Emigration from Eastern Europe with a Focus on Brain Drain

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Abstract

The objective of this paper is to offer a better understanding of the situation on emigration, with a focus on the emigration of the university-educated individuals, from 6 different Eastern European countries, namely Bulgaria, the Czech Republic, Hungary, Poland, Romania and the Slovak Republic. The period studied is 1980-2010, with a greater emphasis on the last decade, as the emigration from these countries increased sharply especially after their adhesion to the European Union. The paper is divided into 2 main parts: the first part focuses on a regression analysis, whose purpose is to determine the main factors that influence the brain drain.

First, data on tertiary educated emigration rates, unemployment rates of the tertiary educated, GDP per capita, wages adjusted for inflation, consumer price indexes and education expenditures were collected for the period 1980-2010 (5 year intervals) and in some cases 2011 as well, for all 6 Eastern European countries. The results showed that Romania and Poland are the most affected by the brain drain. The factors that were significant in shaping emigration were the wages (influenced by GDP) in these countries, as well as the education expenditure (influenced by the inflation).

The second part of this paper focused firstly on the evolution of some important indicators- unemployment rate, wages, GDP, in these 6 countries throughout the years and then on some of the migration aspects and issues. It is confirmed that Romania and Poland suffer most from the brain drain, whereas Romania and Bulgaria experienced the highest total emigration rates in 2010. A positive aspect regarding the brain drain is the amount of remittances sent in the home countries. From this point of view, Bulgarian emigrants send the biggest amount of remittances. The issue of brain waste is pretty common among Eastern European countries and it manifests itself mostly in the case of the tertiary educated Slovak emigrants. Bulgaria, the Czech Republic, Hungary, Poland, Romania and Slovakia are all faced with difficulties in the labor market, because the departure of their highly skilled population is not compensated by a significant enough immigration of foreign population. Policies in order to attract foreign born population or to persuade emigrants to return to their home countries have been implemented in several of these 6 Eastern European countries. Poland, in particular, made efforts in order to make the Polish emigrants aware of the opportunities on the Polish labor market and convince them to return home and maybe even open their own business, with the help of specially created loans for them.

Another issue related to the brain drain is the created shortage of physicians, nurses, teachers, scientists and IT specialists on the labor market in the Eastern Europe countries that are the focus of this paper. Since these occupations are in high demand in certain countries of the Western Europe and since none of these 6 Eastern countries cannot afford to offer high enough
wages to the people working in these occupations in order to stop them from emigrating, the brain drain in these particular fields is getting bigger. The most preferred destination countries for tertiary educated emigrants are the United Kingdom, Germany, Ireland, the United States and Canada. The United States and Canada are known for being the main destination countries for highly skilled emigrants around the world. These 2 countries actually favor this kind of immigration through some particular policies.

Last but not least, this paper offers some possible directions for future research regarding the brain drain phenomenon affecting the Eastern European countries.
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1. Introduction

Approximately 3% of the world population lives in a different country from which they were born in. (http://www.unfpa.org/pds/migration.html). Usually, people leave their home countries searching for a better life, a better wage and more career opportunities. They leave their comfort zone for a different place, where the culture, the language and many more may be different. The migration process nowadays is not what it used to be. Highly skilled individuals find it easier now to move to a new country, as they could bring a lot more than their skills to the “adoptive” country.

The migration process has a certain impact not only at the individual level, but also on both the origin and destination countries in terms of economic, social, political and cultural implications and this is why the phenomenon of migration has been intensively studied and it has also been an important political topic of discussion throughout the years, especially with regards to the emigration of the university-educated individuals. However, while a lot of focus has been on the least developed countries, and within good reason, since a great majority of them experience a very significant brain drain, there have not been as many studies that would analyze the brain drain phenomenon in Eastern European countries, partially due to the fact that many of them had been under communism domination for many years and therefore emigration only occurred under illegal terms, with a few exceptions, of course. Eastern Europe has started experiencing a more massive brain drain in recent years, especially since some of the Eastern Europe countries joined the European Union in 2004 and 2007. Considering the fact that out of the few studies on Eastern Europe brain drain, many of them would not comprise an analysis of several countries, the idea for this current paper came.

The objective of this paper is to offer a better understanding of the situation on emigration, with a focus on the emigration of the university-educated individuals, from 6 different Eastern European countries, namely Bulgaria, the Czech Republic, Hungary, Poland, Romania and the Slovak Republic. The period studied is 1980-2010, with a greater emphasis on the last decade, as the emigration from these countries increased sharply especially after their adhesion to the European Union. The reason for this choice of countries to be studied was in order to make an additional comparison between first of all, the 4 OECD countries studied in this paper, the Czech Republic, Hungary, Poland and Slovakia and the other 2, Bulgaria and Romania, to see if this has any influence on the emigration situation. Second of all, due to the fact that Bulgaria and Romania joined the European Union later on, in 2007, unlike the other 4 countries, in 2004, it would be easier to see whether the European Union played, indeed, an important role in the increased emigration of all these countries or whether, maybe, some of these countries suffered from the brain drain before even joining the EU.

The remaining of this paper is organized as follows: section 2 is called “Literature Review”, whose objective is to offer the reader a deeper understanding of the theories, empirical
models and perceptions regarding the brain drain phenomenon throughout the years. In section 3, an empirical model is built in order to see what the main determinants of the emigration of tertiary educated people from the 6 countries in question to the OECD region during the period 1980-2010 are.

Section 4.1 offers a brief description of the 6 Eastern European countries, from an economical and social point of view. The focus in section 4.1 is to see how a few important indicators (GDP per capita, unemployment rate, gross average monthly wage) have evolved throughout the years in these countries. Section 4.2 offers a general overview of the total emigration rates, as well as the emigration rates of the university educated population in all 6 countries throughout the years and it also touches on the subject of immigration in these countries as well as the importance of remittances and the issue of the brain waste, which seems a rather common phenomenon among the emigrants from these Eastern European countries. Sections 4.3-4.8 consist of a more comprehensive description of each Eastern European country analyzed in this paper. Finally, there is the conclusion, whose role is to summarize the ideas and findings gathered in this paper and to offer any further advice on future research.

**Delimitations**

Migration is influenced by a combination of economic, political and social factors, either in a migrant’s country of origin (push factors) or in the country of destination (pull factors). In this paper, there will only be analyzed the factors that influence migration in the origin countries. The single pull factor to receive closer attention will be the orientation of emigrants to certain destination countries.

Moreover, the nature of the push factors mostly analyzed in this paper will be economical and social and to a smaller extent, political factors.
2. Literature review

According to Rapoport (2002) the term “brain drain” had been used for the first time in the 1950s, referring to the highly skilled scientists that immigrated to the United States from United Kingdom, Canada and the former Soviet Union.

While unskilled migration has been considered a positive phenomenon not only for the emigrants themselves, but also for their families and their sending countries, skilled migration has been generally regarded as a detrimental phenomenon to the sending countries, because they are deprived of their human capital, which is one of their scarcest resources. It is generally believed that if the brain drain were to be eliminated, the inequality across nations would be significantly reduced.

The early economic literature of the 1960 underemphasized the negative externalities imposed on the origin countries.

In the paper written by Grubel & Scott (1966), the focus of the analysis is the changes in income caused by the emigration of high skilled individuals. According to this paper, emigration is beneficial as long as income is maximized. In order for this to happen, two conditions need to be met: the first one is that the emigrant increases its own income and the second condition is that the emigration will not cause a reduction in income for those left behind. The first condition is said to be met as long as emigration is voluntary. The second condition is fulfilled in the case of a market economy where individuals are paid their marginal product. Moreover, externalities are considered of insignificant importance. So the emigrants will only take away the value of their marginal product which they themselves earned anyway. Overall, in the study conducted by Grubel & Scott (1966), it is concluded that the welfare of those left behind is very rarely affected in a negative way by the emigration of the highly skilled. While emigration is likely to cause economic losses in the short run, until replacements for the emigrants can be trained, long run losses in a market economy are small.

Johnson (1967) argues that it is extremely unlikely that the migration of educated people would affect world economic welfare. Johnson also touches on the aspect of compensation to the origin countries through the means of a tax. Moreover, in this study, the migration of the highly skilled is assumed to reduce the labor but also the capital stock of the country. However, a downside of the analysis is that human capital and physical capital are considered to be perfect substitutes in this paper, which results in a less negative effect of the brain drain than normal.

During the 1970, the perspective on the brain drain changed.

Bhagwati & Hamada (1974) argue that there are limitations to the theory on the brain drain of Grubel & Scott (1966) that states that the brain drain should not be considered a problem. The home country is negatively affected by the departure of doctors for example,
because, in this case, the social marginal product is likely to exceed the private marginal product, due to externalities. Moreover, in case the government had financed the emigrant’s education in order to recover its investment in taxes afterwards, then emigration means there is no recovery of the investment and this leads to a decrease in welfare. Therefore, in the paper written by Bhagwati and Hamada (1974), the emigration of the educated labor is likely to result in negative effects on national income, per capita income and unemployment. In one of the models constructed in this paper (Emigration-of-our-Joneses), it is assumed that the emigration of skilled labor does not lead in itself to a simultaneous increase in domestic wage for the educated labor. In case the migration does not have any impact on the expected wage, national income remains unchanged. However, per capita income is increased. If migration means the per capita income of the migrants is also improved, the result is that the “brain drain” is beneficial.

The case where emigration increases the wage of the educated labor is also analyzed. This increase in the wage of the educated labor may also trigger an increase in the wage of the uneducated labor (“leap-frogging process”). If emigration increases the wage of the educated labor only, the employment of the educated labor will be reduced. Moreover, if the elasticity of demand for educated labor is smaller than 1, the supply of educated labor will increase and therefore the unemployment of the educated will increase as well. Therefore, national income is likely to be reduced. In the case where emigration of the educated increases, both the wages of the educated and the uneducated labor in the home country, the employment of the uneducated labor will also be reduced. Therefore the expected wages of the uneducated labor will increase, which might lead to a reduction in the supply of the educated labor. (Individuals would consider an education is not necessary, if the wages of the uneducated labor are expected to increase). However, although the national income will slightly increase because as the supply of the educated labor decreases, the costs of education supported by the governments decrease as well, this increase in the national income will be most likely offset by the reduction in output in both the educated and uneducated labor sectors. Overall, the national income will decrease in most cases when the wages of uneducated and educated labor increase.

In addition, Bhagwati & Hamada (1974) argue that a sufficient condition for the per capita income of those left behind to improve due to an emigration tax, imposed on the migrant, would be that the elasticity of emigration with respect to the tax is smaller than 1.

In conclusion, the results are less in favor of the migration of the educated people in this paper, because this migration can easily lead, under certain conditions summarized above, to a decrease in the welfare of those left behind. The results of this paper are also different from the previous literature, because in this case the assumption of full employment is relaxed and wages are set exogenously.

McCullock & Yellen (1975) also played around with the idea of a tax imposed on emigrants. Their results show that a tax imposed on the emigrants would increase the domestic skilled wages, reduce the supply of skilled labor and lower the wages of the unskilled labor. This
implies that income inequality may be increased by such a tax. On the other hand, the tax would reduce the gap between the incomes earned by emigrants and those in the home country and it could increase national income when both educational costs and tax revenue are taken into account.

