

BRAIN GAIN WITHIN STRUCTURAL UNCERTAINTY?

CASE STUDY ON THE HIGHER EDUCATION

ENROLLMENT RATES IN BULGARIA

By

Blagovesta Chonkova

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Supervisor: Professor Thilo Bodenstein

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Abstract

From 2000 to 2008 gross enrollment rates in higher education institutions in Bulgaria rose only sluggishly (around 50 percentage points less) relative to the other new member states of the EU. The current paper aims to explain this pattern, which diverges from the optimistic predictions of the brain gain theory that increased prospects for migration would motivate more pupils to pursue higher education at home. It is found out that the neglected by the proponents of the theory role of the structural determinants, within which individual decisions are taken, can significantly disrupt the positive effect of migration prospects on the enrollment rates in higher education institutions in the source country. Elaborating on the individual level decision structure of students and testing the generated propositions with empirical data from Bulgaria and Romania, the paper proposes a narrative explaining the deviation of the Bulgarian enrollment rate patterns, which focuses on the role of the quality of education and labor market conditions for individuals' decisions of individuals to pursue higher education.

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Chapter 1 – Introduction

From 2000 to 2008 gross enrollment rates¹ in higher education institutions in Bulgaria increased from 45 to 51 percent of the student-age population in the country. In comparison enrollment rates in Romania started from a little more than 20% and reached 65% in 2008. The average increase in enrollment rates in the countries in Central and Eastern Europe (CEE) was 68%. Compared to these numbers, with 12%² the case of Bulgaria is a clear outlier and significantly deviates from the common trend of significant increase in enrollment rates observed in the CEE region.

One explanation for the increasing enrollment rates in these countries, especially the new member states of the EU, has been provided by proponents of the *brain gain* theory, saying that increased opportunities for migration increase the returns to education and, thus, the incentives of students to pursue higher education. On an aggregate level this causes increased enrollment rates in higher education institutions (Lundborga and Recheab 2002; Farchy 2009). In the long run this is expected to lead to an increased level of economic growth because of the accumulated human capital (Mountford 1997; Stark, Helmenstein and Prskawetz 1997; Vidal 1998). This theory opposes the pessimistic expectation of the proponents of the *brain drain* theory, suggesting that prospects for migration will lead to the depletion of skilled labor in the source countries (Bhagwati and Rodriguez 1976). The contrasting predictions of both theories in terms

¹ “The number of pupils enrolled in tertiary education, regardless of age, expressed as a percentage of the population in the theoretical age group for tertiary education.”, definition provided by the UNESCO Institute for Statistics

² Author’s calculations based on data provided by the UNESCO Institute for Statistics; Numbers include enrollments both in public and private universities. In order to ensure consistency of the comparisons made, the author uses data on the enrollment rates in higher education institutions, categorized as ISCED (International Standard Classification of Education) – level 5-6, created by UNESCO. This ensures the comparability of data among countries.

of the outcomes for the source countries make further research in the field crucial for the sake of taking proper policy making decisions. This paper aims to contribute to the research by in-depth studying the deviant case of Bulgaria, which diverges from the common trend of extensive increase in enrollment rates in the rest of the countries in the region and thus, can be considered to be an outlier in the population, deviating from the predictions of the brain gain theory. The *research question* of the paper, thus, can be formulated as ***why enrollment rates in Bulgaria increased only sluggishly in the period from 2000 to 2008.***

In an attempt to find an explanation for the observed deviation, the paper questions the correlation assumed by brain gain proponents between migration opportunities for high-skilled labor and increased enrollment rates in domestic higher education institutions. It is believed that this oversimplification reveals neglect of the role of the structural determinant (de Haas 2010) within which individuals take decisions regarding their higher education, such as the characteristics of the higher education system and the labor market conditions of the source country. The paper, thus, proposes an elaboration of the decision structure of students. The following general propositions were developed:

- 1) Potential high-skilled migrants anticipate the insecurity of returns to domestic education on the labor market abroad, which is a result both of the inferior quality of education in the source country relative to higher education institutions abroad and the potential discriminative behavior of foreign employers against migrants. In order to cope with this risk, many youngsters prefer studying abroad. Higher costs of education in the host country would, however, constrain the chances of many to pursue studies abroad.

- 2) An alternative to studying abroad might be pursuing higher education at home, after which youngsters can join the domestic labor market, where they can improve their qualifications through professional experience and on-the-job trainings. This is a way to give a positive signal to foreign employers on the skills of the migrant, thus, it will improve one's chances for joining the foreign labor market. This, however, is only plausible if youngsters feel rather secure about the returns to domestic education at home in terms of finding a matching employment on the domestic labor market. If this is not the case, they would rather choose to migrate as low-skilled labor instead of incurring costs for education which brings only uncertain chances for employment.

Based on these propositions, the following two *alternative hypotheses* were generated:

- A. The inferior quality of higher education Bulgaria relative to education abroad is the reason for the stagnating enrollment rates.
- B. Labor market conditions for highly skilled workers discourage the student-age population from investing in domestic higher education.

In order to test the two hypotheses, the case of Romania will be compared with the case study of Bulgaria. The reason to choose Romania is the enormous difference in enrollment rate patterns of both countries and the similarity in other important variables, such as socio-economic situation, institutional arrangements, and historical background conditions. The main finding of the paper is that *uncertainty in the returns from investing in higher education in Bulgaria discouraged many students from pursuing a degree at home*. This uncertainty is mainly due to the inferior position of highly-skilled workers on the domestic job market.

