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The impact of educational level of Eastern European population on the migration
outflows.

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Abstract

Migration of highly skilled individuals or brain drain is an integral part of the globalization. Education is a crucial determinant of human capital accumulation in the country and therefore, a source of economic growth. The aim of this paper is to assess migration tendency as a function of educational level for the Eastern European region. While most previous studies have focused on the rural migration within one country, I look at the migrants from ten countries in Eastern Europe. The interaction between education and migration for Eastern European countries remains unexplored in the literature. The results show that in majority countries the link between skilled emigration and tertiary education attainment depends on the country specific characteristics. Of particular interest were the results that for majority countries increase in educational attainment is not connected to the increase of highly skilled emigrants. Thus, brain is not determined by the global context of Eastern European countries, but by a set of peculiar characteristics of every country. Hence, geographic area doesn't have similar schemes of skilled migration for separate Eastern European countries.

Keywords: migration; education, brain drain, highly skilled, tertiary educated, Eastern Europe

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1. Introduction

1.1. Problem discussion

In the recent years, much attention has been devoted to the concept of the human capital (Kuznets 1966, Mokyr 2005, Schiltz 1961, Stiglitz 1975). Human capital accumulation of the country is a perspective indicator of economic growth and productivity. The main form of human capital is seen through education. Education serves as a screening device by arranging individuals of different skills and abilities. It has a filtering role (Arrow 1973) and marks out individuals according to their educational attainment. Schooling has become a crucial component of the human capital.

The value of human capital differs across countries and regions. Smaller payoffs to education and human capital devaluation are driving forces of the outflow of skilled groups of the population. The reason of mobility is a desire to improve standards of living, earn money and gain new skills.

Migration of highly educated usually refers to “brain drain” concept. Various literature focuses on this phenomena. However, there has been a considerable debate among scholars regarding the link between education and migration.

The relationship between migration and education is a broad area of research. Moreover, it is rather complex from theoretical and empirical perspectives. The literature doesn't clearly specify the way education affects emigration. Several studies have outlined positive effect of educational attainment on the probability to migrate (Antolin and Bover 1997, Caces 1985, Caldwell 1969; Stark and Taylor 1991; Donato 1993; Yang and Guo 1999). Other scholars have questioned this effect and had found negative correlation between education and emigration (Lucas 1985; Massey et al. 1987; Taylor 1987; Massey and Espinosa 1997; Quinn and Rubb 2005). In addition, there is some evidence of insignificant effects of education on migration (Emerson 1989; Adams R.H. 1993; Curran and Rivero-Fuentes 2003, Sahota 1968, Williams 2009, Quinn and Rubb 2005).

The link between migration and education was examined in Mexico (Donato 1993, Massey et al. 1987, Taylor 1987, Curran and Rivero-Fuentes 2003), China (Yang and Guo 1999), Ghana (Caldwell 1969), Botswana (Lucas 1985), Egypt (Adams R.H. 1993), Nepal (Williams 2009), Brazil (Sahota 1968), United States (Emerson 1989), Philippines (Caces 1985), Spain (Antolin and Bover 1997). The interaction between education and migration for Eastern European countries remains unexplored.

The present study focuses on interrelationship between migration and education in Eastern Europe. It adds to overall understanding of migration of highly skilled in this region and it sheds light on possible reasons behind the brain drain. The paper seeks to analyze the impact of educational attainment on migration outflows taking into account labour market characteristics of Eastern Europe.

The magnitude of the brain drain in Eastern Europe hasn't been studied deeply and empirically assessed. The educational dimension of emigration hasn't been largely documented. The lack of harmonized data on migration by educational level is an obstacle while studying the scope of brain drain in Eastern Europe. Generally, data regarding skills and origin of the immigrants can be collected from national censuses and registers. The problem with Eastern Europe and the studied period is that some countries belonged to separate entities (USSR, Czechoslovakia) and they had common censuses and consolidated data.

The main focus of the thesis will start from the 1990s as it was time after the USSR and Warsaw Pact break-ups, the period when Eastern Europe has undergone serious changes and labour migration has reached considerable scope. The fall of Iron Curtain resulted in outflow of scholars and highly educated. The European Union (EU) enlargement generated a large outflow of young skilled people to the West. The majority of sending countries in the 1990s didn't have proper legislation on labour migration that made it difficult for the analysis of the migration

flows. Migration is a complex phenomenon and in case of the outflow of the highly educated individuals it negatively impacts the stock of the human capital in the country. Highly skilled migration happens not only because of wage differentials, this is a case when immigrants get higher returns on their human capital and have more possibilities to apply their knowledge that risk to depreciate in their home country.

When mentioning Eastern Europe, it is usually divided into: post-Soviet countries (Belarus, Moldova, Russia and Ukraine) and new member states of the European Union (Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia). Thus, the general migration trends slightly differ in these regions of Eastern Europe. However, historical mobility of the highly skilled follows the similar patterns and being affected by the same reasons.

There have been studied various reasons, causes and consequences of migration. Meanwhile, in the current context of highly skilled outflows, analyzing the impact of education becomes rather relevant. Human capital in a form of education is an important component of economic growth. Thus, studying migration of highly skilled individuals will help to foresee the possible placement of human capital accumulation and perspective sources for the economic growth.

1.2. Aim and scope of the thesis.

The aim of this paper is to assess migration tendency as a function of educational level of Eastern Europeans. The thesis will focus on emigration in ten Eastern European countries (Belarus, Bulgaria, Czech Republic, Hungary, Moldova, Russia, Poland, Romania, Ukraine, Slovakia). The countries that belong to Eastern Europe are derived from the United Nations Department of Economic and Social Affairs definition. The time constraint is from 1990. The economical and historical events within the area are used to distinguish the factors of migration for the studied countries.

The analysis concerns individuals of ages 16-64 who have attained more than a secondary education. The educational level indicators are educational attainment of the population, educational enrollment and expenditures on education. While discussing education, human capital is taken as a proxy of educational attainment. The thesis aims to apply empirical findings of migration phenomena in the Eastern European countries and assess how the educational level of the population in Eastern Europe is connected to the migration outflows.

To common sense, the topic is relevant in a way to better understand the nature of migration and its flows composition. Moreover, brain drain is closely connected with capital inflows to the home country and may contribute to economic growth for both sending and receiving countries. Therefore, characterizing migration by educational attainment could result in better understanding of brain drain and could shed light on East-West migration. Further, a deeper overview of the over time development of education and migration flows will add to estimation of future inflows of migrants and policies application towards them.

In addition, the paper aims to examine labour market situation of the studied countries in order to draw a substantial conclusion in the end. Labour market experiences are seen as an indicator and push factor for the decision to emigrate. The 1990s was the period of many structural changes and economic reforms for Eastern European countries. Therefore, labour market is a starting point of the analysis.

Hence, specific objectives of the thesis are:

- overview of the main pattern in the labor market;
- detection of “brain drain” phenomena impact on giving country and receiving countries;
- analysis of education\migration relationship;
- identification of benefits and drawbacks of multi-educational migration;
- evaluation of educational influence on emigration

The empirical analysis of positive migration-education relationship was mainly done for internal or rural migration within the developing or least developed countries. In general, higher

educational attainment increases likelihood of migration. However, essentially migration is driven by “demand-supply” factors of the labor market rather than by educational attainment. The studies of migration from rural areas emphasize the search of higher income, better jobs opportunities and self improvements as main driving forces for migration. The same factors are applicable for Eastern European region. Moreover, after the fall of Iron curtain and structural reforms towards market economy, labor market of the region has experienced a complex restructuring. Increasing unemployment and lack of financing in many industrial sectors resulted in outflow of highly skilled. In addition, a high unemployment rate of tertiary educated among post-Soviet countries has generated the outflow of highly skilled. Therefore, taking into account the previous researches and assuming the same pattern of positive education – migration relationship for immigrants from Eastern Europe, I hypothesize that, the more educated people are in the country, the higher the propensity they will emigrate. Thus, I expect positive relationship between emigration and education for Eastern European countries.

1.3. Thesis outline

The remainder of the paper is organized as follows: section 2 reviews theoretical background and previous research; it ends with giving a context of the study by describing main patterns of Eastern European labor market and general migration trends. Section 3 presents the data and method of the analysis. Section 4 outlines empirical framework and discussion. Section 5 concludes. Finally, section 6 gives suggestions for the further research.

2. Background

2.1. Theoretical background

2.1.1. Overview of the “brain drain” concept

For better understanding of interaction between education and migration, the concept of brain drain and impact of migration have to be analyzed.

The term ‘brain drain’ has been used since the 1960s. Brain drain concept is usually characterized by international mobility of highly skilled, tertiary educated individuals in developing countries and formerly it referred to mobility of skilled population from developing to developed countries. Today’s scope of brain drain concerns not only middle and low income countries, but developed industrial countries. The discourse about brain drain is a matter of concern. Thus, creating a favourable economic and scientific environment in the country is a crucial step for preserving human capital accumulation.

When inadequate returns to education and underestimation of educational attainment take place, people tend to move their human capital to get higher returns on invested capital. Literature that deals with brain drain concept usually mention the following consequences of brain drain: sending countries loose important human capital that may contribute to economic growth and welfare; but at the same time social and professional networks are established, scientific cooperation extends; in addition remittances to the sending country contribute to welfare of certain social units. Therefore, for several countries brain drain can partly compensate for skill loss. It is true to note that the home country bears the cost of education of the expatriates, but in a long run brain drain can have positive impact on their home economy. Beine et al. (2001) mention a positive “ex ante” brain drain effect that assumes increasing investments in education because of higher returns to education abroad. Some studies outline that brain drain is a normal process in terms of modern globalisation and therefore it has to be managed (Meyer 2003). Another opinion (Ackers 2005, Mahroum 1998) is that the mobility of scientists is a norm and a nature of highly skilled (Logue 2009).

Empirical magnitude of brain drain is hard to estimate for every region as the data remain scarce. However, it is obvious that the effect differs across countries.

Docquier and Marfouk (2006) state that the increasing mobility of skilled workers has challenges and the transfer of human resources has to be carefully scrutinized. The impact of brain drain is usually valued as detrimental. Evidently, the education of the emigrants is financed by the sending country. However, looking at human capital Docquier and Marfouk (2006) also suggest that emigration increases domestic enrolment in education. Understanding that the returns on education are higher abroad, people start to invest more in education and new skills. “More people, therefore, invest in human capital as a result of increased migration opportunities. This acquisition can contribute positively to growth and economic performance.” (Docquier and Marfouk 2006, p.3)

Other positive impacts of brain drain are mentioned in the literature as following:

- remittances (“feedback effects”)
- return migration with additionally acquired knowledge and skills
- the creation of business, social and trade networks

2.1.2. The consequences of “brain drain” for developing countries

Developing countries have been more on focus when describing consequences of the brain drain. Firstly, they are under the risk of losing their human capital through highly skilled emigration. Secondly, the loss of “brains” not being substituted, reduces the country’s ability to produce and innovate efficiently. The developing countries are short of resources and lagging in economic growth. Human capital is one of the main resources to drive development. Thus, every single loss of highly educated results in the growing gap between developing and developed countries.

Docquier et al. (2007) distinguish two components of brain drain: degree of openness that is measured by the average emigration rate of working-aged natives and the schooling gap measuring the relative education attainment of emigrants compared to natives. Openness is affected by the country size: small countries have higher average emigration rates than large countries. As for the schooling gap, poor countries exhibit higher schooling gaps than more prosperous ones. The intensity of the brain drain is affected by the country of preference of the migrants.

Moreover, the important task of brain drain analysis is to explore the changes of skilled migration in a long run. Migration of highly skilled diminishes the average level of schooling of the country. When the most talented emigrate they are reducing the human capital of the state, therefore, decrease in human capital contributes to reduction of innovation, economic growth and scientific development in the future. Thus, in long run it may affect productivity. According to Beine et al. (2007) the brain drain generates inequality across nations by depriving human capital of poor countries. They underline that it is particularly harmful if “concentrated in some occupations (such as healthcare personnel, teachers, engineers, etc.) and if skilled migrants were mostly trained in their country of origin” (p.2, Beine et al. 2008).

However, some controversial views exist in the brain drain literature: a positive effect of brain drain for developing countries could be seen through remittances, return migration and professional network formation. The next section will look at these issues referring to the sending countries of emigrants.

2.1.3. The effect of the “brain drain” phenomena on the socio-economic state of the giving country

The selective immigration policies add to increasing number of the brain drain from developing countries. Also demographic size of the country is related to the brain drain. In spite of the opinion that skilled migration empowers receiving countries and weakens sending ones, Docquier’s (2006) analysis has shown that limited positive rate of skilled migration is very likely to be beneficial for both sending and receiving countries.

An optimistic view of the brain drain is focused on an efficient allocation of resources that contribute to the total amount of welfare at the world level. Then the redistribution takes place. Several studies have found that in some countries brain drain stimulates human capital accumulation. “It appears that the countries experiencing a positive net effect (the ‘winners’) generally combine low levels of human capital (below 5%) and low skilled migration rates (below 20%), whereas the ‘losers’ are typically characterized by high skilled migration rates and/or high enrolment rates in higher education” (Docquier 2006, p.19).

