

Charles University in Prague

Faculty of Social Sciences
Institute of Economic Studies



MASTER THESIS

**Labour market restrictions and migration
flows in the European Union:
the case of Belarus, Moldova and Ukraine**

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Declaration of Authorship

The author hereby declares that he compiled this thesis independently, using only the listed resources and literature, and the thesis has not been used to obtain a different or the same degree.

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Prague, May 8, 2014

Signature

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Abstract

The thesis aims to estimate the future migration flows from Ukraine, Belarus, and Moldova to the EU. Based on the experience of previous EU enlargements and econometric modelling using the method of Ordinary Least Squares with Fixed Effects, multiple forecasts are created. The forecasts capture the likely development of migration flows in the event of collapse of labour market restrictions as well as the case of no labour market liberalization. The results show that migration flows are expected to be moderate, posing no threats to the stability of the labour markets of EU member states. The increase of migration due to the accession to the EU is likely to be short-term, without substantial impacts in the long-run. Ukraine has the biggest migration potential and is likely to supply the highest amount of labour migration.

JEL Classification

E27, F22, J11, P33

Keywords

migration, migration potential, Belarus, Moldova, Ukraine, EU

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Abstrakt

Práce má z cíl odhadnout budoucí migrační toky z Ukrajiny, Běloruska a Moldávie do EU. Na základě zkušeností plynoucích z minulých rozšíření EU a ekonometrického modelování využívajícího metody Nejmenších čtverců s Fixními efekty, je vytvořeno několik předpovědí. Ty zachycují očekávaný vývoj migračních toků jak v případě kolapsu restrikcí na trhu práce, tak i při jejich zachování. Z výsledků je patrné, že jsou očekávány umírněné migrační toky, nepředstavující žádné ohrožení stability trhů práce ve členských státech EU. Nárůst migrace v důsledku přístupu k EU bude pravděpodobně krátkodobý, bez významných dlouhodobých dopadů. Největším migračním potenciálem oplývá Ukrajina, a proto bude také nejspíše zdrojem největšího počtu pracovní migrace.

Klasifikace

E27, F22, J11, P33

Klíčová slova

migrace, migrační potenciál, Bělorusko, Moldávie, Ukrajina, EU

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Acronyms

BMP	the Building Migration Partnership
BYR	the Belarusian rubble
CEE	the Central and Eastern Europe
CIS	the Commonwealth of Independent States
ETF	the European Training Foundation
EU	the European Union
FE	Fixed Effects
GDP	the Gross Domestic Product
GNI	the Gross National Income
IOM	the International Organization for Migration
MDL	the Moldovan leu
OLS	the Ordinary Least Squares
RE	Random Effects
ths	thousand
UAH	the Ukrainian hryvnia
USA	the United States of America
USD	the United States dollar

Master Thesis Proposal

Author:	Bc. Tomáš Ducháč
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Defence Planned:	June 2014

Proposed Topic:

Labour market restrictions and migration flows in the European Union: the case of Belarus, Moldova and Ukraine

Topic Characteristics:

This thesis will analyse the case of three Eastern European countries represented by Belarus, Moldova and Ukraine and will attempt to estimate the behaviour of migration flows originating from these countries towards the EU in case of visa abolitions and introduction of free mobility of labour. By using empirical evidence of past EU enlargements, economic and migration potential analyses and available data, this thesis will try to predict the impact of such measures on the magnitude of migration flows. The theoretical model is based on the human capital approach as it has been shown in the literature to be a preferred practice (see Sjaastad, 1962; Strielkowski and O'Donoghue, 2006; or Kowalska and Strielkowski, 2013). Migration literature identified key variables that have significant influence on the migration flows such as (un)employment, income, or migration networks (stocks) (see e.g. Massey and Espana, 1987; or Brücker et al. 2007). The results obtained by the application of the proposed methods will provide additional insight into the behaviour of migration flows with relation to the access to unrestricted labour market and should also provide significant information for policy makers.

Hypotheses:

1. Open labour market access lead to the temporary increase in migration flows into the European Union.
2. The abolition of market restrictions does not lead to substantial or threatening long-run increase in migration flows.
3. Migration is negatively correlated to domestic GDP per capita and positively correlated to unemployment.
4. Language similarities and network effects outweigh economic benefits in migrants' decision about their destinations.

Methodology:

The primal concern of the thesis will be the estimation of the effects of visa and labour market restriction abolition on the migration flows from Belarus, Moldova and Ukraine to the European Union. The theoretical model will be based on the human capital approach, which emphasizes the role of investment into human capital on the future income of an individual. Previous EU enlargements will be studied using both extensive amount of literature and available data. Econometric modelling will be used to discover the influence of the accession on the migration flows on the case of 2004 enlargement. Data will be provided predominantly by Eurostat,

appended by data from National statistical offices or World Bank. Comparison of the pre and post accession empirical evidence, comparison of economic situation with states that already acceded and analysis of migration potential of Belarus, Moldova and Ukraine will lead to the formulation of predictions and implications for the migration flows of these countries in the case of their accession to the EU.

Outline:

1. Introduction
 - a. Motivation, hypotheses, methodology, introduction of data
2. Theories of migration: state of the art
 - a. Literature review, aspects of migration, human capital approach
 - b. Lessons learned from previous EU enlargements, empirical evidence
3. Migration flows from Eastern Europe with focus on Belarus, Moldova, and Ukraine
 - a. Historical and present state
 - b. Southern and Eastern enlargements, empirical evidence, comparison of economic situation of the accession countries
 - c. Migration potential of selected countries
4. Estimation of migration flows of Belarus, Moldova, and Ukraine towards the European Union
 - a. Theoretical background, model specification
 - b. Estimation of econometric model using data of countries that joined the EU in 2004, interpretation of results
 - c. Predictions and implications for the studied countries based on the previous evidence, extensive literature and migration potential analysis
5. Conclusions
 - a. Summary, policy recommendations

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Author

Supervisor

1 Introduction

The topic of migration have slowly been gaining attention in the European space over last decades. What started as a small local economic partnership of 6 countries, grew in time into Union with 28 member states. As cooperation and integration deepened new issues emerged that required a common approach to face them. One of such topics was migration.

The initial six countries did have a lot in common and belonged into a group of developed nations with high GDP per capita and stable political climate. With new states joining the pack disparities between individual countries became more obvious and quite naturally people from poorer states began to utilize their European freedoms and searched for happiness elsewhere. Economically strong countries soon started to get mixed feelings about these migration flows and started to wonder whether they are not endangering their domestic labour markets and destroying job opportunities of their own citizens.

The thesis aims at addressing such fears of uncontrolled and harmful migration with respect to three hypothetical candidates of accession to the EU – Ukraine, Belarus, and Moldova. Although the recent development in Ukraine shed little light on its eventual EU membership, the author hopes that the conflict is going to end soon peacefully and the country will be able to pursue its goals under democratic regime. It tries to predict the behaviour of future migration flows based on the econometric analysis and other empirical evidence. Further, it aims to forecast the impact of accession on the level of migration flows of the three studied countries. Arguably, such information is valuable for the policy makers when making decision about the migration policies on the national levels and may prevent contra productive political behaviour and escalation of anti-migrant sentiments. The thesis has a goal of verifying the following hypotheses:

- Open labour market access lead to the temporary increase in migration flows into the European Union.
- The abolition of market restrictions does not lead to substantial or threatening long-run increase in migration flows.
- Migration is negatively correlated to wages and positively correlated to unemployment.

- Language similarities and network effects outweigh economic benefits in migrants' decision about their destinations.

The emergence of new online datasets that contained detailed and rather complete data on migration flows from the Eastern countries to the EU enabled the research to use econometric modelling as the main method of analysis. The core methodology of the thesis is the estimation of migration flows using Ordinary Least Squares (OLS) with Fixed Effects (FE). Various statistical tests, including Hausman test, were used to control the validity and correct usage of the models. The estimations were conducted using heteroskedasticity and serial correlation robust standard errors (adjusted for clustering) in order to mitigate the possible occurrence of a bias. Experience and quantitative data of Poland, Romania, and Bulgaria served as an empirical evidence for the prediction of accession shocks.

From various available approaches of studying migration the models were constructed on the basis of push factors, examining the influence of domestic economic conditions on the stock of migrants abroad. Initially, gross domestic product per capita was supposed to be used as a proxy for wages in the estimation but during the data collection process the data on wages were found to be available. Therefore, data on yearly average of monthly wages were used as the first independent variable. The second regressor that was chosen was yearly unemployment rate. Lastly, the third independent variable was represented by the first lag of dependent variable as a proxy for network effects. The amount of migrants holding residence permits in the individual EU member states was chosen to be the dependent variable, mainly because of the data completeness and availability.

There are serious limitations that need to be kept in mind when interpreting the results of this migration research. Firstly and most importantly, the collected migration statistics used in the study are most likely imprecise and underestimated due to the illegal migration and human trafficking. Secondly, data for wages and unemployment are used in the national aggregate form due to the unavailability of similar data for migrant stocks alone. The national averages most likely differ from the averages of a typical migrant. This also brings a bias to the estimation. Thirdly, the econometric modelling uses panel data of 28 countries (EU countries without Croatia but including Norway) with time period of 5 years. Such time dimension is quite short, especially

when the model uses one lag of the dependent variable as a regressor. This issue could not be remedied due to the data availability limitations. In sum, the results must be interpreted with caution.

The thesis is divided into 7 chapters including Introduction and each of them is further structured to subunits to provide better orientation in the text.

The **second chapter** of the work is theoretical in nature. It consists of brief overview of development of migration theories over time, discussion and findings of the empirical research in the field of migration, and lastly of narrower insights into the migration literature focusing on migration in CEE countries. Arguments of several authors are compared to demonstrate the on-going debate about the causes and future development of the migration flows in the region.

The **third chapter** focuses on the Southern enlargement and lessons that can be learned from it. Both migration literature and data evidence are taken into account to discover the short-term and long-term effects of accession of Greece, Portugal, and Spain on the migration flows to the EU. The chapter aims to provide supportive evidence for the claims made later with regard to the migration from the studied CEE countries.

The **fourth, fifth, and sixth chapter** of the work are devoted to the individual countries of Ukraine, Belarus, and Moldova respectively. These chapters form the core of the work. They aim to provide the reader with understanding of historic development of migration in the individual countries, discuss the reasons stimulating migration, and compare them across these three countries. Most importantly, the chapters also try to deliver long-term forecasts of future migration flows and predict the number of residents from these countries that would arrive to the EU in the case of hypothetical accession to the EU.

Finally, the **seventh chapter** of the work concludes. It summarizes the findings and predictions made in the previous chapters, presents major limitations of the work, and proposes recommendations for further research.

The literature and sources used in the thesis are mostly chapter specific. For the theoretical part, literature review, and chapter on the Southern enlargement online periodicals are the primal resource. Online databases of JSTOR and EBSCOHOST are

among those most used. Chapters with individual case studies rely mostly on online reports of supranational organizations, e.g. International Organization for Migration, and data are collected from online depositories of the Eurostat, the World Bank, and national statistical offices of the respective countries. The sources and structure of the data are described in more detail in the individual chapters.

2 Literature review

The purpose of this chapter is to get a reader familiar with broad literature devoted to migration theories, incentives for migration, migration research, estimation, and specific views of prominent authors. While migration could be studied from various angles the scope of the thesis is limited mainly to the economic implications stemming from migration. Therefore, both theoretical discourse and empirical studies considered are going to be mainly of economic rationale. In order to keep the chapter well-arranged it will be further structured to sections devoted to different areas of migration research.

The studies of migration have established a significant stream of literature in recent years. Arguably, it is because of the development of migration policy salience of international population flows. Over time, a considerable amount of migration theories have developed. A good overview of the development of migration theories is provided by Kumpikaite and Zickute (2012). The main two building blocks are identified as Neoclassical theories of migration and New theories of migration. It is out of reach of this thesis to elaborate on all the theories, rather the following paragraphs aim to demonstrate the key ideas and development.

2.1 *The migration theories*

Perhaps the most traditional approach is the neoclassical theory of migration, proposed by Adam Smith in *The Wealth of Nations* (1776) and followed by Ravenstein (1885) in *The Laws of Migration*. While Adam Smith did not ever write specifically on the topic of migration, his remarks on the free mobility and circulation of labour did form an initial opinion on the matter. (e.g. Smith 2005: 62, 116-123) This theory assumed that every person maximized her or his own utility within a budget constraint, which puts wage differentials as the core point for consideration. Migration can then be viewed as an outcome of differences between labour demand and supply across countries. Intuitively, individuals from low income countries seek better opportunities abroad, which leads to the migration flows from low-income to high-income countries. The neoclassical theory was further developed by Harris and Todaro (1970) who adjusted the theory by dropping the assumption of full employment because ‘...in many

developing nations the existence of an institutionally determined urban minimum wage at levels substantially higher than that which the free market would allow can, and usually does, lead to an equilibrium with considerable urban unemployment.' (Harris and Todaro 1970, p. 129) Additionally, they subjected the employment of migrants in the destination countries to a certain probability, not being equal to one. This idea contrasted the older approach in the sense that model of Harris and Todaro employed the expected wage differentials instead of the actual ones. Similarly, Fischer et al. (1997) claim that the decision-making of a potential migrant can be studied by focusing on the migrant's individual *expectations*. Such a migrant weighs future advantages associated with the change of residence and job with disadvantages of home community and environment. These expectations then primarily influence behaviour of an individual. The primal concern with expectations contrasts the traditional approach of focusing on wage differentials, existence of migration networks, or unemployment.

Classical approaches to migration tend to divide migration decision into either temporary or permanent. Biondo and Lisi (2013) go beyond this division and propose an approach of dynamic model of rational migration. This framework relies on the rationalization of any of the possible migrant decisions (migrate or not migrate at all, return home, change country etc.). The rationalization is essentially based on weighting the preference local consumption and wage differentials.