It is believed that the paper will achieve the following aims: i) it will provide a *micro-level analysis* on the theory of brain gain, which is often disregarded by the literature. Most studies have been using the regression cross-country macro-level analysis, which, having in mind the great divergence of the countries, leads to important omitted variables (de Haas 2010; Miyagiwa 1991); ii) the in-depth study of a diverging case from the theory's predictions (outlier) will provide insights into additional variables/conditions, which can affect the enrollment patterns in source countries; iii) it will provide further support to the critiques of the brain gain theory, suggesting that the structural determinants, such as quality of education and labor market, have to be better taken into account when considering the incentives for young individuals to pursue higher education at home.

The structure of the paper is the following. In the second chapter, the paper illustrates the disparity between the case study's empirical data and the brain gain theory's predictions. This section also reviews literature providing possible explanations for the gap identified. The third chapter provides the methodological framework and develops general propositions which will be used to answer the research question. Then, the paper specifies the two alternative hypotheses, stemming from the general propositions, and tests them with empirical data. The last section summarizes the findings of the paper, its limitations and suggestions for further research.

Chapter 2 – The Gap between Empirical Data and Theory’s Predictions

This chapter aims to present the research puzzle of the thesis paper. It starts with a literature review of international migration literature and more specifically the recent brain gain theory. This is essential in order to be able to interpret the empirical data which is presented in the second part of the chapter. A research question is formulated based on the gap between the theory’s predictions and the case study’s empirical data. Further, the chapter provides evidence for the robustness of the case study for testing the brain gain theory. After demonstrating that the gap is not caused by poor selection of the case study, the paper looks into potential shortcomings within the theory itself, which might have caused the inconsistency between the brain gain’s predictions and the empirical data. For this purpose, the chapter studies the critiques of the theory, which are believed to provide insights on potential omitted variables, and thus contribute to the understanding of what caused the gap discussed in the paper.

2.1. Brain Drain – Brain Gain Literature

The discussion on the effect of migration on human capital in the literature became relevant a few decades ago, when economists recognized human capital as a crucial resource for stirring economic growth (Schultz 1960). Migration has been proclaimed both a “curse” and a “blessing in disguise” (Stark et. al. 1997) for the source country’s human capital. Docquier and Rapoport (2007) give an extensive overview of the three *generations* in migration literature. The first one believed in the rather “neutral effect” with “negligible” negative externalities, compensated by the increased remittances and the left-behind assets of the migrants. Later, scholars (Bhagwati and Rodriguez 1976) put more emphasis on the negative externalities of

migration, such as welfare losses (lost taxpayers), decreased ability to adopt new technologies, and other intra-and intergenerational externalities. It was believed that losing human capital impeded the economic development of the source country and increased the international inequalities between rich and poor.

The emphasis on human capital remained a key factor for the third generation of migration literature as well. The argument about the effect of skilled migration on the “stock” of human capital in the source country, however, was “turned on its head” (Stark 2002). Among others, Mountford (1997), Beine, Docquier and Rapoport (2001), and Stark et. al. (1997) argued that migration opportunities could actually contribute to the formation of human capital. Their theory suggests that prospects to migrate as highly skilled labor increase returns to private investment in education and thus “play a significant [positive] role in education decisions” (Beine et. al. 2001). On an aggregate level, this leads to an increase in demand and thus, private investment in education in the source country (“ex ante brain effect”, Beine et.al. 2001). Constraints, such as financial means and migration quota, however, reduce the extent of migration (ibid). Thus, only part of those who planned to migrate can actually do this and a large share of the graduates eventually stay in the source country (“ex post brain effect”, ibid). Moreover, some of those who migrated eventually return to their countries, thus the *drain* effect is additionally reduced (ibid). As long as the aggregate number of those who increased their investment in education because of migration opportunities is larger than the number of those who actually succeed to migrate, there is an accumulation of human capital “stock” in the source country, thus, “brain gain” can be observed (ibid). The accumulated human capital will according to the theory eventually nurture economic growth and improved long-term economic development prospects in the source country (ibid).

2.2 The European Union Accession as a Natural Experiment for the Brain

Gain Theory

The brain gain theory prediction that with increased migration prospects private investment in education in the source countries will increase make the European Union (EU) enlargement a “natural experiment” (Farchy 2009) for empirically testing the theory. Two factors should be considered in this respect. First, upon joining the EU, the majority of the new member states had significantly lower levels of living standards and income per capital. Furthermore, considering the EU labor market provisions and “the free movement of workers”, new member states’ citizens can only be restricted from the labor markets of the old member states for a maximum period of seven years (Article 45 of the Treaty on the Functioning of the European Union). Therefore, according to the brain gain theory, which suggests that highly skilled workers will be willing to migrate in order to increase the returns to their education, it becomes reasonable to expect a flow of highly skilled migration from the new to the old member states. In addition, student-age population in the new member states is expected to increase the investment in higher education in order to improve their chances of getting a job on the foreign labor markets. Using a panel regression with data on gross enrollment ratios in thirteen of the last countries to join the EU (enlargements of 2004 and 1981), Farchy (2009) tested to what extent the predictions of the brain gain theory apply in the context of the EU enlargement. She concluded that the EU accession had “a significant impact on human capital formation indicating that the prospect of migration can indeed fuel skill formation even in the context of middle-income economies.”