As mentioned above the knowledge outflow can be beneficial in case of remittances, return migration and scientific cooperation through the professional networks. Remittances could contribute to country GDP growth. In terms of European Union, the wealth of remittances is redistributed within the borders and has a circulating nature and “equalizing” effect. However, remittances are very questionable measure of the brain drain. It is unclear whether the skilled emigrant remits more than the unskilled one. Moreover, many skilled emigrants are of the young age and they need money to establish the household and raise children. Return migration is hard to measure and assess, but it could contribute to the home country development only in a long run. Professional networks are advantageous for both sending and receiving countries and are effective for additional knowledge and skills generation and exchange.

Thus, return migration and brain circulation are believed to add to the economic growth. Although the magnitude of return migration is hardly known, the fact that migrants accumulate knowledge and financial capital in rich countries before spending the rest of their career in their origin country may generate beneficial effects on productivity and technology diffusion.

Other opinions of the impact of brain drain on the sending country mention that emigration of talent may be positive in motivating the sending country to acquire more education, thereby raising accumulation of human capital. In addition, emigrants may provide essential inputs to new businesses and activities in the sending country. Finally, emigration may help to promote the inflow of knowledge and information. With regard to unemployment, emigration may lower skilled unemployment, it may raise the wages (Commander et al. 2004). Mountford (1997) also contradicts to the opinion that 'brain drain' may leave a developing country in a poverty trap. He shows that brain drain stimulates educational incentives in the sending country.

2.1.4. Conclusions on “brain drain” phenomena

Talking about the migration of highly skilled it is obvious that movement of human capital occurs. The intensity of this movement depends on economic situation in the country of residence, incentives to stay and the rate of return to invested capital in a form of education. The positive impacts of brain drain could be remittances, return migration and the creation of business and trade networks. The drawbacks of emigration of highly skilled are mirrored in reduction of the average level of schooling of the country, innovation possibilities and scientific development. Thus, in long run it may affect productivity. The brain drain generates inequality across nations by depriving human capital of poor countries. The scope of educational loss is difficult to estimate in a short run, but it has to be scrutinized in a future perspective.

2.1.5. Determination of migration as a phenomenon: its causes and consequences

2.1.5.1. The effects of migration for sending countries.

The most visible effect of high skill emigration on human capital stock in sending countries is the transfer of human capital to another region. Thus, the stock of the human capital is declining in the sending country. High levels of skill emigration reduce growth. The effect of the highly skilled migration on the sending country could be seen through the wages both in home and host countries. Hence, talent emigration results in declined skill supply in the sending country in a long run. If the demand does not change, then the declined supply will put pressure on wages. The wages are likely to rise and it will lead to narrowing the wage gap between home and host countries and decreasing emigration (D'Artis and Julda 2010).

The wage gap in the native country pushes people to move their human capital to the country where they will have a higher rate of return for their skills and achievements. (Massey et al. 1993). Eastern European wages are much lower than in their main destination countries (see section 2.3.1.2 of the thesis). Besides the economic incentives, the probability of the emigration also depends on age, educational attainment, and job tenure. Evidently, the majority of highly skilled migrants are from the age group of 25–29 and they appear to be the most vulnerable to emigration.

The drawbacks of emigration for the country are very straightforward. The outflow of skilled and young people causes labour force decline and therefore results in labour shortages. On the other hand it may raise the number of vacancies in the home country and although those vacancies are mainly bottom-level jobs, they can adjust the unemployment rates. The negative side of this decline in unemployment rate is the depreciation of human capital within the country as when low-skilled jobs are in demand, people are artificially forced to accept those jobs or to seek the employment abroad. Hence, the outflow of human capital is very visible for highly skilled left in the country.

Besides economic consequences of emigration, the demographic outcomes should be taken into consideration. Thus, it causes decline in population with all the ensuing challenges as population ageing, fertility decline and if looking at it more generally – cultural leakage. The lack of working-age people puts burden on the population to provide pension payments for the elderly. The cost of losing the best educated workers is estimated to be high for the source countries. But according to Iranzo and Peri (2009) at the same time, though, the restrictions on labour mobility are very costly. But if thinking more globally in terms of remigration, the returnees are likely to bring new skills, knowledge that the sending country will benefit from. The consequences of the outflow of skilled workers in Eastern Europe after 1990 are seen in possible benefits from return migration, remittances and increased education levels. Unfortunately, the scope of the benefits is very hard to estimate by now.

2.1.5.1. The effects of migration for receiving countries

Borjas (1995) studied the benefits from immigration to the native population. He stresses that natives gain from the immigration if the immigrants' skills are relatively high. Unskilled immigrants are more likely to pay lower taxes and use governmental programs. Thus, the immigration policy should focus on attraction of high-skilled immigrants. "Policymakers are steadily concerned with attracting highly skilled workers from abroad or at least to prevent brain drain, particularly from key workers like researchers and professionals." (p.2, Grossmann and Stadelmann 2008). Frienberg and Hunt (1995) argue that the immigration policy has an economic foundation.¹ They mention that immigrants may lead to welfare rise through complementing some native factors in production. Educational level of the country reflects the stock of human capital. Consequently, increase in the average educational attainment in the country augments economic growth. Thus, the skilled labour inflow may increase economic growth, reduce inflation and interest rates. Migration also has an effect of "demographic time bomb" as the immigrants are of economically active age, they replace retiring inactive population, thereby, they are potential tax payers and human capital influx to the country.

On the contrary to previous opinions, Borjas (1994) states that the immigration increases the labour supply in the receiving country and consequently, it put a downward pressure on wages. Therefore, lower wages in the destination country decrease the wage gap between the sending and receiving countries, therefore diminishing incentives to emigrate. The result implies that skilled workers stay in their native county and the country keeps its human capital.

Human capital inflow needs a solid base to resolve in a new country. According to D'Artis and Julda (2010), there are two main determinants of international knowledge spillovers: a

¹ This and some other information has been taken from my own previous papers from EKHM 04, EKHM 15, EKHP 15 courses of the ongoing Master Programme in Economic Demography.

country's relative backwardness and a country's absorptive capacity. The first determinant is self-explanatory: in case of economic backwardness, wage differentials and societal pressures, the emigration is favoured. The absorptive capacity of knowledge inflow is determined by human capital capability of the home country and by 'adaptive' research capacity of the host country. Thus, through the absence of knowledge transmission barriers and the 'adoptive' technologies availability, the home country can adopt new knowledge and ideas. Highly skilled workers are key determinants of the country capability to use and develop imported knowledge. The country level of education determines the ability to absorb new knowledge. Thus, the emigration of highly skilled workers diminishes possible benefits from technological spillovers. Other determinants of the country's 'adoptive' capacity are expenditures on R&D sector and research activities in the country (D'Artis and Julda 2010). Cohen et al. (1997) underline that if an immigrant has a higher educational attainment than a native, it will decline with duration of residence to a native-born level. Thus, the 'adaptive' capacity is an ability of the receiving country to keep the level of incoming highly skilled and stimulate its further development.

2.2. Previous research

There are several theoretical concepts of migration: neoclassical theory, new economics of migration, dual labor market theory, world systems theory, network theory, institutional theory, migration systems theory (Massey et al. 1993). The main idea of relationship between education and migration is the expected returns on education in home and host countries. However, there is no clear consensus on the impact of education on migration outflows (Quinn and Rubb 2005).

According to neoclassical theory, international migration is caused by "geographic differences in the supply of and demand for labor" (Massey et al. 1993). Thus, the migrants tend to move from labor scarce to labour-abundant countries. The skills acquired in the home country increase the propensity to search for better opportunities and outcomes. Borjas (1995) studied the benefits from immigration to the native population. He concluded that natives gain from the immigration if the immigrants' skills are relatively high.

The relationship between migration and education is a broad area of research. The impact of education on migration doesn't have clear consensus. Several studies have outlined positive effect of educational attainment on the probability to migrate (Caces 1985, Caldwell 1969; Stark and Taylor 1991; Donato 1993; Yang and Guo 1999). Other scholars have questioned this effect and had found negative correlation between education and emigration (Lucas 1985; Massey et al. 1987; Taylor 1987; Massey and Espinosa 1997; Quinn and Rubb 2005). In addition, there is some evidence of insignificant effects of education on migration (Emerson 1989; Adams R.H. 1993; Curran and Rivero-Fuentes 2003, Sahota 1968). (Williams 2009; Quinn and Rubb 2005).

2.3. The context of the study

2.3.1. Labor market situation as a major push factor of the emigration in Eastern Europe.

Labour market situation of the home country has a great impact on the migration decision. It might be neglected in special cases of migration (family reunion, refugees, temporary working contracts, et cetera). For emigrants characteristics of the job market indicate the final destination choice. Therefore, the national labour market experience serves as a starting point for the decision to emigrate. Thus, it could be viewed as a push factor not only for skilled migration, but for labour mobility in general. The 1990s were the period of many structural changes and economic reforms for Eastern European countries. This period was marked by Warsaw Pact collapse, USSR and Czechoslovakia break-ups, Iron Curtain lifting, the transition from centrally planned to market – oriented economies. Restructuring and economic growth paths were identified by the extent to which the communist economies followed market oriented reforms.

For Europe May 1st 2004 was marked as enlargement of EU-15² to EU-25³. Four of the entrant economies EU-8⁴ (Poland, Hungary, Czech Republic, Slovakia) belong to the ex-communist block in Eastern Europe (Moreno-Fontes and Cantú-Bazaldúa 2004). Later, in 2007 Bulgaria and Romania also joined EU. The access of new member states extended the borders of European Union, increased its population and facilitated labour movement. By expanding membership, Euro area acquired a new level of internal cooperation through common space creation. EU expansion resulted in more massive population move from less developed to high developed EU states.

The countries of Eastern Europe are seriously lagging behind their destination countries. Thus, the emigration is mostly driven by incentives of higher income and better opportunities. Moreover, worsening of the situation of the labour market and disparities in unemployment before the EU enlargement caused a new wave of migration from the newly accepted member states, with Poland being the leader. Unemployment rates among highly skilled are high in former Soviet Union countries, which implies that either people are pushed to emigrate in search of jobs abroad, or they are forced to have their human capital depreciated in their home country.

2.3.1.1. General overview of East European labor market from 1990: main trends, problems and differences in national labor market experiences.

The 1990s were marked by the end of Soviet block as an integrated economic unit. Unemployment remained high and the only long-term solution of this problem was seen in economic progress. (Stern 1996).

Adams G. (1993) underlines that the second half of 1991 is connected with overwhelming changes: the dissolution of the Soviet Union, sequential economic difficulties, the "shock treatment" economic policy change in Russia and other post-Soviet countries. Consequently, those changes affected economies of Soviet bloc countries as well as the other Warsaw Pact members. Unemployment has risen greatly especially in Poland. Post Soviet countries kept relatively low unemployment rate because of governmental subsidies of loss-making companies and the policies that kept workers even if they were not required to produce.

Also inflation was very rapid and very high. "In the former Soviet Union prices increased by approximately two hundred percent in 1991. In the first few months of 1992, prices increased by a factor of five. Inflation has been accelerating and is expected to reach hyperinflation levels of 1,200-1,500 percent per year." (Adams G. 1993, p.42)

In the beginning of 1990s, the labour market situation of Eastern Europe (except Bulgaria) was defined by relatively full employment and an excess of labour demand over supply. Nevertheless, a comparatively high employment was achieved by paying low wages and keeping part-time jobs. The industry suffered from low levels of labour productivity as a consequence of labour hoarding (Nesporova 2002).

Later, macroeconomic stabilization policy opened national economies to world markets and employment started to fall down. For example, in Slovakia, Hungary, Russia and Poland, unemployment increased for several years and "then stabilized with only a negligible recovery." Due to the serious macroeconomic imbalances, the countries were unable to sustain economic growth and unemployment continued to grow. Moreover, besides high unemployment, CIS (Commonwealth of Independent States) countries had high underemployment due to forced

² EU-15: Austria (A), Belgium (B), Denmark (DK), Germany (D), Greece (EL), France(F), Finland (FIN), Ireland (IRL), Italy (I), Luxembourg (L), Netherlands (NL), Portugal (P), Spain (E), Sweden (S) and United Kingdom (UK)

³ EU 15 plus Cyprus (CY), Czech Republic (CZ), Estonia (EE), Hungary (HU), Latvia (LV), Lithuania (LT), Malta (MT), Poland (PL), Slovak Republic (SK) and Slovenia(SI)

⁴ Czech Republic (CZ), Estonia (EE), Hungary (HU), Latvia (LV), Lithuania (LT), Poland (PL), Slovak Republic (SK) and Slovenia (SI)

administrative leaves, hidden unemployment and wage payments delays. (Nesporova 2002). Even when in the beginning of the 1990s private sector developed rapidly, it couldn't provide jobs to all unemployed. (Blanchflower 2001)

The CIS countries had stable slow growth in unemployment. The reason behind this was the reluctance of governmental assistance to unemployed persons essentially because of the lack of financing. "Eligibility rules for registration as a jobseeker are set in such a way that many jobseekers do not qualify. Jobs reported to public employment services (PES) are usually of poor quality and unattractive for more competitive jobseekers, which rely on other channels of job-finding" (Nesporova 2002, p.16). In addition, understaffing and low wages of PES employees resulted in demotivation of assistance to jobseekers.