As Bauer and Zimmermann (1999) explained, the implications of the neoclassical framework indicate that in the situation of free trade, increased trade between countries leads to decrease in migration flows. Standard neoclassical model suggests that in the long/run, under conditions of equal technology and free trade, the factor prices (such as interest rates or wages) for all workers in both rich and poor countries equalize, ultimately leading to halt in the migration flows because the incentives to migrate disappear.

Another stream of literature considers the migration as an investment into human capital. This view departs from the work of Sjaastad (1962) who describes the decision to migrate as an investment in human capital whose returns are determined by the net present value of expected income streams in the future. Therefore, an individual migrates if the expected returns in a destination country after subtracting costs are

greater than expected returns in the domestic country. Migration costs comprise a lot of factors, including both economic and psychological components. The importance of relevant factors in an individual decision to migrate is highly specific, which means that a person can consider economic factors to be superior while someone else may have the values inverted.

Ionescu (2013) lists many factors that underlie a decision to migrate in a form of cost-benefit analysis. These factors include human and social capital, willingness to bear risk, adaptability, family goals, or wage differentials. Out of all of those the author highlights the most important causes for migration that boils down to two things – jobs and money. Icduygu et al. (2001) highlight the influence of the socio-economic variables, such as poverty of the region of origin. Increase in the level of poverty creates stronger incentives to migrate in the bell shaped relation, resulting in decrease of migration in the case of too severe poverty because people have no funds to overcome migration costs.

Hatton (1995) works with the idea of risk with relation to the expected income abroad. From the economic standpoint, he specifies that uncertainty about both wage and employment rates have impact on migration flows. He also concludes that when effects of both variables are studied simultaneously in the same regression, unemployment effect dominates, especially in the destination country. In another words, a worker uncertainty about future income is more influenced by the risk of unemployment rather than by the risk of undesirable wage.

The human capital approach has several important impactions for the modelling of migration. Firstly, incentives to migrate decrease with age because the older a person is the lower are the expected gains obtained from moving abroad. Krieger and Maître (2006) show that propensity to migrate of persons in family phase of life (25-39) seems to be negatively correlated with age.

Secondly, Strielkowski and Turnovec (2011) point out that wages in the sending and destination countries do not equalize even in the situation of free market due to the presence of migration transaction costs. Using this concept they derive in the model of two countries that potential migrants do not travel unless the difference between wages is higher that transaction costs. The argument above implicates that

migration does not provide a channel through which economic differences across countries could equalize. Additionally, the authors say that even though migration transaction costs influence the propensity to migration, it is country specific. Thirdly, education highly influences the propensity to migrate. It decreases the uncertainty about future expected income because educated individuals are better at gathering and using information and because higher education makes an individual suitable for higher range of jobs.

Another way of looking at migration is offered by Stark and Bloom (1985) who perceive the migration as a process characterized by asymmetric information. This stream of literature can be considered as a representative of the New migration theories. The authors elaborate on the idea that migrants have a perfect knowledge about their skills and abilities while future employers in the destination countries do not. Since the ability endowments of migrants are heterogeneous in practise the best strategy for employers is to give them wages equal to an average level of observed abilities. If the potential employers could perfectly observe the skills of each individual then obviously the least skilled migrants would not move because they would be offered low wage but high skilled migrants would still have good incentives to move. However, the employers do not have perfect information and so they pay average wages but these wages are too low for high skilled migrants, discouraging them. Therefore, the authors conclude that under this simple theoretical framework only two corner solutions are available: migration of all or no migration at all. In reality, migrants can overcome information asymmetry by supplying employers with additional information, such as diplomas or certificates. Additionally, the unjust wages should not last long since employers should be able to distinguish the good from the bad in the long run. The ability of employers to differentiate wages would again make the existence of non-corner solution possible which would lead to the overall increase of both migrant skills and migrant flows.

Lastly, Stark and Bloom (1985) claim that migrants themselves often do not make the decision about migration on their own. They are influenced by the peer pressure, family members, and other non-migrants. Individuals, but also whole households, tend to compare themselves with the others in their particular reference group. As a result of such approach, not only expected income in a receiving country

but also deprivation in a reference group at home may significantly motive a migrant to stay or go.

A different set of theories emerged because of the relevance of migration processes established by Neoclassical and New theories of migration. Kumpikaite and Zickute (2012) mark this stream as Theories of international movement solvents. One of the major examples in this set is the Network theory. It is based on the assumptions that migration is a sort of self-generating process. Massey and España (1987, pp. 733) characterize a migrant network as ‘...a web of social ties that links potential migrants in sending communities to people and institutions in receiving areas. The emergence of a well-developed migrant network dramatically lowers the costs of international movement and gives a powerful momentum to the migration process.’ In other words, the key idea of the model is that a first migrant have to face the highest migration costs but these costs diminish with the number of other migrants moving to a selected country. The already settled migrants provide assistance and help to the new-comers, which creates stronger stimulus for migration. Nevertheless, Bauer and Zimmermann (1999) argue that this self-perpetuating process may eventually end because the benefits from migrant networks may not apply to everyone. Additionally, due the higher labour supply in the receiving country and lower labour supply in the sending country, wage differentials decrease leading to smaller incentives to migrate. It is important to mention that the migrant networks still constitute a significant variable that diminishes migration costs

To conclude this part, one might mention that several authors (Lee 1966, Bauer and Zimmermann 1999, Wang 2010, Kumpikaite and Zickute 2012) have implied that it is possible to arch the exiting theories by the specific framework of *push* and *pull* factors, which can surprisingly be traced back as far as to the founder of the neoclassical theories, Ravenstein (1885). Push factors are such unfavourable domestic conditions that influence individuals to seek work abroad, whilst pull factors can be described as favourable conditions in the receiving countries that make them more attractive in the eyes of potential migrants. Again, one should not think of the push factors in purely economic way, such as low wages or high unemployment, but also in the terms of bad political situation, police oppression, and corrupt institutions. The

same rationale holds for the pull factors, e.g. higher wages, higher living standards, better health care etc.

2.2 *Empirical research on migration*

The development of migration theories have motivated researchers to try to investigate the migration more rigorously, through empirical data, in order to validate or refute proposed theoretical models. The empirical studies on migration have been allowed to emerge mainly due to the increased collection and availability of migration data. Nevertheless, only some countries engaged in observation of migration flows, e.g. Germany, while others started to monitor this phenomenon not sooner than the past decade. Thence, there is no surprise that the datasets for econometric analysis are limited, especially with regard to time dimension. This part will introduce the main approaches used for empirical research. Starting from the wider perspective, the subsection will converge in the end towards the literature most relevant for the topic of this thesis.

Most generally, the literature aiming at measuring the effects of migration can be divided into two main categories based on the nature of the data used – aggregate or micro data analysis. Both approaches have their strengths and weaknesses.

The former studies tend to employ several economic variables and try to assess their influence on migration. The advantage of the approach is data availability. If a country collects data on migration it is usually aggregated. The same holds for other economic variables. However, there are several issues associated with the aggregate studies. The use of aggregate data often face the difficulty of inability to differentiate between labour and non-labour migrants, as countries tend to monitor only overall population movements. This issue makes the interpretation of the results harder and can lead to biases in the estimation. In the case of using average wages in the models it may be argued that the actual level of average wages among migrants is lower than the national average and therefore misleading. The same argument could hold in the case of disposable income or gross domestic product per capita. On the other hand, not only uneducated people with low wages migrate. In recent decades, significant effects of ‘brain drain’ were recorded, leading to the outflow of intelligence out of the sending countries. The argument of spurious effects of variable averages thus weakens.

Aggregate studies share some common findings. Bauer and Zimmermann (1999) report that the vast majority of the studies that used aggregated data were able to find a significant relationship between migration and income. The results are not so straightforward in the case of unemployment because some studies observe correlations in opposite direction to those expected by migration theories (Pissarides and McMaster 1990, Fields 1991). Lagged levels of migrant stocks are also often used in the modelling strategy to account for the network effects (see e.g. Glazar and Strielkowski 2010). We can find other aggregate variables used in the econometric studies of migration, such as disposable income, economic growth, population, etc. Similarly to the issues with migration data, use of aggregated independent variables may bring a bias to the true effects.

Micro-data methods rely on surveys and questionnaires. They aim to overcome the issues of aggregate data by gathering specific individual characteristics. Theoretically, they do not have many disadvantages but the use of such method is severely limited by the nonexistence of required datasets. Only few countries possess such datasets, which makes them suitable only for a specific research, usually for internal migration. With respect to the CEE countries and international migration they are not able to supply much evidence.

The evidence provided by this branch of research also contributes to the deeper understanding of migration. Significant negative correlation is found between migration and age. (Adams 1993, Krieger and Maître 2006) Goss and Paul (1986) show the necessity to consider migrant skills together with age. They find a significant influence of years of labour market experience and argue that by omitting this variable the negative effects of age are only partially detected. Mincer (1978) agrees that marital status is also an important feature, claiming that single men and women are more likely to be prone to migration. Levy and Wadycki (1974) find a significant relationship between decision to migrate and education. The authors demonstrate that educated people are less negatively influenced by the distance of future country of residence and more responsive to wage differentials. Similarly to aggregate studies, network effects are especially significant driver of international migration. Abandoning the idea of presenting all of the studied variables, the last that will be mentioned is unemployment. Not surprisingly, even micro-data research concludes that unemployment is positively

correlated with emigration. Herzog and Schlottmann (1984) derive that individuals who are not employed at their domestic country are more likely to migrate because they do not suffer from salary losses when leaving the country. This is consistent with the theoretical model of push and pull factors. DaVanzo (1978) continues to study the same variable and observes that heads of families who are lacking employment tend to migrate more often.

As described above, although studies differ in the use of data type, their findings are often similar. Both income (wages) and unemployment seem to have unambiguous impact on decisions to migrate.

2.3 Literature on migration from the CEE countries to the EU

Since the aim of this thesis is to estimate the migration flows from the three selected countries of Eastern Europe to the EU in the case of free labour market, the last part of the literature review will focus on the number of studies that applied various methodologies to estimate or forecast the migration from the CEE countries to the EU.

Table 1 lists a number of studies on migration from the CEE countries to the EU. Most of the studies in the table were focused on the 2004 wave of accessions. Both the research methodologies and results differed. The estimations of migrant flows range from 130 thousands incoming to the whole EU per year to 3 million in the horizon of 10-15 years since the accession. Among the preferred destinations Germany is cited the most. An important fact is that the accession comprised 10 countries with the total population of over 70 million. If the highest numbers are taken into account the migration flows are estimated to be between 4-5% of the total population of acceding countries over long-term period.

Looking at the available data from the receiving countries on migration flows from Poland, Romania, and Bulgaria it is possible to get an approximate estimate of the magnitude of post-accession migration flows. Eight years after the accession the migrant stocks of Poles living abroad in other member states increased by about 0.75 million. The major destinations included Germany, Spain, Italy, and the UK. In the case of Romania, 5 years after the accession, migrant stocks in Italy, Spain, Portugal, the UK, and Germany increased by over 600 thousand. Lastly, number of Bulgarian

migrants in Italy, Spain, Portugal, the UK, and Germany increased only by 80 thousand based on the official statistics of Eurostat (2014). In the case of all three countries, the migration flows increased shortly after the accession but returned back to their original levels in the period of up to 3-4 years.

Table 1

Selection of studies on migration from CEE countries to the EU

Research	Estimated migration	Countries included	Methods and remarks
Layard et al. 1992	130 thousand immigrants per year in western countries	Poland, Czechoslovakia, Hungary (projected on the other CEE countries)	Method of potential estimation of South-North migration flows (3% of population in 1950-1970)
Brueker, Franzmeyer 1997	Depending on a scenario: (1) 340 – 680 thousand per year in the EU (2) 590 thousand – 1 million 800 thousand per year in the EU	(1) Poland, Czech Republic, Slovakia and Slovenia (2) All candidate countries	Gravitational model (embodying different economic parameters, the importance is given to wage differentials)
Fassmann, Hintermann 1997	721 thousand – actual migration potential, 320 thousand to Germany, 150 thousand to Austria	Czech Republic, Poland, Slovakia, and Hungary	Representational research of Gallup Institute in all four countries included the prognoses
Aintila 1998	About 13 thousand immigrants in Finland each year	Baltic countries and Poland	Same as Layard 1992
Birner, Huber, Winker 1998	(1) 24,100 (2) 21,700 Regional flows of migrants in the year of accession (to Austria)	Czech Republic, Poland, Slovakia, Slovenia, and Hungary	(1) The year of accession is settled on 2004. (2) The year of accession is settled on 2010. Methods taken from Walters-kirchen and Dietz for Austrian border regions.
Hofer 1998	25 – 40 thousand	Same as Brueker, Franzmeyer 1997	Estimations of Brueker, Franzmeyer results
Lundborg et al. 1997 Lundborg 1998	628 thousand – 1 million 885 thousand of workers (with families) to EU countries in 15 years, 126 thousand, 20-30 thousand of workers to Sweden alone.	Baltic countries and Poland	Same as Layard 1992
Šujanová, Šujan 1997 (later Huber-Pichelmann 1998 and Hofer 1998)	39 thousand in 2005-2010 to the EU	Czech Republic	Econometric model

Huber, Pichelmann 1998	140 – 200 thousand to EU	CEE countries	Based on Šujanová, Šujan method used for all countries
Šik 1998 (later Huber 1999 and Salt 1999)	Migration potential in the border regions is irrelevant.	Hungary	Panel research
Walterkirchen, Dietz 1998	(1) 42 thousand (2) 31,600 to Austria (workers and commuters), 150-200 thousand each year for five years (workers), 150 thousand for commuters in the long run	Czech Republic, Poland, Slovakia, Slovenia, and Hungary	Same as Brueker, Franzmeyer (1) if free movement is to be implemented in 2005. (2) if it is to be implemented starting from 2015
Wallace, IOM 1998	No exact numbers but the explanation of migration and the preferable countries (Germany)	Czech Republic, Poland, Slovakia, Slovenia, Hungary, Romania, Bulgaria, Croatia, former Yugoslavia, Ukraine, and Belarus	Representational research based on questioning of about 1,000 people in each country
Bauer, Zimmermann 1999	About 3 million in the next 10-15 years, 200 thousand each year to the EU	Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovenia, Slovakia	Same as Layard 1992. Two scenarios: transition periods and immediate free movement
Fertig 1999 (Huber 1999)	(1) 38-31 thousand each year to Germany for the next 20 years, (2) 39-33 thousand each year	(1) first candidates: Czech Republic, Estonia, Hungary, and Poland	Hatton model (1995) used, estimations based on statistics of the Bureau of Migration Germany and with the assumption of the economic growth of 2% in CEE countries.
Salt et al. 1999	41 thousand each year to the EU	Czech Republic, Estonia, Hungary, Poland, and Slovenia	Projection of the basic immigration factors of chosen EU countries (1985-1995)

Source: Strielkowski and O'Donoghue 2006

Danzer and Dietz (2009) study temporary migration flows of five former Soviet Union countries and report high temporary labour emigration since 2004 for Moldova. Belarus and Ukraine were reported to face moderate outflows. Majority of these migrants headed to CIS countries, mainly the Russian Federation.