Miyagiwa (1991) shows that brain drain has a positive effect on the host countries, namely it increases the host countries’ education and income levels because firstly, economies of scale raise the income for those who already have an education and second of all, a higher income provides an incentive for the uneducated to acquire an education and then earn more as skilled workers. As far as the origin countries are concerned, the brain drain can cause a decline in the country’s income and it may also have a highly inequitable income distributional effect on the population, especially upon the individuals who have intermediate abilities. The emigration of skilled workers will hurt mostly the skilled workers who did not emigrate, while unskilled workers would be relatively less affected. In addition, although previous studies mostly assumed that the emigrants are always better off, in this study this is not necessarily the case. So if the emigrants also suffer income losses sometimes, imposing a tax on them in order to compensate those left behind may be unfair.

Mountford (1994) analyzes the interaction between the income distribution, human capital accumulation and labor emigration. The conclusion is that the chance of emigration increases the returns to education and may increase human capital accumulation enough to compensate for the negative effect of the brain drain, under the conditions that human capital accumulation is endogenous and successful emigration is not a certainty.

Haque and Kim (1995) demonstrate in the context of an endogenous growth model that highly educated people in poor countries tend to emigrate to richer countries and as a consequence, the income levels and long-run growth rates of the origin countries are reduced. On the other hand, the brain drain could cause an increase in the growth rate of the host countries.

Vidal (1998) also focuses on the effect of emigration on human capital formation and complements the work of Mountford (1994). The possibility of emigration to a country where there are higher returns to education provides the population of the origin country with an incentive to invest in education, which in turn is constructive for growth.

Carrington and Detraghiace (1998) are the first to provide a quantitative assessment of the brain drain phenomenon. They constructed estimates of the stock of migrants to OECD countries by educational attainment and by country of origin for 61 developing countries. The findings show that the biggest brain drain occurs in the Caribbean, Central America and some African countries.

Beine (2001) also focuses on the impact of the migration on human capital formation and growth in the source countries. The theoretical model is supported empirically (cross-country
evidence). However, the authors use data on total migration, instead of skilled migration. This is an issue, considering that migrants from developing countries are mostly unskilled, so their emigration would automatically lead to an increase in the skill level of the population left behind. The approach in this paper is that there are 2 effects associated with the emigration of the highly educated, a potentially positive one and a negative one. The potentially positive effect comes from the fact that the possibility of emigration fosters investments in education in the home country, while the negative effect is the emigration. Whether, overall, the brain drain is beneficial or not depends on which one of the 2 effects dominates.

Beine et al. (2003) use data on migration rates by educational level, in order to provide empirical evidence supporting the beneficial brain drain hypothesis at an aggregate level. In a cross-section of 50 developing countries, migration prospects exert a positive effect on human capital formation. Moreover, it appears that the countries experiencing a beneficial brain drain are those that combine low levels of human capital with low skilled migration rates, whereas the countries that are characterized by high skilled migration rates, that is above 20% and/or high rates of highly educated in the adult population (above 5%) experience a detrimental brain drain. Although there are more countries experiencing a detrimental brain drain rather than a beneficial one, the countries that do experience beneficial brain drain are also the biggest ones in demographic size. China, India, Brazil, Indonesia and Pakistan all experience a beneficial brain drain.

Faini (2003) focused on the link between skilled migration, education and remittances. The findings are in contrast with the positive approach to the brain drain because the author argues that first of all, there is little evidence that raising the skill composition of migration is beneficial for the educational achievements in the origin countries. The author attributes this result to the choice of would-be migrants to pursue their education abroad. He admits the findings need to be analyzed with caution, due to the fact that they are based on enrollment data, which is known to raise measurement issues. Second of all, higher educated emigrants are associated with lower amounts of remittances so the positive effect of the brain drain is diminished (higher educated emigrants tend to emigrate permanently so their connections to the sending country becomes weaker over the years; they also have a larger propensity to reunify with their family in the host country). Faini (2006) finds empirically evidence that the brain drain is associated with a smaller flow of remittances.

Poutvaara (2004) acknowledges a very important aspect of the brain drain with the help of a theoretical model, namely the fact that, since the possibility of migration provides incentive to investment in education in the origin country, an increasing number of students have the tendency to opt for internationally applicable educations (medicine, nursing, engineering as opposed to law for example) and because of this, individual governments of the European Union distort the provision of public education away from internationally applicable education towards country-specific skills. As a consequence, those countries may end up having too many lawyers
or too few engineers. The proposed solution is the introduction of graduate taxes or income dependent loans that would also be paid by emigrants.

Docquier and Lodigiani (2006) stress the fact that diaspora externalities constitute an additional channel through which migration affects the home countries. The authors analyze the magnitude of diaspora externalities on foreign direct investment, as foreign direct investment inflows are a major source of capital and technology diffusion in developing countries. The result is that skilled migration stimulates aggregate foreign direct investment inflows in origin countries, especially large demographic countries that exhibit intermediate corruption. Very corrupted countries are much more unlikely to attract foreign direct investment. Therefore, according to Docquier and Lodigiani (2006), the brain drain has a positive effect on the home countries through the diaspora externalities.

Docquier and Bhargava (2007) acknowledge the fact that general emigration rates may hide significant occupational shortages, for example among engineers, physicians, nurses, IT specialists, teachers etc. In many developing countries shortages are particularly severe in the medical sector, as physicians from these countries emigrate mainly to the United States, Canada, the United Kingdom or Australia. The authors collected data on doctors with foreign qualifications working in 16 OECD countries in the period 1991-2004 and computed medical emigration rates. The results showed that even if some countries exhibited moderate total emigration rates, they suffered from significant medical brain drain. This is for example the case of Luxemburg. The most affected region in 2004 was sub-Saharan Africa (12 out of the 30 most affected countries are in sub-Saharan Africa) followed by South Asia and Middle East and North Africa.

Beine et al. (2008) argue that there is a range of benefits for the source countries connected to emigration, namely the amount of remittances, the creation of scientific and business networks as well as possible return migration with additional skills acquired abroad. As far as the amount of remittances sent in the home country is concerned, Beine et al. (2008) consider it is yet unclear whether educated migrants remit more than the uneducated ones. The educated migrants may remit more in order to reimburse the family for funding of education investments and because they have a higher income potential, but on the other hand, they tend to emigrate with family and usually on a permanent basis.

Moreover, the authors acknowledge the fact that as opportunities for high skilled emigration arise; people tend to invest more in education and therefore the domestic enrollment in education increases. However, in order for this beneficial effect to take place, it is necessary for education to increase both one’s chances to emigrate and also allow for access to legal, high-skill jobs. This condition is necessary because in the situation where the emigrants only access unskilled jobs, the prospect of migration can instead reduce education investment.
Bollard (2009) uses micro data from surveys of immigrants in 11 major destination countries in order to analyze the relation between the amount of remittances and education. The conclusion reached is that high educated migrants remit more (around 300$ more yearly) than the migrants without a university degree and the main reason is that they earn a higher income. This conclusion contradicts the one reached by Faini (2006).

Docquier (2009) constructs a new data set on emigration rates, by educational attainment and gender. The authors’ findings reveal that the share of women in the highly skilled immigrant population increased in almost all OECD countries in the period 1990-2000. On average, women’s highly skilled emigration rate is 17% above men’s. Moreover, growth rates of highly skilled women emigrants have exceeded the growth rates of low skilled women emigrants. This partially reflects the fact that more women enroll in education than men.

Gibson and McKenzie (2010) provide microeconomic empirical evidence from 5 countries that experience high tertiary educated emigration rates (Tonga, Micronesia, Papua New Guinea, Ghana and New Zealand) on the economic impacts of the brain drain. The authors investigate whether highly skilled emigrants generally engage in knowledge transfers, trade and foreign direct investment or if it is just the case for Chines and Indian emigrants. The findings show that the migrants benefit from massive gains in income and greater human capital, they usually send remittances to the origin countries, but they rarely engage in trade or foreign direct investment. On the other hand, they engage in knowledge transfer, by helping others learn about the opportunities abroad regarding work or study.

Docquier (2012) assessed the impact of immigration and emigration in the OECD countries in the 1990s on the employment and wage levels of the natives who did not migrate. Contrary to common belief, the results show that immigration had a positive effect on the wages of the non-college educated people in the host country. It also increased or left unchanged the average native wages and the native employment in all OECD countries in the period 1990-2000. On the other hand, emigration caused a wage decline for the less educated people and contributed to inequality increases within all OECD countries. Therefore, immigration in OECD countries is likely to help native wages and employment, even when it is accounted for the skill downgrading of immigrants.

Li and Sweetman (2013) investigate the relationship between the quality of the immigrants’ education in the origin country (based on 6 sets of test scores in math and science) and the labor outcome in the host country, namely Canada. They find that differences in the source country quality of pre-immigration educational outcomes have significant implications on the Canadian labour market incomes of immigrants. Controlling for the GDP of the source country does not change the relation. However, the quality of the education only matters for those who had obtained their education before emigrating and not for the immigrants who obtained their education in Canada. Therefore, the integration of the immigrants on the host country’s labor market is more complex than previously thought.
Docquier (2014) investigates empirically the effect of emigration on the quality of the home country institutions (measured by standard democracy and economic freedom indices), considering that institutions play an important role when it comes to the economic growth of a country. One way migration affects institutions is by providing the population with an exit option and a safety net through remittances, thereby reducing its incentive to protest in case the economic, political or social environment in the home country is in need of a reform. Moreover, emigration increases the home country’s exposure to new political values and practices through return migrants or diaspora networks for example. The finding of this paper is that openness to emigration contributes at improving the quality of institutions in the origin countries and that emigration to liberal democracies had important, and for the most part positive implications in determining institutional and political change in the developing countries. The same result is reached by Batista (2010).
3. Empirical Analysis: the Determinants of the Brain Drain

In this section, an empirical analysis will be conducted in order to explain what the determinants of emigration for the 6 European Countries are. The focus will only be on push factors.

The data on tertiary educated emigration rates cover information for 20 OECD destination countries for the years 1980-2010 (5 years intervals).

The source of the data for the emigration rates is Brücker H., Capuano, S. and Marfouk, A. (2013). Education, gender and international migration: insights from a panel-dataset 1980-2010, mimeo. In addition to this, OECD also provided data on emigration rates for the years 2008 and 2010.

The data from Brucker (2013) only cover emigration rates to 20 OECD destination countries, which are Australia, Austria, Canada, Chile, Denmark, Finland, France, Germany, Greece, Ireland, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States.

The emigration rate is defined as the proportion of migrants over the pre-migration population (defined as the sum of residents and migrants in each source country).

The dependent variable is emigration of tertiary educated people from Bulgaria, Czech Republic, Hungary, Poland, Romania and Slovakia to OECD countries in the period 1980-2010.

The independent variables that entered the first model are: the logarithm (10) of wages adjusted for inflation in the origin country, the unemployment of tertiary educated people in the origin country, the logarithm (10) of real GDP per capita in the origin countries, education expenditure as % of Gross National Income, the consumer price indexes with 2005 as a base year, in the origin countries, 4 interaction terms and 6 dummy variables that represent the countries of origin. The data for the independent variables in this regression analysis was collected from various sources, such as OECD, World Bank, United Nations, the International Monetary Fund, Eurostat etc.