Young people are the perspective source of human capital in the country. However, young people in former communist countries are subject to high and persistent unemployment. (Roberts 2001). In general, young skilled people are at risk of receiving small return on their education and they aim to move abroad to apply their knowledge there. It has to be admitted that besides total unemployment, unemployment of people with tertiary education are worth analyzing. Part 2.3.1.4 of the thesis will add to the understanding of this issue.

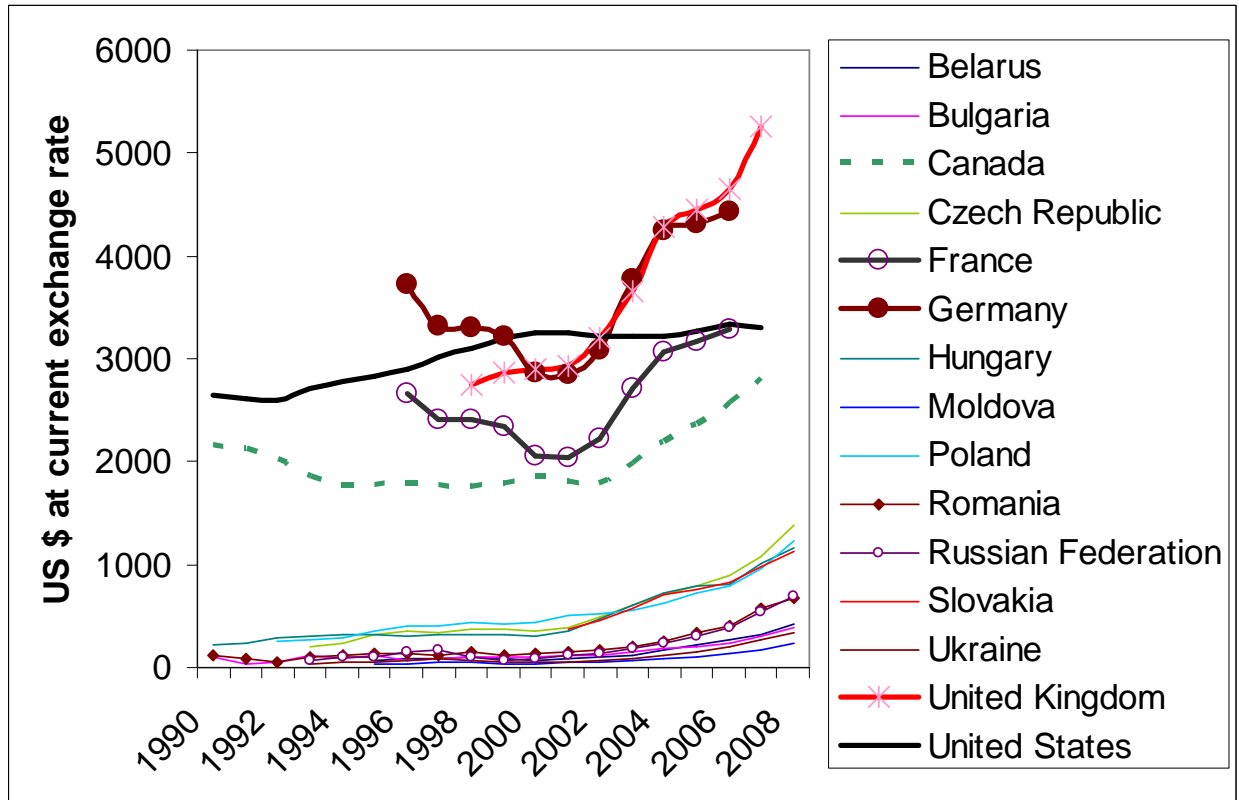
2.3.1.2. Wage differentials between Eastern European countries and their main destination countries of migration.

Wage differentials are among the main factors that impact migration. According to World Bank statistics, the main receiving countries for Eastern European emigrants are 6 OECD countries (Australia, Germany, France, Canada, USA, UK). Figure 1 summarizes gross average monthly wages calculated in US dollars using the nominal exchange rate for five OECD countries (Germany, France, Canada, USA, UK) and Eastern European countries. As seen from the Figure 1 the wage gap is notably high. Significant wage gap and difference in standards of living between these regions are the main push factors of emigration.

Studied ten Eastern European countries and their main receiving six OECD countries might differ in living standards, inflation rates and prices for goods and services. Thus, it is logical to sort countries by GDP derived from Purchasing Power Parity index (PPP) to compare relative prices and purchasing power across these countries (see Figure 2). Looking at GDP at PPP per capita of the studied countries and their main destinations will add to entire picture of the income and the possibility to acquire necessary goods. In addition, it will provide a picture of relative welfare of the country and therefore, will help to see the attractiveness of the final destination for migration.

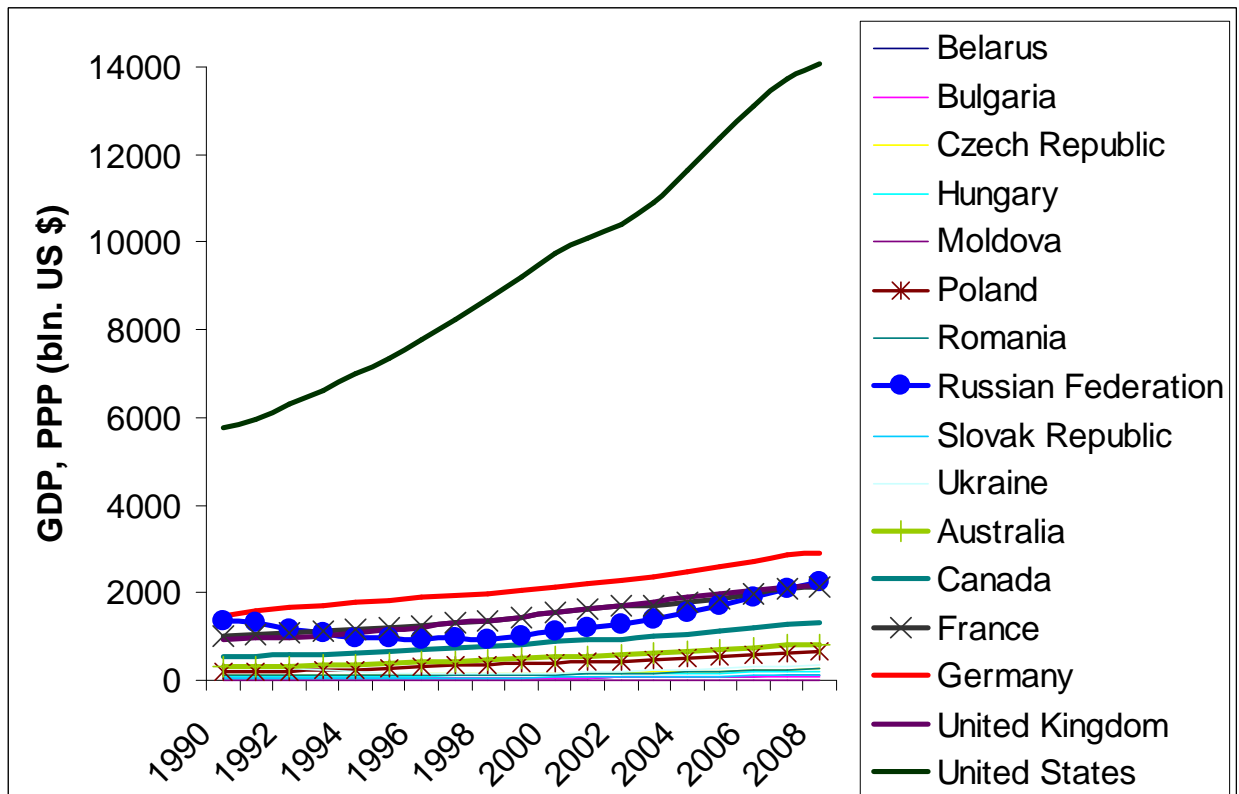
From the Figure 2 it could be concluded that even though wage differentials are notably high between ten Eastern European countries and their main destination countries for emigration, GDP at PPP difference is visible only for the United States. Russia has higher GDP at PPP than Canada and Australia during the whole studied period. Poland has similar pattern as France. Consequently, a quest for higher income is questionable in these cases. Certainly, if looking at wages at purchasing power parity, the reasons for emigration could appear more obvious. However, the data are lacking and the only possible solution for PPP estimation is analyzing total income of the country at purchasing power of the population.

Figure 1. Gross average monthly wages for Eastern Europe and 5 OECD countries.



Source: UNECE Statistical Division Database, compiled from national and international (CIS, EUROSTAT, IMF, OECD) official sources.

Figure 2. GDP, PPP (current international \$) in bln.



Source: WDI and GDF (World Development Indicators and Global Development Finance database)

2.3.1.3. Unemployment: general overview and reasons behind it

The period 1990-1998 was one of the deep recessions in much of Europe. Nickell and Nunziata (2005) explain unemployment through shifts in labour market institutions. München and Svejnar (2007) outline three main explanations of unemployment in Central and East Europe. Firstly, unemployment was related to macroeconomic policies or major external shocks. Secondly, economic structures of the countries contributed to maintaining long-term unemployment. Finally, Eastern Europe was still in transition state from plan to market economy. In contrary, it is believed that unemployment in Western Europe was a result of aggregate demand shocks, structural shocks and hysteresis. All Eastern European countries went through an economic downturn in the early 1990s. However, the analysis of München and Svejnar (2007) suggests that during the 1991-2005 period Eastern European countries also experienced aggregate demand shocks, structural shocks and hysteresis. The main differences across Eastern and Western economies appeared in size and timing of these events.

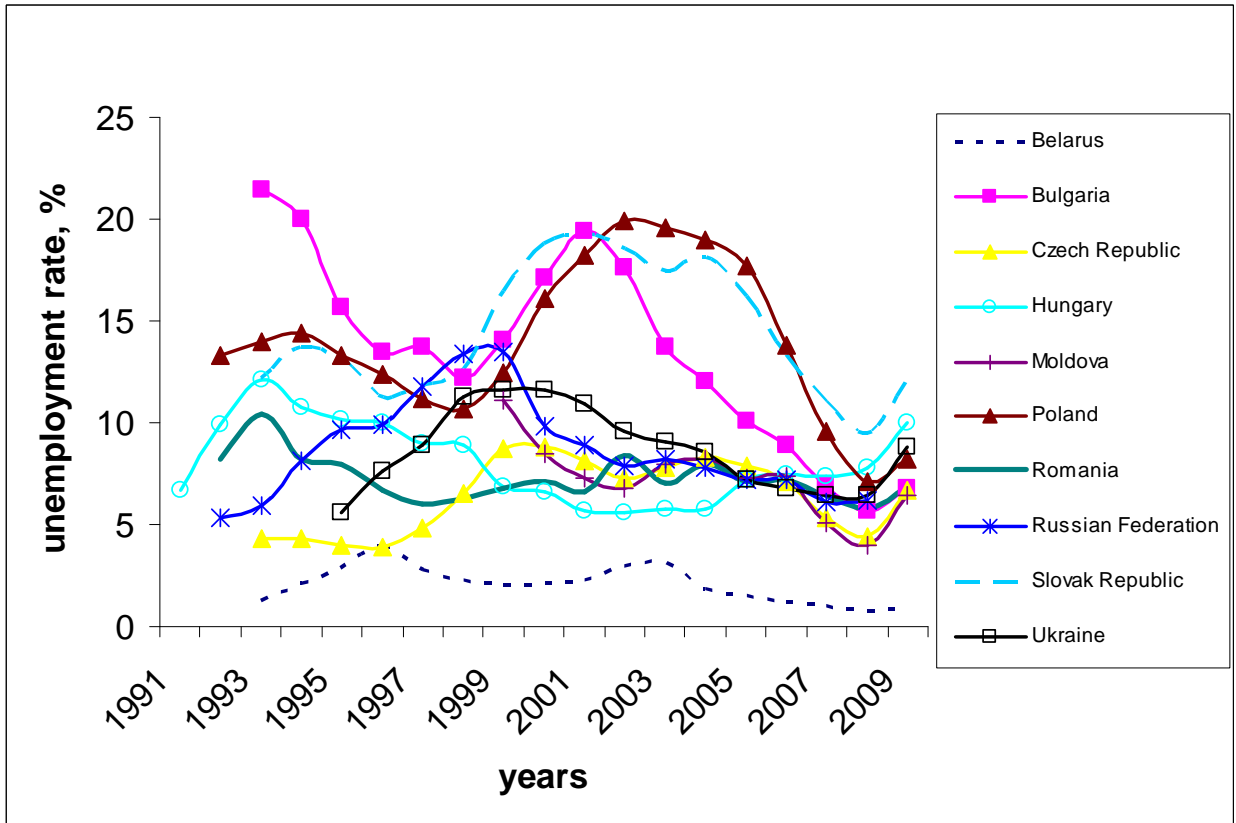
By the end of the 1990s, macroeconomic and structural factors had contributed to a new reduction in employment virtually everywhere. Demographic changes occurred in the first half of 1990s were characterized by young-age cohorts entry to the labour markets. The employers had their preference towards prime employees with previous years of working experience. Moreover, educational establishments supplied education that was out of market demand (Nesporova 2002).