Coupé and Vakhitova (2013) estimate 1.5 – 2 million labour migrants within Ukraine, out of which more than half travel for work to the EU. The prevalent part of the stocks are men who work in unqualified jobs, e.g. construction. The authors also comment on the current negotiations of a visa free regime between Ukraine and the EU. They claim, that large increase in migration flows is unlikely to happen even if negotiations are successful. Instead, Coupé and Vakhitova expect replacement of

illegal migration by legal migration, shorter duration of labour migration, and more circularity.

Barbone et al. (2013) share the same prospects about the future migration from the Eastern countries. The simulations created in their study confirm that possibility of massive immigration of workers from Belarus, Moldova, Ukraine, and other CIS countries is remote. The Russian Federation is likely to boost its demand for migrant labour force and is likely to “compete” for them with the EU. These estimations are made based on the demographic developments of the countries and are limited by the predictability of the development of economic situations in the countries of origin. The authors suggest that dire economic situation is a key push factor driving migration.

Lastly, Fertig and Kahanec (2013) also reach optimistic conclusions. Estimating the migration flows using the model of Hatton (1995) and post 2004 enlargement data, the authors expect modest migration flows in case of no liberalization of labour market restrictions and only moderate increases in case of free labour market access. The increase is likely to occur right after the liberalization and is not predicted to last for much longer. Ukraine is likely to send the most migrants due to its population size. The amount is estimated to be about 850 thousand over the period of 10 years. However, even in the two most preferred countries (Germany and Italy) the increase of migrants is predicted to be around 100 thousand over the forecasted period.

In sum, the literature attempting to predict the future migration flows from the Eastern countries is rather optimistic and does not expect any sudden increases in migrant flows. Up to date data record moderate increase in migrant stocks of Poland, Romania, and Bulgaria in the EU countries, not supporting fears of uncontrolled emigration. The forecasts for Moldova, Belarus, and Ukraine also expect moderate migration flows in the migration literature.

3 Evidence from Southern enlargement

This purpose of this chapter is to summarize what we have learnt about migration flows from the accession of Spain and Portugal in 1986. Similarly to the contemporary worries about prospects of mass emigration from CEE countries, back in the beginning of 1980s some of the EU states were worried about the same thing with respect to the accession of Greece, Spain, and Portugal. (Kraus and Schwager 2000) However, the predictions about mass emigration proved to be unfounded and exaggerated.

Spain underwent a transformation in migration patterns since the mid-1970s. Emigration flows diminished dramatically while immigration began to rise significantly. Since 1974 emigration remained rather stable somewhere between 15 000 and 20 000 persons in comparison to previous era of around 100 000 emigrants per annum. (Valderrama 1993) Conversely, the number of foreign residents was growing steadily ever since the statistic was measured (1966). The growth accelerated in the period of 1978-1985 and rocketed in the period of 1985-1990. According to Valderrama (1993) there are three main reasons for this behaviour. Firstly, Spain joined the EC, secondly, the country was viewed as yet unexploited alternative to other European Community (EC) member states whose migration policies were stricter, and thirdly, the fact that Spain could serve as a gate to the other EC countries.

Kraus and Schwager (2000) stress that since the accession Spain's emigration experienced a persistent decreasing trend. The same happened in the case of Greece and Portugal. The authors come up with an original reasoning. They claim that when the announced EU accession is suddenly refused potential migrants start to fear about possible future immigration restrictions and may migrate hastily, increasing migration. In the case of peaceful accession no such fears arise and so the accession does not lead to substantial long term labour migration. Additionally, the accession process in fact leads to convergence of the economy of the acceding country. This usually results in improvement of economic situation, leading to the positive expectations about the future, therefore reducing incentives to migrate. Uncertainty about wage and employment differentials also leads to the postponement of the migration decision in the case of certainty that the borders remain open.

The substantial increase in net migration in Spain is further documented by Table 2, located in Appendix. Together with other sources it shows that number of foreign residents climbed from 335 thousands in 1987 (seventh highest among the EC countries at that time) to roughly 540 thousands in 1996, 896 thousands in the year 2000, 2.7 million in 2005, and finally reaching more than 3.25 million in 2012. (Elcano Royal Institute and European Parliament 2006, Eurostat 2014) The change in the nature of migration of Spain is also supported by Malgesini and Hiltermann (1993) who claim that throughout 1980s Spain stopped being only a transitory country for Moroccans and Latin Americans heading towards other countries of the EC but rather became their final destination.

Boeri and Brücker (2001) argue that increased capital inflows to Spain and Portugal were observed after their accession. Such capital inflows from the EC may contribute to rapid economic growth in new member states, hence to income convergence. However, the main conclusion of the study is that trade and capital inflows are not going to lead to the equal prices of factors in the new member states and the EU. Therefore, there will always be economic incentives to migrate.

Penninx (1986) document an increasing trend of return migration since the mid-1970s. According to Penninx, the return of Greek, Spanish, Italian, and Yugoslavia workers cannot simply be explained by push factors. Change of political climate in Mediterranean countries may play an important role. He also points out a significant decrease in emigration from these countries since 1973/1974.

Kasimis and Kassimi (2004) show that Greece too transformed into a receiving country after the accession. Restrictive immigration policies of the EU, improvement of political climate, and new economic opportunities due to the accession brought almost half of the post-war emigrants back to Greece.

Portugal was no exception. Solsten (1993) mentions a long tradition of emigration in the modern era caused predominantly by seeking of better economic conditions altered in the second half of the 1980s. Portugal was for a long time one of the poorest European countries and many left the country in search for a job. Higher

political stability and membership in the European Community, which attracted foreign capital, led to the creation of jobs and reduced economic migration.

The Southern enlargement did not result in any substantial increase of emigration from the acceding countries. On the contrary, the previous trends changed and economic upheaval improved domestic labour market conditions resulting in stabilisation of emigration flows.

4 Case of Ukraine

The following part gives a comprehensive description of the migration history and process in the specific context of Ukraine. Firstly, a brief overview of the past migration flows is discussed. Next, the key factors that determine the migration decisions are identified, while special attention is placed on the push factors. Based on these findings a theoretical model explaining migration flows using economic variables is created. The viability of the model is tested by econometric modelling, employing Ordinary Least Squares (OLS) with Fixed Effects. Data for the model are retrieved from various online repositories described further below.

Based on the above performed, forecasts of migration flows are derived both with and without the theoretical accession to the EU. The forecasts are based on econometric modelling and experience gained from recent accessions.

4.1 *History and fundamentals of Ukrainian migration*

The history of Ukrainian migration was significantly shaped by the political development in the Eastern Europe. Ukraine presented a valuable conquest prize in the past due to its abundant natural resources. Therefore, alteration of periods of independence and subjugation was common in its history. Waves of emigration appeared in the 19th and 20th century where noticeable groups of Ukrainians departed to the USA, Canada, or Australia. However, largest part of the country's diaspora have always existed in the Russian Federation.

The internal migration within the Soviet Union suddenly became an international migration after the collapse of the Union. Consequently, a new system of migration policy had to be developed. Ukrainian economy suffered from hyperinflation in the initial period after gaining independence in 1991. The inflation rate rocketed and reached hundreds of percent, above 500% in 1995. It stabilized by January 1998 to the point that the fluctuations reduced to tens of percent instead of hundreds. (Trading economics 2014a)

Remaining ties to the Soviet Union were apparent in the structure of migration flows – most of the migrants were heading towards the Russian Federation. Regions

such as Moscow and St. Petersburg attracted Ukrainians mainly because of better income opportunities, same language, geographical proximity, demand for labour, and visa free access. Nevertheless, it was hard to distinguish the true motivation for migration especially in the case of Ukraine. A significant stream of migrants going to the Russian Federation did so mainly due to ethnical reasons and therefore the amount of labour migration was difficult to separate. (Bardak et al. 2011)

Migration in Ukraine has also been geographically biased. For population living in the eastern part of the country and Crimea, the Russian Federation was their preferred destination whereas western regions took advantage of the geographic proximity and searched for work in the EU. Ukraine has also experienced significant demographic decline caused by sharp drop in birth rate and negative migration balance. According to the data from the World Bank (2014) the total population decreased in the period of 1991 to 2012 from 52 to 45.6 million.

Over 6.56 million Ukrainians were living abroad in 2010 which constituted nearly 15% of the whole population. There was only about 500 -700 thousand living in the EU. (Eurostat 2014) Bearing in mind that the Russian Federation remains the number one destination, having about 1-2 million Ukrainians living in the country, other major destinations comprise Canada, USA (both with stocks of about 1 million), Moldova (660 ths), Kazakhstan (550 ths), Poland (300 ths), Belarus (240 ths), Italy, Czech Republic (both 200 ths), Israel, Germany, Portugal (all three 150 ths), Spain (100 ths), Slovakia (60 ths), and Turkey (35 ths). (Bardak et al. 2011) A different source, report from IOM (2011), mentions stocks of about 3 million in the Russian Federation, nearly 3 million together in the USA and Canada, 600 ths in Moldova, 500 ths in Kazakhstan and 0.5 million elsewhere.

Extended migration profile of Ukraine (BMP 2011) summarizes the post-Soviet period of Ukrainian migration by five main patterns of migration flows. The (1) return of Ukrainians back home, including (2) ethnic minorities persecuted after the World War II by the Soviet regime (Crimean Tatars, Mtskhethian Turks, Bulgarians, Armenians, Greeks and Germans), (3) emigration of other ethnic minorities (Jewish community, ethnic Germans and Russians, and others), (4) labour migration to Western Europe of both permanent and circular nature and both regular and irregular frequency, and finally (5) irregular transit migration to the West through Ukraine.

The economic incentives to migrate (domestic push factors) stem from both the level of living standard and high degree of economic divergence between Ukrainian regions. It varies from 20% above average to 37% below average of national per capita income. According to IOM report (2011) economic disparities are not the only source of migration pressures but they have to be viewed as one of the main reasons for the current geographical distribution of migrants. IOM report further stresses key factors influencing migration, such as EU border proximity, migration networks, and cultural ties. The document also cites a study performed by ETF in 2009 in which over 56% of the respondents agreed that “prospect of higher salaries and improvement of living standard” is an important push factor. Interestingly, only 7% considered unemployment an important push factor.

Today, the most pressing challenges in alleviating poverty are to reduce inefficiencies in the distribution of incomes, increase wages that belong among one of the lowest in Europe, and increase access to education. Due to the unfavourable demographic evolution there is an increasing pressure building up on the pension system which in turn does not allow for reduction in payroll taxes. The Ukrainian labour market is also facing a number of challenges resulting from the transition of a centrally planned to a market economy. The market is characterised by a large public sector, low labour force participation, and lack of employment opportunities, especially for highly educated. (BMP 2011)

Although Ukraine predominantly remains to be a country of origin of labour migration leading both to the CIS and the EU countries, Ukraine has also become an attractive destination for labour migrants. Particularly immigration from Asia is on the rise. (BMP 2011) Incompleteness is a common issue of migration statistics and so there is a fairly high chance that many of the migrants travel illegally and do not show up in any of the statistics.

Out of the three studied countries Ukraine collects the highest amount of received remittances. In 2012 Ukrainians working abroad sent home around 8.5 billion in current USD, which made a total of 4.8% of domestic GDP. (The World Bank 2014)

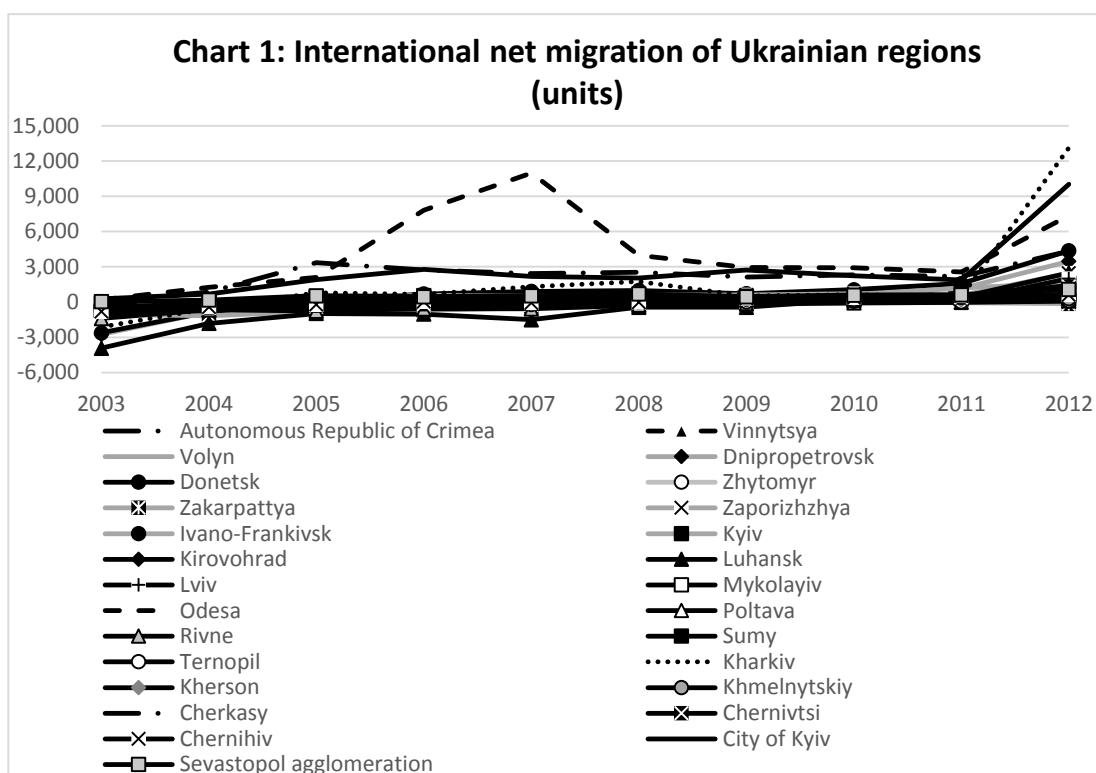
4.2 Modelling of Ukrainian migration potential

This section will provide insights about the mobility of the population of Ukraine. In order to reveal such information a migration potential framework will be used, similarly to study of Strielkowski and O'Donoghue (2006). Estimation of migration potential is going to be performed only in the case of Ukraine because of data availability. It will be measured by regressing gross number of immigrants and emigrants on the variables representing domestic economic conditions. Generally, it is expected that all three countries have rather mobile populations, which react to the economic incentives in domestic economies.