Model 1 is:

$$\text{Emigration}_{it} = \alpha_1 + \alpha_2 \cdot \log \text{real wage} + \alpha_3 \cdot \text{unemployment of tertiary educated people} + \alpha_4 \cdot \log \text{real GDP per capita} + \alpha_5 \cdot \text{education expenditure} + \alpha_6 \cdot \text{CPI} + \alpha_7 \cdot \text{education expenditure} \cdot \text{CPI} + \alpha_8 \cdot \text{real wage} \cdot \text{CPI} + \alpha_9 \cdot \text{real GDP per capita} + \alpha_{10} \cdot \text{inflation} + \alpha_{11} \cdot \text{real wage} \cdot \text{real GDP per capita} + \alpha_{12} \cdot \text{Bulgaria} + \alpha_{13} \cdot \text{Czech Republic} + \alpha_{14} \cdot \text{Hungary} + \alpha_{15} \cdot \text{Poland} + \alpha_{16} \cdot \text{Romania} + \alpha_{17} \cdot \text{Slovakia} + \xi.$$
The purpose of this enlarged model is just an initial step towards a much reduced model 2. The first model would have too many variables and not enough observations.

Model 2 is:

\[ \text{Emigration}_{it} = \alpha_1 + \alpha_2 \cdot \text{log. real wage} + \alpha_3 \cdot \text{education expenditure} + \alpha_4 \cdot \text{education expenditure} \cdot \text{inflation} + \alpha_5 \cdot \text{wage} \cdot \text{real gdp per capita} + \alpha_6 \cdot \text{Bulgaria} + \alpha_7 \cdot \text{Czech Republic} + \alpha_8 \cdot \text{Hungary} + \alpha_9 \cdot \text{Poland} + \alpha_{10} \cdot \text{Romania} + \alpha_{11} \cdot \text{Slovak Republic} + \xi. \]

All the variables are lagged by 1 year in order to account for information based on which the people decide to emigrate (Pedersen 2004). What this means is that, for example the unemployment rate of tertiary educated people is from year (t-1), whereas the actual emigration year is t.

There are some issues with the model, considering that the model is unbalanced and there are some data missing. The number of observations (44) is rather small for this type of model. Moreover, the results need to be treated with caution, due to the fact that these Eastern European countries lived under communism domination until the year 1989-1990 and as a consequence, the data is not very reliable. The most unreliable data are the ones concerning the unemployment rate because in the communist period, unemployment was considered non-existent. In addition, the emigration rate is also rather unreliable because since emigration was prohibited in the communist countries, with the exception of a very few cases, illegal emigration was a rather common phenomenon.

In addition, the emigration rates of these countries are not fully explained by the variables included in the model. There are very likely other variables that would contribute to better explain the migration rates. Even with these limitations in mind, the results should still be valid.

Figure 1 shows the coefficients of the regression for 2 models. The first model has an adjusted $R^2$ of 0.868 which implies that 86.8% of the dependent variable is explained by the independent variables included in the model. However, this first model includes variables that are not significant, whereas the second model, which has an adjusted $R^2$ of 0.781, contains only the variables that are statistically significant.

This first variable to be insignificant is the unemployment rate of the tertiary educated people in the origin country. Although this variable is insignificant, the results show that if it had been significant, an increase in unemployment would have led to an increase in the emigration rate.

In addition, education expenditure as a % of gross national income in the origin country was insignificant for the first model. However, in the second model, education expenditure is significant, showing that holding all the other variables constant, an increase of 1% in education
Expenditure as a percentage of gross national income reduces the emigration rate of tertiary educated people by 1.48%.

Figure 1. Model 1 and Model 2 Coefficients of Regression
The consumer price index was also insignificant. The coefficient is positive which means that increasing the inflation rate in the origin country would increase the emigration, which is not surprising.

Wages in the origin country proved to be very significant, since in the first model, holding all the other variables constant, a 1% increase in wage leads to 0.44 increase in the emigration rate. However, in the second model the impact is smaller, since a 1% increase in wage leads to 0.124 increase in emigration rate. The positive relationship between wages and emigration can be due to the fact that, as it shall be seen in the section “Description of the Economies”, the wages in these 6 Eastern European countries are far from reaching the wages in the rest of the European Union, therefore, even if the wages in these 6 countries do increase, they still have not increased enough to discourage emigration. The gap between the wages in Eastern Europe and other developed countries is still very wide.

The interaction term (education expenditure*inflation) only proved significant in the second model. The result implies that an increase in education expenditure contributes more to the emigration of the tertiary educated people in the countries where inflation is higher.

The interaction term (real wage* inflation) did not prove to be significant. The negative coefficient shows that higher inflation contributes less to emigration in countries where the wages are higher.

GDP per capita in the origin country has no significant effect. The positive coefficient shows that if GDP had been significant, an increase of GDP would lead to an increase in emigration. The GDP result may reflect the classic “immigration hump” that many countries go through as their economies develop. The hump-shaped pattern hypothesis refers to a positive correlation between GDP per capita and migration in the case of countries that have relatively low GDP per capita levels. This pattern can be related to migration costs, which can reduce the possibility of migration. This positive relation between GDP per capita and emigration from East European countries has been previously observed by Berthelemy and Maurel (2009).

Another possible explanation is that economic growth might lead to more migration due to a relaxation of financial restrictions. (Beine et al. 2008).

The interaction term (real GDP per capita* inflation) has no significant effect. However, the negative sign means there is a penalty on the GDP effect coming from inflation.

Finally, the interaction term (wage* GDP per capita) has a significant effect in the second model. This implies that there is an additional boost to the wage effect coming from GDP.

From the results, it can also be observed that Romania experiences a bigger brain drain than Bulgaria, the Czech Republic and Slovakia, whereas the difference in emigration rates between Romania and Hungary and Romania and Poland is not significant.
Bulgaria’s brain drain is lower than that of Czech Republic’s, Hungary’s and Poland’s. The difference is significant with 95% confidence. On the other hand, the difference between the brain drain of Bulgaria and that of Slovakia is insignificant. After Bulgaria, Slovakia is the least affected by the brain drain.

The Czech Republic’s brain drain is significantly higher than the brain drain of Slovakia. On the other hand, with 95% confidence, it can be admitted the difference in emigration rates of the highly skilled workers between the Czech Republic and Hungary and respectively between the Czech Republic and Poland is insignificant.

Finally, with the exception of Romania, Poland is the most affected by the brain drain. Moreover, we are 95% confident that the difference in the tertiary educated emigration rates between Poland and Hungary is significant.

In conclusion, 78.1% of the variance in the emigration of the tertiary educated people is explained by country of origin, wages and education expenditure. Moreover, the effect of wages on the emigration is influenced by GDP per capita and the effect of education expenditure on emigration is influenced by inflation. The results of the regression also prove that Romania, followed by Poland are suffering the most from the brain drain in the period 1980-2010. On the other hand, Bulgaria has been the least affected by the brain drain.
4.1. Description of the Eastern Europe Economies

Out of the 6 East European countries that have been the focus of this paper, 4 of them are OECD countries: the Czech Republic, Hungary, Poland and the Slovak Republic. Most OECD countries are high-income economies, with high Human Development Indexes. OECD’s mission is to promote policies that will improve the well-being of people around the world. The members of OECD collaborate and develop economic and social policies in order to raise the standard of living of the member countries, to contribute to the expansion of world trade and promote economic stability, among other things.

The fact that the Czech Republic, Hungary, Poland and the Slovak Republic are members of the OECD is just one of the many criteria that suggest there is a difference between these 4 countries and Bulgaria in Romania in terms of their economic development.

According to the World Bank (http://data.worldbank.org/news/new-country-classifications 2013), high income countries are countries that have a GNI per capita of $12,616 or more in 2013 and the Czech Republic, Poland and the Slovak Republic fulfill this condition. Hungary fulfilled this condition until recently, in 2012, but in 2013 it slipped back into an upper-middle income country.

The Human Development Index, used to divide countries into 4 categories of human development, is a composite statistic of life expectancy, education and income indices. The Czech Republic, Hungary, Poland and Slovakia were part of the very high human development countries’ in 2013, while Romania and Bulgaria were part of the high human development countries in 2013. (United Nations Development Programme 2013).

Moreover, Czech Republic, Hungary, Poland and Slovakia joined the European Union in 2004, while Romania and Bulgaria joined it in 2007. This has important implications for the migration patterns of these countries, because as it shall be discussed later in this paper, once these countries joined the EU, their outflow of emigrants increased significantly.

During the 40 years of communist domination, the economy of the Czechoslovak Republic deteriorated. Before the World War 2, in the year 1938 for example, the average GDP per capita of the Czechoslovak Republic was close to that of Austria, and in 1990 its GDP per capita was around 1/5 that of Austria (Gerold 1997).

After the end of communism, the Czechoslovak Republic went through a radical economic reform. While all the other former communist countries also went through similar reforms that involved macroeconomic stabilization, privatization, tax reforms, convertibility of the currency, liberalization of prices and foreign trade, the Czechoslovak Republic went through one additional transformation when the disintegration of the Czech and Slovak Federal Republic took place, resulting in 2 independent states in 1993.
Even so, as it can be seen from Figure 2, the Czech Republic distances itself quite a bit from the other 5 countries in terms of GDP per capita and, in addition, it has always had the highest GDP per capita out of all the 6 countries during the period 1990-2013. However, the Slovak Republic follows closely. Overall, throughout the years, there wasn’t much distance between the Czech Republic, Slovak Republic, Hungary and Poland. As far as Bulgaria and Romania are concerned however, not only do they have a quite significantly lower GDP per capita during this whole period compared to the other 4 countries, but also Bulgaria seemed to have been hit quite hard by the recession. Fortunately, it managed to recover pretty quickly. Overall, the 4 countries part of the OECD had a GDP per capita situated between 20.000 current international dollars (Hungary) and 27.200 current international dollars (Czech Republic) in 2013, while Bulgaria and Romania had a GDP per capita of 14.499, respectively 13.395 international current dollars.

As a comparison, according to the International Monetary Fund, the GDP per capita on a PPP basis of the United Kingdom in 2013 was 37.307 current international dollars, while Germany’s GDP was 40.007 current international dollars. This comparison puts in light the fact that the standard of living of these 6 European Countries is well below that of their main destination countries, which in turn is an incentive for the population of these countries to emigrate.
Unemployment (Figure 3) was an unknown phenomenon during the communist era. While in some former communist countries (Poland, Slovak Republic, Bulgaria) the unemployment rate soared after the end of the communism, in the Czech Republic the unemployment rate was 4.4% in 1992 and it further decreased to 3.5% in 1993. As a comparison, in Slovakia the unemployment rate reached 11.8% in 1991. (Gerold 1997).