While labour market situation is characterized as very complex in general, Blanchflower (2001) states that Eastern European countries with communist labour market policies differed in productivity and labour market situation. Poland and Hungary were more flexible to adjust their national markets to open markets than the Czech and Slovak republics before 1990s. The Czech Republic settled labour market policy that had low unemployment benefits and incentives. CIS countries (in my study they are: Belarus, Ukraine, Moldova, Russia) lagged labour market reforms and privatization was slower than in the rest of Eastern Europe. Thus, in CIS countries unemployment rates were generally smaller than in the rest of studied Eastern European countries because of the delayed changing process of democratization. In addition, unemployment was “an ideological impossibility during the Soviet period” and it remained surprisingly low through the mid 1990s (Donahue 2004).

Figure 3 illustrates unemployment rates fluctuation for ten studied countries during 1991-2009. Evidently, in the beginning of the 1990s Poland, Bulgaria and Slovak Republic had the highest unemployment rates. Belarus, Czech Republic and Russian Federation had the lowest unemployment rate. Unfortunately, the data for Ukraine are available from 1995 and for Moldova from 1998, but as those countries were the members of USSR they were likely to have low unemployment rate due to unregistered unemployment and governmental control of keeping employees on part-jobs, unproductive positions and by simply keeping payrolls for those employees. Before the expansion of the EU in 2004 Poland, Bulgaria and Slovakia had the highest unemployment rates around 15-18%. In contrary, Czech Republic, Romania and Hungary had the lowest (below 10%); later after 2006 Hungary had experienced substantial growth in unemployment. After the august “Ruble crisis” of 1998 in Russia, the unemployment has grown up to 13 %.

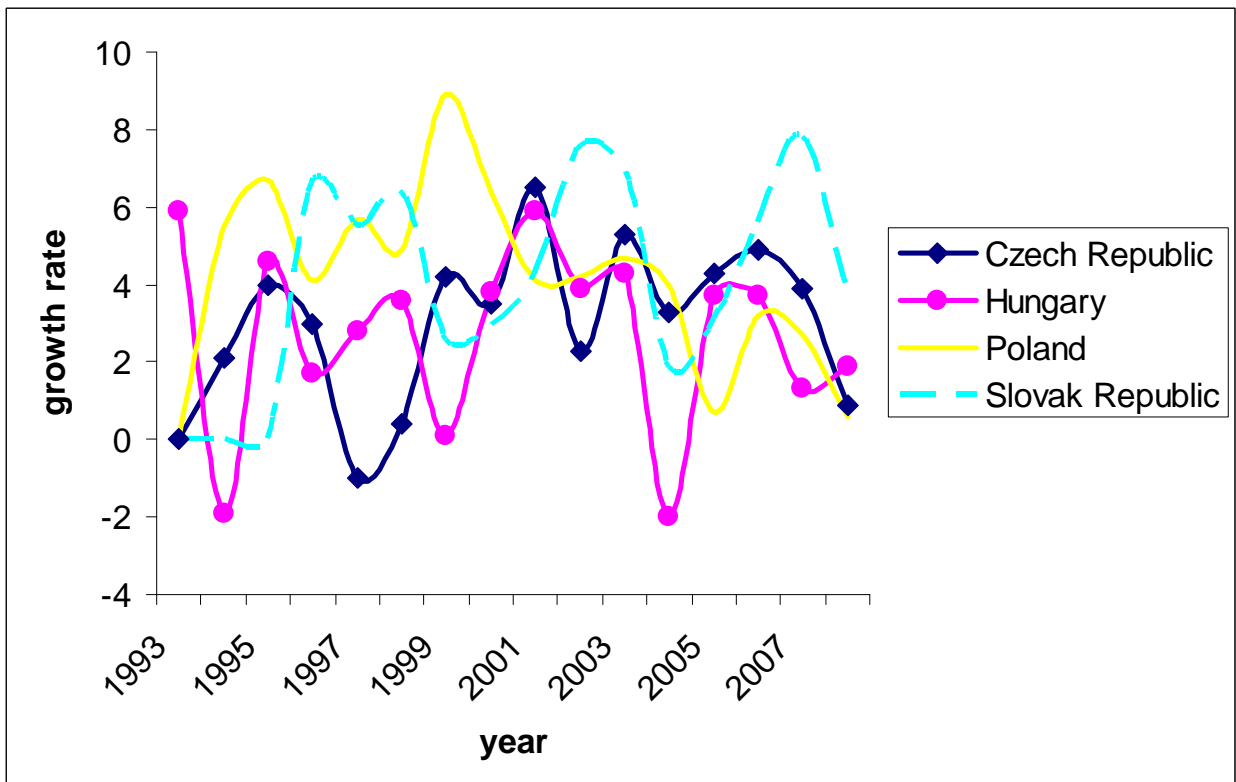
According to D'Artis and Julda (2010) in most Eastern European countries, emigration helped to reduce labour market pressures during the restructuring period and it reduced unemployment and increased productivity growth. However, it is evident that unemployment began to cease only after 1999, but the outflow of highly skilled took place in the beginning of the 1990s. Moreover, labour productivity growth rates didn't have any pattern and are very volatile. (See Figure 4) The volatility could be a result of successes due to foreign investments after the 1990s and the failure of remaining centrally planned economy burdens.

Figure 3. Unemployment rate in Eastern Europe (as a percentage of total labor force), 1991-2009.



Source: UNECE Statistical Division Database, compiled from national and international (EUROSTAT, OECD, CIS) official sources; World Development Indicators (WDI) Database of World Bank.

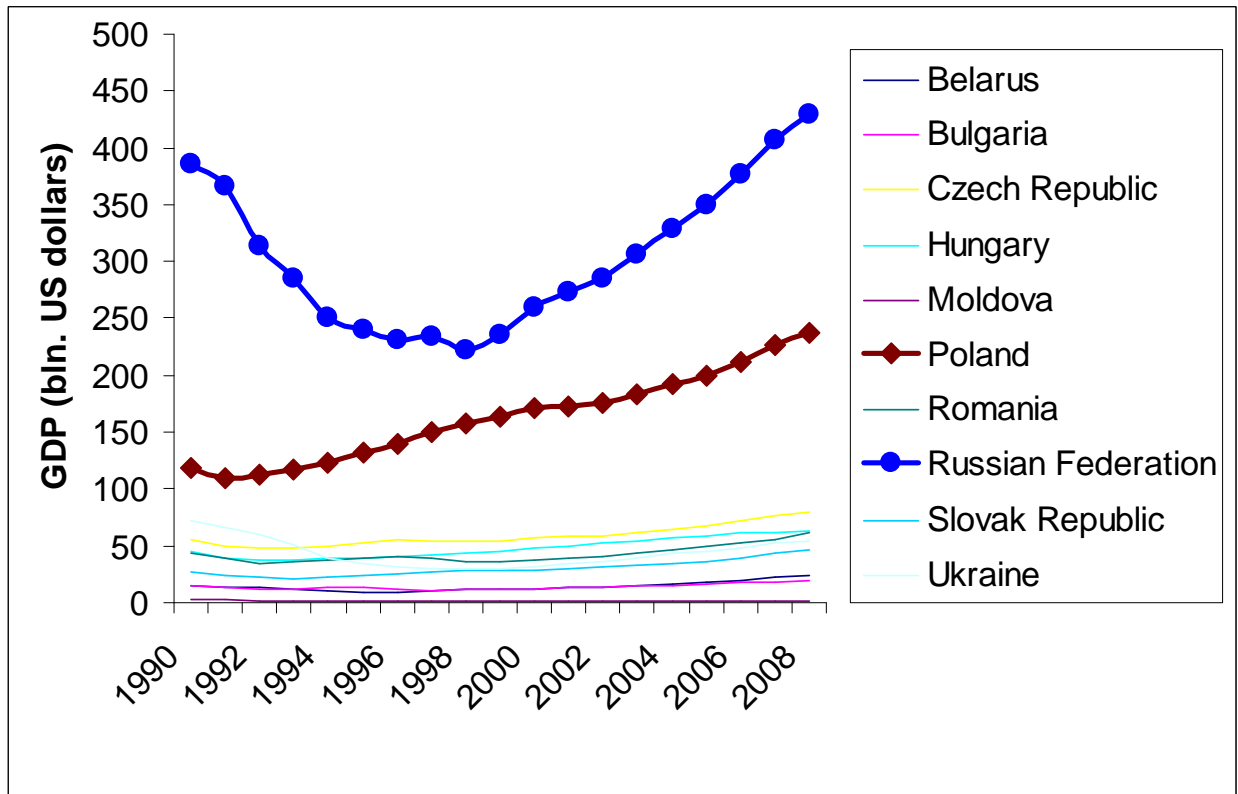
Figure 4. Labour productivity annual growth: 1993-2008



Source: OECD.Stat

Eurostat measures labour productivity by dividing Gross Domestic Product at constant prices by either total employment or total hours worked. Thus, according to this formula, when the employment is low, labour productivity may seem higher and vice versa. GDP in US dollars at constant 2000 prices is shown in Figure 5). Obviously, GDP growth has different patterns only for Russia and Poland, other countries follow similar patterns. Hence, the volatility in productivity may be explained by the changes in working hours and total employment.

Figure 5. GDP in billion US dollars at constant 2000 prices.



Source: World Development Indicators (WDI) Database of World Bank.

2.3.1.4. Unemployment of highly educated individuals.

The educational level of the labor force in Eastern Europe is high. Section 4.1.1 of the thesis will touch upon this issue more deeply. Education was the one of the indicators of the speed of countries to correspond to changing labor markets, to attract foreign investors and to adjust skills to a new level of market economy after the lift of Iron Curtain.

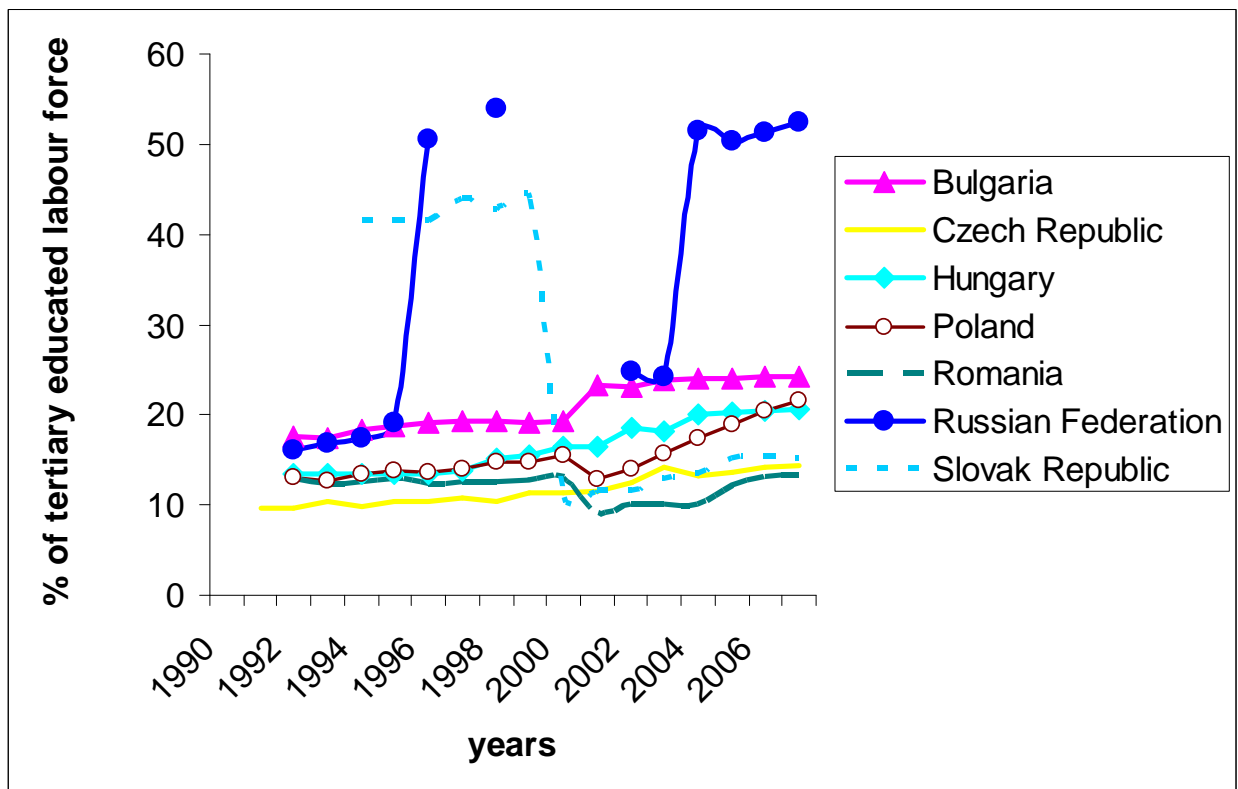
Figure 6 illustrates labor force with tertiary education as a percentage of total labor force in seven countries: Bulgaria, Czech Republic, Hungary, Poland, Romania, Russian Federation and Slovak Republic. The data for Belarus and Moldova are not available. For Ukraine the data are only available for 2002 and 2005 and constitute 66,1% and 45,2% respectively.

