

An analysis of out-migration of Eastern Europeans in Norway

by

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Master's thesis

This thesis completes the following degree

Master in Economics

University of Bergen, Department of Economics

June 2018



UNIVERSITETET I BERGEN

Acknowledgements

With this thesis I complete my Master degree in Economics at the University of Bergen. It has been a challenging and sometimes tiring but very rewarding work. I would like to express my sincere gratitude to my supervisor, Julian Vedeler Johnsen, for the outstanding guidance and patience during the process of writing this thesis. His valuable input and comments have been extremely helpful.

I would like to thank Norwegian Centre for Research Data for providing me the sample which made it possible to perform this study.

I am also grateful to my family and friends for their support and presence in the most challenging times. A special thanks to my friends Kostiantyn, Georg and Aliona for their comments and correction.

Inga Rusin, Bergen 01. June 2018

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Abstract

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Return migration, also referred as an out-migration, is an important research topic within the labor economics. The main questions investigated within this field are concerned with the selection of the returners and the factors, affecting immigrants' decision to leave.

This thesis investigates an income effect on the probability to out-migrate. The main scope of analysis covers Eastern European immigrants in Norway. The countries of origin are divided into the regions, both inside and outside the European Union, to examine the impact of the EU factor on the immigrants' behavior. The micro data of the immigrants' has been provided by Norwegian center for research data (NSD). The sample contains 10% of all Eastern European population in Norway.

The following questions are brought up: i) do low income earners or high income earners have a higher probability to out-migrate? ii) what are common demographic characteristics of the returners? iii) do the citizens of EU differ from the non-citizens in their out-migration behavior?

The analysis is conducted on the individual level, using the linear probability model to predict the likelihood of out-migration. The empirical results of this study reveal that immigrants with the lowest income or no income at all are most likely to out-migrate, compared to middle and high income groups. The effect of income on return migration is higher in times of economic recession. The citizens of the EU countries are mostly affected by the low income. In addition, the analysis outputs indicate that growing income decreases the probability of return migration.

The data has been analyzed with the statistical software Stata/IC 14.1.

Table of Contents

Acknowledgements	ii
Abstract.....	iii
Tables and figure	v
1. Introduction	1
2. Relevant empirical literature	4
2.1. Theoretical introduction	4
2.2. Previous studies	5
3. Data description.....	10
3.1. Descriptive statistics of income distribution	14
3.2. Economic growth by regions.....	17
4. Immigration and return migration statistics in Norway	19
5. The out-migration analysis.....	23
5.1. Model design	23
5.2. Main analysis.....	26
5.3. EU and non-EU	29
6. Robustness analysis.....	33
6.1. LOGIT model	35
6.2. Different years	37
7. Discussion and concluding remarks	40
References	44
Websites.....	45

Tables and figure

Figure 1. Weighted annual GDP growth (%) by regions, years 2009 and 2013	17
Figure 2. Immigration and out-migration rates of Eastern Europeans in Norway years 2000 – 2013	19
Figure 3. The immigration rates for EU area, years 2000 - 2013	21
Figure 4. The immigration rates for EU area, years 2000 - 2013	22
Table 1. Demographic characteristics of the sample, years 2008 and 2012	12
Table 2. Descriptive statistics of income in EU and non-EU regions, by gender and marital status, in 2008 (%).....	14
Table 3. Descriptive statistics of income in EU and non-EU regions, by gender and marital status, in 2012 (%).....	16
Table 4. Explanatory variables for the main model	25
Table 5. The estimation results for the performed regression, years 2009 and 2013.....	27
Table 6. Estimation results for year 2013: all regions, EU-citizens and non-EU citizens	31
Table 7. Estimation results for year 2009: all regions, EU-citizens and non-EU citizens	32
Table 8. Explanatory variables for the robust model	33
Table 9. Estimation results for the changed model, years 2009 and 2013	34
Table 10. Estimation results for LPM and LOGIT models, years 2009 and 2013.....	36

1. Introduction

Immigration is a wide area in labor economics which has become especially important in the end of 20th century. Extensive research has been done to reveal the actual problems and implications within this field. Recently a new trend within international migration has drawn the attention of the economists: temporary migration since many migrants actually return home. Despite the fact that theoretical literature on return migration is quite limited, it is important to note that quite the topic has been investigated. Main questions arise on the selection of return migrants. Who actually returns and who stays in the host country? What factors may affect individuals' decision to return? Are these reasons exclusively economic or do they also include "social" factors? Does high income affect that decision positively or negatively?