4.2.1 The data

Firstly, the migration potential of Ukraine is studied. All of the data for modelling are obtained from State Statistics Service of Ukraine (2013). The migration studies generally encounter problems of data availability but in the case most of the desired variables were available. For the migration potential analysis regional data of 27 Ukrainian provinces are used. It is possible to construct a balanced regional dataset of given variables – wages, employment rates, population, gross emigration, gross immigration, and net migration. The first limitation of the dataset is its restricted time dimension. The dataset is balanced panel ranging from 2004 to 2012 across 27 regions (oblasts), with annual frequency, overall making 243 observations. The published migration data are announced in a separate form for domestic and international migration. For the purposes of this analysis both domestic and international flows are added up, e.g. gross emigration comprises of emigration from a particular region to both international destinations and other Ukrainian regions. Second drawback of the data is that migration figures do not report labour migration but population movements. This fact makes it harder to interpret the results. However, it is a common issue subjected to data availability.

Examining the data, Chart 1 shows the distribution of international net migration among Ukrainian regions. In most regions international emigration was higher than immigration in the period 2003-2007 (negative values in the chart). An opposite trend is visible since then. The regions tend to exhibit similar both amount



Source: own results

of flows and direction of migration in the specific time periods. There are, however, few noticeable exceptions. Firstly, Odessa region experienced abnormal international immigration in the period of 2006-2007. Secondly, most of the regions faced increased international immigration in the last two years of the dataset. Especially Kharkiv, City of Kyiv, and Odessa regions experienced noticeable increase in immigration.

Significant internal migration is also present in the Ukrainian regions. In most of the regions it has higher magnitude, especially in City of Kyiv where net domestic migration was over ten times higher than the net amount of international flows over the observed period of time. Noticeable net internal migration flows were also recorded in the regions of Kirovohrad and Luhansk.

4.2.2 *The empirical model and results*

The model is constructed to estimate the dependence of migration on push factors (with respect to emigration) and pull factors (with respect to immigration). In order for Ukrainian population to have strong migration potential, net migration should be positively correlated with average wages and negatively with unemployment

(positively with employment). For migration to be considered as an adjustment mechanism for asymmetric shocks, net and gross immigration should be positively linked to both average wages and employment, whilst the opposite relation should hold for emigration. These expectations stem from the simple economic rationale that higher domestic unemployment creates additional pressures for labour migration. Similarly, the higher the wage the lower incentives workers have to abandon the country in search for income improvement. Nevertheless, the effect of wages may not be so straightforward. While better income undoubtedly leads to worker satisfaction in the long-run, short-run effects may be ambiguous. Workers may use the additional resources to overcome the costs of migration, which prevented them from leaving.

Unfavourable conditions at home may create enough incentives for people to migrate. Fidrmuc (2002) further argues that migration helps to adjust regional disparities in face of asymmetric shocks, while bearing in mind that it is only one of several possible adjustment channels and is highly idiosyncratic.

The migration potential model is constructed in the following way:

$$M_{it} = \beta_0 + \beta_1 wage_{it} + \beta_2 emprate_{it} + \varepsilon_{it}$$

where $i = 1, \dots, 27$ and $t = 1, \dots, 9$, dependent variable M_{it} is either gross immigration, gross emigration, or net migration, $wage_{it}$ are yearly averages of monthly average wage in the Ukrainian hryvnia (UAH) per capita, $emprate_{it}$ are employment rates of population between 15-70 years, clearing the data from individuals not likely to engage in migration flows, and ε_{it} is error term. The estimation process reveals significant group effects present in the data, implying that constant terms are not equal. Therefore the model is transformed to error-components model where the error term is split into country-specific and idiosyncratic error:

$$M_{it} = \beta_1 wage_{it} + \beta_2 emprate_{it} + v_i + \varepsilon_{it}$$

where v_i are omitted group-specific effects. This model is estimated using Fixed Effects (FE), by within transformation. Hausman and F tests are performed to see whether Pooled OLS or Random Effects (RE) do not represent better candidates for

estimation. The statistics confirm the validity of the chosen approach. Table 3 describes the outcome of the estimation for regional determinants of migration:

Table 3

Determinants of regional migration: Ukraine (2004-2012)

	Immigration	Std. errors	Emigration	Std. errors	Net migrat.	Std. errors
Employment rate	0.0002553	0.0000812	0.0001	0.0000648	0.0001553	0.0000595
wages, UAH	-5.66e-07	1.20e-07	-1.02e-06	9.58e-08	4.57e-07	8.80e-08
Constant	-0.0145029	0.0074859	0.0077294	0.0059759	-0.014874	0.005485
R ² -within	0.1372		0.3568		0.1311	
Number of observations	243					

Source: own results

The results confirm the expected dependence. Net migration is positively correlated with both average wages and employment rate. The interesting fact is that emigration seems to be positively correlated to the increases in employment rate. This dependence could be explained similarly to the possible short-term influence of wage increases – short-term gains may economically prepare the migrants for the execution of migration decision.

The Ukrainian population is highly mobile and responding to domestic negative push factors. It is interesting to see that the effect of average wages is much more significant than that of employment in all three regressions. Additionally, when studying a relation of emigration and independent variables, employment tends to lose significance. This can be interpreted as an evidence that Ukrainians are more influenced by income differentials among countries than by worsening of the employment rate at home. The suggested interpretation seems to hold with the findings reported by the International Organization for Migration (IOM). IOM (2011) shows that the average wage of a Ukrainian worker abroad was approximately USD 820 in 2008, corresponding to the 3 times value of domestic salary at that time (USD 281). IOM concludes that *‘...migration push factors for Ukrainian labour migrants are the improvement of their living standards and the prospect of higher salaries (over 56%); whilst unemployment is a marginal variable (less than 7%).’* As already mentioned earlier, in a study performed by ETF in 2009 over 56% of the respondents agreed that

“prospect of higher salaries and improvement of living standard” is an important push factor, while only 7% considered unemployment an important push factor.

The analysis above provide sufficient evidence that population of Ukraine has high migration potential and therefore it is worth exploring what impacts would the accession to the EU free labour market have on the Ukrainian migration flows, especially emigration.

4.3 *Modelling of Ukrainian migration*

In connection to the estimation of migration potential this section will continue with empirical research of future migration flows using available data. From multiple feasible methods of studying migration this thesis chooses to approach the issue focusing on push factors as determinants of migration. There are two reasons for this approach. The first one being the availability of data and the second one being better comparability. The focus on Ukrainian variables enables to see the different influences of these variables on migration to individual countries of the EU. While use of pull factors would make it possible to observe different powers of countries to attract foreign migrants, the use of push factors emphasises the role of negative domestic factors, identifies the strongest drivers of migration, and reveal preferred destinations of emigrants.

One of the incentives for trying to make quantitative estimation of the migration flows is to discover whether the inclusion of Ukraine to the EU and the access of Ukrainian workers to the European labour market would cause massive emigration, and thus attempts to assess the justifiability of European fears of further widening of the EU. Nowadays, the debate gained on significance due the political development in the country.

The push factors comprise multiple variables such as economic, institutional environmental or social ones. This study will focus purely on economic incentives to migrate and therefore neglect the influences other variables. For that reason, it is necessary to bear in mind that the model presented below attempts to discover the influences of variables of economic nature only. One additional limitation needs to be mentioned and that is the use of aggregate data. Migrants are a unique group within a

population and as such may or may not differ from the average of the population characteristics. The use of aggregate data may therefore lead to biased results. Unfortunately, the issue cannot be solved due to the data availability.

Data are obtained from multiple online sources. Crucial statistics for the number of Ukrainian migrants with residence permits in the individual EU countries is retrieved from Eurostat online Migration database. This data file is characterized by nearly full completeness of data but rather short time dimension of 5 years from 2008 to 2012. It covers statistics of migrants in all of the countries of the EU in addition of Norway, but excluding Croatia. The migration studies generally encounter problems of data availability but in this case most of the desired variables are available. The statistics for independent variables used in the regressions are obtained from the online database of State Statistics Service of Ukraine (2013). It is possible to construct a nearly fully balanced panel from 2008 to 2012 with 28 cross sections. The obvious limitation of the dataset is its restricted time dimension of only 5 consecutive time periods. Second drawback of the data is that migration figures do not report labour migration but all population with resident permits. Thirdly, migration statistics are known to be underestimated as they do not include illegal migration. All of these facts make the interpretation of results harder. However, it is a common issue subjected to data availability.

The econometric model is based on the previous research done in the field and derived from the works of Hatton (1995), Boeri and Brücker (2001) and Glazar and Strielkowski (2010). Focusing on the estimation of the dependence of migration on push factors the theoretical model is constructed in the following way:

$$umig_{it} = \beta_0 + \beta_1 lnuwages_t + \beta_2 lnuunemp_t + \beta_3 umig_{it-1} + \varepsilon_{it}$$

where $i = 1, \dots, 27$ and $t = 1, \dots, 5$, dependent variable $umig_{it}$ is stock of Ukrainian migrants with residence permits living in country i in time t normalized by Ukrainian population in time t , $lnuwages_{it}$ is natural logarithm of Ukrainian average monthly wage in UAH in time t , $lnuunemp_{it}$ is natural logarithm of unemployment rate (in %) in Ukraine in time t , and ε_{it} is error term. The estimation process reveals significant group effects in the data, implying that constant terms across cross sections are not

equal. The model is transformed to error-components model where the error term is split into country-specific and idiosyncratic error

$$umig_{it} = \beta_0 + \beta_1 lnuwages_t + \beta_2 lnuunemp_t + \beta_3 umig_{it-1} + v_i + \varepsilon_{it}$$

where v_i are omitted group-specific effects. The model is then estimated using Fixed Effects within transformation to eliminate v_i . This is achieved by including α_i dummy variables in the regression where each dummy variable equals to 1 for country i and 0 for the others for each time period. Group-specific effects are assumed to be correlated with the regressors. To account for possible serial correlation in the idiosyncratic errors, which causes bias in standard errors, the regression is run in the way that standard errors are adjusted for clustering. Based on the migration literature that uses similar variables in the research, such as Hatton (1995), Boeri and Brücker (2001) and Glazar and Strielkowski (2010), Ukrainian migration stocks in foreign countries are expected to be negatively correlated with average gross monthly wages, positively correlated with unemployment, and also positively correlated with lagged dependent variable because it represents network effects in the equation. Table 4 describes the outcome of the estimation:

Table 4

Migration model based on push factors: Ukraine (2008-2012)

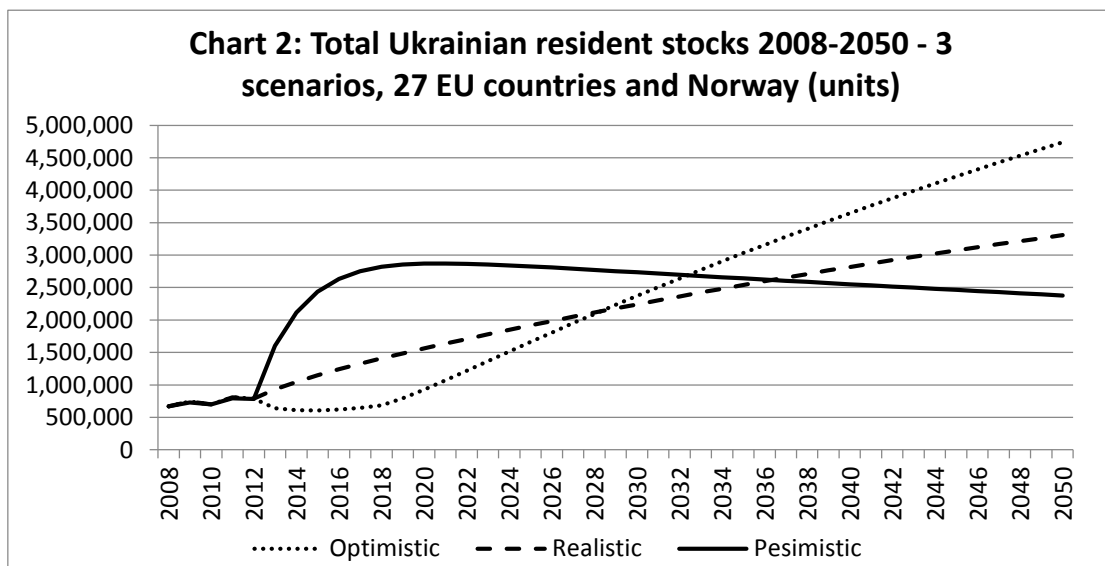
	Estimate	Standard errors (cluster)	t-value	p-value
lnuwages	0.0840467	0.0445687	1.89	0.07
lnuunemp	0.2530514	0.1253847	2.02	0.054
umig _{t-1}	0.6415681	0.2423186	2.65	0.013
R^2 -within	0.3962			
Number of observations	105			

Source: own results

The results confirm the expected dependencies except for one variable – monthly wages. While the straightforward reasoning would suggest that higher earnings would lead to lower incentives for Ukrainians to migrate, the opposite is true. The positive relationship of the variables makes sense due to the high transactions costs

of migration. In order for an individual or even whole family to be able to migrate a not negligible amount of funds is required to gain necessary paperwork, pay for travel and moving expenses, or have enough cash to pay rent in the destination country. Therefore, positive and significant influence of wages shows that there exists a significant transaction cost barrier which needs to be overcome before a person achieves sufficient financial strength to migrate. The Ukrainian population is responding to domestic push factors. All of the variables used in the regression are significant, especially the lagged dependent variable serving as a proxy for network effects.