The Czech Republic is still doing better than all the other 5 countries, with an unemployment rate of 6.95% in 2013. Its unemployment rate decreased sharply in the 2007, to 5.32% and even more in 2008, to 4.39% soon after the Czech Republic had joined the European Union. On the other hand, its neighbor, the Slovak Republic, had the highest unemployment rate, of 14.173% in 2013. However, this is much lower compared to its pre-accession to EU. In 2004, the unemployment rate was 18.35% but then it decreased in the following years and it even reached only 9.57% in 2008. Poland also experienced an impressive decline in its unemployment rate following its accession to EU. On the other hand, Hungary’s unemployment rate increased after 2004.

Regarding Bulgaria and Romania, there were no significant changes to their unemployment rate after they had joined EU in 2007. Bulgaria’s unemployment rate peaked in the year 2000, reaching 18.1%. However, it decreased sharply after 2000 due to the results of
several reforms in the country, starting with the year 1997. The government had been changed, an IMF currency board system had been introduced and enterprise privatization was accelerated. (https://www.imf.org/external/np/rosc/bgr/overv.htm, 1999)

Overall, the unemployment rate in 2013 of the 6 European Countries ranged from 14.17% (Slovak Republic) to 6.95% (the Czech Republic). The European Union average in 2014 was 10.6%. (http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/3-01042014-AP/EN/3-01042014-AP-EN.PDF 2014)

![Gross Average Monthly Wages in US$ at current exchange rates](image)

**Figure 4. Gross Average Monthly Wages in US$ at current exchange rates**

Source: DataMarket and United Nations Economic Commission for Europe

Figure 4 (gross average monthly wages) in the 6 countries is the one that reflects the most the differences between Bulgaria, Romania and the rest of the 4 countries.

In the period right after the communism collapsed, there was not much disparity between the wages of these 6 Eastern European countries, especially between the monthly wages in Poland, Hungary and Czechoslovakia. Even after Czechoslovakia was dissolved into the Czech
Republic and Slovakia in 1993, the gross average monthly wages in these 2 countries remained very similar to this day. The gross average monthly wage in the Czech Republic in 2012 was 1326 US dollars, while in Slovakia it was 1275 US dollars. Poland and Hungary managed to keep the pace with them until the recession struck. Even in 2012, the average monthly wages in Poland and Hungary did not increase to that they used to be. So the average monthly wage in Poland in 2012 was 1083 US dollars and the one in Hungary was 1113.8 US dollars. Compared to other OECD member countries, except for Estonia, the wages in these 4 countries are the lowest in the OECD area.

The situation is again very different when it comes to Bulgaria and Romania, whose average monthly wages have always been lower anyways, but in recent years, it seems that the gap between the wages in these 2 countries and the other 4 became significantly wider. The average gross monthly wage in Bulgaria is 2012 was 506.6 US dollars and in Romania it was 614.8 US dollars. Therefore the gap between the wages in Romania and Bulgaria and other OECD countries is even wider than the one between the Czech Republic, Hungary, Poland and Slovakia and other OECD countries.
4.2. Migration patterns in Eastern Europe

There is a high degree of international mobility among OECD countries and it is especially focused on the highly skilled, due to the increasing importance of gaining international experience and language skills for professionals. Many students, researchers, professionals look for opportunities beyond the borders of their origin countries and their mobility is facilitated among OECD countries by the existence of free mobility areas, agreements for recognition of foreign diplomas, collaborations between institutions and easier access to visas. (OECD 2008).

Europe’s tertiary educated people’s emigration rate in 2005/2006 was 8.6% (8.3 million people) and they mostly emigrated within the borders of Europe, but also to USA. (Widmaier & Dumont 2011).

The EU enlargement has resulted in a significant increase in labour mobility. More than 99% of migration flows between the newer and older member states have been East-West flows from EU 8+2 to EU15. Despite the fact that many countries from EU15 imposed several restrictions to their labour markets, the stock of emigrants from EU 8+2 to EU15 tripled in the period 2003-2009. (Fic Tatiana et al. 2011).

![Figure 5. Total Emigration Rates](http://www.iab.de/en/daten/iab-brain-drain-data.aspx)
As it can be seen from Figure 5, until the year 2005, Poland has always had the highest total emigration rate (calculated as the proportion of migrants over pre-migrant population; pre-migrant population is defined as the sum of residents and migrants in each home country). However, in 2010 already, Poland no longer had the highest total emigration rate. Romania did, followed very closely by Bulgaria. Considering the fact that the emigration rates of these 2 countries before the period 1995-2000 were so low compared to the other 4 countries and that in just 10 years they managed to surpass them, reflects how much this emigration phenomenon has escalated in these 2 countries.

One possible cause for this is that there are higher economic disparities between Bulgaria and Romania and EU15 than respectively between the Czech Republic, Hungary, Poland, Slovakia and EU15, therefore the EU2 population has more incentives to emigrate. It can be seen from the previous graphs, such as the GDP per capita one, that in the year 1990, right after the communism fell, all the 6 countries had more of a similar economic situation than they do at the present. After 1990, Bulgaria and Romania’s economic developments could not keep the pace with the other 4 OECD countries.

About 28% of all EU 8+2 migrants working in EU15 countries are low skilled, 55% are medium-skilled and 17% of them are high skilled. (Fic Tatiana et al. 2011).

![Emigration rate of the tertiary educated](http://www.iab.de/en/daten/iab-brain-drain-data.aspx)

**Figure 6. Emigration rate of the tertiary educate**

The situation is however different when it comes to the brain drain phenomenon in these East European countries (see Figure 6). While Romania still remains at the top of the list, by having the highest emigration rate of the tertiary educated (20.36% in 2010), Bulgaria’s tertiary educated emigration rate in 2010 (12.22%) was much closer to that of the Slovak Republic (11.65%), Czech Republic (11.5%) and Hungary (13.16%). Poland’s emigration rate was slightly higher at 14.54% in 2010. Therefore, although all 6 countries are significantly affected by the brain drain, Romania finds itself in a much worse situation compared to the other 5 countries. Moreover, by taking into account that Bulgaria had a very high total emigration rate, but a low emigration rate of tertiary educated, it means that most of the population emigrating from Bulgaria has medium or low skills.

**Brain Waste**

A more severe issue even is the phenomenon called brain waste, which happens when emigrants work at a job that requires fewer qualifications than their skills. In 2000, considering that none of the Eastern European countries analyzed in this paper were yet part of the European Union, around 24% of the tertiary educated Slovak emigrants were working jobs requiring low skills, whereas in the case of Hungarian and Polish emigrants, the share was around 21-22%, Bulgarian’s share 20%, Czech’s 17% and Romanians’ 14%.


However, these countries’ accession to the EU in 2004 and 2007 facilitated the recognition of their diplomas abroad and as a result the brain waste was reduced.

Many immigrants are overqualified for their jobs for several reasons, such as problems of transferability of human and social capital, or as not being proficient in the host country’s language. These reasons are especially relevant for the highly skilled and that is why the highly educated migrants generally face more difficulties in the labor market compared to their lower-educated counterparts. (OECD 2008).

**Immigration in the Eastern European countries**

According to Fafo (2008), even though the outflow of the highly educated population from the Eastern European countries may not be so dangerous for the economic situation of the countries for now, it is important to note that this outflow is not compensated by an inflow of foreign labor. Moreover, the migration of skilled workers already caused labor and skill shortages in fields such as medicine, engineering, science.
In 2005, the percentage of foreign-born population was smallest in Poland (2.1%), followed by the Slovak Republic (2.5%), Hungary (2.9%) and largest in the Czech Republic (4.5%). This means the share of immigrants is rather low in Eastern Europe. While in Poland and Hungary, the largest share of foreign-born population is from other Non-OECD neighboring countries, in the Czech Republic most of them are from other OECD countries and in the case of the Slovak Republic, from OECD neighboring countries. Since most of these immigrants came from earlier waves of immigration and very few from recent immigration, most of the immigrants are part of the age group 65+, which means they are no longer participants in the labor market and are unable to compensate for the outflow of mostly young people from these countries. (OECD 2008).

In fact, the share of persons aged 65+ is significantly higher among the foreign-born than in the general population of all these countries, with Poland presenting the most worrisome situation, considering that in 2005, 61.9% of its foreign-born population was 65+. (Widmaier & Dumont 2011).

Unfortunately, aside from the fact that most of the immigrants coming to Poland are of retirement age, 11.3% of the Polish emigrants to other OECD countries are in the age range 15-24, 66.5% are in the age range 25-64 and 22.2% are 65+. This means that almost all of the Polish emigrants are of working age, which leaves Poland drained of its labor force. (OECD 2008).

**Policies to attract high skilled immigrants**

Considering that in the United Kingdom and Ireland, the main destination countries for some of the East European countries analyzed in this paper, the share of people with tertiary education is much higher among the immigrants than the natives (41.1% versus 22.7% for Ireland and 34.8% versus 20.1% for United Kingdom) it is no wonder that United Kingdom and Ireland have designed policies in order to attract high educated migrants. (OECD 2008).

Host countries have gradually introduced quality-selective immigration policies. The first countries to be applying this kind of policies have been Canada and Australia in the 1980s. Since 1984, Australia officially privileged skilled workers, the candidates being selected according to their prospective “contribution to the Australian economy”. Canadian immigration policy follows along similar lines. Later on, starting with the year 1990 the USA also started to put more emphasis on the immigration of highly educated people, by implementing a system of quotas that would favor candidates with academic degrees and/or specific professional skills. In the EU, immigration policies are less clear but they are also however oriented towards quality-selective immigration. For example, in the year 2000, Germany was planning on recruiting 10,000 IT specialists. (Beine et al. 2003)
According to Fafo (2008), remittances can be very important in some sending countries, due to the fact that they increase national income, directly and indirectly (through foreign exchange and savings) and they influence investment rates and consumption and therefore demand. However, there are limitations concerning data on remittances, because the amount of remittances is measured by taking into account only the formal channels such as banks, non-banks money transfer operators, post offices, without considering for example physical transfers of cash or goods across borders, transactions by private households or incomes of short-term workers etc. Therefore the amount of remittances is generally underestimated. The impact of remittances is generally positive, but there are some negative effects as well such as growing income inequality, decline in incentives to engage in activities on the domestic market, dependency on remitted money and inflationary pressures.

![Personal Remittances, Received (% of GDP)](http://data.worldbank.org/indicator/BX.TRF.PWKR.DT.GD.ZS)

Figure 7. Personal remittances, received (% of GDP)


From Figure 7 it can be noticed that the amount of remittances as % of GDP has increased over the years for all the 6 countries analyzed. In Bulgaria’s case, the amount of remittances received was not exceeding 1% of GDP in 1996, but in 2012 it was 2.84% of GDP. However, Bulgaria used to receive a much larger amount of remittances in the past. In 2003, the amount of remittances accounted for 8.32% of GDP. In addition, except for the Slovak Republic, where remittances continued increasing despite of the recession, in the other 5 countries the recession had a negative impact on the share of remittances received. The Czech Republic's share of remittances declined very little due to the recession, while in the case of Bulgaria and
Romania the negative impact was much more substantial. This may have depended on how hard the destination countries were hit by the economic crisis; for example, since Spain has had a lot to suffer from the economic crisis and since Spain is one of the main destination countries for Romanians, it comes as no surprise that the amount of remittances sent in Romania declined so sharply.
4.3. Bulgaria

The World Economic Forum ranked Bulgaria 128th country in the world in terms of brain drain, in 2012. The report includes 144 countries, the first ranked country in the list suffering the least from the brain drain phenomenon. Moreover, in the survey conducted by WEF, the weighted average of the answers to the question “Does your country retain and attract talented people?” was 2.4. (1= no, the best and brightest normally leave to pursue opportunities in other countries and 7= yes, there are many opportunities for talented people within the country). The conclusion is the vast majority of Bulgarians do not consider Bulgaria as a country that is capable of offering enough opportunities for its citizens. As a result, many Bulgarians decided to find better opportunities abroad. (Schwab 2012).