The most cited research on the topic is conducted by Borjas and Bratsberg in 1996. They argue that main reasons for return migration are i) an initial plan to migrate for a certain time period in order to accumulate capital or wealth; or ii) failure to succeed in a new country. They also conclude that immigrants are more likely to return to rich countries.

The main purpose of this thesis is to investigate an income effect on the probability to out-migrate. Higher wages is one of the main reasons that motivate people to work abroad. The question is: what influence does the income have on immigrants' motivation to stay in a host country or leave? On one hand, an increase in income substantially improves the quality of life and provides an incentive to stay. On the other hand, people with higher income may achieve their goals faster than others and then return to their country of origin, because they prefer to live and spend the accumulated capital at home. When it comes to low income, it is reasonable to assume that low earners are less motivated to stay in the host country and out-migrate sooner than other income groups. Nevertheless, they might be persistent in reaching their specific goals, so the low income will just prolong their stay until they finally achieve it. This thesis aims at analyzing whether it is highest or lowest income earners who have higher probability to return migrate. When it comes to middle income workers, I intend to use them as a reference group in the analysis and investigate the behavior of all mentioned income groups comparing to this one.

The question of interest in such studies is also the situation in the home country. Are immigrants more likely to return home if economic conditions of the source country improve? In line with the previous literature, I include in my analysis the data on annual GDP growth in source countries to address this issue.

The aim of this study is to contribute to the body of literature on out-migration by analyzing the behavior of a specific group of immigrants. The main scope of analysis covers Eastern European immigrants in Norway. After the expansion of the EU in 2004 (Lithuania, Latvia, Estonia, Poland, Cyprus, Czech Republic, Hungary, Malta, Slovakia, Slovenia) and 2007 (Bulgaria, Romania) the flow of immigrants from Europe to Norway increased rapidly. Norway has become a popular emigration destination due to high salaries and overall better quality of life. According to Statistics Norway, between 2004 and 2014 a total of 138,000 people immigrated from the new EU-members in Eastern Europe to find a job in Norway. During the same period, 40,200 immigrated to Norway due to family relations with one of the immigrant workers. About 22,000 of them eventually returned home.

The aspiration of this study is to find common features within the group of Eastern European workers and to analyze their return migration patterns. Next to the EU member states, Russia, Ukraine and Balkan countries are considered in the analysis. The main part of my research focuses on two years: I study 2009 and 2013 to investigate whether the income effect on return migration is different in times of crisis (the global crisis of 2008, also known as The Great Recession) and economic growth (in 2013). I also analyze EU and non-EU countries separately.

Based on the above, this thesis addresses the following research questions: i) do low income earners or high income earners have a higher probability to out-migrate? ii) what are common demographic characteristics of the returners? iii) do the citizens of the EU differ from the non-citizens in their out-migration behavior?

The empirical results of my study show that immigrants with the lowest income or no income at all are most likely to out-migrate, compared to middle and high income groups. The effect of income on return migration is higher in times of economic recession. The citizens of the EU states are mostly affected by the low income. In addition, the analysis outputs indicate that growing income decreases the likelihood of return migration. The correlation between return migration and economic growth is negative in times of crisis and non-existing when the economy thrives.