Having found a model with good fit for the explanation of Ukrainian migration the next step in the modelling is to provide forecasts. It is clear that forecasting capability of the model is very limited due to short time dimension of the available data, nevertheless it may offer revealing information for future decision making on migration policies of EU countries. Chart 2 shows three different scenarios of development of Ukrainian migration flows, dependent on the various extrapolation of the independent variables. The three scenarios vary in the monthly wage growth rate and unemployment level predicted over the forecasted period.



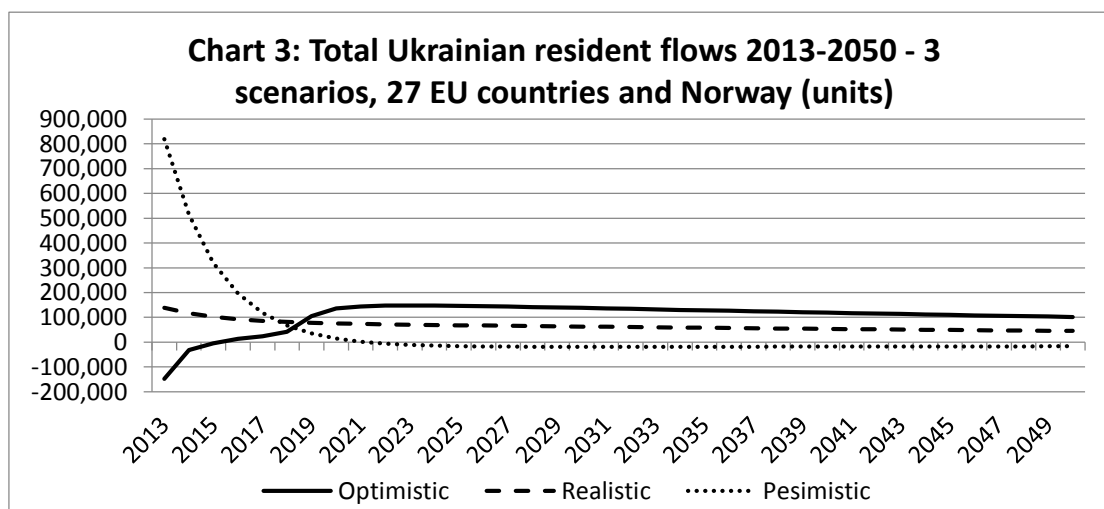
Source: own results

The optimistic scenario presumes favourable economic development, hence its name. It calculates with stable average wage growth rate of 6%, unemployment percentage equal to the average of unemployment rate in Ukraine in the period 2008-

2012 minus 1 percentage point. Finally, as in the base model, the dependent variable is normalized by the domestic population of Ukraine, which is modelled to decrease annually at the speed of 0.7% (yearly average of population decrease over the period of 2008-2012). The forecasting period is from 2013 to 2050. Keeping in mind the effects of the regressors we see that especially high wage growth rate leads to higher emigration in the long run, resulting in bigger stocks of migrants with residence permits in the EU countries. Under such circumstances the stocks reach 4.75 million in 2050 across the whole EU.

Realistic scenario counts with stable average wage growth rate of 3%, unemployment percentage is equal to the average of unemployment rate in Ukraine in the period 2008-2012 with no bonuses or penalties. Both length of forecasting period and decrease of Ukrainian population is the same as in the previous case. Using these more sober assumptions the number of Ukrainians living in the EU in 2050 culminates at approximately 3.5 million.

Lastly, the pessimistic scenario working with stable average wage growth rate of 0%, unemployment percentage being equal to the average of unemployment rate in Ukraine in the period 2008-2012 plus penalty of 2% yields long run estimates of around 2.5 million residents with permits in the EU. Chart 3 displays yearly migration flows for the respective scenarios. It is worth to notice that while the pessimistic scenario estimates the lowest migration in the long run, it presents quite high emigration flows in the very short run.



Source: own results

The total amount of migrant stocks in the EU in the long run based on the development of domestic economic incentives varies from 2.5 to 4.75 million. When taking into account that the total stocks are dispersed to 28 countries over 38 years such emigration does not constitute serious threats to the stability of labour markets of receiving EU countries.

4.4 Modelling of shock to migration flows

The second and more problematic part of modelling is to derive the effects of possible accession of Ukraine to the EU free labour market. Ukraine did not experience a similar event in its modern history and thus it is impossible to estimate the accession impact relying solely on Ukrainian data and empirical facts. If the country had such an experience the model would be expanded by a dummy variable capturing the period before and after the change. The estimated coefficient of the dummy variable could then be used to simulate the effect for future similar events. Since the mentioned approach is not feasible the thesis studies available data of the countries that joined the EU in past and tries to deliver estimates based on their experience.

Migration data of Bulgaria, Poland, and Romania are used to attempt to quantify the possible impact of Ukrainian accession. These countries are chosen because of multiple reasons. Each country underwent accession process to the EU in recent history but not too recently. For these reasons migrant data are available both for period before and after accession. Secondly, all of the countries have tradition of emigration and their population exhibit high migration potential. Thirdly, the countries share close geographic location with Ukraine and proximity to the EU which makes them more comparable.

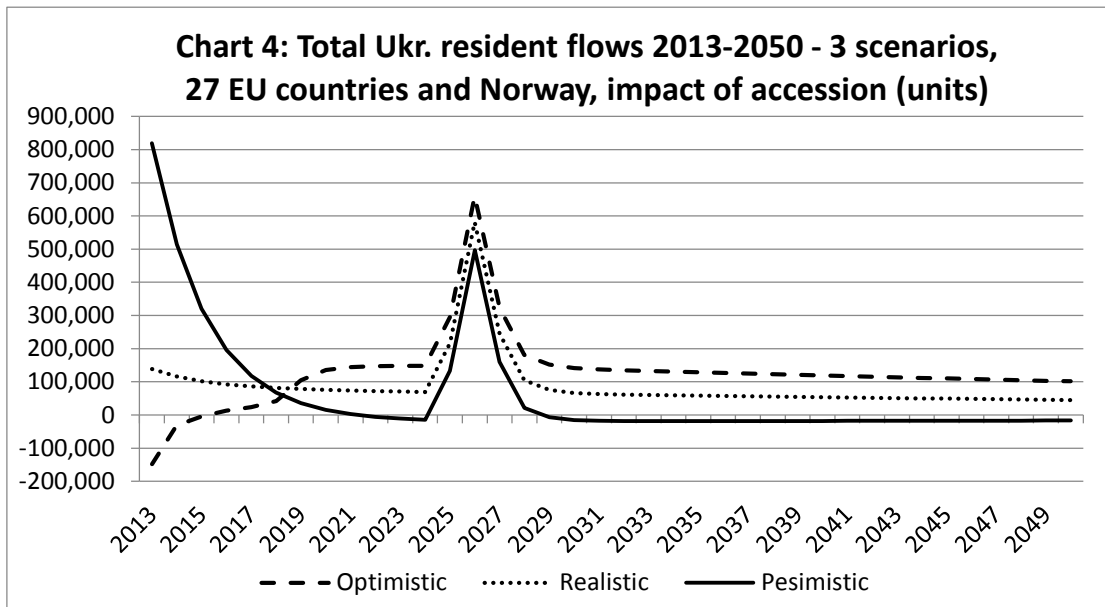
For each of the three countries the top 5 favourite destinations in the EU for their emigrants were chosen and behaviour of migration flows into these destinations was observed over the period of 2000-2012 (this captures vast majority of the overall migration to the EU). Additionally, a special attention was placed on the temporary restrictions to free access to the EU labour market which many of the European countries enacted in order to protect domestic labourers. Every EU country has an option to postpone the full opening of its labour market for a newly acceded member for up to 7 years. Majority of the EU members use this right although in different

length. Not all of the countries decide to implement the restrictions for the maximum of 7 years. Old member states defend such actions by claiming that they create a smoother transition period for their labour markets and they also protect the local markets in times of severe disturbances.

From the empirical data it is clearly visible and unambiguous that accession leads to increased emigration flows from new member states to the old ones. More specifically, relaxation of labour market restrictions causes the increase. The act of accession does not have such power. On the example of Bulgaria, Poland, and Romania it is apparent that in the case of every of top 5 EU destinations for each country the increase in migration flows occurs right after the abolishment of the restrictions. However, the effect is not huge and quickly dissolves. The biggest reaction occurs in the first two years after the collapse of the restrictions and then hastily diminishes. Generally, the migration flows return to their original level after 4 years and in many cases even further below. There are no visible increases in migration flows prior to the collapse of restrictions.

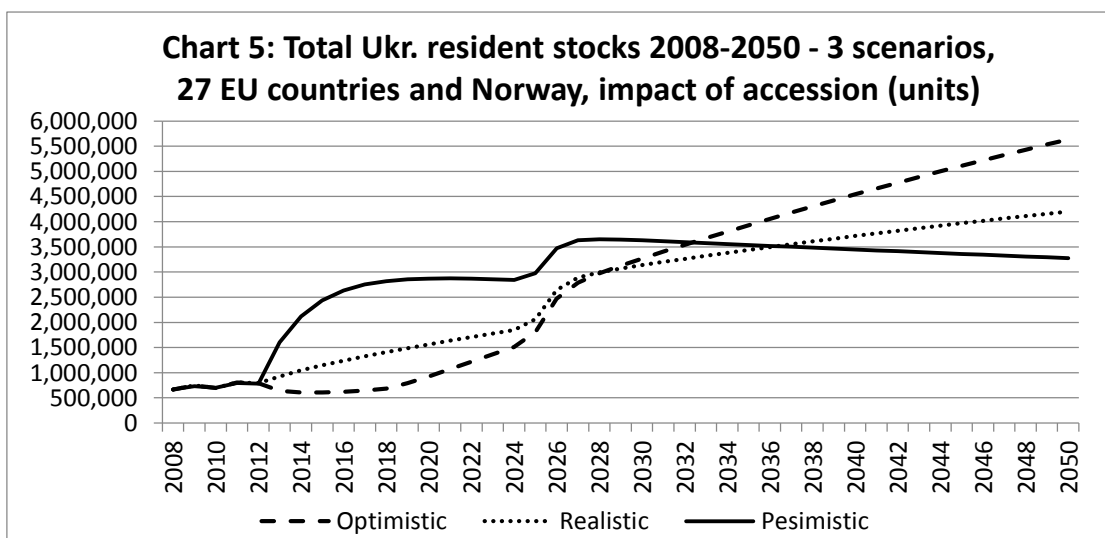
Therefore, the last year's value of migration flows before the collapse is taken as a benchmark value of normal migration flows. The following 4 years are observed and benchmark value is deducted. This effect is then summed up across 5 destinations for each country separately. As a result, we get the approximate value of shock for each of the 3 countries. Next, a variation in the level of shocks is narrowed down by normalizing the values of shocks to a domestic population. This eliminates the inequalities due to the population size. Once such normalized shocks are obtained, an arithmetic average is calculated to further narrow down a variation. Lastly, this generalized shock is normalized to the Ukrainian population and projected on the modelled migration flows and stocks in the previous exercise.

To model the shock, the accession date is set to the beginning of the year 2025. The date is considered to be the soonest possible date for the Ukrainian accession but in the light of the recent political developments it is hard to predict any future development. Shock is modelled for all 3 scenarios and is depicted on the Chart 4.



Source: own results

It reveals significant and short-term impact on the migration flows. However, the long-term impact and influence on migrant stocks is shown on Chart 5. In the long run, the effects of accession have marginal influence on the total number of Ukrainian residents in the EU 27 and Norway. When compared to the prediction in the absence of shock the range of resident migrant stocks shifts from 2.5 – 4.7 million to 3.2 – 5.6 million.



Source: own results

In sum, based on the evidence of previous accessions of countries such as Greece, Portugal, Spain, Poland, Bulgaria, and Romania migration flows tend not to

exhibit long term patterns of growth or instability. Usually, there is a noticeable increase of emigration in the short run but it is always followed by a rapid rally of the trend or even below the original values. When the empirical observations are applied to the case of Ukraine, with the use of econometric modelling it is estimated that the potential accession would augment the total number of Ukrainian residents in the EU by about 0.8 million in the first 3 years after the accession across all member states. If member states were to exercise their right to postpone the opening of the free labour market by up to 7 years the proposed number would be scaled down. Ultimately, the long term equilibrium of the resident stocks is not significantly impacted by the accession but rather by the development of Ukrainian economy and other influencing factors.

The current crisis in Ukraine presents quite a challenge for any prediction of future migration flows. The type of resolution of the conflict is likely to influence the migration. Nevertheless, in the light of up to date data hypothetical migration is not viewed as threatening.