The national 2011 census indicated a rapid decline in Bulgaria’s population, one third of which is attributed to external emigration. According to a 2011 National Public Opinion Institute survey of 1,000 respondents, 12% stated they would emigrate once restrictions on free movement to the EU were lifted, a 3% increase from 2009. A further 28% intend to work or study abroad for a defined period of time. (http://www.tradingeconomics.com/bulgaria/youth-unemployment-rate 2014)

The brain drain had become a serious issue in Bulgaria in recent years, the corruption and the way the country was governed in the last 20 years, forcing many people, especially young ones, out of the country. Moreover, the brain drain is estimated to have cost Bulgaria around 20 billion euros in the last 20 years. (http://www.novinite.com/articles/140586/Brain+Drain+Lost+Bulgaria+EUR+20+B+in+20+Years.+Syndicate+Estimates 2012).

The main destinations for the Bulgarian migrants are Spain (166,000), Germany (66,000), Greece (55,000), Italy (46,000) and UK (26,000). In total, in the EU countries there are 437,000 Bulgarian migrants (January 2014). (http://www.channel4.com/news/immigration-eu-uk-romanians-bulgarians-italy-spain-germany 2014)

A significant part of the Bulgarian foreign born population in the OECD countries worked in the agriculture and industry sector (55.7%), while the rest of them worked in personal and social services sector (26%), or in the distributive services sector (13.4%). Few of them (5%) worked in producer services (in 2000).

Bulgarian immigrants represented 4.4% of the total immigrant population in Greece in 2005/2006, making Bulgaria one of the top 5 foreign nationalities in Greece. The situation was the same in 2000, when Bulgarian immigrants represented 3.9% of the total immigrant population in Greece. Moreover, in 2000, Bulgarian immigrants represented 9.5% of the total
immigrant population in Turkey, making Bulgaria the most representative foreign nationality in Turkey at that time. (OECD 2008).

The employment rate of tertiary-educated Bulgarian immigrants in Greece was 70.6% in 2000 and in Turkey it was 78.9%. The average employment rate of tertiary educated Bulgarians in the OECD area was 70.4%. (OECD 2008).

*Most affected labor fields*

Bulgaria’s medical field suffers from brain drain. Each year between 500 and 600 doctors choose to continue their careers abroad, while around 600 new doctors are graduating each year in the whole country. The main reason for the massive brain drain in this sector is the low wages. The wage for a doctor, according to a study from 2011, was 307 euros ($417), the lowest among the EU countries. In comparison, the wage in the UK was 2,180 euros ($3,000) or 4,569 euros ($6,200) in France, more than 14 times bigger than in Bulgaria. There is a shortage of medical staff especially in the less developed parts of the country and the low salaries and few opportunities are the main reasons for this situation. ([http://www.aljazeera.com/indepth/features/2014/01/bleeding-doctors-bulgaria-medical-crisis-2014119105114882799.html](http://www.aljazeera.com/indepth/features/2014/01/bleeding-doctors-bulgaria-medical-crisis-2014119105114882799.html) 2014)

The educational system is also affected by the brain drain, many school teachers immigrating to other countries. Due to the decline of the birth rate and of the ageing of the population, the number of children enrolled in school gradually decreased, resulting in fewer jobs for teachers. The number of children enrolled in school (primary, secondary and high-school) in 1993-1994 were 167,732, while in 2007-2008 it was 26,346. The number of teachers employed decreased by more than 30% in the same interval. The school teachers prefer immigrating in countries like Greece and Spain. (Markova 2010).

*Remittances*

Remittances sent by Bulgarians recorded a new high in May 2012 despite the global economic issues. The sum of 78.2 million euros is the highest monthly sum since 2004, when the Bulgarian National Bank started recording the data. However, there are studies reporting that the real sum is with 30-40% higher than the official number. ([http://www.novinite.com/articles/141333/Migrant+Remittances+to+Bulgaria+Break+All-Time+Record](http://www.novinite.com/articles/141333/Migrant+Remittances+to+Bulgaria+Break+All-Time+Record) 2012).

Over the years, the remittances have increased regularly, from 693.9 million euros in 2008 to 774 million euros in 2011 and 806 million in 2013.
Unfortunately, according to a survey by the Bulgarian National Bank, conducted in 2012, only 50% of migrant workers send money to relatives in Bulgaria. The others admit they are not able to help financially their families here even though they are permanently employed. (http://www.novinite.com/articles/141333/Migrant+Remittances+to+Bulgaria+Break+All-Time+Record 2012)
4.4. Czech Republic

After the collapse of the communism, the Czech population had high expectations with regards to the economic future of the country. This may explain why only 14% of highly educated people answered positively to the question of whether they were considering working abroad in 1995 in a survey conducted by Centre of Empirical Surveys (STEM). (Marešová et al. 1995).

In 2012 however, the citizens of the Czech Republic did not feel the same way regarding the expectations with regards to the future of the country. According to the Global Competitiveness Report 2012-2013 of the World Economic Forum, the Czech Republic’s weighted average score to the question “Does you country retain and attract talented people?” is 3.3 on a range from 1-7. This implies that Czech Republic ranks 84 out of 144 countries, in terms of brain drain, where the number 1 spot country experiences the least brain drain. (Schwab 2012).

In the paper “The effect of the brain drain in the Czech Republic” (Vavrečková 2009), the authors analyze the most important aspects relating to the Czech Republic brain drain. The main findings are discussed below.

Most affected fields

The Czech tertiary educated foreign-born population in the OECD area as a whole, in 2000, had an education in either Science and Engineering (39.2%), either Education and health (22.1%), either Humanities and social sciences (29.1%) or other kind of education (9.6%). (OECD 2008).

The highly skilled Czech group most susceptible to emigration is mostly formed by doctors, IT specialists, technical engineers from corporate research and development and doctorate students. The Czech emigrants working in the medical field are usually between the ages of 30-39, while those working in the IT field or are doctorate students are commonly between the ages 25-29.

According to another study by Vavreckova (2007), the demand for doctors with various specializations, nurses and assisted living care givers is high, due to the fact that many European countries experience low birth rates and aging population. Therefore, even in countries where access to the labor market has been restricted to the Czech Republic, such as in Germany, Czech medical specialists are in great demand.

The fact that the Czech healthcare is in a difficult situation makes the incentive to emigrate even more appealing. The Czech healthcare finds itself in a difficult situation partly
because of its management and financing. Because of this situation, there are significant
differences between medical facilities across the country, meaning that there are hospitals that
have international, top-quality standards, but there also hospitals that are not provided with
sufficient financial support. There are also big differences between private and state hospitals.

Another issue is the fact that the workload of doctors in the Czech Republic is generally
higher compared to other European countries, because of bureaucracy/ high administrative load,
meaning that they have a lot of paperwork to do.

**Destination Countries**

The main destination countries for the Czech emigrants have been the Great Britain and
Ireland, especially after the Czech Republic’s accession to EU in 2004, followed by Germany,
due to the geographical proximity, but also USA and Canada.

Moreover, Czech immigrants represented 8.1% of the total immigrant population in
Austria in 2000, making the Czech Republic one of the top 5 foreign nationalities in Austria. The
Czech Republic was also one of the top 5 foreign nationalities in Poland in 2000, with a 0.2%
share out of the total immigration in Poland. Although this share is extremely small, it still makes
the Czech Republic immigrants representative in Poland in 2000 for the simple fact that
immigration to Poland is very low. (OECD 2008).

**Migration determinants**

The main reasons for emigration are economic ones, due to the difference in income
between the Czech Republic and the chosen destination country. Apart from the economic
reasons, other factors contributing to the emigration decision are good opportunities to gain new
knowledge and experience, improving language skills and getting to know different cultures. In
the case of highly skilled emigration, the reasons mentioned earlier still hold true, but broadening
of the professional knowledge, working in a renowned organization, taking part in international
projects and access to the latest technology are also important contributors.

Doctors, IT specialists and technical engineers regard the higher wages in the destination
country as a fundamental condition for emigrating, whereas for the science workers working in
academic research the wage abroad is less significant, but working in prestigious institutions,
taking part in important international projects is essential.

Common reasons that hinder high skilled Czech population from emigrating are
separation from family, concerns about language problems and already having a good job in the
Czech Republic. On the other hand, a previous stay abroad, contacts abroad and knowledge of a
foreign language, especially English are factors that make the possibility of emigration more appealing.

With the exception of doctors, where besides young doctors, experienced middle-aged Czech doctors are also planning to go abroad, there is significant correlation between highly skilled emigration and age, as the incentive to emigrate diminishes with advancing in age. The reason why middle-aged doctors have a higher propensity to emigrate than the rest of the middle-aged educated population is because there is specific demand in the world for experienced doctors with 2 and more attestations.

In conclusion, according to Vavreckova (2009), the Czech Republic is affected by the brain drain, especially in the fields of medicine, IT and science. The main reasons for emigration are the low wages in the country, the few employment opportunities and the need to experience a different culture. The main destinations are Great Britain, Ireland and Germany.
4.5. Hungary

Hungary is a member of the OECD since 1995, a member of the World Trade Organization since 1996 and a member of the European Union since 2004.

Hungary became a market economy in 1990. Its post-communist economic transition was achieved relatively smoothly as in no more than 4 years after the communist period ended, almost 50% of the country’s enterprises had become part of the private sector and by 1998 Hungary was attracting nearly half of all foreign direct investment in its region. ([http://news.bbc.co.uk/2/hi/europe/country_profiles/1049641.stm](http://news.bbc.co.uk/2/hi/europe/country_profiles/1049641.stm) 2012)

Unlike the other countries, whose total emigration rates fluctuated a lot throughout the period 1980-2010, Hungary’s total emigration rate remained quite constant at around 4%, while the average rate of the tertiary educated has been 12.61%. However, Hungary is ranked as the 129 out of 144 countries in terms of brain drain by the World Economic Forum in 2012 and the weighted average answer to the question “Does your country retain and attract talented people?” was 2.3 ( 7= yes ,there are many opportunities for the talented people within the country). (Schwab 2012).

Main reasons for migration

In the paper “Some sociological aspects of skilled migration from Hungary” (2011), the authors, together with the Hungarian Academy of Sciences analyzed some aspects of the Hungarian brain drain. According to their research, the main reasons for emigration from Hungary are income, professional development/career opportunities and the overall political situation in Hungary. The field most affected by skilled migration is the natural sciences one, considering that out of 4 graduates, 1 of them emigrated during the period 1990-2000. (Személyi and Csanády 2011).