As seen from Figure 6, Slovak Republic had a sharp decline in tertiary educated labor force in 1999-2001 from 43,9% to 10,8 %. The reasons behind the decline could be a new concept of higher education adopted in 2000 that provided the creation of non-university sector in the country that concentrated on Bachelor programs. Hence, the statistical institutions didn't include new form of educational establishments into tertiary education sector. Another reason could be a massive entry of mobile operators in 1998-2001, privatization of the utility sector in the country which didn't stimulate people to go further than secondary education.

Statistics for Russian Federation is lacking data of four years (1997, 1999, 2000, 2001). It will be interesting to look at the fluctuations of tertiary educated labor force in the country. A

sharp decline is also visible for Russia in 2002 with a sharp increase of tertiary educated labor force in 2004. Presumably, the decline of skilled labor was a result of Russian Financial crisis from 1998, the emigration of highly skilled and the decrease in spending on education. Consequently, the upgrowth was a result of augmenting financing of education. For the rest of the countries with data availability (Bulgaria, Czech Republic, Hungary, Poland, Romania) in general, the parameter of labor force with tertiary education had a steady increase during 1992-2007.

Figure 6. Labor force with tertiary education (1992-2007)



Source: World Development Indicators (WDI) Database of World Bank.

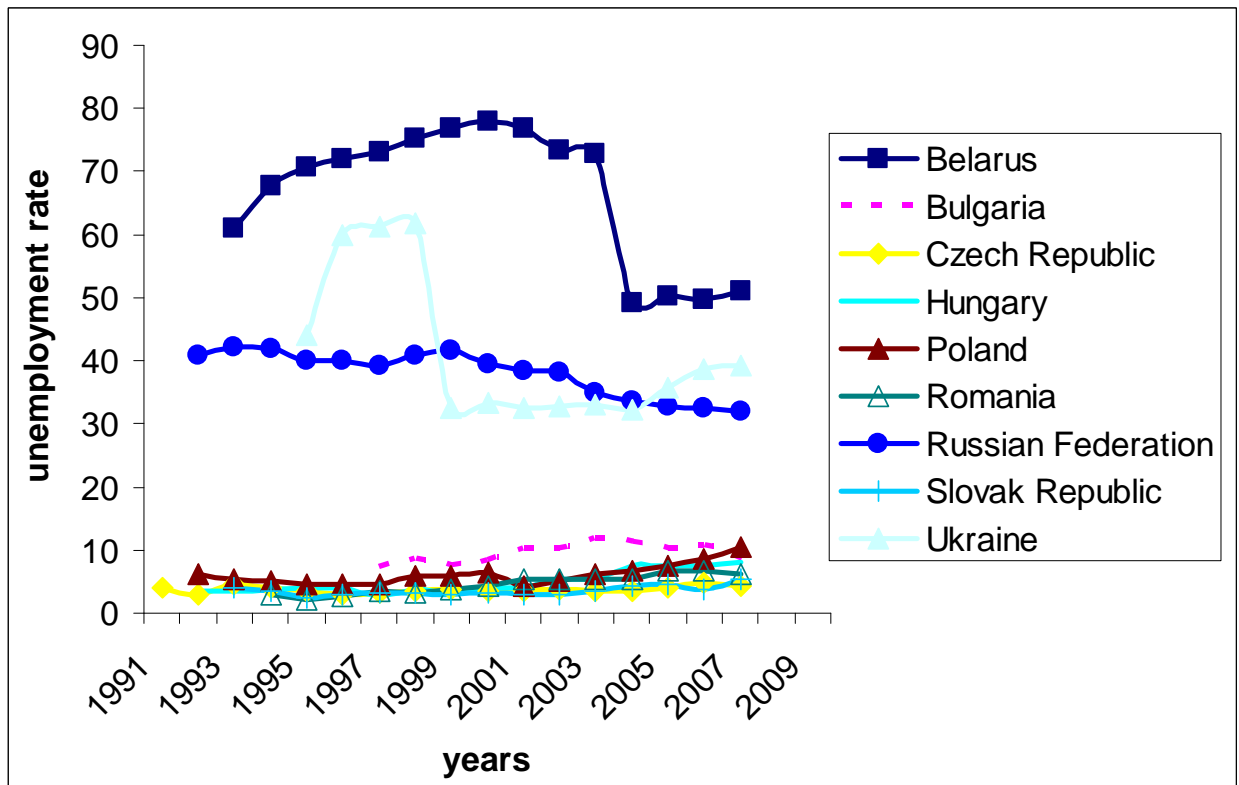
In order to analyze the factors that influence decision of highly skilled to emigrate, the unemployment rate of tertiary educated population should be studied. Figure 7 summarizes unemployment in this population group as a percentage of total unemployment in the country. The data for Moldova are lacking, but more likely that the values are quite high as for the other post Soviet countries: Belarus, Ukraine and Russia. These countries have the highest rate of unemployment among highly skilled individuals. Interestingly, the general unemployment rates are the lowest among studied countries, but when it comes to tertiary educated people, it appeared that they are very vulnerable to unemployment and sometimes constitute the majority of jobseekers.

Thus, the human capital of highly skilled in Belarus, Russia, Ukraine and probably Moldova is devalued and they have to seek for new employment opportunities either by reducing their requirements and accepting less skilled jobs or by searching for their knowledge application abroad.

To sum up, the unemployment is a visible push factor that drives emigration. Even by the time entering European Union, the perspective members didn't overcome the economic distress. A long lasting transitional process to market economy forced many highly educated people to accept unqualified jobs in their native countries. The reason of their human capital depreciation was a lack of demand for their knowledge and a low payment for their skills. Many tertiary

educated people in the former USSR in the 1990s were employed in retailing and wholesaling in the bottom-level positions that brought them more income than top positions in jobs demanded highly educated personnel. The educational attainment of the Eastern European population in general is high and therefore, tertiary educated and young skilled people are more likely to search for better application of the skills and getting higher returns abroad.

Figure 7. Unemployment rate of tertiary educated (as a percentage of total unemployment)



Source: World Development Indicators (WDI) Database of World Bank

2.3.1.5. Conclusions about labor market situation in Eastern Europe.

The period from the beginning of the 1990s was characterized by enormous changes in economy of Eastern Europe. The communist regime broke up giving a start to a new market economy. The restructuring process of the economy caused considerable change in GDP, great inflation and the rise of unemployment. Unemployment increased greatly after the USSR collapse and during the path to market economy. In addition, unemployment remained high for Poland, Bulgaria and Slovakia and reached near 15-18% before the accession of these countries to the European Union. Wage gaps between Eastern Europe and its main Western destination countries also determine migration outflows. Significant wage gap and difference in standards of living between these regions appeared to be the main push factors of emigration. Unemployment rate of highly educated remained very high in CIS countries. In contrary, total unemployment level is relatively low for these countries. Therefore, highly skilled population is at risk of being jobless. Thus, the push factors of emigration of highly skilled in post-Soviet countries are self-explanatory: unemployment rate for individuals with tertiary education constituted more than a half of total unemployed people. The rest of studied countries have relatively low unemployment of highly skilled (less than 10%). To sum up, labor market situation favored emigration and added to leakage of human capital from Eastern European region.

2.3.2. Overview of migration trends in Eastern Europe from 1990s.

Migration pressure in East Europe was stimulated by low wage level, over-employment, economic shocks and economical restructuring. Moreover, people were politically isolated of moving abroad. Before 1990, migration was “repressed” by totalitarian regimes.

Two historical events became crucial for shaping new migration trends in the region: the collapse of Soviet Empire and parliamentary elections of 1989 in Poland (Okólski 2007).

In general, the main reasons of migration can be stated as following: poorly functioning labour markets and insufficient productive capital. Thus, the main factors of migration were ethnical and economic and they were partly explained by the USSR dissolution. The flows were distributed between neighbouring countries with common historical, economic and cultural traditions. Some of migration trends are similar to general ones worldwide. However, some particular features apply to Eastern Europe given the circumstances of democratization, liberalization and transition to market economy.

Market economies in Eastern Europe were developing with different speeds. The process of integration into the international economy began in 1990. As a result, a large number of people lost their stable jobs due to closure of some industries due to inefficiency.

The economic situation pushed many people to emigrate abroad. The paper of Robila (2008) with referring to previously conducted studies in Poland and Ukraine, concluded that the rate of out-migration depend on the level of integration of the country with Western markets. The more the country is integrated, the higher the emigration rates are. Also Robila (2008) mentions that the majority of the immigrants were coming as a result of family reunion or as professionals. Professional immigrants came in search of jobs or Masters and Doctoral students and upon graduation receive US-based job offers.

Due to economic crisis and societal transformations many countries experienced large population losses. For example, Romania had the largest absolute population loss of 1.2 million in 1989-2002. More recent migration losses should become evident after the next round of population censuses in 2011 (Sobotka 2009). Hence, the lifting of the Iron Curtain resulted in increase of emigration in Eastern Europe. In the beginning of the 1990s a number of officially recorded migrants comprised approximately 850,000. This number was twice smaller that during the last 20 years (Salt 2002).

Kaczmarczyk and Okólski (2005) distinguish seven types of flows in Eastern European countries:

- 1) Migration for settlement (ethnically motivated, for family reunification and other)
- 2) Labour migration
- 3) Other non-settlement migration (flows related to study, professional training, business)
- 4) Incomplete migration
- 5) Flows of asylum seekers and refugees
- 6) Transit migration
- 7) Non-migration mobility (tourism).

Thus only labour migration and non-settlement migration is suitable when describing migration of highly skilled. Labour migration to the West could be underlined by Polish and Czech seasonal workers in Germany, Ukrainian workers in Poland. Non-settlement migration comprises for example students, scholars, professional and entrepreneurs abroad.

World Bank publication by Mansoor and Quillin (2006) mention that migration flows in Eastern Europe before the 1990s were tightly controlled. Migration flows were directed to Western Europe, emigration from the CIS countries was mainly internal. The main accepting countries were Germany (for Poland, Czech Republic, Slovakia, Bulgaria) and Israel (for Russia). In addition Russia was the main destination in intra-CIS emigration. The undocumented migration is estimated to be around 3 millions in EU and around 3,5 millions in Russia in 2006.

The collapse of communism encouraged a massive migration in the Eastern European region. In addition the break up of the USSR resulted in many statistical migrants defined by the

UN. They could be long term foreign-born residents who were not physically moved from the country. The patterns of migration have also changed since the USSR break-up: Russia became a net recipient of migration of CIS states.

According to UN Population Division (2002), Germany was the main receiving country in the West in the 1990s. The UK has outrun Germany after 2004. Other main receiving countries were the United States (with Poland and Ukraine as main sending countries), Israel (the Russian Federation, Ukraine). Eastern Europeans constituted “more than 80 per cent of all migrants in Israel and more than 70 per cent of all in Germany. In contrast, Eastern migrants are less than 10 per cent of the total number of permanent migrants recorded in the United States.” (p.21, UN Population division working paper 2002). The former USSR was a separate migration space where Russia attracted a net inflow of 3.7 million migrants from former states in 1992-1998. 79 per cent of this inflow was the repatriation of Russian nationals.

During the 1990s Eastern Europe was characterised by new types of migration:

- between the successor states of the USSR
- temporary labour migration to the West (Russians to Finland, Romanians to Israel, Czechs, Bulgarians, Poles and Hungarians to Austria and Germany);
- intra-regional flows of workers (Ukrainians, Belarusians, Romanians and Russians to the Czech Republic, Hungary and Poland);
- ethnic migrations from Poland, Romania and the former USSR to Germany, Israel and the former USSR. (Salt and Clarke 2000)

3. Data and method

3.1. Problems with data acquisition.

Since the early 1990s when freedom of movement has been restored the Eastern European region has witnessed a lot of emigration. According to OECD Secretariat, Eastern Europe can be considered as a separate migration entity when distinguishing different migration patterns. However, the lack of well-developed data is a crucial problem for the analysis. The reasons of data limitations are insufficient methods of data collection. In addition, the complexity of migration doesn't allow capturing short-term movements and status changes in CIS countries. Evidently, also illegal migration is not reflected. (Salt and Clarke 2000). The statistical systems during Communist times recorded only certain types of flows, mainly permanent migrants. Thus, it is difficult to access the data for migration flows from 1990.

The problem in the data for highly skilled consists of the absence of an agreed definition of a highly skilled person among scholars (Mahroum 2000). Chaloff and Lemaître (2009) suggest several possible definitions of highly skilled migrants: people who possess at least tertiary education, or according to wages: when they earn above a threshold value, or the level of occupation. Thus, they outline three definitions of highly skilled based on education, occupation or wage level. These three definitions are also used in receiving countries. In the thesis the term “highly skilled” refers to individuals who have at least tertiary education.

In order to measure migration of highly skilled, OECD and Eurostat have framed human resources devoted science and technology (HRST). It is called “Canberra Manual” and according to it HRST are those who: have completed education at tertiary level in science and technology or who are employed in science and technology even not formally qualified in it.

Today the main sources for migration data in the Eastern European countries are population censuses, administrative statistics of persons crossing international borders and surveys. World Bank, however, managed to create the dataset that measures international skilled migration for the years 1975-2000 in six main receiving countries of OECD.