2.3 The Gap between Theory and Empirics and Research Question

Inspired by Farchy's analysis on the role of the European Union for skills accumulation in the EU candidate countries, this paper looks into the gross enrollment ratios (GER) of tertiary education in the last two countries to join the Union in 2007 - Bulgaria and Romania - which were not covered by Farchy's analysis. As elaborated above, the brain gain theory suggests that when citizens perceive improved opportunities to join the foreign labor market, the demand for higher education will increase. Thus, since 2000, when the countries started negotiations for their EU accession, it is expected that enrollment rates would increase significantly.

Indeed, the countries which joined the European Union in 2004 and Romania, which joined in 2007, experienced large increase in their enrollment rates for the period of study. The average increase of enrollment rates in higher education institutions for the period between 2000 and 2008 in eight of the new EU member states³ was 66%. In Romania, enrollment rates increased around 200%, which is the highest increase among the sample of countries. Compared to these data, the case of Bulgaria reveals a rather deviant pattern. It is the country with slowest increase in enrollment rates of only 12%⁴ for the period between 2000 and 2008⁵. Experiencing enrollment rates of 45% in 2000, the country was one of the leading countries in the sample of cases only after Latvia and Slovenia. In 2008 its higher education enrollment rates were the

³ Malta and Cyprus were excluded from the analysis because of lack of data. In addition, it has been argued by Beine, Docquier and Oden-Defoort (2011) that this relationship does not hold for very small countries.

⁴ Indeed, in both countries there has been centrally determined enrollment rates into the higher education institutions, thus, these numbers do not fully reflect the real demand for education. Considering that the enrollment numbers for higher education institutions are proposed by university authorities and approved by the Ministries of Education, it is presumed that enrollment rates are based on the demand for degrees universities face. Data on real demand for higher education degrees, however, should be improved, in order to improve the robustness of analysis.

⁵ This period was chosen because of data availability and because it is the period between the countries starting EU negotiations and one year after EU accession, which is considered to be the period when the countries' labor force perceived the increase in migration opportunities.

lowest in the region (51%)⁶. This makes Bulgaria a clear outlier in the sample of CEE countries. Moreover, it is the only country to face decreasing enrollment rates after 2000 when it started accession negotiations with EU. This rather unexpected decrease of enrollment rates plus the sluggish increase of GER compared to the other states in the region, reveal the contradiction of empirical data from Bulgaria with the predictions of the brain gain theory and Farchy's conclusion about the potential of EU accession to stir human capital formation.

The present paper will aim to explain this deviation. The *research question* of the study can, therefore, be formulated as ***why enrollment rates in Bulgaria increased only sluggishly in the period from 2000 to 2008***. Being an outlier in the sample of countries and diverging from the predictions of the brain gain theory, the case of Bulgaria is expected to provide useful insights into the theoretical assumptions and potential omitted variables in this last generation of migration literature – the brain gain theory.

2.4. Robustness of the Choice of Case Study

There can be two explanations for a gap between theory and empirics - either the case study is not suitable for testing the particular theory or it is a result of the shortcomings of the theory itself. On the question of the appropriateness of the case study, two issues can be identified: i) choosing a case which is not within the population of cases for which the theory should hold; ii) choosing a case which experienced an external shock affecting the expected relationship between the dependent and independent variable. This section of the paper aims to prove the suitability of the case study for testing the theory and consider possible shocks that might have affected the data on enrollment rates in Bulgaria.

⁶ Author's calculations based on data of UNESCO Statistical Institute

Empirical literature conclusions are contradictory as to their predictions on the extent to which there should be brain gain effects observed in middle-income countries. Most recently, Beine, Docquier and Oden-Defoort (2011) argued that the theory holds for rather impoverished developing countries and not for middle- to high-income countries. On the other hand, Beine, Docquier and Rapoport noted quite reasonably that with increased impoverishment individuals in the source countries might not have the means to increase education investments even though they have more incentives to migrate because of the higher wage differentials (Beine, Docquier and Rapoport 2003). It seems to be reasonable to conclude that there is a certain bracket of middle-income countries where brain gain effect is expected to be observed. In the case of Bulgaria, clearly the country surpasses the minimum threshold of income. Considering Farchy's finding that the brain gain effect played a role in increasing enrollment rates in the new EU states, all of which are better-off than Bulgaria, it seems sound to assume that Bulgaria falls within this bracket of middle-income countries where the brain gain would be expected. Therefore, although empirical findings have been diverging as to their conclusion on the impact of increased migration opportunities on investment in education in the middle income countries, the case of Bulgaria is believed to be a suitable case for testing the theory.

Another possible explanation for a gap between the theory's predictions and the empirical data would be an external shock affecting the enrollment rates in the country. In order to find the relevant variables which might have an impact on the relationship between migration prospects and investment in education the paper will look into literature on the demand for higher education. It suggests that two major factors explain enrollment rates - cost of education and perceived returns to education (Altonji 1993).

Measuring the cost of education involves direct costs, e.g. tuition fees, and opportunity costs, e.g. time and foregone earnings from employment (ibid). In addition, factors such as access to financial support (e.g. financial aid), loan schemes, and change to family incomes would have an impact on the perceived costs of pursuing a higher education degree. In the case of Bulgaria, indeed there was an increase in the cost of education in 1999. The new Higher Education Act⁷ of 1999 introduced centrally determined tuition fees for higher education in Bulgaria. The Act stipulates further that the tuition fees cannot exceed 30% of the costs a university incurs for the student. Before this reform, since 1990, part of the students had been on scholarships provided by the state and the rest had been paying fees. The dire situation of the economy in the transition period and the decrease in the education budget with 20% (Georgieva 2002) implies that the increase in enrollment rates in the 1990s was due to increased private investment in education, thus, increase in the number of students paying tuition fees. Therefore, the introduced in 1999 tuition fees are not considered to have played a significant role in the decisions of individuals to pursue higher education, as on average, while the costs for some students increased (those on state scholarships), they decreased for a large share of the students who have previously paid higher tuition fees. An aggregate decrease in the number of students can also be excluded as a possible external factor to consider because enrollment rates, as the share of enrolled students as a percentage of the student-age population, take into account the aggregate number of the student-age population.