A similar study has been conducted by Bijwaard and Wahba (2013) on immigrants in Netherlands, where they investigated whether the high-income or low-income recipients return home faster. Their findings have shown that both highest and lowest income earners are most likely to out-migrate, comparing to the other income groups. The main aim of my research is to examine how immigrants in Norway respond to higher wages, while accounting for demographic characteristics of return migrants, such as age, gender and civil status. Statistics Norway (SSB) has performed an analysis in 2016, where they investigated the probability of return migration or moving to another region of a country for different groups of immigrants. This particular study differs from mine in two important aspects. SSB conducted their research on all immigrants in Norway, while the focus of my study is specifically Eastern Europe. Furthermore, SSB does not investigate the income effect on the return migration.

The outline of this paper is as follows. In chapter 2, I discuss the empirical literature on the subject. Chapter 3 presents the data and overview of my sample, also discusses income distribution in details. Chapter 4 contains the statistics of immigration and out-migration in Norway, while in chapter 5 the main model and the separate analysis on EU and non-EU countries conducted for this research are presented. Chapter 6 contains the results of a robustness analysis. Chapter 7 is the conclusion.

2. Relevant empirical literature

2.1. Theoretical introduction

It is important to keep in mind that the topic of return migration has not yet been touched in theoretical literature in much detail, and the number of sources therefore is small. However, many practical researches have been conducted in the last decades. First of all, it is worth noticing that not only economic reasons drive immigrants away from the host country. According to Dustmann and Görlach (2015), the common reason for return migration is preference of consumption in the country of origin. However, since the purpose of this paper is to investigate the income effect, I will focus on the economy.

The theory provided in empirical literature predicts a skill-based and income-based selection in the cohort of return migrants. If an immigration flow to a host country mostly includes the high-skilled individuals, the less skilled ones will eventually out-migrate. In contrary, if the immigrants possessing low skills prevail in the host country, the most skilled will leave (Borjas and Bratsberg, 1996). Individuals with lowest income will out-migrate in higher rates than others (Bijwaard and Wahba, 2013; Kangasniemi and Kauhanen, 2013). However, the highest income gainers are also more likely to leave, according to Bijwaard and Wahba. Attachment to labor market seems to be a very significant factor to stay in the host country (Constant and Massey, 2003; Bijwaard, Schluter, Wahba, 2011; Kornstad, Skjerpen and Stambøl, 2016).

In addition, the economic conditions in the source country may also affect the return migration. Immigrants are more likely to return to the countries with a high GDP per capita (Borjas and Bratsberg, 1996; Bijwaard and Wahba, 2013) and low unemployment rate (Bijwaard and Wahba, 2013).

The next subchapter further discusses the mentioned studies and other researches.

2.2. Previous studies

Borjas and Bratsberg (1996) provide a solid theoretical framework on return migration from the United States. They analyze the behavior of immigrants by using data from Public Use Sample of the US together with micro data from the Immigration and Naturalization Service. Based on their argumentation on findings from previous studies by Borjas (1989) and Jasso and Rosenzweig (1988), they assume that out-migration can arise for two reasons. First, some of the initial immigrants may have planned a temporary migration in order to earn money or gain specific skills and then go back to their countries. Other reason is the failure of immigrants to make a good living in the host country, presumably because of the incorrect information about economic perspectives in the US or just bad luck. Furthermore, the authors construct a theoretical model, based on the difference in earnings in host and source countries, costs of immigration and return migration, potential skills of the immigrants. They examine the rate of return to skills in the source country relative to that in the US among the other dependent variables and assume a skill-selection in immigrant flows, affecting decisions on return migration. Further they show that return migration rate depends negatively on migration costs and positively on mean income in source countries; also that the migration costs are increasing functions of variable, interpreting distance between source and host countries. Thus they conclude that the immigrants tend to return to rich countries which are relatively close to the US. Their important findings reveal the correlation between outmigration and “richness” of the source country and distance between US and countries of origin. They conclude that migrants are more likely to return to well-doing countries which are placed not far away from United States. Another important implication is that return migration accentuate the type of initial selection that generated the immigrants’ flow. As they conclude, if the immigrant flow is positively selected, i.e. immigrants are high-skilled; the return immigrants will be the least skilled individuals. Conversely, if immigrant flow is negatively selected, the return migrants will be most skilled individuals. Even though the article provides us a good theoretical framework, it has some differences from the current situation in Europe. For example, the distance in terms of Europe may not be so important factor for making a decision to return. I also intend to focus on the immigration from Eastern Europe, where the economic situation of source countries is initially worse compared to “rich” Western Europe and Nordics.