A consistent data to estimate brain drain are partially covered. However, several attempts to aggregate the necessary data for the whole world and particularly for OECD countries were made. In the paper of Groizard and Llull (2004) the authors give an overview of existing datasets of highly skilled emigrants. Thus, Carrington and Detragiache (1998) classified foreign born

population in the United States and OECD countries in three groups (primary, secondary and tertiary educated) in order to calculate emigration stocks for 61 countries. Docquier and Marfouk (2006) collected data of migration rates by educational attainment for 170 countries for 1990 and 2000. The data are based on national population censuses.

The data of United Nations population division (UNPD) consist of the number of international immigrants by region and country of destination, but it doesn't classify the migrants by educational attainment. "General emigration rates may hide important occupational shortages (e.g. among engineers, teachers, physicians, nurses, IT specialists, etc)" (Docquier 2006, p.9).

Moreover Groizard and Lull (2004) state that "brain drain can only be captured by aggregating consistent immigration data collected in receiving countries" (p. 6, Groizard and Lull 2004). The statement looks quite logical and the information about the origin and skill of the immigrants is easier to get in the receiving country using national population censuses. Docquier and Marfouk (2006) following the United Nations concept of emigration, use country of birth rather than citizenship when calculating emigration rates. They stress that naturalization process is time-consuming and the data by country of birth are available in major OECD countries.

Capturing migration flows is problematic as the boundaries that were considered internal during the communist times are now international. Additionally, the visa-free travel among the CIS countries makes it difficult to record migration flows there. It took some time to adjust previous systems of centrally planned economies which were inadequate while measuring movements across newly formed states. Reporting systems differ significantly between the countries of the region, definitions of migrants are not clear: travellers, seasonal workers, and economic migrants are not clearly defined. Finally, the undocumented migration could change the statistics dramatically in case of CIS countries.

In addition, "the break-up of the Soviet Union, Yugoslavia, and Czechoslovakia created a large number of "statistical migrants." The commonly accepted UN definition describes a "migrant" as a person living outside his or her country of birth. As used here, statistical migrants refers to persons who migrated internally while those countries existed, thus not qualifying as a migrant under the UN definition at the time, but who began to be counted as migrants when those countries broke apart even though they did not move again. Having a large number of these statistical migrants has hampered analysis of migration patterns across the ECA region because of the difficulty of separating those who moved during the communist period, before the start of transition and independence, and those who moved later for ethnic or economic reasons. However, with data that are available from population censuses, it is possible to get a fairly good idea of the total number of statistical migrants and changes in their numbers since the breakup of the countries" (Mansoor and Quillin 2006, p.28).

According to OECD report "International Mobility of the Highly Skilled"(2001), brain drain in Eastern Europe can be overestimated as the rate of return of highly skilled is high. However, no data are available of this matter as the returnees can be considered as immigrants to the country.

In addition, student mobility is increasing and universities attract more foreign students and many of them are recruited after their studies. It worth stressing that students are also possible migrants after graduating. Firstly, they are a potential group of migrants because of their mobility and independency, Secondly, there is high unemployment among young people in Eastern European countries. Finally, young people have a higher chance to social assimilation as they possess knowledge of English and can learn the local language of the accepting country faster than the elder generation. Unfortunately, the data on students and foreign scholars who also a category of temporary migrants are difficult to gather.

Emigration rates of skilled migrants are estimated from different perspectives. In case of measuring brain drain they could be calculated as a percentage of total highly educated population in the home country. Another method is to calculate skilled emigrants as a percentage of total emigrants from the country. However, the most widespread way is to define emigration

rate of the highly skilled as a percentage of highly skilled natives in the receiving country. Such data of emigration rate of the highly skilled are available from Beine, Defoort and Docquier (2006) based on Docquier and Marfouk (2004, 2006). Docquier et al. (2007) state that emigration statistics provided by origin countries is insufficient to have a realistic picture of the emigration and brain drain itself. They consider aggregating harmonized immigration data should be collected in main receiving countries. They use the data that are collected in all OECD countries and include foreign-born individuals of the age 25 and over living in an OECD country in 1990 and 2000. The brain drain is defined as the migration of the highly skilled (i.e. post-secondary educated individuals).

Panel data on international migration of World Bank extended the time span of the study (1975-2000) and focused on six major receiving OECD countries (USA, UK, Germany, France, Canada, Australia). The emigration rate is defined as the ratio of the number of skilled emigrants aged 25+ to the total number of skilled natives aged 25+ (residents + emigrants). Skilled workers are those with a post-secondary certificate. These data don't cover the other receiving countries. The literature regarding the distribution of Eastern European emigrants emphasizes OECD countries as a major destination. With this in mind and taking into consideration that another data are unavailable, OECD countries data for the thesis seem sufficient.

3.2. Data and method of the study

The qualitative empirical analysis of the thesis is based on several data sources. Secondary data are used for the study. The analysis of educational attainment of migrants is based on the panel data (1975-2000) of Schiff and Sjoblom gathered in terms of Research Program for International Migration and Development of World Bank. This macro dataset has observation every five years and refers to the individuals aged 25 and over in six major receiving OECD countries (USA, UK, Germany, France, Canada, Australia). According to World Bank, these six countries accept around 77% of all migrants. Educational attainment is measured comparatively to the native population in the host country.

The data for the educational attainment are taken from Barro and Lee (2010) "Educational Attainment for Total Population, 1950-2010" that consists of 146 countries for the age group 15 years and over in 5-year interval.

Additionally, the data regarding labour market and other different economic and social indicators are taken from UNESCO Statistics, Eurostat Statistics, CIS Statistics, World Development Index Database of World Bank, UNECE Statistical division, United Nations Human Development Reports, Database on Immigrants in OECD Countries (DIOC). The datasets are representative for the research and possesses both reliability and validity. The database consists of official statistics regarding migration outflows.

It is aggregated data from national statistical institutions, population censuses and population registers

The longitudinal studies of the thesis use qualitative method with both descriptive and exploratory approaches.

4. Empirical analysis

4.1. Analysis of migration flows as defined by educational level

4.1.1 Measurement of educational attainment: enrollment rate in tertiary education and expenditures on education

Table 1 illustrates tertiary education attainment for the total population of the studied countries, except Belarus. The table is derived from Barro and Lee (2010) and it clearly shows that Ukraine has the highest and Romania has the lowest number of tertiary educated population.

Besides total tertiary educational attainment, it is possible to measure enrolment in tertiary education. Eastern European countries usually have very high enrolment in tertiary education. (See Appendix 1).

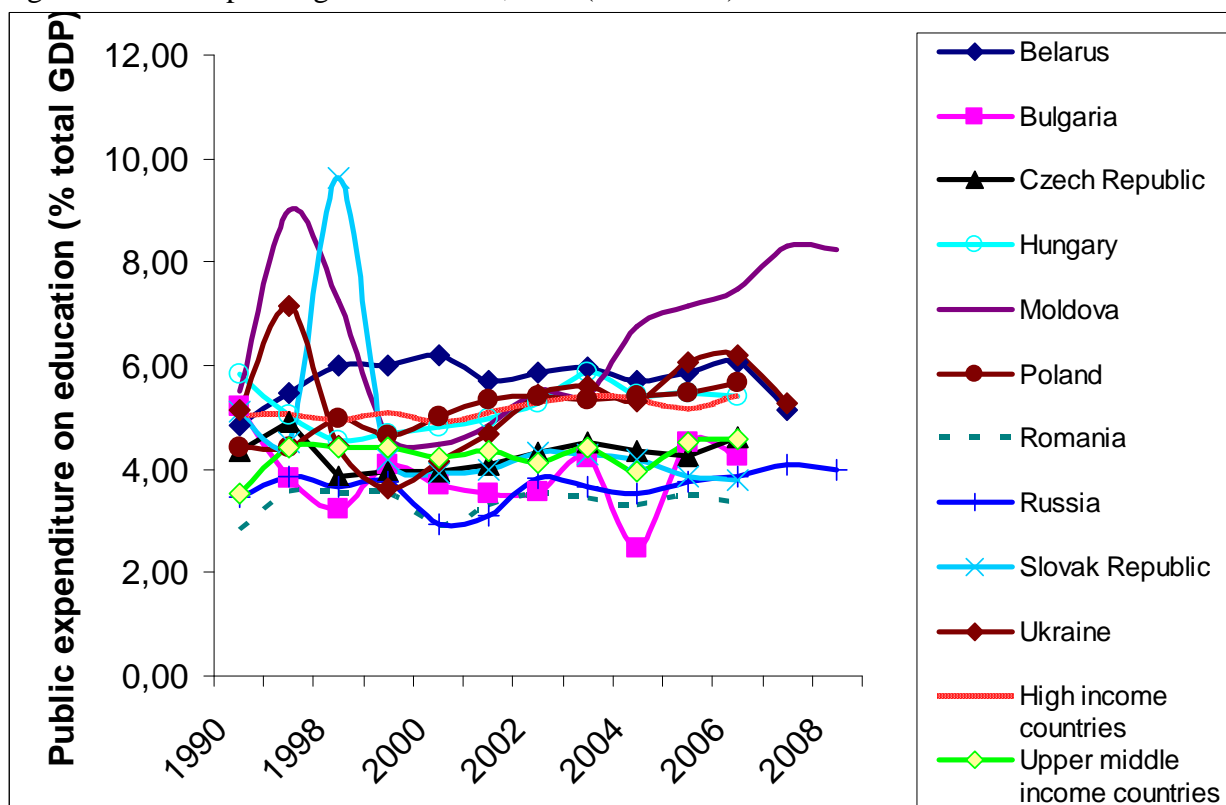
Table 1. Tertiary educational attainment for total population aged 15 and over (% of total population aged 15 and over)

Year	Bulgaria	Czech Republic	Hungary	Moldova	Poland	Romania	Russia	Slovakia	Ukraine
1990	15	13,7	10,1	11,3	7	6,9	13,7	9,5	20,8
1995	15,8	11,2	11	11,5	9,4	7,3	16,8	11,2	35
2000	18,4	10,2	12,6	11,6	12,8	9,1	15	11,7	36,7
2005	17,9	12,5	12,2	11,5	12,2	8,8	14,5	12,2	38,1
2010	17,7	10,5	13,8	11,5	13,8	10	13,8	12,4	39,2
Average	16,96	11,62	11,94	11,48	11,04	8,42	14,76	11,4	33,96

Source: Barro and Lee (2010), retrieved from <http://www.barrolee.com>

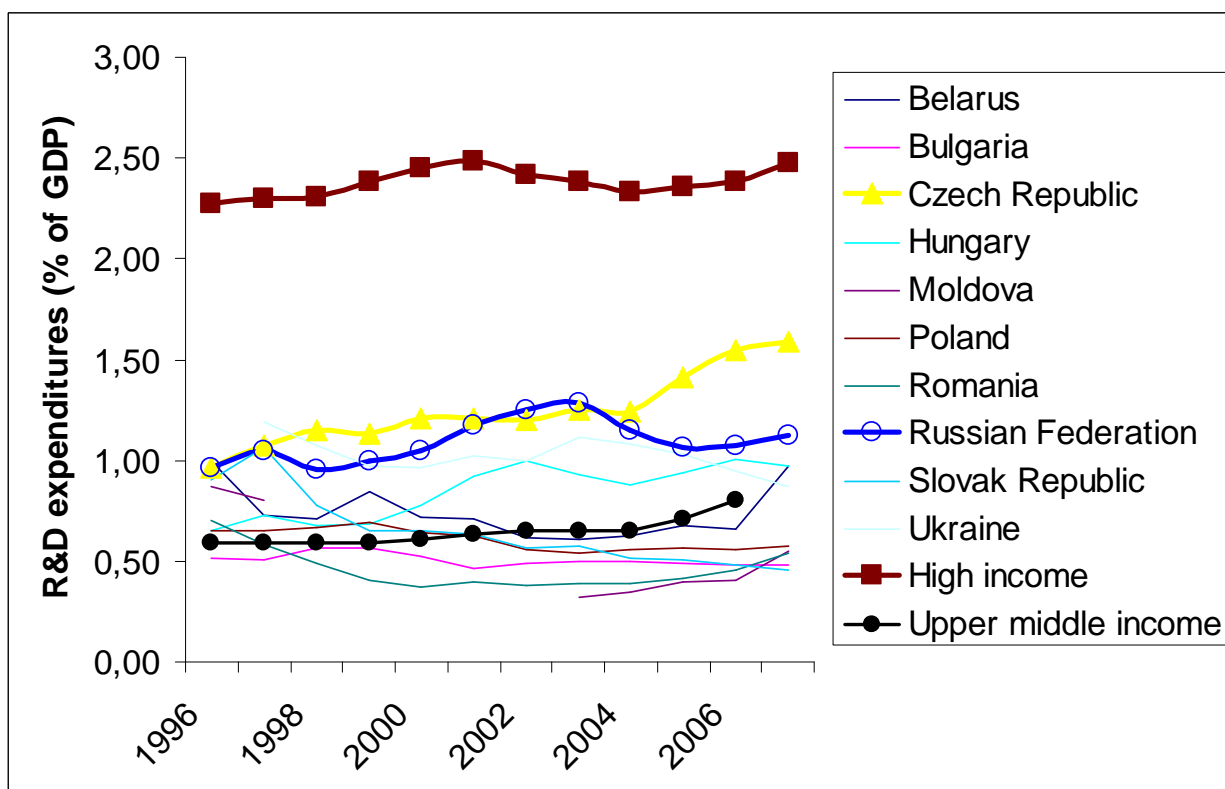
Expenditures on education reflect quality of the workforce of the country. They also can be determinants of the perspective educational level. The Eastern European countries have similar level of expenditures (see Figure 8). Belarus spent more on education than the high income countries during the whole studied period. Moldova, Poland and Ukraine augmented the expenditures during recent 5-7 years. Thus, high educational expenditures on education could contribute to the growth of human capital in the country and therefore lead to high educational attainment of the population. Research and development (R&D) expenditures also show the state of the science and the research technologies. In order to make the comparison, Eastern European R&D expenditures are shown together with high and upper middle income countries according to the World Bank. (See Figure 9).