Now that the suitability of the case for testing the theory has been demonstrated, the paper will go into the assumptions of the theory and look for potential shortcomings, which could explain the gap between the theory's predictions and the empirical data for the chosen case

⁷ Available at <http://www.cepes.ro/services/pdf/bulgaria.pdf>

study. To do this, the next section will consider the critiques of the brain gain literature and the potential omitted variables pointed out by the scholars. By doing this, the contribution of the paper to the literature of international migration and brain gain theory will be highlighted.

2.5. Shortcomings of the Brain Gain Literature

The critiques of the brain gain theory follow two main directions – critiques related to the methodology of the empirical studies and the assumptions of the theory. The main focus of the latter can be summarized as *ignoring the role of the structural determinant* in both the relationship between increased migration opportunities and investment in education and the relationship between increased level of education and economic growth in the source country. Regarding the second one, authors (de Haas 2010; Schiff and Özden 2006) argue that the brain gain effect in the source countries is not as big as claimed by its proponents. Noting that in most source countries tertiary education is heavily sponsored by the state, increased demand for education and thus, public investment in education, would affect other areas in the public budget, such as health care and investments in infrastructure. Moreover, it would mean decreased potential for the state to collect taxes because of the decreased numbers of potential labor force (Schiff and Özden 2006). Although one might argue that increased education level of citizens would increase tax collections because of the higher income of graduates, this might not be the case if the economy cannot assimilate the increased number of graduates and thus provide them suitable positions, or if education does not provide relevant skills to the graduates which do not match with the demand on the labor market. Further elaboration on the relationship between increased investment in education and economic growth would be beyond the scope of the present paper.

The focus of the present research is the relationship between increased migration opportunities and investment in education. As described above, the brain gain literature suggests that increased personal incentives of individuals to pursue higher education because of migration opportunities will boost human capital formation the country. Among the few constraints discussed by the authors (Beine et. al. 2011) is the extent of migration, which in case of being too large, might impede the brain gain effect. In addition, if a country's income per capita is large enough, student-age population would not be incentivized by migration possibilities (ibid). These are, however, factors related to the *agent's* education choice (de Haas 2010). Thus, brain gain is viewed in a way as “self-help development ‘from below’” (ibid). This “naivety” in the brain gain literature is harshly criticized by de Haas, who argues that authors “shift the attention away from structural constraints and the vital role of states in shaping favorable conditions for positive development impacts of migration to occur.” Even though individuals might have incentives to pursue higher education at home, structural constraints might discourage them from doing so (such as inferior quality of higher education and labor market conditions). Up to now, there are just few attempts to consider the role of these structural determinants in relation to the brain gain effect. The present paper will elaborate precisely on the impact of these determinants on individuals' choices to pursue higher education.

The other contribution of the paper is related to the critiques on the empirical studies of the literature. Authors suggest that the cross-sectional regressions, which are most often used for testing the theory, involve cases which are too heterogeneous, therefore, there is a high chance for omitted variables in the analyses (Beine et. al. 2003, Faini 2003, de Haas 2010). The other major problem with the cross-section regression is related to the possible endogeneity between increased migration and higher levels of human capital. On the one hand, better opportunities for

high-skilled migration might increase incentives for education. On the other hand, the same correlation would occur with more people pursuing education as it would mean that more people can take advantage of migrating as highly skilled labor force. Although scholars have been using different instruments to overcome this problem, it increases the uncertainty of their conclusions (Beine et. al. 2003). Batista, Lacuesta and Vicente rightfully pointed out that “the simplistic definition of “brain gain” at the macro level (as the change in the country’s tertiary schooling of natives due to migration of skilled workers) misses potentially important individual heterogeneity and is, by design, incapable of identifying the channels through which these positive effects work” (Batista, Lacuesta and Vicente 2007). The empirical micro-level literature, is, however, rather scarce (Batista et. al. 2007, Boucher, Taylor and Stark 2005; de Haas 2010). There are a few case studies on the brain gain effect in Mexico and India (Boucher et. al 2005; McKenzie 2006). These, however, might not be useful to provide insights into the processes in smaller countries. As Beine et. al. (2011) pointed out brain gain would have different effects for smaller and bigger countries. Moreover, two of the case studies (Boucher et. al 2005; McKenzie 2006) suggest that increased migration opportunities had a positive effect on secondary education achievements in Mexico, but rather negative effect on tertiary education. Having in mind the scarce micro-level empirical analysis done so far and the contradictory finding of some of the studies, it becomes even more pertinent to look into more cases and trace the relationship between the different variables in the process. Thus, it is believed that the present paper is a step in the right direction.