5 Case of Belarus

The following chapter is going to discuss the case of Belarus. Similarly to the case of Ukraine, the description of the migration flows and economic situation of the country will be described. Firstly, the structure of migration flows, migration stocks, and population prospects are discussed. Secondly, the key factors that determine the migration decisions are identified, while special attention is placed on the push factors. Finally, a theoretical model explaining migration flows using economic variables is created. A good fit of the model is tested by econometric modelling, employing Ordinary Least Squares with Fixed Effects. Data for the model are retrieved from online databases described further below.

No migration scenarios and forecasts are created because the estimated coefficients of the chosen economic variables are found to be statistically undistinguishable from zero.

5.1 *History and fundamentals of Belarus migration*

Belarus suffered economically after the transition with the economic output staggering. Nevertheless, Belarus belonged to a group of countries that had faster recovery and achieved above average GDP growth among CIS countries. Belarus was left with important industrial sector (Ukraine as well) that granted it a better starting conditions in comparison to Moldova, which was primarily oriented on agriculture. Political affiliations have also boosted Belarusian growth since it was able to utilize Russian growth spill-over. Growth recorded since 2000 has been heavily driven by an increase in exports to the Russian Federation. Public sector still has a dominant role in Belarus and level of bureaucracy is high, hampering the potential growth of the economy. (Bardak et al. 2011)

Lastly, one of the biggest issues in Belarusian economy is long-term high inflation. The country did not manage to get below two digit inflation before 2006 and experienced hyperinflation in thousands of percent in the period 1993-1996. (Trading economics 2014b) Most recently, after Lukashenka's 2010 electoral campaign, inflation rate again rocketed to over 100%, accompanied by substantial decrease of

wages from 500 to 280 dollars between the last quarters of 2010 and 2011. (Plaschinsky 2012)

Focusing on migration, there were three major emigration waves in the modern history of Belarus. First being economic migration at the borderline of 19th and 20th century, second during the period of World War II and finally third after the collapse of the USSR in early 1990s. With regard to migration, Belarus shared a fate of other CIS countries after the dissolution of the USSR. Migration flows were significantly shaped by the political development in the Eastern Europe and were motivated primarily by social and political factors. While Belarus combatted influence of the Russian Federation in the modern era the migration flows became increasingly intertwined with its neighbour.

The internal migration within the USSR suddenly became an international migration after its collapse. Majority of the migrant population headed to the Russian Federation either because of family reunification or because of the ethnic origin. Military resettlement and Chernobyl disaster were also important non-economic push factors. Apart from the Russian Federation, other frequent destinations were Ukraine, Poland, Lithuania, Kazakhstan, the USA, Israel, Germany, Latvia, and Estonia. (Bardak et al. 2011) The economic incentives to migrate (domestic push factors) are formed by low living standard and problematic professional employment and career growth. Bobrova et al. (2012) describe the gradual increase of influence of economic push factors over the influence of socio-political factors. They mention the following economic push factors: monetary system separation, population impoverishment, lack of prospects for housing purchase, and unemployment. The authors also detect gradual decrease of emigration from early 1990s to mid-2000s and change in the structure of destination countries, non-CIS countries becoming more preferred.

Nevertheless, the historical orientation on eastern neighbours remains pervasive in the structure of today's migration flows. Lot of educated Belarusians leave for Moscow and other big Russian cities, attracted by higher salaries and similar costs of living. (Plaschinsky 2012) Undeniable advantages of leaving for the Russian Federation apart from economic opportunities are language and geographical proximity, demand for labour, free education, and visa free access.

Belarus has also experienced demographic decline but not as steep as Ukraine. The World Bank (2014) reports that total population decreased in the period of 1991 to 2012 from 10.2 to 9.5 million.

On average Belarusian migrants have medium to high level education. Abroad, they tend to work in medium level education jobs or lower. Majority of the migrants heading to the EU are female (more than 60%) while population going after work to the Russian Federation and other CIS states is formed prevalently by men (over 90%). In 2012 there were around 1 million Belarusians in the Russian Federation who were born in Belarus. However, only 30 thousand were Belarusian citizens. Such difference is caused by massive ethnic repatriation wave that occurred in early 1990s. Generally, two thirds of all migrants head to the Russian Federation. There were only around 285 thousand migrants in total in Europe. The biggest diasporas being in Poland (84 ths), Latvia (nearly 60 ths), and Lithuania (over 55 ths). The top EU destinations for Belarusian workers today are Poland and Italy. (Migration Policy Centre 2013a)

According to Belarusian national statistics the country has a positive net migration balance since 2000. The validity of such claim is as puzzling as the reported values of unemployment, which are in long-term under 1%. Therefore, these numbers need to be used cautiously. Around 140 thousand foreign citizens were working in Belarus in 2012. Not surprisingly, more than 83 thousand were Russians and 17 thousand Ukrainians. European countries do not have any significant minorities present in Belarus. (Migration Policy Centre 2013)

Temporary migration and migration in general tend to be highly underestimated by national statistical offices of sending countries. In 2012 Poland alone registered ten times more Belarusians working within its borders than national statistical office of Belarus acknowledged to be working in all non-CIS countries. Additionally, illegal migration needs to be taken into account. The reason why Belarusian statistics may record so low numbers is that Belarusian migrants might enter the destination countries on guest or visitor visa and then participate in informal market. Luchenok and Kolesnikova (2011) estimate the annual number of migrants irregularly travelling abroad at 150 000, out of which 85% departs for the Russian Federation.

In the case of Belarus remittances do not represent as significant part of the GDP as in the case of Ukraine and Moldova. The remittances reached over 1 billion in current USD, which made a total of 1.7% of domestic GDP. (The World Bank 2014)

5.2 *Modelling of Belarus migration*

The modelling approach used for the case of Belarus will be the same as the one used for the estimation of migration flows of Ukraine. It is characterized by focusing on push factors as determinants of migration. The pros and cons of this approach were already characterized earlier in the thesis. Similarly, the incentives for trying to make quantitative estimation of the migration flows is to discover whether the inclusion of Belarus to the EU and the access of Belarus workers to the European labour market would trigger uncontrolled emigration.

From the variety of push factors the study will focus purely on economic incentives to migrate and therefore neglect the influences other variables. For that reason, it is necessary to bear in mind the limitations of the modelling framework. Another limitation is the use of aggregate data. Migrants are a unique group within a population and as such may or may not differ from the average of the population characteristics. The use of aggregate data may therefore lead to biased results. Unfortunately, the issue cannot be solved due to the data availability.

Data are obtained from multiple online sources. Statistics for the number of Belarusian migrants with residence permits in the individual EU countries is retrieved from Eurostat online Migration database. The data file is characterized by nearly full completeness of data but rather short time dimension of 5 years from 2008 to 2012. It covers statistics of migrants in all of the countries of the EU in addition of Norway, but excluding Croatia. The migration studies generally encounter problems of data availability but in this case most of the desired variables are available in full range. The statistics for independent variables used in the regressions are obtained from the online database of National Statistical Committee of the Republic of Belarus. It is possible to construct a nearly fully balanced panel from 2008 to 2012 with 28 cross sections. The obvious limitation of the dataset is its restricted time dimension of only 5 consecutive time periods. Second drawback of the data is that migration figures do not report labour migration but all population with resident permits. Thirdly, migration statistics are

known to be underestimated as they do not include illegal migration. All of these facts make the interpretation of results harder. However, it is a common issue subjected to data availability.

The econometric model is based on the previous research done in the field and derived from the works of Hatton (1995), Boeri and Brücker (2001) and Glazar and Strielkowski (2010). Focusing on the estimation of the dependence of migration on push factors the theoretical model is constructed in the following way:

$$bmig_{it} = \beta_0 + \beta_1 \ln bwages_t + \beta_2 \ln bunemp_t + \beta_3 bmig_{it-1} + \varepsilon_{it}$$

where $i = 1, \dots, 27$ and $t = 1, \dots, 5$, dependent variable $mmig_{it}$ is stock of Belarusian migrants with residence permits living in country i in time t normalized by Belarusian population in time t , $lnmwages_{it}$ is natural logarithm of Belarusian average monthly wage in BYR (the Belarusian ruble) in time t , $lnunemp_{it}$ is natural logarithm of unemployment rate (in %) in Belarus in time t , and ε_{it} is error term.

Similarly to the model for Ukraine, based on the migration literature that uses economic variables to estimate migration flows, such as Hatton (1995), Boeri and Brücker (2001) and Glazar and Strielkowski (2010), Moldovan migration stocks in foreign countries are expected to be negatively correlated with average gross monthly wages, positively correlated with unemployment, and positively correlated with lagged dependent variables (network effects).

The estimation process reveals significant group effects in the data, implying that constant terms across cross sections are not equal. The model is transformed to error-components model where the error term is split into country-specific and idiosyncratic error

$$bmig_{it} = \beta_0 + \beta_1 \ln bwages_t + \beta_2 \ln bunemp_t + \beta_3 bmig_{it-1} + v_i + \varepsilon_{it}$$

where v_i are omitted group-specific effects. The model is then estimated using Fixed Effects within transformation to eliminate v_i . This is achieved by including α_i dummy variables in the regression where each dummy variable equals to 1 for country i and 0 for the others for each time period. Group-specific effects are assumed to be correlated

with the regressors. To account for possible serial correlation in the idiosyncratic errors, which causes bias in standard errors, the regression is run in the way that standard errors are adjusted for clustering. Table 5 describes the outcome of the estimation:

Table 5

Migration model based on push factors: Belarus (2008-2012)

	Estimate	Standard errors (cluster)	t-value	p-value
lnbwages	-0.0354391	0.0378564	-0.94	0.358
lnbunemp	-0.0906017	0.0945915	-0.96	0.347
bmig _{t-1}	0.2912648	0.001501	194.04	0.000
R^2 -within	0.1409			
Number of observations	104			

Source: own results

The estimated coefficients of the independent variables are very insignificant for average monthly wages at 36% and for unemployment at 35% level of significance. The lagged dependent variable serving as a proxy for network effects remains highly significant at 1% level of significance.

In this case the process of estimation proved that it is not possible to achieve a well-fitted model using only the economic variables selected by the approach of the study. Inclusion of squares of independent variables, testing for the presence of additional effects, did not substantially add significance to the model. From the statistical point of view the results cannot be reliably interpreted. Due to the high p-values the null hypothesis stating that the coefficients on the variables are insignificantly different from zero cannot be resoundingly rejected. The risk of committing the so-called Type I error is too great.

As a result of not being able to construct a reliable model based on the available data the forecasts of the migration flows are not going to be performed. One of the issues that may prevent the functioning of the model are the values of unemployment reported by the National Statistical Committee of the Republic of Belarus. Yearly aggregates range from 0.5 to 0.9 percent which are suspiciously low numbers. Another

reason might be the insufficiency of the data. Five time periods may not be enough to capture the true causalities.

6 Case of Moldova

This chapter is going to be focused on Moldovan migration flows. The structure of the chapter will be the same as in the case of Ukraine and Belarus. Firstly, description of the migration history and economic situation will be discussed. Secondly, the key economic factors that induce migration are going to be identified, focusing on push factors. Thirdly, based on previous research a theoretical model explaining migration flows using economic variables will be created. The explanation power of the model will be tested by econometric modelling, employing Ordinary Least Squares with Fixed Effects. Source of the data are various online databases of national statistical offices and supranational institutions.

6.1 *History and fundamentals of Moldovan migration*

Moldova was affected by steep economic downfall after the collapse of the USSR. The process of transition was lengthy and harsh. Economic output decreased significantly and GDP growth of Moldova was the worst of the countries in the region. Although Moldova shared a soviet history with Ukraine and Belarus, the three countries had different starting conditions at the beginning of transition.

Moldovan GNI reached only USD 3 000 while Belarus and Ukraine could enjoy levels of 5 000, similar to Romania and Bulgaria (expressed in terms of purchasing power parity). On the other hand, Moldova recorded rather low economic contraction during the latest financial crisis in the amount of -6.5% in comparison to Ukraine, which lost -15.1%. (Bardak et al. 2011) Unlike its neighbours Moldova did not have a developed industrial sector and focused rather on agriculture. Transition period was characterized by widening of the wage differentials. Additionally, unfavourable political relations towards the Russian Federation and civil war in Moldova consumed vast amount of resources that could have been used elsewhere. In contrast to Belarus, inflation is quite stable in the long run. Moldova managed to successfully tame initial inflation spike of hundreds of percent in the beginning of 1990s and have maintained very stable inflation ever since of about 1-2%. (National Bureau of Statistics of the Republic of Moldova 2013)

The major wave of emigration began shortly after the collapse of the USSR. Permanent emigration peaked in the first five years of 1990s. The main destination countries were Israel, the Russian Federation, Ukraine, and Germany. Migration flows were significantly shaped by the political development at first but soon economic rationale took over. In 2010 almost quarter of the economically active population left to look for a job abroad. (IOM 2013a)

The internal migration within the USSR suddenly became an international migration after its collapse. Majority of the migrant population headed to the Russian Federation either because of family reunification or because of the ethnic origin. Apart from the Russian Federation, other frequent destinations that became popular were Italy, Romania, and Spain. (Bardak et al. 2011) The economic incentives to migrate (domestic push factors) are primarily widespread poverty and lack of job opportunities. (IOM 2013b) A specific characteristic of Moldovan migration to the EU is migration via Romania. Due to historical connections of both countries many Moldovans have access to the acquisition of Romanian citizenship if they have Romanian family ties. Romanian citizenship became valuable after Romania acceded the EU in

The continuation of migration's orientation on eastern neighbours is characteristic for former CIS countries and Moldova is no exception. Similarly to Ukraine, Moldovan migration is to some extent associate with brain drain. Undeniable advantages of leaving for the Russian Federation apart from economic opportunities are language, geographical proximity, demand for labour, free education, and visa free access.