The most significant differences between the last jobs the emigrants had in Hungary compared to the jobs abroad are in terms of salary, employee rights, work tools, professional development, promotion and expectations of the employer. All of these factors were considerably improved at the job abroad. The only aspect in which the job abroad proved to be less satisfying was in terms of the emigrants’ relations to colleagues, which had been slightly better in Hungary than abroad.
**Most affected fields**

The Hungarian tertiary educated foreign born population in the OECD area in 2000 had as an education either Science and Engineering (34.4%), either Education and Health (26.1%) or Humanities and Social Sciences (34.8%). (OECD 2008).

Prior to the EU’s accession of Hungary, taking up a permanent position as a doctor abroad would have required complete retraining, but since 2004, when Hungary became part of the EU, its qualifications have been recognized abroad and then led to an increasing number of emigrants. The brain drain will probably continue increasing as according to the Hungarian Residents Association, which represents junior doctors, two thirds of medical students in 2011 were debating leaving Hungary to work in Western Europe. The main motivation for emigrating is the low wages, considering that a resident doctor’s average monthly-take home pay is around 300 euros.  


According to the same source, the top destination countries for high skilled emigrants are Ireland, the UK, Scandinavia and more recently, Germany.

**Remittances**

According to Személyi & Csanády (2011), as far as remittances are concerned, 65% of the emigrants interviewed had admitted to sending money back home at least once. The amount varies between 550$ and 5.500$ a year. Considering that they earn around from 35000$ to 90.000$ per year, which is 4 times more than in Hungary, the amount of remittances is not very high, but only a relatively small proportion of their current income (maximum 15%). Since not all of the emigrants are sending money back home, the positive effect of remittances is not substantial for Hungary.

**Measures taking against the brain drain**

The Hungarian government has been aware of its highly skilled emigration for some years now. In 1990, an ad hoc committee has been appointed by the Hungarian Academy of Sciences to analyze the emigration of tertiary educated people in 1990. (Személyi & Csanády 2011).

In 2012, the Hungarians introduced a new law concerning higher education that stated that Hungarian students receiving state sponsored university places must remain in Hungary several years after their graduation. (http://www.bbc.com/news/world-europe-19213488 2012).
This new law was given in order to stop the brain drain. The idea behind it is paying the state back for investing in education. The length of stay in Hungary after graduation depends on the duration of studies. For example, in the case of a medical student, he/she would have to remain in Hungary for at least 10 years and the annual fee to study medicine is around 7175 euros.

It is understandable that the Hungarian government would want to stop the highly skilled population from emigrating considering that 50% of Hungarians under the age of 30 were thinking of leaving the country in 2012. However, the education law given in 2012 raised high criticism because it was considered that it violated the whole concept of the EU that allows for the free movement of the workforce.

**Main destination countries**

60% of all Hungarian emigrants in 2005/2006 were either in Germany, the United States or Canada. The shares of Hungarian immigrants in the 3 main destination countries in 2005/2006 were 24% in Germany, 23.1% in the United States and 13% in Canada. As far as the share of highly educated Hungarian emigrants is concerned, the share of highly educated Hungarians in Germany decreased from 30.2% in 2000 to 27.2% in 2005, while in the United States it increased from 34.5% in 2000 to 39.3% in 2005 and in Canada it also substantially increased from 31.5% in 2000 to 40.3% in 2005. (Widmaier & Dumont 2011).

While in the case of Germany, the share of low skilled and high skilled Hungarian immigrants is quite balanced (21.4% versus 27.2%) the situation for the United States and Canada is different. The Hungarian immigrants in the United States and Canada are predominantly high skilled.
4.6. Poland

Until the communism collapsed, Polish citizens could not easily leave the country because of the restrictive passport and exit-visa policies. Those who wished to leave the country could only do so temporarily; otherwise, if they were looking to emigrate permanently somewhere else, there was no possibility to return home afterwards. The situation changed after the communism period, especially when Poland joined the EU in 2004. Poland’s EU accession in 2004 triggered significant additional outflows of people. The post-enlargement migrant flows are structurally different from those prior to the enlargement. Not only do the flows appear to be more individualistic and regular, but legally speaking they are more solidly based and more diversified with respect to both immigrant characteristics and destination countries. Moreover, the post-accession migrants from Poland are younger and better educated. (Kahanec et al. 2009).

According to Fafo (2008) the proportion of the most highly-educated Polish emigrants increased substantially in the post-accession period. It increased from 10% to 16.5% and most importantly, the share of tertiary educated emigrants of age group 25-29 increased from 21.6% to 33.7%, meaning that the drainage of highly educated people in younger working age bracket has increased considerably after Poland had joined the EU.

According to estimates by the Central Statistical Office, around 2.06 million Polish citizens (5.2% of the total population) were established abroad in 2011, an increase of 3% compared with 2010. Around 1.5 million Polish citizens were staying abroad for 12 months or longer. Around 75% of recent emigrants can be described as labor migrants. (OECD 2013).

**Main destination countries**

74.2% of all Polish emigrants in 2005/2006 established themselves in Germany, the United States or United Kingdom. The shares of Polish immigrants in the 3 main destination countries in 2005/2006 were 45% in Germany, 16.8% in the United States and 12.4% in the United Kingdom. (OECD 2013).

The share of highly educated Polish people in Germany slightly increased from 16.5% in 2000 to 16.9% in 2005, while it substantially increased from 26.4% in 2000 to 36.2% in 2005 in the United States and it increased from 37.8% in 2000 to 42.1% in 2005 in the United Kingdom. (OECD 2013).

Out of the total number of Polish immigrants in Germany, 28.9% of them were low skilled while 16.9% of them were high skilled. Polish immigrants in Germany were also generally older. In the case of the United States, out of the total Polish immigrants, 16% of them were low skilled and 36.2% of them high-educated. The number of high educated Polish
immigrants in the United Kingdom is also far bigger than the number of the low-educated ones (42.1% versus 20.1%). Polish immigrants in the United Kingdom are generally young. Therefore, while Germany is a preferred destination country for low-educated rather than for high-educated people, the situation is the opposite for the Polish immigrants in the United States and United Kingdom. (OECD 2013).

The reasons for this different choice of destination countries, according to the level of education and age are that the highly skilled are more mobile and therefore willing to move to more distant labor markets, English is the dominant second language among the young, whereas German is more commonly known among the older Polish generations and last but not least Germany has more of a closed door policy with regards to immigrants in comparison with the UK and Ireland. (Kahanec et al. 2009).

Poland’s immigrants represented 4.5% of the United Kingdom’s total number of immigrants in 2005, making Polish immigrants one of the top 5 foreign nationalities in the United Kingdom. Polish immigrants are also one of the top 5 foreign nationalities in Ireland, Germany, the Czech Republic and Austria, considering that Polish immigrants represented 11.1% of the total immigrant population in Ireland, 12.5% of the total immigrant population in Germany, 6.1% of the total immigrant population in the Czech Republic and 5% of the total immigrant population in Austria in 2005/2006. (OECD 2013).

In 2000, Polish immigrants were one of the top 5 foreign nationalities in: Austria, the Czech Republic, Germany, the Slovak Republic and Sweden. (OECD 2013).

Considering that in the year 2000, the United Kingdom and Ireland were not among these countries, this means that in 5 years’ time the number of Polish emigrants to these 2 countries increased very much, especially because the United Kingdom and Ireland are countries that receive many immigrants so in order to become one of the top 5 foreign nationalities in these countries in such a short amount of time, it would require a huge amount of Polish emigrants to these countries. (OECD 2008).

Unfortunately, a substantial share of the Polish migrants abroad is employed in jobs that do not correspond to their education. For example, 30% of the Polish migrants in the United Kingdom have tertiary education. However, 80%-90% of them are overqualified for their jobs. Therefore the rate of return to human capital investment for them is low. Upon return to Poland, reintegration in the labor market can prove difficult so, in order to avoid unemployment, those who return usually become self-employed. (OECD 2013).
**Most affected fields**

The first significant flow of high skilled emigration was in the 1980s. Of the 700,000 emigrants in the period 1981-1988, 15% had a higher education and 31% had secondary education. Therefore approximately 15,000 higher educated people left Poland every year during the 1980s, which constituted around ¼ of Polish university graduates of all higher education institutions. In this period, a high proportion of the emigrants was formed by scientists. Around 11% of all scientific workers in Poland emigrated between the years 1981-1984. The general situation of the scientific staff was problematic during those years due to the fact that many scientific workers either took up positions in other industries across Poland, which were better paid and offered better career opportunities, either emigrated abroad. The main push factors were low wages, unsatisfying labor conditions, poorly equipped laboratories and lack of research funds.

While at the beginning of the 1980s a big portion of the scientists who left the R&D sector in Poland decided to emigrate (52%), in the beginning on the 1990s the amount decreased to only 11%, while the rest of them left the R&D sector for other sectors in Poland. (Kaczmarczyk 2006). Even in 2000, the largest share of the tertiary educated Polish immigrants in the OECD area had an education in Science and Engineering (39.4%) and the second largest share had one in Humanities and Social Sciences (33.3%). (OECD 2008).

Another sector very affected by emigration is the medical and healthcare field, since there is huge demand for this type of migrants in highly developed states. Many Western European countries are facing a shortage of medical staff, which could only be beneficial for the emigrants in the medical field, because most of the receiving countries are typically offering good financial and social conditions, paired with a simplified immigration process.

Due to the fact that the wages and labor conditions are not as good in the Eastern European countries as in the West, a significant outflow of medical staff is to be expected. For example, the average wage of a Polish medical resident is around PLN 1,637, while in the West this wage could be up to 20 times more. Moreover, since the EU expansion in 2004, more and more nurses left Poland, creating a brain drain. During the period 2004-2007, out of the 2139 Polish nurses (1.5% of the country’s employed nurses) that emigrated, 1013 of them registered in Great Britain, 820 registered in Italy, 158 in Ireland, 111 in Norway and 37 in Netherlands. ([http://content.healthaffairs.org/content/27/2/593.1.full](http://content.healthaffairs.org/content/27/2/593.1.full))

One of the favored destinations for medical doctors from Poland is the United Kingdom. A total of 2178 medical doctors of Polish origin were registered in the UK in the period 2004-2008. (Murdoch and Hutrya, 2008).
Remittances

After Poland joined the European Union, the remittances more than doubled from US$4.7 billion in 2004 to US$10.7 billion in 2008 before dropping to an estimated US$8.5 billion in 2009, according to the World Bank. ([http://www.migrationpolicy.org/article/eu-membership-highlights-polands-migration-challenges 2010](http://www.migrationpolicy.org/article/eu-membership-highlights-polands-migration-challenges 2010))

In 2004, Germany accounted for 35% of remittances, United Kingdom for 21% and the United States and Ireland for 13%.

After accession to EU, the main source of the remittances shifted to the United Kingdom, which accounted for 34% of remittances in 2007, Ireland for 34% as well and Germany and the United States only accounted for 13%, respectively 4% of the remittances.