Figure 8. Public spending on education, total (% of GDP)



Source: World Development Indicators (WDI) Database of World Bank.

Figure 9. Research and development expenditure (% of GDP)



Source: World Development Indicators (WDI) Database of World Bank.

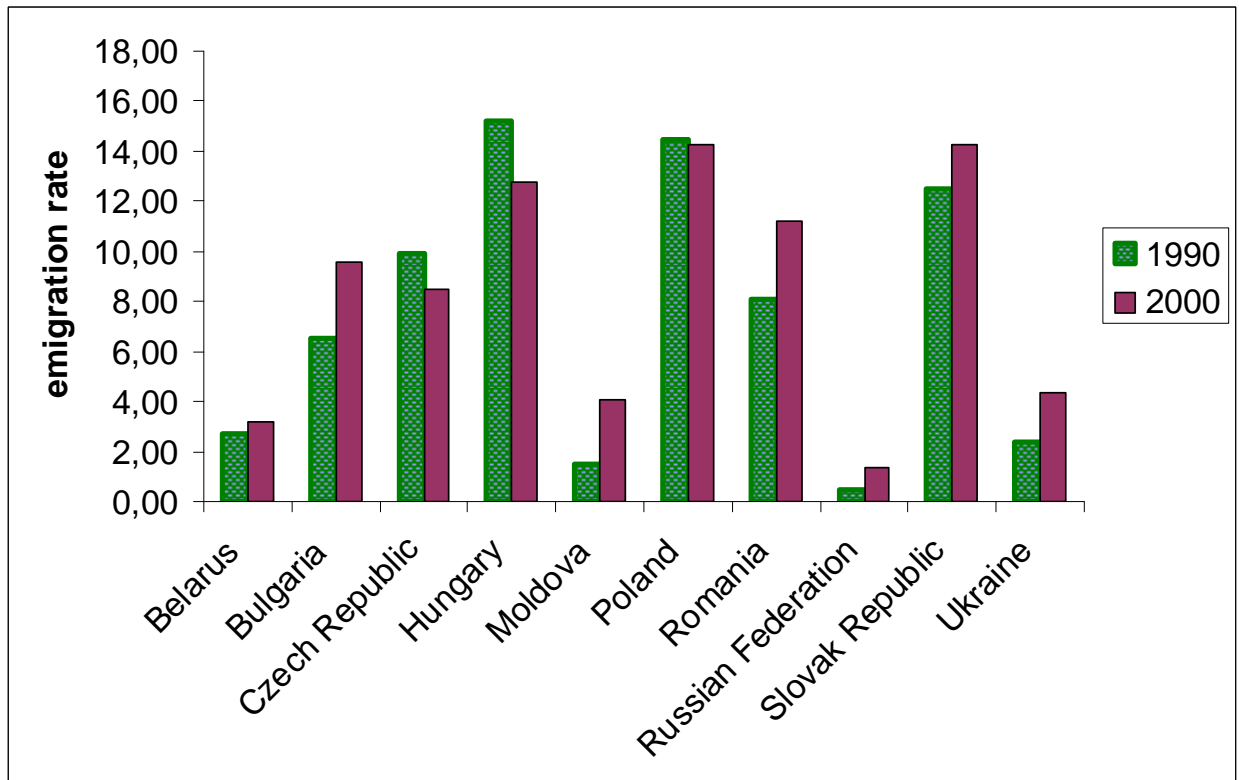
Thus, Russia Ukraine, Czech Republic, Hungary and Belarus have the level of R&D expenditures higher than in the upper-middle countries in general. Moldova has the lowest level of R&D expenditures among the studied countries. However, Hungary and Czech Republic together with high expenditures in R&D also have high level of emigration of tertiary educated individuals. Thus, the R&D expenditures in these countries do not stimulate scientists to conduct their researches in the home country. Moreover, these expenditures are almost two times less than in high income countries.

4.1.2. Migration of the highly skilled

Obviously, brain drain is more severe in small countries and in countries with less skilled people. Therefore, Romania is a subject to devastating effect from the brain drain. From Figure 10 it can be concluded that the number of emigrants in the former Soviet Union is approximately 3 to 5 percent of the total number of tertiary educated population; for other countries of the region 5-12 percent. Consequently, Hungary, Poland and Slovakia having high educational attainment of the population also have high levels of skilled emigration.

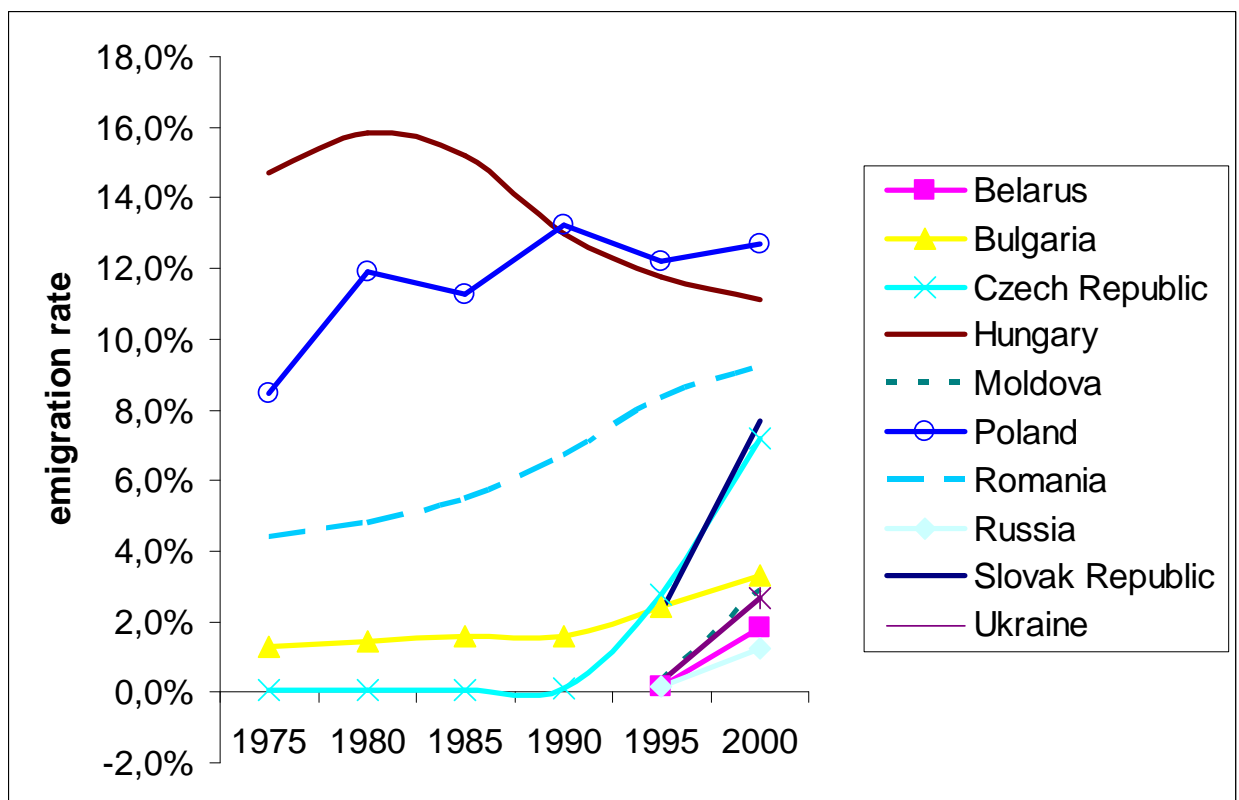
When Brain Drain Database of Docquier and Marfouk focuses on emigration rates to all OECD countries for 2 years (1990, 2000), panel database of Schiff and Sjoblom summarizes over time development of emigration rates to six major OECD receiving countries (See Figure 11). The data for Former-Soviet countries and Slovak Republic are available for 1995-2000.

Figure 10. Emigration rate of tertiary educated (% of total tertiary educated population)



Source: World Bank Brain Drain Database (2006)

Figure 11. Emigration rate of highly skilled 1975-2000

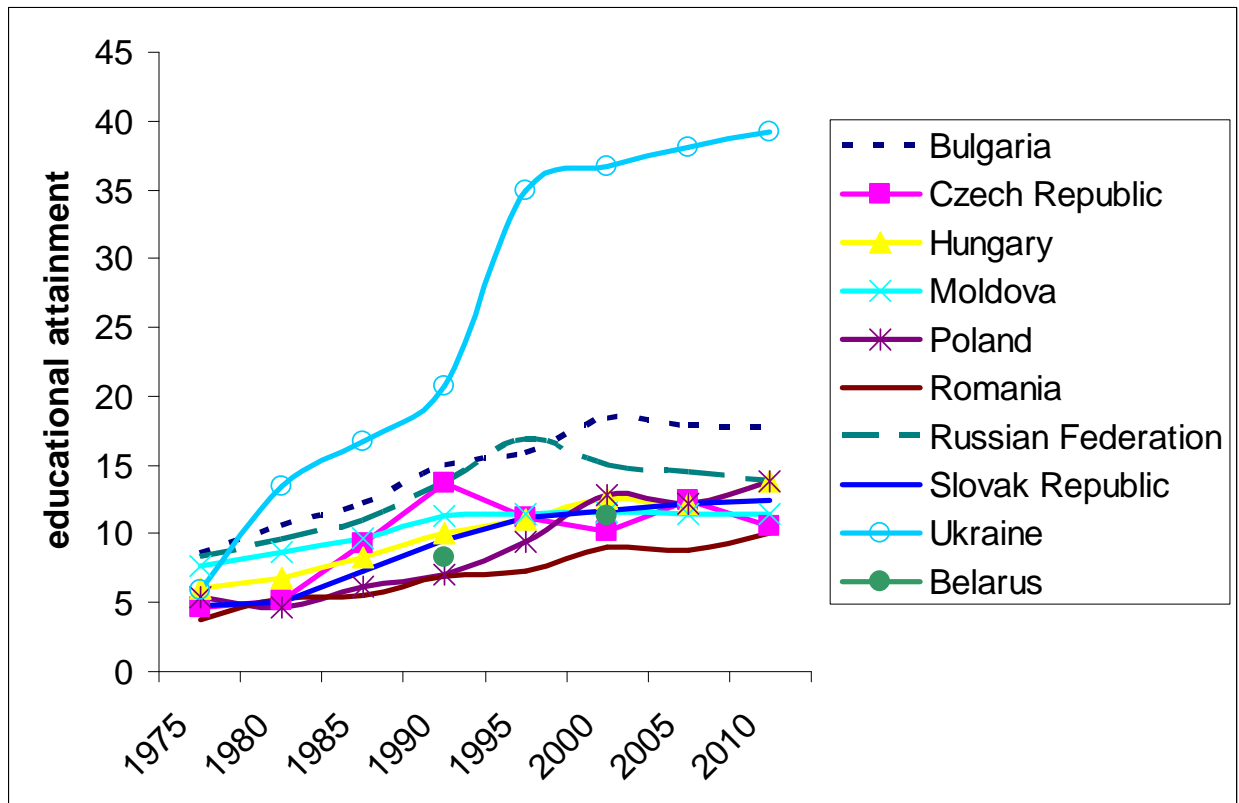


Source: World Bank panel database on international migration.

Thus, post-Soviet countries in 1995-2000 have undergone the similar pattern of skilled emigration increase. In 1995 the rates of emigration remained low with a visible increase in five years. The other Eastern European countries (except Hungary) also have an increase of skilled emigration through 1975-2000. After 1990, emigration ceased in Hungary and Poland with an increase in 1995 for the latter. In general, skilled emigration remained high for Hungary, Poland, Romania. Bulgaria and Czech Republic have been exposed to noticeable upgrowth of emigration since 1990, Slovakia – since 1995.

In order to distinguish the relation between outflow of highly skilled and educational level, Figure 12 visually shows tertiary educational attainment trends for the countries.

Figure 12. Tertiary educational attainment of total population



Source: Barro and Lee (2010), Statistics Belarus

Thus, Hungary, Poland and Romania, being the leaders in skilled emigration among Eastern European countries have lower tertiary education attainment than Russia, Bulgaria and Ukraine which have the lowest emigration rate. Ukraine has the highest level of education and Romania has the lowest. At the same Ukraine is among the countries with low skilled emigration rates and Romania refers to the opposite category. Moldova and Poland have similar patterns in high educational attainment, but differ in emigration rates: Poland has one of the highest rates; Moldova is among post-Soviet countries with low emigration rates of highly skilled. Russia has higher educational attainment of the population than Romania being the country sending much less skilled emigrants than Romania. Only Slovak Republic has supposed pattern in educational attainment and in skilled emigration from 1995: increase in education in 1995-2000 leads to increase in skilled emigration. Summing up, the educational attainment of the population is not in the direct relation with the outflow of the highly skilled.