Similarly to Ukraine, destinations of migrants vary with geographic location. Population living in the eastern regions of the country tend to look for work in the Russian Federation whereas those living in the west embrace the advantage of the geographic proximity to the EU and search for work there. Demographic decline in Moldova was not as substantial as in Ukraine or Belarus. The World Bank (2014) reports that total population decreased in the period of 1991 to 2012 from 3.7 to 3.56 million. Moldova clearly has negative net migration balance. Fertility rate in 2010 accounted for 1.3 child per woman, which is far from replacement rate. With regard to type of migration, permanent migration is a domain of women, men prefer temporary labour migration. When relying on national statistics at least 300 thousand Moldovan

citizens were international migrants in 2010. (IOM 2013a) However, illegal migration needs to be taken into account. Looking at statistics from destination countries, Italy alone reported over 120 thousand legally residing migrants. The official figures are therefore questionable and as usual underestimated.

Education characteristics of migrants differ with relation to the destination country. Migrants leaving for EU countries are predominantly (60%) women and over 53% of migrants have tertiary education. On the contrary, those leaving for the Russian Federation and other CIS countries tend to have only medium education and work in construction sector. In 2012 there were around 280 thousand Moldovans in the Russian Federation who were born in Moldova. However, only 51 thousand were Moldovan citizens. The difference is caused by massive ethnic repatriation wave that happened in early 1990s. There were around 277 thousand migrants in total in Europe. The most preferred destinations are Italy (143 ths), Romania (49 ths), and Spain (over 17 ths). (Migration Policy Centre 2013b)

Remittances sent by Moldovans reach by far the highest percentage of domestic GDP out of the three countries. Amount of remittances reached almost 1.8 billion in 2012 in current USD, which made a total of stunning 24.6% of domestic GDP. (The World Bank 2014) Although the country was three times less populous than Belarus the amount of remittances was nearly twice as high.

6.2 *Modelling of Moldovan migration*

The modelling approach used for Moldovan case will be the same as the one used for the estimation of migration flows of Ukraine and Belarus. It is characterized by focusing on push factors as determinants of migration. The pros and cons of this approach were already characterized earlier in the thesis. Similarly, the incentives for the effort of trying to make quantitative estimation of the migration flows is to discover whether the inclusion of Moldova to the EU and the access of Moldovan workers to the European labour market would trigger uncontrolled emigration.

From the variety of push factors the study will focus purely on economic incentives to migrate and therefore neglect the influences other variables. For that reason, it is necessary to bear in mind the limitations of the modelling framework.

Another limitation is the use of aggregate data. Migrants are a unique group within a population and as such may or may not differ from the average of the population characteristics. The use of aggregate data may therefore lead to biased results. Unfortunately, the issue cannot be solved due to the data availability.

Data are obtained from multiple online sources. Statistics for the number of Moldovan migrants with residence permits in the individual EU countries is retrieved from Eurostat online Migration database. This data file is characterized by nearly full completeness of data but rather short time dimension of 5 years from 2008 to 2012. It covers statistics of migrants in all of the countries of the EU in addition of Norway, but excluding Croatia. The migration studies generally encounter problems of data availability but in this case most of the desired variables are available in full range. The statistics for independent variables used in the regressions are obtained from the online database of National Bureau of Statistics of the Republic of Moldova (2013). It is possible to construct a nearly fully balanced panel from 2008 to 2012 with 28 cross sections. The obvious limitation of the dataset is its restricted time dimension of only 5 consecutive time periods. Second drawback of the data is that migration figures do not report labour migration but all population with resident permits. Thirdly, migration statistics are known to be underestimated as they do not include illegal migration. All of these facts make the interpretation of results harder. However, it is a common issue subjected to data availability.

The econometric model is based on the previous research done in the field and derived from the works of Hatton (1995), Boeri and Brücker (2001) and Glazar and Strielkowski (2010). Focusing on the estimation of the dependence of migration on push factors the theoretical model is constructed in the following way:

$$mmig_{it} = \beta_0 + \beta_1 lnmwages_t + \beta_2 lnmunemp_t + \beta_3 mmig_{it-1} + \varepsilon_{it}$$

where $i = 1, \dots, 27$ and $t = 1, \dots, 5$, dependent variable $mmig_{it}$ is stock of Moldovan migrants with residence permits living in country i in time t normalized by Moldovan population in time t , $lnmwages_{it}$ is natural logarithm of Moldovan average monthly wage in MDL (the Moldovan leu) in time t , $lnmunemp_{it}$ is natural logarithm of unemployment rate (in %) in Moldova in time t , and ε_{it} is error term.

The estimation process reveals significant group effects in the data, implying that constant terms across cross sections are not equal. The model is transformed to error-components model where the error term is split into country-specific and idiosyncratic error

$$mmig_{it} = \beta_0 + \beta_1 lnmwages_t + \beta_2 lnmunemp_t + \beta_3 mmig_{it-1} + v_i + \varepsilon_{it}$$

where v_i are omitted group-specific effects. The model is then estimated using Fixed Effects within transformation to eliminate v_i . This is achieved by including α_i dummy variables in the regression where each dummy variable equals to 1 for country i and 0 for the others for each time period. Group-specific effects are assumed to be correlated with the regressors. To account for possible serial correlation in the idiosyncratic errors, which causes bias in standard errors, the regression is run in the way that standard errors are adjusted for clustering.

The process of estimation and fitting of model led to the modification of the original model in the following way

$$mmig_{it} = \beta_0 + \beta_1 lnmwages_t + \beta_2 lnmwages_t^2 + \beta_3 lnmunemp_t + \beta_4 mmig_{it-1} + v_i + \varepsilon_{it}$$

where a square of variable $lnmwages_t$ was added to the regression. Squares of variables often incorporated into regressions to capture the hidden momentum of variables. In this case the estimated coefficient of $lnmwages_t$ is positive while the estimated coefficient of $lnmwages_t^2$ is negative. This means that at the beginning income serves as a boosting factor of migration but its effect weakens over time and ultimately reverses. The inclusion of the square root makes sense from the economic rationale. While higher income may motivate to stay home and relieve migration pressures it can also help to overcome migration transaction costs and enable migrants to initiate the move. However, once the income reaches higher levels it no longer maintains this function and only serves as a factor reducing migration.

Similarly to the model for Ukraine, based on the migration literature that uses economic variables to estimate migration flows, such as Hatton (1995), Boeri and

Brücker (2001) and Glazar and Strielkowski (2010), Moldovan migration stocks in foreign countries are expected to be negatively correlated with average gross monthly wages, positively correlated with unemployment, and positively correlated with lagged dependent variables (network effects). Table 6 describes the outcome of the estimation:

Table 6

Migration model based on push factors: Moldova (2008-2012)

	Estimate	Standard errors (cluster)	t-value	p-value
lnmwages	44.39309	18.76206	2.37	0.026
lnmwages2	-2.77643	1.172194	-2.37	0.026
lnmunemp	-0.2406896	0.1097416	2.19	0.037
mmig _{t-1}	0.263183	0.0373654	7.04	0.000
R ² -within	0.4904			
Number of observations	104			

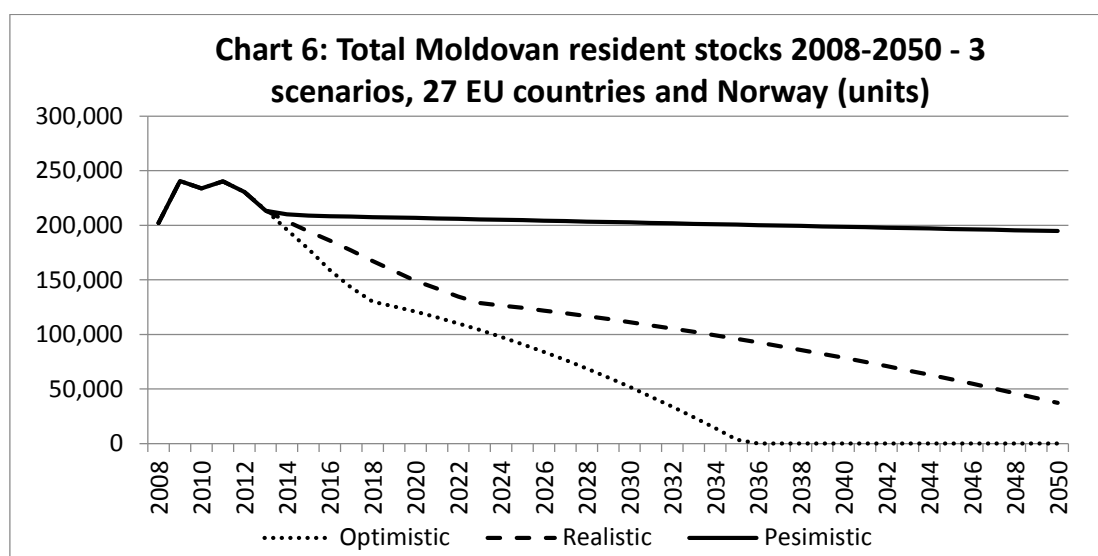
Source: own results

All variables are significant at least on 4% level of significance. The results confirm the changing influence of wages on migration flows discussed further above. Again, the initial expectation would suggest that higher monthly earnings would lead to lower incentives for Moldovans to migrate but the relationship is not that simple. The positive relationship of the variable makes sense due to the high transactions costs of migration. In order for an individual to be able to migrate he needs to overcome a barrier in the form of not negligible amount of funds that is required for travel documents, moving expenses, and establishment of function household in the destination country. Therefore, positive and significant influence of wages that weakens over time shows that there exists a non-negligible transaction cost barrier to migrate. Significance of the variables in the model shows that Moldovan population is reacting to domestic push factors. The most significant variable is the lagged dependent variable. It demonstrates dominant influence of network effects.

Equipped with well-fitted model for the explanation of Moldovan migration the next step in the modelling process is to generate forecasts. The forecasting capability of the model is very limited due to short time dimension of the available data and suffers from the same data related problems as the models for Ukraine and Belarus.

Nevertheless, it may still unmask patterns in the migration development which could be useful for future decision making on migration policies of EU countries.

The three different scenarios of development of Moldovan migration flows, based on the various extrapolation of the independent variables is shown in Chart 6. The scenarios differ in the monthly wage growth rate and unemployment level predicted over the whole forecasted period.



Source: own results

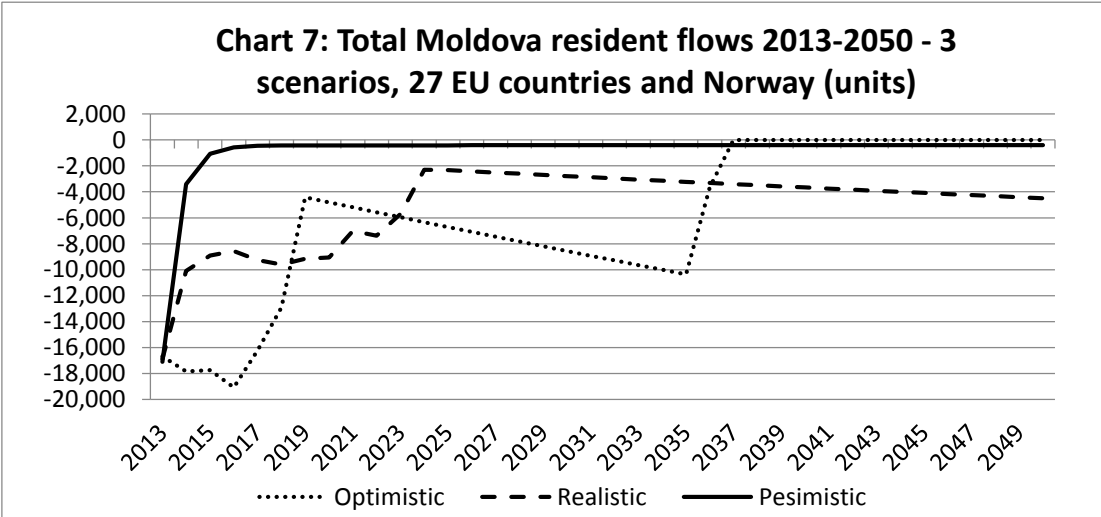
The optimistic scenario presumes positive growth of independent variables. It calculates with stable average monthly wage growth rate of 4%, unemployment percentage being equal to the average of unemployment rate in Moldova in the period 2008-2012 minus half percentage point. As in the base model the dependent variable is normalized by the domestic population of Moldova, which is modelled to decrease annually at the speed of 0.2% (yearly average of population decrease over the period of 2008-2012). The forecasting period is from 2013 to 2050 with last data available for year 2012. Having in mind the effects of the regressors it is observed that changes in the monthly wage growth rate have a dominant impact on the predicted values of resident migrant stocks in the long run. More dramatic changes in the level of unemployment would be needed to achieve a similar influence on the migration flows. Higher domestic growth of average monthly wages leads to diminishing stocks of migrants with residence permits in the EU countries. Under optimistic scenario the

positive developments in the Moldovan economy result in return migration and level of resident stocks in the EU plummets to 0 in the forecasted period.

Secondly, the realistic scenario is computed with different levels of independent variables. It counts with stable average monthly wage growth rate of 2%, unemployment percentage is equal to the average of unemployment rate in Moldova in the period 2008-2012 with no bonuses or penalties. Both length of forecasting period and decrease of Moldovan population is the same as in the case of optimistic scenario. Using these assumptions the number of Moldovans holding residence permits in the EU in 2050 culminates at approximately 40 thousand individuals. Similarly to the optimistic scenario, the migrant stocks are predicted to decline but in slower pace.

Lastly, the pessimistic scenario calculates with stable 0% average monthly wage growth rate, unemployment percentage being equal to the average of unemployment rate in Ukraine in the period 2008-2012 plus penalty of 0.5% yields long run estimates of around 195 thousand of residents with permits in the EU. In this case the level of migrants remains rather constant over the whole forecasted period and does not exhibit decreasing trend as in the case of the two previous scenarios.

Chart 7 displays yearly migration flows for the respective scenarios. While pessimistic scenario is characterized by fast stabilisation of the emigration from the EU to near zero values, the other two scenarios maintain not-constant varying migration



flows. The key finding is that the number of residents is not increasing in any of the scenarios. They only vary in the speed of emigration from the EU member states.