Chapter 3 - Methodology and Theoretical Framework

The main focus of the paper is the case of Bulgaria, which as illustrated in the previous chapter, is a *deviant* case (Gerring 2008) for the population of countries in the CEE region. The paper will utilize the case to generate hypotheses providing explanation for the deviating value of the dependent variable – the enrollment rates in higher education institutions in Bulgaria. It is worth noting that the paper does not aim to disprove the brain gain theory, but rather add to the causal factors that affect the expected relationship between migration opportunities and increased enrollment rates in domestic higher education institutions. The explanation generated from the case study served to draw general propositions, which, it is hoped, will be useful to build further insights into the theory of brain gain.

In order to come up with an explanation for the deviation observed, Romania will be compared to the case of Bulgaria. Romania was chosen for comparative purposes because of the similar socio-economic situation, institutional arrangements, and historical background conditions, which the countries display and which are expected to play a role in the development of education in these countries in general, and in the patterns of enrollment rates into higher education institutions in particular. Moreover, the countries have been proceeding with the negotiations for EU accession in parallel, which is of particular importance for the research of the paper, as it controls for the time variable. As the brain gain theory would predict, similar enrollment rate patterns in time would be in place as the countries were facing increased migration prospects simultaneously. Moreover, according to the theory, with the approach of EU accession enrollment rates should be increasing. Although the case of Romania complies with these predictions, Bulgarian enrollment rates have displayed very different pattern as described

above. Thus, the comparison of these two cases, which have similar background conditions, but different enrollment rate patterns, will be a useful tool for tracing the possible explanations for the unexpected trend in Bulgaria.

Before going into the general theoretical propositions, which will be elaborated below, it is important to specify the main assumptions of the paper. These are: i) *wage differentials between countries matter*. Facing lower wages at home than what individuals could earn abroad, will increase the perceived returns to their education and therefore, their incentives to advance with their studies. This is in line with the main assumption of the brain gain theory that migration is economically driven. It is important to highlight once again that the suggested propositions do not refute the assumptions of the brain gain theory, thus they do not aim to disprove the theory, but rather add to factors affecting the correlation between migration opportunities and enrollment rates; ii) *wage premium of higher education matters*. This assumption is in line with the literature on the economics of higher education, suggesting that students will pursue higher education if the return to their education is perceived to be higher than the costs students would incur studying (Altonji 1993).

Based on the case study research, a few general propositions were developed, which, it is believed, will improve the understanding of the complex relationship between migration incentives and higher education enrollment rates. The main principles for building up these propositions were: i) the logical consistency of the decision structure of the individuals based on the assumptions specified above; ii) the consistency of the expected by the propositions outcomes with the available empirical data on the cases.

It is believed that the brain gain proponents oversimplified the theory, assuming straight correlation between migration opportunities for high-skilled labor and increased enrollment rates in domestic higher education institutions. Individuals' decisions are taken within a structural frame, which might encourage or discourage individuals from pursuing certain actions (de Haas 2010). By elaborating on the complexity of choices which potential young migrants in the source countries make in regard of their higher education, the paper suggests a channel through which structural determinants enter the analysis of the gain theory. Thus, the suggested propositions focus on individual level decisions, which reflect the broader macro-level environment.

As specified above, it is assumed that youngsters in the source country will be willing to migrate because of existing wage differentials on the foreign and domestic labor markets. Furthermore, individuals will make choices regarding their higher education based on the economic rate of return from pursuing a higher education degree (returns minus costs). Therefore, rather than assuming that migration opportunities will directly result in increased willingness of youngsters to pursue higher education at home, the paper suggests the following elaborated decision structure:

- 1) *Pupils can choose between studying at home and studying abroad. Two factors affect this decision. Broadly, these are the expected returns and costs from pursuing higher education degree. Contrasting domestic and foreign higher education degrees, students will anticipate: i) to what extent domestic education is worth in terms of quality, and thus, genuine skills it will give them to be competitive on the foreign labor market; ii) to what extent domestic degrees would be valued by foreign employers. If pupils feel **uncertain** about their chances of getting a job on the foreign labor market with a*

domestic higher education degree, they will prefer pursuing a degree abroad, most probably in their chosen destination country. Taking into account the significantly higher costs of education abroad, however, many potential migrants will be restrained to study abroad due to financial concerns. In this case, alternative ways to enter the foreign labor market will be considered, which will be the focus of the next section of the chapter.

The described proposition is based on both the empirical research done for the purposes of the paper, which will be described in the next chapter, and the existing literature in the field. Authors studying human capital have often ignored the role of institutions and quality of education for the formation of human capital (Castelló-Climent and Hidalgo 2010). Considering the quantitative aspect of education, such as the average years of education of a population, implies that a year of education in one country necessarily gives the same level of skills and knowledge as a year of education in another country (ibid). Using international tests for cognitive skills in mathematics and sciences, Castelló-Climent and Hidalgo argued that this assumption in the literature is erroneous and brings misleading implications. Their case-study regression analysis demonstrated that quality of education plays a role in encouraging or discouraging students from pursuing secondary and tertiary education because of its effect on the expected returns from education.

As suggested above, students will also look into the behavior of foreign employers in terms of how students' higher education degrees are valued abroad. An anticipated discriminatory behavior by the foreign employers would, therefore, additionally decrease the expected returns from their domestic graduate degrees. This will have an impact on pupils' final decision on the destination country for their studies. The brain gain literature largely neglects this issue. Authors generally assume that skills are perfectly transferable and a degree from home

university will be valued equally to a degree from a foreign university. Other authors admit that this assumption may not hold but exogenize the variable by assuming that foreign employers do not have information on the skills of foreign graduates (Kwok and Leland 1982). Empirical studies (Chiswick 1978), however, reveal that foreign workers often occupy positions which are below their qualifications. Therefore, a perception of foreign employers discriminating against graduates from domestic higher education institutions increases the uncertainty, thus reduces the expected returns from domestic education by young individuals in the source country.