However, in 2009, Germany’s share grew up again, to 24%, while the shares of the United Kingdom and Ireland dropped to 16% and 19%. One reason for this shift in the share of remittances is the recent recession, which caused the Polish immigrants in the United Kingdom and Ireland to reduce the amount of money they send to Poland. ([http://www.migrationpolicy.org/article/eu-membership-highlights-polands-migration-challenges 2010](http://www.migrationpolicy.org/article/eu-membership-highlights-polands-migration-challenges 2010))

Measures taken against the brain drain

The Polish government launched a campaign in 2008 called “Have you got a PLan to return?”, whose aim was to draw emigrants back to Poland, considering that at the time, there was a deteriorating economic situation in Western Europe, whereas Poland was experiencing positive economic forecasts. However the campaign was perceived as propaganda by emigrants and it was not very successful. ([http://edition.cnn.com/2011/WORLD/europe/09/07/poland.return.migration/ 2011](http://edition.cnn.com/2011/WORLD/europe/09/07/poland.return.migration/ 2011))

The campaign includes a guide book and a website for those who have decided to return. These include practical information about necessary paperwork, answers to problems return migrants have to face, and opportunities in the local labor market with lists of local employment agencies and job openings in areas where return migrants might like to settle.

The government has spent about 4 million Polish zloty (about 1 million euros) on the campaign, which was allegedly based on consultations with Polish diaspora organizations. ([http://www.migrationpolicy.org/article/eu-membership-highlights-polands-migration-challenges 2010](http://www.migrationpolicy.org/article/eu-membership-highlights-polands-migration-challenges 2010))

Poland has been very much aware of its outflow of emigrants over the years and in order to fight this phenomenon that has greatly intensified after the post-accession, several initiatives,
both at a national and at a regional level have been taken. One of these initiatives, called “ReturntoPoland.pl” had as a time frame the period 2007-2011 and it was focused on the highly skilled group of emigrants who worked mostly in IT or in banking and finance. The program’s main objective was to address the shortages of skilled labor on the Polish labor market. Several information and training activities were therefore conducted with the help of an international human resources company, called HAYES. (OECD 2013).
4.7. Romania

The results of the Romanian 2011 census reveal a considerable population decline of 7.2% compared to 2002. This issue is not new, considering that the population in Romania in 1992 was 22.81 million, in 2002 it was 21.68 million and in 2012 it reached only 19.04 million. The main contributor to this outcome is external migration. Romania has more than 2 million Romanians registered as residents in other EU countries, out of which 70% of them are located in Spain and Italy, making Romania the European country with the largest outflow of migrants. (OECD 2013).

The people who emigrated from Romania are generally from an urban area, the nature of their departure is labor-oriented, they are mostly working age (46% in the 20-34 age group and 25% in the 35-44 age group) and there are around as many women as men emigrating.

A significant part of the Romanian foreign born population in the OECD area in 2000 worked in the agriculture and industry sector (40.1%), while 31.9% of them worked in the personal and social services sector, 16.3% in distributive services and 11.7% in producer services. (OECD 2008).

In 2005, the highest employment rates for the Romanian immigrants were in Great Britain (around 90%), followed by Portugal and Canada (around 80%) and the lowest employment rates were in France (around 57%). (Widmaier & Dumont 2011).

Considering the fact that Portugal, Canada, UK and Ireland were the countries that registered the lowest gaps in employment rates between the native born and the foreign-born and that France was one of the countries with the highest gap, it is not surprising to see these results. (Widmaier & Dumont 2011).

The largest share of the tertiary educated Romanian immigrants in the OECD area in 2000 had an education in Science and Engineering (48.3%). The rest had an education in Education and health (23.6%) or in Humanities and social sciences (24.2%). (OECD 2008).

Docquier, Lowell and Marfouk’s (2008) database show that Romania is among top 30 countries in the world in terms of skilled emigration stocks (migrants with any post-secondary education).

During the Communist period, Romanian authorities exercised restrictive exit policies, severely limiting international travelling. Although emigration was kept under control, it still occurred. The share of emigrant population during the period 1975-1989 was 35.5%. (Suciu 2010).
Temporary emigration for the purpose of education or labor also occurred during the Communist era. However, the emigration was state-managed, meaning that the emigrants’ labor activities were strictly regulated and family reunification was forbidden (Suciu 2010).

The highest rate of emigration occurred in 1989 when over 40,000 Romanians emigrated, mostly by applying for asylum in other OECD countries. The migration continued after 1989 and the fall of the Communist party.

The emigration of skilled labor left a negative impact on the Romanian economy. The country’s accession to EU was associated with significant increases in migration. (OECD 2009).

The transition from a centrally planned economy to a market economy generated a higher unemployment rate in the Romanian labor market, which was a factor for over 2 million Romanians to seek employment opportunities in the Western European countries. The benefit of this flow of emigration is that the level of money transfers back home has increased from year to year. Remittances to Romania were EUR 4.8 billion in 2007, that is 5.5% of GDP. (OECD 2009).

According to Suciu (2010), in the last decade, emigration has started to become a serious issue, as more and more people emigrate due to the lack of opportunities in Romania. The results of the 2011 Romanian census show a sharp population decline by 7.2% compared to 2002. External emigration is the main contribution of this outcome, considering that 1.91% of the population was reported to be temporarily absent (for a period of less than 12 months) and 3.61% of the population was abroad for a period longer than 12 months. (OECD 2013). Therefore, out of the 7.2% decline in population in 2011 compared to 2002, 5.53% is due to emigration, either on a short term or long term basis. This is considered an undercount by the Romanian National Institute of Statistics.

According to the EUROBARAMETER survey in 2002, 18.6% of Romanian students have a desire to emigrate, compared to only 9.1% in the Czech Republic, Hungary, Slovakia and 13.3% in Poland. The other country with 18.6% of students who wish to emigrate is Bulgaria. Minca (2008).

**Main destination countries**

Between the years 1980-1989, the main destination countries were Germany, the USA, Hungary, Canada and Israel. (Suciu 2010).

According to Suciu (2010), the dominant migration direction has changed with time. Between the years 1990-1995, the main destination countries were Israel, Turkey, Italy, Hungary and Germany. Then, in the period 1996-2002, Canada and Spain have also become attractive in terms of emigration. Starting from the year 2002 until present, Romanians oriented themselves
mostly to Italy and Spain. These are preferred destinations especially for those with vocational or less than secondary education who work in agriculture, construction, housekeeping, hospitality or manufacturing.

70% of all Romanian emigrants in 2005/2006 were in Germany, Spain and Italy. To be more specific, 31.1% of them were in Germany, 24.9% in Spain and 13.9% in Italy. (Widmaier & Dumont 2011).

As far as the share of highly educated Romanian emigrants is concerned, the percentage of highly educated Romanians in Germany remained constant at 18.6% in both 2000 and 2005, whereas in Italy it decreased from 9.8% in 2000 to 6.9% in 2005 and in Spain it increased from 13% in 2000 to 16.6% in 2005. Another important aspect is that far more low skilled emigrants than high skilled ones establish themselves in these 3 destination countries. The number of low skilled emigrants is the most overrepresented in Italy, where the percentage of low skilled is 31.3% while that of high skilled is only 6.9%. (Widmaier & Dumont 2011).

Romanian immigrants represented 9.3% of the total immigrant population in Spain, making Romania one of the top 5 foreign nationalities in Spain in 2005/2006. Romania was also one of the top 5 foreign nationalities in Italy, Greece and Germany, considering that Romanian immigrants represented 7.9% of the total immigrant population in Italy, 2.9% of the total immigrant population in Greece and 4.9% of the total immigrant population in Germany in 2005/2006. (Widmaier & Dumont 2011).

However, the situation was different in 2000, in the sense that in 2000, Romania was not one of the top 5 foreign nationalities in Italy, Spain or Greece. This has very important significations. It means that in 5 years’ time, the number of Romanian immigrants in Italy, Spain and Greece increased to such an extent, that they became top representative as a foreign nationality in these countries. (OECD 2008).

On the other hand, Romanian immigrants were in the top 5 foreign nationalities in the following countries in 2000: Czech Republic, Germany, Hungary and the Slovak Republic. (OECD 2008).

One of the main reasons why most Romanians emigrate to Italy and Spain may be that they are Latin-speaking countries, so learning of the language is easier. As a result of the huge immigration of Romanians and Bulgarians in Italy and Spain in the period 2004-2009, the GDP of these 2 receiving countries has increased by 1 ¼ - 1 ⅓ %.

Concerning the highly skilled Romanian emigrants, they tend to emigrate mostly to France, the UK and Germany and work in IT and business and social service sectors. (OECD 2013).
The highly educated emigrants benefit from the skills, knowledge and experience acquired abroad and those of them that returned home were able to make use of them by increasing their productivity at the workplace or by opening their own businesses. (OECD 2013).

**Most affected fields**

According to the National Agency for Employment and the Labour Inspectorate, in 2007, about 55,260 persons emigrated from Romania under mediated temporary employment contracts. (OECD 2009).

Most of the skilled labor has a university education degree either in medicine or IT. About half of the 5000 graduates of Romanian universities in computer science emigrate each year. (Ferro 2004).

Concerning the medical field, Romania ranked 18 as a source country for doctors in the OECD countries with an expatriation rate of 10.9% in 2000. (Prelipceanu 2008).

Since Romania joined the European Union in 2007, about 14,000 doctors left Romania.

Over the past 2 years, 30% of resident doctors emigrated, reducing the number of physicians from 20.000 in 2011 to 14.000 in 2013. (http://www.ft.com/intl/cms/s/0/f4c0b734-7c70-7c70-11e3-b514-00144feabdc0.html#axzz2y8YIL7qe 2014)

One of the main reasons why Romanian doctors decide to emigrate is the wage gap. The starting salary of a doctor in Romania is around 300 euros, whereas abroad, in a country such as UK or Germany, they can earn around 3000 euros, that is 10 times more.

The main destinations of emigrants working in the medical field are France, the UK and Germany.

One of the attempts in 2014 at reducing the number of medical staff from leaving Romania has been a salary increase of 20-25%. Last year, there was an increase in the health budget, from 3.7% to 4.3% of GDP. (http://www.theguardian.com/world/2014/feb/07/romanian-health-service-crisis-doctors-uk 2014)

The main push-pull factors for emigration have been the search for better job opportunities, the desire to acquire a better social status, discontent with the Romanian society and desire for an experience of another culture, knowledge of the French language, familiarity with the French culture, the existing community of Romanian immigrants in France.

In the case of researchers, a few more factors, besides those already mentioned, were significant, such as the lack of possibilities to conduct research at international level in Romania and the low rate of investment in R&D. (Prelipceanu 2008).
Apart from the skilled emigrants, a big portion of Romanian emigrants have been students, who decided to study abroad, mainly in Western Europe and North America and who afterwards decided to stay there due to more job opportunities in their field of study. Considering that university fees have been significantly reduced for Romanian students since 2007, many youngsters choose to emigrate in order to get a better education and remain abroad after graduation, get a job and remain immigrants for the rest of their lives. The reason why most of them do not come back to Romania after graduation is because they would be overqualified and their income would be lower than what they expected.

**Measures taken against the brain drain**

In order to stimulate the return of the Romanian emigrants, several information campaigns have been organized multiple times in Italy and Spain in 2008, whose focus have been to inform the Romanian expatriates about job vacancies in Romania, about funding opportunities for starting a new business in Romania, about work rights, obligations and risks, about aspects regarding social security (pensions, unemployment, health) etc. Moreover, a strategy focused on stimulating the return or retention of highly skilled emigrants has been attracting foreign investment into the country, particularly in the automotive industry, but also in IT (Google entered the Romanian market in 2010, Ford opened a new car factory in 2012, whereas Renault opened a new research center near Bucharest in 2010). (OECD 2013).