The total amount of resident migrant stocks in the EU in the long run based on the development of domestic economy varies from 0 to 195 thousand. It indicates either unchanging level of Moldovan residents in the EU or stable decline of the resident population. In any case the migrant stocks are not likely to increase in the forecasted period and therefore does not form any threats to the stability of labour markets of the receiving EU countries.

6.3 *Modelling of shock to migration flows*

Having reviewed the scenarios of migration unaffected by any major influencing factor this section will engage in more problematic part of the modelling process. It aims to derive the effects of possible accession of Moldova to the EU free labour market. Moldova did not experience a similar event in its modern history and thus it is impossible to estimate the accession impact relying solely on Moldovan migration data and empirical facts. If the country had such an experience the model would be expanded by a dummy variable capturing the period before and after the change. The estimated coefficient of the dummy variable could then be used to simulate the effect for future similar events. Since the mentioned approach is not feasible the thesis chooses an alternative approach. It studies available data of the countries that joined the EU in past and tries to deliver estimates based on their experience.

Migration data of Bulgaria, Poland, and Romania are used to attempt to quantify the possible impact of Moldovan accession. These countries are chosen because of multiple reasons. Each country underwent accession process to the EU in recent history but not too recently. For these reasons migrant data are available both for period before and after accession. Secondly, all of the countries have tradition of emigration and their population exhibit high migration potential. Thirdly, the countries share close geographic location with Ukraine and proximity to the EU which makes them more comparable.

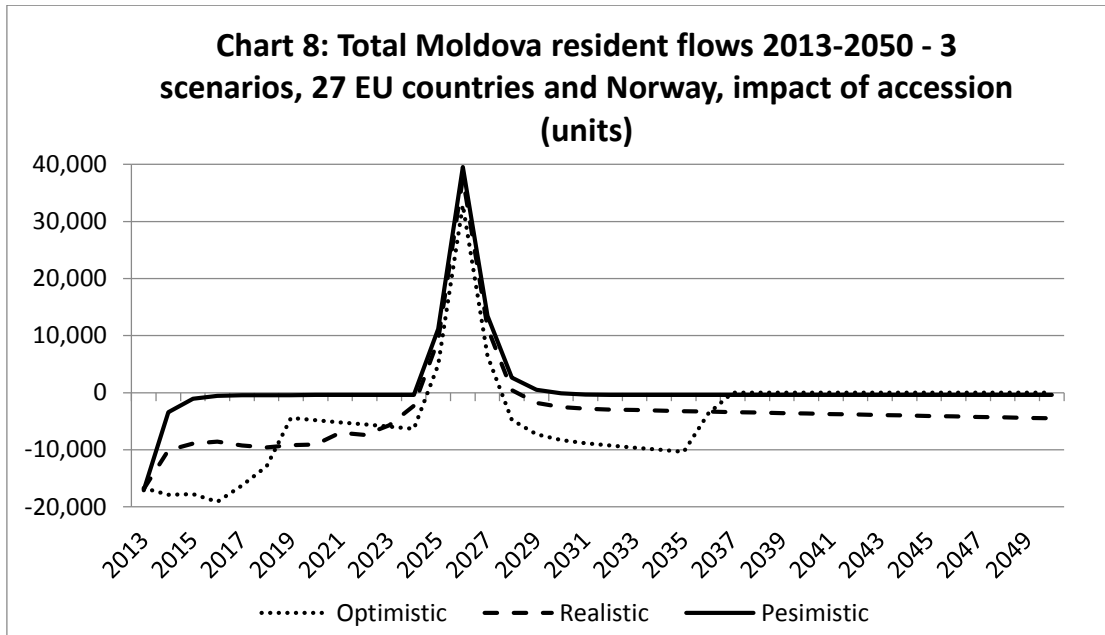
For each of the three countries the top 5 favourite destinations in the EU for their emigrants were chosen and behaviour of migration flows into these destinations was observed over the period of 2000-2012 (this captures vast majority of the overall migration to the EU). Additionally, a special attention was placed on the temporary

restrictions to free access to the EU labour market which many of the European countries enacted in order to protect domestic labourers.

As already mentioned, empirical evidence unambiguously suggests that relaxation of labour market restrictions causes increase in migration flows. On the example of Bulgaria, Poland, and Romania it is apparent that in the case of every of top 5 EU destinations for each country the increase in migration flows occurs after the abolishment of the restrictions (does not have to necessarily be equal to the point of the accession to the EU). However, the effect is not huge and dissolves rapidly. The biggest reaction occurs in the first two years after the collapse of the restrictions and then hastily diminishes. Generally, the migration flows return to their original level after 4 years and in many cases even further below. There are no visible increases in migration flows prior to the collapse of restrictions.

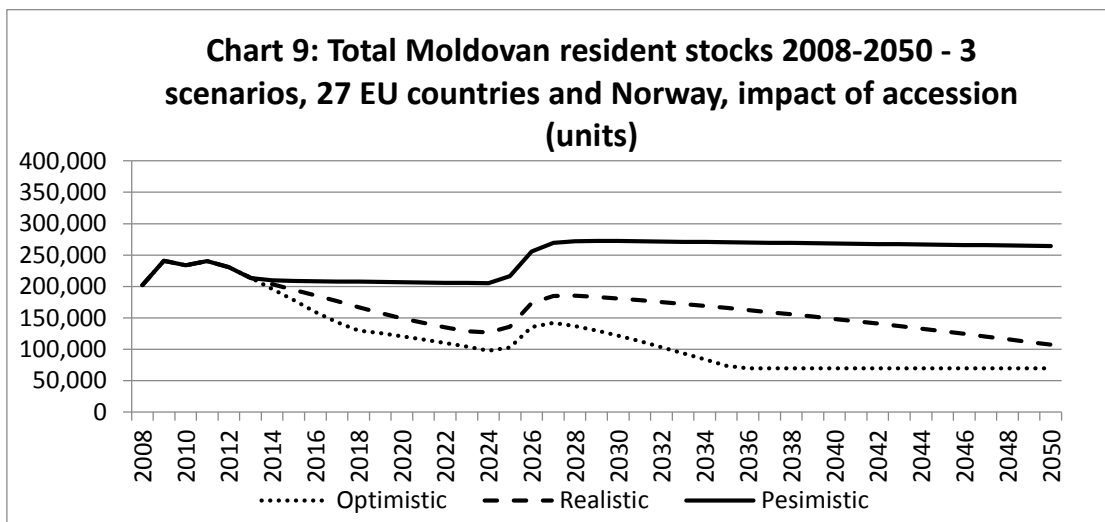
Therefore, the last year's value of migration flows before the collapse is taken as a benchmark value of normal migration flows. The following 4 years are observed and benchmark value is deducted. This effect is then summed up across 5 destinations for each country separately. As a result, the approximate value of shock for each of the 3 countries is obtained. Next, a variation in the level of shocks is narrowed down by normalizing the values of shocks to a domestic population. This eliminates the inequalities due to the population size. Once such normalized shocks are obtained, an arithmetic average is calculated to further narrow down a variation. Lastly, this generalized shock is normalized to the Moldovan population and projected on the modelled migration flows and stocks in the previous exercise.

To model the shock, the accession date is set to the beginning of the year 2025. The date is considered to be the soonest possible date with regard to length of the accession process and required economic and institutional convergence. Shock is modelled for all 3 scenarios and is depicted on the Chart 8.



Source: own results

The graph reveals significant and short-term impact on the migration flows. However, the long-term impact and influence on migrant stocks is shown on Chart 9. The effects of accession have marginal influence on the total number of Moldovan residents in the EU 27 and Norway in the long run. When compared to the prediction in the absence of shock the range of resident migrant stocks shifts from 0 – 195 thousands to 70 – 265 thousand.



Source: own results

To sum it up, based on the evidence of previous accessions of countries such as Greece, Portugal, Spain, Poland, Bulgaria, and Romania migration flows tend not to

exhibit long term patterns of growth or instability. Usually, there is a noticeable increase of emigration in the short run but it is always followed by a rapid rally of the trend or even below the original values. When the empirical observations are applied to the case of Moldova, with the use of econometric modelling it is estimated that the potential accession would augment the total number of Ukrainian residents in the EU by approximately 70 thousand in the first 3 years after the accession across all member states. If member states were to exercise their right to postpone the opening of the free labor market by up to 7 years the proposed number would be scaled down and spread out over the longer time period. Consequently, the long term equilibrium of the resident stocks is not significantly impacted by the accession but rather by the development of Moldovan economy and other influencing factors.

Most recently, on 28th of April 2014, the visa-free access to the EU was granted to the citizens of Moldova, based on the Eastern Partnership program. (Lewis 2014) This is likely to contribute to reduction of any hypothetical accession shocks in the future.

7 Conclusions

The aim of the thesis was to analyse migrations flows of Ukraine, Belarus, and Moldova and predict impact of accession to the EU free labour market. The countries were chosen because they are natural candidates for accession in the process of widening of the EU. Geographic proximity, lower living standards, existence of migration networks, unemployment, and political situation represent significant push factors that induce migration. The goal of the thesis was to assess whether accession to the EU free labour market would result in uncontrolled migration to the EU member states and whether often pessimistic expectations of national governments were well-founded. In order to carry out the analysis, the thesis was divided into five parts.

Firstly, theoretical chapter provided reader with a brief overview of the migration theories, their development, and key factors influencing migration. The migration literature has identified several economic and non-economic variables influencing migration. The thesis approached the issue strictly from the economic point of view and chose to follow the path of aggregate data research. Further, the chapter revealed that there is not a unified agreement in the migration literature on the incidence of accession to the EU on migration flows.

Secondly, a chapter was dedicated to the Southern enlargement in order to demonstrate the empirical experience of the countries that have already acceded in the past. Based on the gathered data it was shown that in the case of Spain, Portugal, and Greece there was no long-term emigration increase that would create instability on domestic labour markets of the three countries. On the contrary, decrease of emigration and return migration were observed.

Thirdly, three individual chapters studied the cases of Ukraine, Belarus, and Moldova. In the cases of all three countries emigration to the EU is only a fraction of the total emigration flows. In line with the previous research in one of the streams of migration literature an econometric model was established in each case to study the relationships of the economic push factors and migration stocks abroad. Collecting available data from online databases of Eurostat, World Bank, and national statistical offices three push factors were included in the regressions. Lagged migrant stocks of residence permit holders were used as a proxy for network effects. Unemployment rate

and average monthly wage were chosen to represent economic conditions of the countries. The dependent variable was established as migrant stocks of residence permit holders, mainly because of the completeness of the data across majority of the EU member states.

In the case of Ukraine and Moldova, economic push factors were found to be significant in driving migration decisions. Availability of regional data for Ukraine made it possible to check migration potential of Ukrainian migrants. The results confirmed that Ukrainian population is quite mobile and responding to the changes of domestic push factors. In the case of Belarus, a good fit of the model using economic variables was not found and therefore the effects of economic variables could not be statistically distinguished from zero. For Ukraine and Moldova three scenarios of development of migration flows were extrapolated using different growth rates of independent variables. The number of Ukrainian residence permit holders in the whole EU except Croatia but including Norway was estimated to rise from nearly 800 thousand in 2012 to 2.5-4.7 million in 2050. In the case of Moldova, residence permits migrant stocks would decrease from 215 thousand in 2012 to 0-195 thousand in 2050, depending on a scenario. No forecasts were created for Belarus.

Additionally, based on the accession experience of Poland, Romania, and Bulgaria a migration shock was modelled in all scenarios to discover the influence of the EU accession on the migration flows. The accession to the EU free labour market would increase the long-term migrant stocks in the EU by 0.8 million for Ukraine and by 70 thousand for Moldova. Such increases would most likely happen in the short-run, not having any further influence on long-run migration flows.

Considering that the shock would be distributed among 28 EU countries over 3-4 years and would leave no long-term effects, it is safe to conclude that the worries of the massive immigration waves are not well-founded. From the economic point of view, migration to the EU is beneficial and leads to higher GDP growth rate. Migration policies of European states should acknowledge the fact and do not succumb to protectionist behaviour. Especially under unfavourable demographic trends, which lead to the diminishing of young labour force cohorts.

In sum, the research provided enough evidence to support the claim that accession of Ukraine, Belarus, and Moldova to the EU would not lead to excessive

migration flows endangering labour markets of the EU member states. However, accession to the free labour market was observed to result in short-term increase of migration flows. In the case of Ukraine expected influences of independent variables were calculated. Migration was found to be negatively correlated to average monthly wages and positively correlated to unemployment. In the case of Moldova, wages were found to be positively correlated with migration with decreasing tendency. This suggests the existence of significant transaction costs that need to be overcome before the act of migration. Lastly, network effects were the most significant variables in regressions of both Ukraine and Moldova, proving their key importance in the migration decisions.

The results can be partly corroborated by the current development of Moldovan migration flows to the EU, since starting from the 28th of April 2014 Moldovan citizens possessing biometrical passports can travel to the EU visa-free. In the near future, it will become clear whether the flows of Moldovans are to increase and what is going to happen to Moldovan migration to the EU.

Even though the modern datasets provide sufficient data for econometric modelling, panel data with longer time dimension would likely yield more precise results. Therefore, there is a space for future research to re-estimate the model with additional data. Finally, explanation of migration using economic variables is only one of the possible approaches. A qualitative research should be done on the effects of language, distance, culture, or political climate.

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Appendix

Table 2

Foreign residents in countries of the EC

Country	Year	Foreign residents (units)
Germany	1987	4,630,000
France	1982	3,680,000
Britain	1985	1,736,000
Belgium	1987	853,000
Netherlands	1987	568,000
Italy	1987	541,000
Spain	1987	335,000
Greece	1987	193,000
Denmark	1987	128,000
Luxembourg	1981	96,000
Portugal	1987	90,000
Ireland	1985	88,000
Source: Valderrama 1993 (OIT 1989)		