When looking at the highest educational attainment of the migrants as a percentage of total emigrants from the home country and their unemployment rates in OECD countries, some more conclusions could be withdrawn (Table 2).

Post-Soviet countries have the most highly skilled emigrants among Eastern European region to OECD countries. Moldavian and Russian immigrants end up with the highest unemployment levels, when Ukrainian and Belarusian immigrants are less vulnerable to unemployment. The pattern seems weird as the countries belong to post-Soviet countries and had similar approach to education. However, Moldavian and Russian skilled emigrants are less demanded than Ukrainian and Belarusian.

The data on skilled migration have a drawback, namely it can generalize the educational attainment numbers. It does not underline whether the education has been acquired in the home or in the host country. Thus, the brain drain could be overestimated. Beine et al. (2006) use the age of entry of the immigrants to the OECD countries as a proxy for where education has been acquired. The skilled emigration rates are lower than the ones calculated without the age of entry (Appendix 2).

Table 2. Education and employment of international migrants in OECD countries (aged 15 years and above) 2000-2002 as a % of all migrants aged 15 and over

	tertiary educational attainment of the migrants	unemployment rate of tertiary educated migrants
Belarus	25,0	6,4
Bulgaria	13,0	8,7
Czech Republic	23,7	3,6
Hungary	27,4	5,0
Moldova	34,6	10,3
Poland	21,1	6,1
Romania	22,3	5,9
Russian Federation	27,1	13,0
Slovak Republic	12,9	3,9
Ukraine	27,0	7,9

Source: Human Development report 2009, UNDP

4.2. Discussion

4.2.1. Scope of the educational loss

Since the 1990s skilled migration has accelerated. Obviously, the outflows of the highly skilled grow more rapidly than the less skilled migrants. For example, labour force survey in the European Union shows that highly skilled migrants constituted around 38 percent in 1997. (Commander et al. 2004). Moody (1996) describes the brain drain of military and defence researchers, but in general the trend of emigration remains similar for highly skilled in the post-Soviet area. Before the break-up of the USSR, scientists and engineers were under a strict control. The opportunities to travel abroad were limited and had to be approved by the top party. With a collapse of the Soviet system and disappearance of the restrictions to emigrate, the scientists started to search for opportunities to move abroad.

Table 3 gives an overview of the emigration rates of tertiary educated in Eastern Europe in 1990 and 2000.

Table 3. Emigration rate of tertiary educated (% of total tertiary educated population)

	1990	2000	% change
Belarus	2,74	3,19	16,18
Bulgaria	6,53	9,57	46,61
Czech Republic	9,90	8,50	-14,10
Hungary	15,24	12,79	-16,09
Moldova	1,47	4,05	175,42
Poland	14,46	14,24	-1,50
Romania	8,10	11,19	38,19
Russian Federation	0,48	1,38	189,11
Slovak Republic	12,48	14,28	14,42
Ukraine	2,35	4,34	84,86

Source: World Development Indicators (WDI) database

Within ten years the scope of educational loss increased dramatically in Bulgaria, Romania, Moldova, Russian Federation and Ukraine. Belarus and Slovak Republic have medium increase of brain drain. Czech Republic, Hungary and Poland have decrease in emigration of tertiary educated. The possible reason is temporary economic upturn and incentives for highly skilled to stay in the country of origin.

Educational loss for the country is very evident for Moldova, Russia, Ukraine, Bulgaria and Romania for ten years from 1990 to 2000. Even though educational level augments in long run in these countries, the leakage of human capital will diminish positive effects from investment in education.

4.2.2. Brain drain interpretation and assessment.

In general, it is more likely than the more educated the population is, the higher will be the rate of tertiary educated migrants. However, the case of Eastern Europe shows that the possession of higher education does not follow this pattern. Ukraine has the highest average attainment in tertiary education and the percentage of this group increases, but emigration rate of highly educated is low. The same pattern of low emigration of skilled applies to Russia, Moldova and Belarus.

Thus, the empirical evidence implies that post Soviet countries have very low emigration rates of highly educated and follow the same pattern of its increase. At the same time the tertiary educational level of the population in the countries is rather high. From all immigrants to OECD countries from these countries the average number of Post-Soviet highly educated varies from 25 to 35 % (Table 2).

In case of internal mobility in Eastern Europe, migration within the Post-Soviet countries was directed primarily to Russia. After 1991 Russia felt the strongest migration gains from the countries of the former Soviet Union. Migration was driven not only by income differentials, but the desire to escape conflicts. After the collapse of the Soviet Union there were 53 different ethnic homelands and diasporas living outside their ethnic area. Thus, ethnical migration was one of the patterns during the beginning of the 1990s transition period. As economic motives were not driving forces of the “diaspora” migration, Russia benefited from knowledge inflows. Additionally, the former USSR educational system didn’t demand educational recognition and legalization of the CIS countries immigrants. Therefore, the adoptive capacity of Russia was good enough to accumulate more human capital.

When talking about scholars and scientists, it is obvious that the youngest and best researchers are most likely to leave the country. The outflow of skilled workers has negative impact on the quality of the research of the source country. In 1996 UNESCO estimated the

decrease of the Russian scientists from 900,000 to 500,000 from 1991 to 1995. Ukraine was losing near 15,000 tertiary educated every year since 1990. Bulgaria had the number of 50,000 qualified scientists leaving the country annually. The main incentives in the receiving countries were mentioned as access to new technologies and higher salaries. To give an example of the outflow of highly skilled in OECD report “International Mobility of the Highly Skilled” (2001) Gokhberg and Nekipelova in chapter 10 called “International migration of scientists and engineers in Russia” underline that R&D sector in Russia faced problems in financing in the 1990s, employment and salaries declined, the prestige of science and technology sector declined and a large-scale outflow of scientists occurred. The majority of researchers were employed in OECD countries.

The rest of Eastern European countries (Bulgaria, Hungary, Poland, Slovakia, Czech Republic, Romania) have different patterns in migration-education relationship. Romania seems to have the opposite effect, rather than the one expected in this study. Having low educational attainment of the population, it has high brain drain. Thus, the outflow of skilled influence greatly the overall educational level as less skilled people remains in the country. Bulgaria has high level of education and low emigration of highly skilled; thus, the country follows the same pattern as post-Soviet countries. Hungary, Poland, Slovakia and Czech Republic have similar educational attainment patterns. Nevertheless, Hungary and Poland have the highest skilled emigration rates, while Czech Republic has a fluctuating pattern of high educational attainment. Slovak Republic has increasing educational attainment and at the same time increasing pattern of emigration from 1995.

Thus, only Slovak republic confirms the hypothesis that implies positive relationship between education and migration. This finding is in line with previous studies Caces 1985, Caldwell 1969; Stark and Taylor 1991; Donato 1993; Yang and Guo 1999).

However, the rest of the countries provide ambiguous results. It implies insignificant effects of education on migration concluded by other scholars. (Emerson 1989; Adams R.H. 1993; Curran and Rivero-Fuentes 2003, Sahota 1968). (Williams 2009; Quinn and Rubb 2005). Taking into account the varying patterns of relations between migration and education, one of the plausible explanations is that the relation between migration and the level of the education is not determined by the global context of Eastern European countries, but by a set of characteristics specific for every particular country. Hence, geographic area doesn't have similar schemes of skilled migration. Another explanation is the nature of the data used for the research. It turned out to be a rather challenging task to find one source with relevant data for all the countries. Consequently, the data were obtained from a wide range of sources that used different methods of data collection.

5. Conclusion

The present paper offers an insight into the link between migration and education for Eastern Europe. A lot of literature exists on the brain drain phenomena, but no studies have been conducted to assess the interrelation between education and migration for the region. The previous studies regarding this matter were mainly focused on internal migration of other countries (Donato 1993, Massey et al. 1987, Taylor 1987, Curran and Rivero-Fuentes 2003, Yang and Guo 1999, Caldwell 1969, Lucas 1985, Adams R.H. 1993, Williams 2009, Sahota 1968, Emerson 1989, Caces 1985, Antolin and Bover 1997). It was interesting to discover different patterns of migration-education relationship. Moreover, the findings prove the necessity to conduct further study for the Eastern European region. Hence, the study adds to the common knowledge of migration phenomenon and its driving forces as well as helps to design policy of brain drain prevention. The empirical evidence highlights the different nature of education-migration interaction. Of particular interest were the results that for majority countries increase in educational attainment is not connected to the increase of highly skilled emigrants. Thus, brain is not determined by the global context of Eastern European countries, but by a set of

characteristics specific for every particular country. Hence, geographic area doesn't have similar schemes of skilled migration for separate Eastern European countries. Even though this study derived some insightful conclusions, a lot remains to be handled. Thus, it is crucial to keep in mind that migration is firstly driven by demand-supply situation of the labour market.

6. Further research

Whereas the present paper is primarily deals with general figures for migration-education relationship, the study could be extended to the analysis of highly skilled emigration from gender perspective. To my knowledge, gender differentials in skilled migration decisions for Eastern Europe haven't been studied before. Thus, the extension of the previous research could shed light on this issue. To conduct a research, World Bank has a dataset available (Brain Drain by Gender, 2008).

The next recommendation is rooted in one of the possible reasons of ambiguous results concerning the character of data applied in the study. It was assumed that the accuracy of the data is somewhat questionable. If this is true, then it is important to allocate maximum resources to ameliorating data collection procedures in home as well as host countries. Such improvement will be beneficial for both sending and receiving countries. In the case of the sending country, the government will gain valuable information about the characteristics of migrating people and apply this information when to creating policies to prevent brain drain. Regarding receiving country, the awareness of educational levels of the arrivals possesses potential for using these additional external educational sources for county's development. This is especially true if to take into account the fact that an overwhelming number of migrants are left out of the economic and social life of the country of their new residence (eg.: Carlsson and Rooth 2007; Constant and Zimmermann 2009).

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Appendix

Appendix 1

School enrollment in tertiary education (% gross)

	Belarus	Bulgaria	Czech Republic	Hungary	Moldova	Poland	Romania	Russian Federation	Slovak Republic	Ukraine	Low income countries	Low and middle income countries	Middle income countries	High income countries
1991	47,62		15,97		35,52		9,67	52,13		46,98				
1998	48,06			31,07					24,48	45,24				
1999	50,92	45,58	26,41	33,84	33,43	44,76	21,80		26,25	47,19	4,79	12,95	14,59	57,00
2000	53,40	44,70	29,42	37,29	32,78	49,70	24,04		28,76	48,94	4,93	13,54	15,31	57,00
2001	55,91	42,85	30,91	40,74	32,18	55,05	28,48		30,37	52,37	5,34	14,46	16,36	58,67
2002	58,13	40,21	35,07	44,98	33,24	58,40	31,79		32,25	56,86	5,43	15,47	17,58	63,68
2003	60,16	41,22	37,12	51,75	34,15	60,19	36,40	65,70	33,89	60,67	5,55	16,50	18,81	65,65
2004	61,52	41,54	43,51	58,89	34,97	61,74	40,41	69,71	35,89	64,77	5,60	17,47	19,98	66,69
2005	63,62	44,03	48,12	63,87	37,32	64,09	45,17	71,77	40,29	68,50	5,66	18,18	20,83	67,57
2006	65,78	45,90	49,95	66,77	39,81	65,58	52,24	72,78	44,76	72,78	5,90	19,15	21,98	68,13
2007	68,36	49,72	54,30	67,21	40,69	66,91	58,27	75,04	50,12	76,37	6,27	20,23	23,22	68,59
2008	72,84				39,86					79,44				
Average	58,86	43,97	37,08	49,64	35,81	58,49	34,83	67,86	34,71	60,01	5,49	16,44	18,74	63,66

Source: World Development Indicators (WDI) Database of World Bank

Appendix 2

International migration of highly skilled controlling for age of entry.

Country	Brain drain 0+		Brain drain 12+		Brain drain 18+		Brain drain 22+	
	1990	2000	1990	2000	1990	2000	1990	2000
Belarus	-	3,2%	-	3,1%	-	3,%	-	2,9%
Bulgaria	4%	6,8%	3,90%	6,6%	3,8%	6,5%	3,7%	6,2%
Czech Republic	-	10,4%	-	9,6%	-	9,2%	-	8,4%
Hungary	14,4%	13,2%	12,80%	11,7%	11,8%	10,8%	10,3%	9,3%
Poland	14,4%	14,1%	13,10%	13,%	12,3%	12,2%	11,3%	11,2%
Moldova	-	3,6%	-	3,5%	-	3,5%	-	3,3%
Romania	9,1%	11,9%	8,70%	11,4%	8,2%	10,8%	7,7%	10,2%
Russian Federation	-	1,5%	-	1,4%	-	1,3%	-	1,3%
Slovakia	-	16,7%	-	15,9%	-	15,4%	-	14,4%
Ukraine	-	3,6%	-	3,4%	-	3,3%	-	3,1%

Source: World Bank International Skilled Migration Database (2006)