To sum up, it is believed that perceptions on the inferior quality of domestic education and the anticipated discriminative behavior of employers in the host countries against foreign graduates will reduce the expected returns to education pursued in a domestic institution. Thus, the returns from education abroad might be perceived to be considerably higher than returns from domestic education. When choosing destination for their studies, however, costs (direct and opportunity costs, as described above) of education will also be considered. Often costs of education in the host country are significantly higher than in the source country, considering that students migrate from relatively poor to relatively rich countries. Thus, costs of studying abroad might be beyond the financial capabilities of a large share of the potential migrants despite the better returns they will get from it on the foreign labor market. Facing these constraints, students willing to migrate will consider alternative ways to enter the foreign labor market, which is described in the following part of the chapter.

- 2) *Apart from studying abroad, which for many might be a financially unfeasible option, students might decide to obtain further qualifications through entering the domestic job market. This will bring them professional experience and on-the-job-training, which*

could be give a positive signal to foreign employers regarding migrant's skills. Thus, this might reduce the asymmetry of information on the foreign labor market in terms of migrant workers' skills. If youngsters, however, feel insecure about their prospects to find a matching job on the domestic labor market, they might decide to migrate as low-skilled labor rather than incurring costs for domestic education, which might not bring them the expected returns.

To justify the propositions suggested above, it will be useful to take a closer look into the literature on demand for higher education. Literature disagrees on the way pupils build their expectations in terms of returns, or in other words the wage premium, they will get from education. Some authors (Freeman 1971) argue that individuals base their education decisions on “backward expectations” (ibid), namely expectations for the future are grounded on the current employment indicators, such as wage and unemployment rate. Others (Siow 1984) contend that students use more complicated rational techniques to build their expectations on the returns from education. These authors assume that pupils build rational expectations based on “forward forecasting” (Neugart and Tuinstra 2003). Having in mind that there is significantly more empirical evidence in favor of the first theory (Borghans, de Grip and Haijke 1996), it seems reasonable to assume that current levels of wage and employability will have an impact on the decisions of pupils regarding their higher education and the chances it will bring them to successfully enter the labor market.

The second proposition that individuals might choose to migrate as low-skilled labor rather than pursue higher education at home was extensively studied by McKenzie (2006) and McKenzie and Rapoport (2005). They demonstrated a direct substitution effect between

education and migration for student-age population in Mexico. Chiquiar and Hanson (2005) estimated that the returns to education for Mexicans in Mexico are significantly higher than the returns for Mexicans in the United States. McKenzie (2006) argued that this effect increases with the higher level of wage differentials in the remunerations on the domestic and foreign labor markets. Thus, being in line with the assumption of the brain gain theory that wage differentials matter for migrants' choices, it is believed that the possibility for a direct substitution effect between education and migration should also be taken into account for the purpose of the current study.

In view of the sluggish increase of the enrollment rates in higher education institutions in Bulgaria compared to these in Romania, and based on the above developed propositions, the following two alternative hypotheses will be tested:

- A. *Quality of higher education* in Romania is significantly higher than quality of education in Bulgaria, which causes the difference in the enrollment patterns. Thus, expected returns from Romanian higher education on the foreign labor markets is relatively high, which encourages students to study in domestic institutions. On the other hand, the inferior quality of higher education in Bulgaria discourages potential migrants from pursuing higher education at home because of the uncertain returns of domestic education on the foreign labor markets.
- B. *Labor market conditions* for highly skilled workers in Bulgaria discourage student-age population from investing in domestic higher education. Facing the uncertainty in returns from domestic higher education both on the foreign and domestic labor markets, student-age individuals in Bulgaria choose to study abroad or migrate as low-skilled labor. In

contrast, Romanian labor market provides better conditions for high-skilled labor, which encourages students to postpone migrating abroad after obtaining a domestic higher education degree and increasing their qualifications on the domestic labor market.

These hypotheses will be tested with empirical data from both countries in the next chapter.

Chapter 4 – Empirical Test of the Alternative Hypotheses

Before providing empirical data to test the above presented hypotheses, it is important to mention the extent of evidence the paper aims to provide in this empirical chapter. First, by data analysis on the case studies, the paper is meant to demonstrate the logical consistency of the developed above propositions and their empirical reliability, rather than prove the veracity of suggested events, which would be beyond the scope of the paper. It is also worth noting that the data used to test the hypotheses and substantiate the empirical coherence of the theoretical chapter have only limited weight to provide empirical evidence. Since the general propositions describe individuals' decision structure, admittedly, surveys on the perceptions of student-age population in these countries would be the best way to test the hypotheses of the paper. Lack of data on individuals' perceptions on quality of education and labor market conditions, however, necessitates using alternative indicators. The literature, discussed in the previous chapter, on the correlation between quality and expected returns from education (Castelló-Climent and Hidalgo 2010) and on students building their expectations on “backward forecasting” (Freeman 1971) makes using these indicators a sound alternative to measuring individuals' perceptions for testing the paper's hypotheses. Another issue is data on illegal migration. According to the hypotheses, higher percentage of young Bulgarians migrating as low-skilled labor would be expected. Because of limitations for Bulgarian and Romanian workers on the labor markets in the old EU member states, however, low-skilled labor migration is essentially illegal, thus, data is insufficient.