However, because of the fact that the unemployment rate in Romania continues to be high (7.3% in 2013), especially among youth (15-24 group, 23.7% in 2011) and wages are low compared to the rest of Europe, Romania will continue to be a migrant-sending country, with a low rate of return in the near future.

**Conclusion**

Romanian emigration has had both positive and negative effects on its domestic situation. As far as the positive effects are concerned, these has been lower unemployment rate, decreased pressure on social protection budgets, the amount of remittances, and the fact that workers abroad facilitate skill transfer.

Regarding the negative aspects of the emigration, these include an unbalanced distribution of the available workforce by sector and geographical area, loss of the investment in education and a possibly future threat regarding the sustainability of the social protection systems (pension, medical care). In addition, Romania also suffers from distorted wage demand,
depopulated regions, inflationary pressure due to remittances, social problems with children left behind by migrant parents to be cared for by relatives, etc. (OECD 2013).
4.8. The Slovak Republic

The Slovak Republic ranks 122 out of 144 countries in terms of brain drain in 2012, according to World Economic Forum. Moreover, the Slovak population does not find their country to be offering enough opportunities, since to the question “Does you country retain and attract talented people?” Slovakia ranked 2.5 on a scale from 1-7, 7 being “yes, there are many opportunities for talented people within the country.” (Schwab & Klaus 2012)

After becoming part of EU (1st of May 2004), around 120,000 Slovak individuals migrated to EU countries within one year. In 2008, around 250,000 Slovaks migrated, being the highest number of workforce that left the country. (http://www.euractiv.com/enlargement/slovak-labour-migration-discrete-news-222822 2009)

The emigration of the skilled labor force caught Slovakia unprepared, the county losing a part of its labor market, creating lacks of staff in different fields. Slovakia is faced with the prospects of losing more of its brainpower, due to the lack of agreements or prospects for the accommodation of the highly skilled Slovaks returning to their home country. (The Government of the Slovak Republic 2011).

However, the data gathered from the Slovak Labor Force Survey reveals that the number of Slovaks working abroad is declining, from 130,000 in 2010 to 116,000 in 2011 and the number of immigrants in Slovakia slowly increased, from 62,500 in 2010 to 66,000 in 2011. (OECD 2013).

Main Destination Countries

According to Widmaier et al. (2011), 56.3% of the Czech Republic’s and Slovakia’s emigrants in 2005/2006 were in Germany, the USA or the UK. To be more precise, 24.7% of them were in Germany, 15.9% of them were in the UK and 15.7% of them in the US. While in Germany and the UK, the share of low-skilled and high-skilled emigrants was about the same (21.9% versus 26.2% for Germany and 28.5% versus 31.2% for the UK), in the case of the US, the number of highly skilled immigrants is overrepresented (42.6% versus 14.2%). This means that the US is a country preferred mostly by the highly educated emigrants, while Germany and the UK is a top destination country for both low-skilled and high-skilled emigrant population from the former Czechoslovakia.

Moreover, Slovakian immigrants represented 44.3% of the total immigrant population in the Czech Republic in 2005, making Slovakia the most representative foreign nationality in the Czech Republic. Slovakian immigrants in the Czech Republic increased significantly from the year 2000, when the share of Slovakian immigrants in the Czech Republic was of only 32.5%. However, even in 2000, it still represented the most representative foreign nationality in the
Czech Republic. Moreover, Slovakia was the most representative foreign nationality in Hungary in 2000 with 4.4% share out of the total immigrant population in Hungary. The employment rate of tertiary educated Slovakian immigrants in Hungary in 2000 was 67.4%, while that in the Czech Republic it was 90.5%. (OECD 2008).

The reasons why Slovaks workers settle in the Czech Republic had to do with the language similarities, the cultural similarities and the proximity. The interesting fact about the workers settled in the Czech Republic is that the average age (between 32, 8 and 36 years old) is higher than the average age of the Slovak migrants to the countries from Western Europe (between 22, 8 and 27, 1). The difference proves once again that the younger generation is willing to migrate for a better life in the West. (http://www.euractiv.com/enlargement/slovak-labour-migration-discrete-news-222822)

According to OECD (2008), most of the Slovak immigrants in the Czech Republic in 2000 worked in the agriculture and industry sector (46.4%). A large share of them also worked in the personal and social services sector (30.5%) and fewer of them in distributive services (15.5%) or producer services (7.6%).

Slovak workers have migrated massively to the UK after 2004. In 2011, 1% of Slovakia’s population (49,000) lived in the UK. In 2004, only 8,000 Slovaks settled in the UK. This is a 531% increase from 2004, becoming the fastest growing population in the UK. (http://www.dailymail.co.uk/news/article-2002710/UK-immigration-1-Slovakians-come-live-Britain.html 2011)

**Most affected fields**

According to OECD (2008), the largest share of the tertiary educated Slovak immigrants in the OECD in 2000 had an education in Science and Engineering (41.9%). The rest had an education in Education and Health (24.5%) or in Humanities and Social Sciences (29%).

Many of the young Slovaks are considering studying or working abroad. A significant part of the Slovaks students from abroad remain abroad after finishing their education, as they would earn less in their home country compared with the country they finished their degree.

In recent years, Slovaks educated within the medical field have been leaving the country. However, they do not work within their profession, but in low-level jobs. The exodus of medical staff from the country leaves Slovakia with a big problem, as the medical system lacks medics and nurses.

(http://www.euractiv.com/enlargement/slovak-labour-migration-discrete-news-222822)
Conclusion

The emigration rate of the Slovakian population accelerated after 2004, when Slovakia joined the European Union. The preferred destination countries are the Czech Republic, Germany and the United Kingdom, among others. The field most affected by the brain drain is Science and Engineering, but also Medicine.
5. Conclusion

This paper’s objective was to offer a better understanding of the emigration situation, especially the situation concerning the emigration of tertiary educated individuals, in 6 different Eastern European countries, starting from the year 1980, but with a main focus on the recent times.

In order to achieve this objective, first, a general literature review about the brain drain offered a reader a better perspective on the theories and models that have been around since the 1960s until present and how recent literature points out to the fact that brain drain may not be considered entirely detrimental to the sending countries. The brain drain has been shown to positively affect, among other things the incentive to invest in education in the home countries.

The regression analysis of the emigration of the tertiary educated population from Eastern Europe to the main OECD countries in the period 1980-2010 has revealed that the push factors that have the most impact on the emigration are the wages and the education expenditure in the sending countries. Moreover, the effect of wages on the emigration is influenced by GDP per capita and the effect of education expenditure on emigration is influenced by inflation. The results of the regression also prove that Romania, followed by Poland is suffering the most from the brain drain in the period 1980-2010. On the other hand, Bulgaria has been the least affected by the brain drain.

The results of the regression are confirmed by the descriptive part of this paper. These 6 Eastern European countries are indeed affected by the emigration of their educated population to mainly more developed countries in Europe. The brain drain has created specific shortages in the labor market of these 6 countries, especially in the field of medicine, science and research and IT. The main factor, regardless of the occupation of the emigrants that motivates people to emigrate is the significant wage differential between Eastern Europe and other more developed countries. In addition, prestige of the working place, access to the latest technology and research are also great influences. Accession to the European Union increased the emigration rates from these countries, especially in the case of Bulgaria and Romania and to a lesser extent, Poland. Bulgarians and Romanians are more likely to emigrate compared to the Czech, Hungarian, Polish or Slovak population because the economic and social disparities between Bulgarians and Romanians and the rest of Europe is even greater than those between the other 4 countries and the rest of Europe.

In order to improve the current situation of the labor market in the East European countries, several measures could be taken such as improving the worker skills through reforming the educational system in order to make it more responsive to labor market demands, improving labor supply incentives through reforming the social security systems for example and
least but not least opening the labor market to foreign workers, especially those that have the skills that could fill in the shortages.

Since the brain drain most likely cannot be avoided completely in the Eastern European countries, it is necessary to implement some measures in order to reduce its negative effects. Such measures could be for example creating programs that would encourage the return of highly skilled migrants, investing more in R&D, encouraging diasporas and encouraging investment, which would lead to economic development.

Since education is essential for a knowledge-based country, it is of great importance for countries to preserve their skilled manpower in order to be able to have a future successful development. Therefore, considering the fact that these 6 countries need to keep the pace with the rest of Europe, future research about the causes of the emigration from these countries and possible appropriate policies to prevent the brain drain is necessary. Moreover, a future understanding of the pull factors in the destination countries may also be beneficial in order to better see what could be improved in the origin countries. Recent studies have also pointed out to the fact that there is a gender dimension of the brain drain. In general, skilled women exhibit higher emigration rates than skilled men. (Docquier 2009, http://www.frdb.org/upload/file/Docquier.pdf).

Therefore a possible direction of future research could also be to see if there is also a gender dimension of the brain drain for the Eastern European countries, because the fact that women are more prone to emigration than men are can have serious implications, such as a decline in the fertility rate, in the home countries.
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7. Appendix

Model I

Model Summary

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</table>

- Predictors: (Constant), (real wages) (real gdp per capita), unemployment.tertiary.educated, Czech.Republic, (education expenditure)(inflation), Poland, Slovakia, log real gdp per capita, Bulgaria, Adjusted savings: education expenditure as % of GNI, Hungary, (real wage)(inflation), log.real.wage, CPI 2005=100, (real gdp per capita) (inflation)

ANOVA\textsuperscript{a}

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>283.381</td>
<td>14</td>
<td>20.242</td>
<td>12.252</td>
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<tr>
<td></td>
<td>Residual</td>
<td>16.521</td>
<td>10</td>
<td>1.652</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>299.902</td>
<td>24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Dependent Variable: Emigration to OECD countries

- Predictors: (Constant), (real wages) (real gdp per capita), unemployment.tertiary.educated, Czech.Republic, (education expenditure)(inflation), Poland, Slovakia, log real gdp per capita, Bulgaria, Adjusted savings: education expenditure as % of GNI, Hungary, (real wage)(inflation), log.real.wage, CPI 2005=100, (real gdp per capita) (inflation)

Figure 8. Model Summary 1
Model 2

Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>.917&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.341</td>
<td>.781</td>
<td>1.92716</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), (real wages) (real gdp per capita), Hungary, Slovakia, Czech Republic, Bulgaria, Adjusted savings: education expenditure as % of GNI, (education expenditure)(inflation), Poland, log.real.wage

ANOVA<sup>a</sup>

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
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<td>52.361</td>
<td>14.098</td>
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<td>3.714</td>
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<td>Total</td>
<td>560.379</td>
<td>33</td>
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</table>

a. Dependent Variable: Emigration to OECD countries
b. Predictors: (Constant), (real wages) (real gdp per capita), Hungary, Slovakia, Czech Republic, Bulgaria, Adjusted savings: education expenditure as % of GNI, (education expenditure)(inflation), Poland, log.real.wage

Figure 9. Model Summary 2