	0.00	-0.131033	-0.047347	
rural	0.014490	0.020275	0.71	0.48	-0.025249	0.054228	
krim	0.184491	0.056151	3.29	0.00	0.074436	0.294546	
vinitaska	-0.082507	0.064723	-1.27	0.20	-0.209361	0.044348	
volinska	-0.070621	0.073420	-0.96	0.34	-0.214521	0.073280	
dniprope	0.036033	0.069333	0.52	0.60	-0.099858	0.171923	
donetska	0.112076	0.102873	1.09	0.28	-0.089552	0.313703	
zhitomir	-0.262326	0.068805	-3.81	0.00	-0.397182	-0.127470	
zakarpal	0.193938	0.055290	3.51	0.00	0.085573	0.302304	
zaporizk	0.165452	0.079808	2.07	0.04	0.009031	0.321873	
ivanfran	-0.039021	0.056002	-0.70	0.49	-0.148784	0.070742	
kirovogr	0.037885	0.064030	0.59	0.55	-0.087612	0.163381	
luganska	0.221390	0.095289	2.32	0.02	0.034627	0.408153	
lvivska	0.074275	0.045994	1.61	0.11	-0.015871	0.164421	
mikolaev	0.148672	0.063866	2.33	0.02	0.023497	0.273846	
odeska	0.033731	0.063537	0.53	0.60	-0.090800	0.158262	
poltavsk	-0.143596	0.059939	-2.40	0.02	-0.261075	-0.026118	
rivensk	-0.082494	0.060894	-1.35	0.18	-0.201844	0.036856	
sumska	0.019690	0.060162	0.33	0.74	-0.098226	0.137605	
ternopil	-0.029464	0.076357	-0.39	0.70	-0.179120	0.120192	
harkivsk	0.056825	0.053865	1.05	0.29	-0.048749	0.162398	
hersonsk	0.111673	0.061868	1.81	0.07	-0.009585	0.232932	
hmel'nits	-0.177154	0.070552	-2.51	0.01	-0.315433	-0.038875	
cherkask	-0.239580	0.063626	-3.77	0.00	-0.364283	-0.114876	
chernigi	-0.090340	0.065566	-1.38	0.17	-0.218846	0.038166	
kiev	0.235396	0.143045	1.65	0.10	-0.044968	0.515760	
_cons	0.200883	0.145894	1.38	0.17	-0.085063	0.486829	

**Table 7. Ukraine: Probit regression, probability to work at state enterprise**

Probit estimates		Number of obs		19969		
		LRchi2(45)		1348.98		
		Prob > chi2		0		
Log likelihood		-13105.7		Pseudo R2		
				0.0489		
state_wor	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
grp	-0.000006	0.000021	-0.30	0.77	-0.000047	0.000034
arrears	-0.004310	0.013969	-0.31	0.76	-0.031690	0.023069
wage	-0.000420	0.000857	-0.49	0.62	-0.002099	0.001259
y_2001	-0.009463	0.056668	-0.17	0.87	-0.120529	0.101604
y_2002	-0.165537	0.098462	-1.68	0.09	-0.358519	0.027445
age	-0.008392	0.002661	-3.15	0.00	-0.013607	-0.003177
female	0.318068	0.018690	17.02	0.00	0.281436	0.354700
yearswor	0.014158	0.002667	5.31	0.00	0.008931	0.019384
married	0.033968	0.022869	1.49	0.14	-0.010855	0.078790
higheduc	0.503413	0.031830	15.82	0.00	0.441028	0.565798
inchied	0.149794	0.081318	1.84	0.07	-0.009586	0.309173
college	0.277959	0.040524	6.86	0.00	0.198534	0.357385
voctrsch	0.015133	0.032075	0.47	0.64	-0.047734	0.077999
voctrain	0.181849	0.031009	5.86	0.00	0.121072	0.242626
inseeduc	-0.179638	0.056170	-3.20	0.00	-0.289729	-0.069548
primeduc	-0.078587	0.133862	-0.59	0.56	-0.340952	0.183779
h_ch	0.005093	0.012102	0.42	0.67	-0.018626	0.028813
h_elder	-0.029831	0.014375	-2.08	0.04	-0.058006	-0.001656
city	-0.329792	0.022591	-14.60	0.00	-0.374071	-0.285514
rural	0.021451	0.025698	0.83	0.40	-0.028916	0.071818
krim	0.017883	0.064158	0.28	0.78	-0.107863	0.143630
vinitaska	-0.170601	0.081694	-2.09	0.04	-0.330719	-0.010484
volinska	-0.243575	0.095430	-2.55	0.01	-0.430614	-0.056535
dniprope	-0.063064	0.073787	-0.85	0.39	-0.207684	0.081556
donetska	0.282913	0.113337	2.50	0.01	0.060777	0.505049
zhitomir	-0.180765	0.079246	-2.28	0.02	-0.336084	-0.025445
zakarpaz	-0.121027	0.071969	-1.68	0.09	-0.262083	0.020029
zaporizk	-0.145089	0.087102	-1.67	0.10	-0.315805	0.025628
ivanfran	-0.193349	0.065718	-2.94	0.00	-0.322153	-0.064545
kirovogr	0.026894	0.079867	0.34	0.74	-0.129643	0.183430
luganska	0.077179	0.105823	0.73	0.47	-0.130230	0.284587
lvivska	0.009255	0.053076	0.17	0.86	-0.094773	0.113283
mikolaev	-0.018023	0.074947	-0.24	0.81	-0.164917	0.128870
odeska	-0.056523	0.071058	-0.80	0.43	-0.195794	0.082748
poltavsk	-0.337557	0.065734	-5.14	0.00	-0.466393	-0.208720
rivensk	-0.101211	0.070859	-1.43	0.15	-0.240092	0.037669
sumska	-0.323096	0.070950	-4.55	0.00	-0.462155	-0.184037
ternopil	0.061073	0.094118	0.65	0.52	-0.123395	0.245541
harkivsk	-0.076219	0.058602	-1.30	0.19	-0.191076	0.038637
hersonsk	-0.294372	0.075360	-3.91	0.00	-0.442075	-0.146668
hmelnits	-0.080015	0.086873	-0.92	0.36	-0.250283	0.090254
cherkask	-0.252010	0.075587	-3.33	0.00	-0.400157	-0.103863
chernigi	-0.240546	0.078667	-3.06	0.00	-0.394731	-0.086362
kiev	0.132307	0.145929	0.91	0.37	-0.153709	0.418323
_cons	0.190733	0.177998	1.07	0.28	-0.158136	0.539603

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