In the following part of the paper, qualitative and quantitative empirical data will be evaluated with a view of testing the above specified hypotheses.

Hypothesis: quality of education

Rather limited quantitative data on suitable higher education indicators necessitates the qualitative analysis of the Bulgarian and Romanian systems of higher education in order to be able to evaluate their quality.

In the last 20 years, after the start of the transition to market economy, the Bulgarian higher education system went through major changes resulting from both the external environment and the attempts for internal reforms of the system. Because of the major economic disruptions during the transition period, Bulgarian governments cut considerably from public expenditure, including education. The decrease in public spending for education was around 20% (Georgieva 2002). The outcome was deteriorating infrastructure, low salaries to the academic staff, thus, inability to attract motivated qualified faculty, worsening staff/student ratio, and decreased public expenditure per student. Moreover, the inefficient and intransparent way of funds distribution among universities, which did not take into account the quality of education provided by the institution added to the deteriorating quality of the higher education provision in the country (Georgieva 2002). Another aggravating factor was the lack of regulations to set minimum standards of educational outcomes for the higher education institutions. The reforms introduced in 1990, supposed to give academic autonomy to the universities, were rather interpreted to give university authorities full freedom from any regulatory requirements imposed by the central level. This resulted in higher education institutions admitting excessive numbers of

students without considering the capacities of the university to provide adequate quality of education (Georgieva 2002).

In an attempt to improve the deteriorating quality of higher education, in 1999, the Bulgarian government introduced significant reforms to the system. One of the major changes was in the way of fund allocation among the universities. Finance was distributed according to the number of students admitted to the institution plus the results of the quality assessment by the National Evaluation and Accreditation Agency. This reform was aimed to improve the incentives for better cost efficiency and quality provision in the system. Georgieva (2002) and Dainov (2007), however, contended that the reforms failed to ensure an adequate institutional autonomy and in the same time sufficient regulatory framework for quality assurance, which have been the major setbacks in the systems.

The reforms of the higher education system in Romania started right after the fall of the Communist regime from by and large similar position as in Bulgaria –the Socialist type education system with its extremely centralized governance and the major downturn of the country's economy in the early transition period. In this environment, the public expenditure on education suffered major decrease of funds together with the overall decrease of public spending. Thus, insufficient funding for infrastructure, low salaries for the faculty, worsening staff/student ratio, and decrease in the expenditure per student were prevalent in Romanian education system as they were in Bulgaria. The inadequate regulatory framework in the country's educational system, similarly to Bulgaria, proved to be an aggravating factor for the deteriorating quality of education together with the financial privation in the system. In the case of Romania, this resulted in an overnight opening of multiple private higher education institutions. Without an

adequate regulatory framework, the provision of quality education in these institutions can be questioned (Tsakonas 2002).

Although limited, quantitative data can also suggest a few trends in terms of quality of higher education in Bulgaria and Romania. For the period between 1999 and 2008, the students per academic staff ratio increased gradually from 15.9 to 33.1⁸. In the case of Bulgaria these figures are provided only for 2004 (14.9) and 2005 (14.7). In these two years, the corresponding figures in Romania were 22.8 and 24.3. Another indicator, measuring the quality of research according to the ISI citation index reveals that between 1998 and 2001, for which period data is available, Bulgaria scores better with an average value of 2.32 compared to Romania's 1.55. Bulgaria performs better also in terms of publications per 1000 inhabitants with 0,074 average value for the period between 1998 and 2005. For the same period, Romania had a ratio of 0,048 publications per 1000 inhabitants.

The above presented data on the quality of higher education in Bulgaria and Romania suggest that the first tested hypothesis can be eliminated. Thus, the diverging enrollment rate patterns in both countries cannot be explained by significant differences in the quality of higher education they provide. On the contrary, the indicators on staff/student ratio and publications per 1000 inhabitants suggest that Bulgarian institutions provide conditions for better quality of higher education than is the case in Romania. Thus, it is rather unreasonable to believe that Romanian graduates compared to their Bulgarian counterparts experienced lower degree of uncertainty in terms of successful entering the foreign labor markets.

⁸ Data provided by the European Commission in 2011; Available at: ec.europa.eu/economy_finance/publications/.../country_fiches/romania.pdf for Romania and ec.europa.eu/economy_finance/publications/.../country_fiches/bulgaria.pdf for Bulgaria

Hypothesis: labor market conditions

In order to assess the conditions on the labor market for highly skilled workers in both countries, statistical data provided by Eurostat was analyzed. The following four major indicators were found useful for the purpose of the analysis:

Table 1

Indicator	Period		Romania	Bulgaria
Distribution by occupation of persons with higher education (25-34 years old)	2007	Professionals and managers	73%	54,20%
		Elementary*	11,50%	28,40%
Education/occupation mismatch (persons with higher education on low-skilled positions)	2003-2007		6,80%	23,40%
Unemployment rate for high-skilled labor	2000-2008		4,16%	6,32%
	2000-2004		4,90%	9,40%
Increase in average wage	2004-2008	Professionals and managers	157%	89,80%
		Elementary	120%	80%
* not managers, professionals, technicians, associate professionals				

Source: Eurostat

A few trends can be identified based on these data. First, the mismatch between education and occupation in Bulgaria is enormous, compared to this in Romania. Whereas only 6.8% of the high-skilled labor in Romania could not find suitable occupation for their qualifications, the corresponding figure in Bulgaria is 23.4%, which is the largest mismatch between education and qualifications among youngsters in the whole European Union⁹. Further look on the distribution of highly skilled labor by occupation confirms this trend. Data from 2007 reveals that 28.4% of the Bulgarian highly skilled workers aged 25-34 years occupied low-skilled labor positions. This is significantly higher than the figure in Romania, which was 11.5%. These numbers clearly

⁹ Eurostat Statistical Data

point to the structural incapacity of the Bulgarian labor market to absorb the high-skilled workers in the country.

In addition, data on the unemployment rates for highly skilled labor in both countries illustrate further the uncertainty university graduates in Bulgaria experienced on the domestic labor market. Whereas the difference between the unemployment rates for highly skilled workers in Bulgaria and Romania for the period between 2000 and 2008 is 2.18 percentage points, the difference for the period between 2000 and 2004 is even higher - 4.5 percentage points. This high divergence in the unemployment rates for highly skilled labor in the two countries coincides with the period of decreasing enrollment rates in Bulgaria, as described in Chapter 2. This further underpins the conclusion of the paper that the uncertainty on the domestic labor market in Bulgaria was the main factor discouraging the student-age population in the country to pursue higher education in domestic institutions.

To sum up, the above presented data reveals that higher education in Romania is more rewarding than pursuing a degree in Bulgaria, where apparently the supply of graduates does not match with the demand for workers with these qualifications. It is believed that this mismatch contributed to the high level of uncertainty among the student-age population in the country in terms of their prospects to enter successfully the domestic labor market. The higher level of uncertainty in Bulgaria relative to Romania discourages pupils from pursuing higher education in domestic institutions, which is believed to have been the main factor causing the different

enrollment patterns for higher education institutions in the Bulgaria and Romania¹⁰.

Based on both the general theoretical presumptions developed above and the presented empirical data, the following narrative can be deducted: The perception on the inferior quality of higher education in Bulgaria, on the one hand, and the potentially discriminative behavior of foreign employers on the other, increased the perception of uncertainty among the student-age population in the country in terms of their successful entering the foreign labor markets as highly skilled workers. The limited prospects to successfully find employment abroad with their domestic degrees anticipated by the Bulgarian youngsters made them look for other alternative ways to migrate. One option is studying abroad, which significantly increases the migrant's prospects on the labor markets in the host country. Indeed, on average, 3.9%¹¹ of the student-age population (20-24 years old) in Bulgaria studied abroad in the period between 2000 and 2008 (compared to 1.1% in Romania). Pursuing higher education abroad, however, is associated with certain constraints, such as higher cost of education and language skills. Therefore, this proved to be unfeasible alternative for many. Another option is to join the domestic labor market and migrate as highly skilled labor in a few years when young workers have accumulated certain professional experience and on-the-job training. This could potentially increase their chances on the foreign labor market as it gives positive and more reliable signals for the migrant's skills to the foreign employers. Pupils, would, however, choose this strategy if they believe that they have good chances to successfully enter the domestic labor market after graduation. Great

¹⁰ Once again, note that aggregate data is used to provide estimation for the expected returns of education by individuals because of data scarcity on students' perceptions. Despite the obvious limitations of the conclusions about individual perceptions based on aggregate data, literature on the determinants of the expected returns from higher education suggests that aggregate data is a reasonable estimator of individuals perceptions as students base their decisions largely on current employment data available (Freeman 1971)

¹¹ Author's calculations based on Eurostat data

occupational mismatches on the labor market for highly skilled workers in the Bulgaria, however, discouraged many from pursuing this option. Taking into account the costs for education and time spent studying, many chose to avoid these expenses and migrate as low-skilled labor.

Chapter 5 – Conclusion

This paper aimed to explain why enrollment rates in higher education institutions in Bulgaria rose only sluggishly (around 50 percentage points less) relative to the other countries in the CEE region which joined the EU in 2004 and 2008. This pattern seems to diverge from the optimistic predictions of the brain gain theory. Thus, the paper looked into one of the assumptions of the theory, which seems to have been rather oversimplified by authors, and which is believed to be the main reason for the deviation of the Bulgarian case. This is the assumed straight correlation between migration opportunities for high-skilled labor and increased enrollment rates in domestic higher education institutions. The paper argued that this assumption neglects the role of the structural determinant within which individuals take decisions regarding their higher education. Thus, the paper proposed an elaboration of the decision structure of students, which takes into consideration the effects of the quality of education and the labor market conditions for highly skilled labor over the education decisions of individuals.

After testing two alternative hypotheses by comparing empirical data for Bulgaria and Romania, which despite similar background characteristics reveal a very different enrollment pattern than in the case of Bulgaria, the following has been concluded: the uncertainty in the returns from investing in higher education in Bulgaria discouraged many students from pursuing a degree at home. This uncertainty is mainly due to the inferior position of highly-skilled workers on the domestic job market.

In order to confirm the veracity of the proposed general propositions, which explain the channel through which the structural determinants affect individual decisions on higher education choice, further research will be needed. A cross-case analysis using labor market

indicators as independent and enrollment rates as dependent variables will be needed in order to test the suggested propositions of this paper. Furthermore, it is believed that the contradictory suggestions of the brain gain and brain drain proponents reveal the pressing need for a more micro-level case-study analysis in the field. Last but not least, data collection on the real demand for higher education, on students' perceptions on higher education institutions, and on illegal migration patterns should be improved in order to provide more robust findings in terms of the relationship between migration prospects and education attainment.

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