Bijwaard, Schluter, Wahba (2011) examine the impact of labor market dynamics on the return migration by using administrative panel data on the entire population of new labor immigrants to The Netherlands. They point out that unemployment and return migration are prevalent events: at least one third of immigrants face unemployment and about 50% of all immigrants leave the host country in the observation period. Authors assume that duration of unemployment periods and potential re-employment has causal effect on immigrants' decision to out-migrate. They construct a model using the "timing-of-events" method of Abbring and van den Berg (2003), where they measure employment, unemployment and migration durations for each immigrant. All immigrants are divided in 3 groups: old (15 prior to 2004) EU countries, new and non-EU countries. They find that unemployment spells increase return probabilities for all immigrant groups, while re-employment spells typically delay returns. The precise impact on migration duration depends on both timing and lengths of the employment and unemployment spells. Authors also notice that the majority of immigrants are temporary rather than permanent.

Bijwaard and Wahba (2013) analyze the effect of income earned in the host country on return migration by using administrative panel data of labor immigrants from developing countries to the Netherlands. They argue that the reasons affecting the migration duration are ambiguous. On one hand, the migrants would like to stay longer in the host country if their incomes are high; on the other hand, the gain from staying abroad diminishes, and that happens for two possible reasons: i) either the earners accumulate a certain capital and no longer have a need to work abroad, or ii) the income gap between host and source country is smaller for high-earners. Thus, there might be a positive or a negative effect of higher wages on the migration length. The authors refer to previous studies and claim that empirical evidence on this subject show very different results. To avoid bias in the results they account for the dependence of immigrants' labor market status (employed, unemployed, non-participant) and their income. They also control for unemployment rate and economic growth of the source country. Authors discover the U-shaped form in correlations between return migration and earnings, which means a higher intensity of return in low- and high-income groups. The interpretation of the fact that low-income migrants leave faster could be their failure, while high-income individuals leave because they achieve their goals (such as saving targets or gaining job skills).

Dustmann and Görlach (2015) provide a theoretical framework to study temporary migration. They argue that expected temporariness of working abroad influence immigrants' economic

behavior and thus generate possible consequences for host and source countries. Authors point out that economic literature on this topic is very limited, presumably because of poor quality of available data. Their general theoretical model allows an analysis of immigrations' behavior under different assumptions on reasons and motives for return, such as preference of consumption in the country of origin, the purchasing power difference in home and host countries or temporarily higher earnings in the destination country. In terms of reasons for return, they conclude that the marginal utility of consumption in source country must be significantly larger than that in host country to affect individuals' decision to return home despite the higher income abroad. The purpose of migration in this case is the accumulation of capital in the host country for later consumption upon return. Another motive for temporary migration is the price difference in source and host countries driven by higher currency value in the host country. In this case migrants increase their consumption in long run by migrating and saving abroad. Temporary migration contributes to welfare of the source country via remittances sent from the host country: it is either a support for families left in country of origin, savings for future consumption or investments. When it comes to consequences for the receiving country, it benefits from absence of immigrants in their costly retirement years, while they spent their most productive years working in the host country. A negative consequence for host country is less investment, as immigrants tend to remit and invest in the source countries.

Skjerpen, Stambøl and Tønnensen perform a research on return migration for Statistics Norway (SSB) on macro level. They study the effect of fluctuations in unemployment rate and GDP per capita on out-migration of immigrants in Norway in time period between 1990 and 2012. They use these variables both for Norway and for the countries of origin. To conduct the analysis the authors use a time-series model. First they divide all immigrants in 3 groups by the country of origin. The first group contains the immigrants from Western European countries, North America, Australia and New Zealand. The second group is especially interesting for my study since it contains the immigrants from new Eastern European countries. The third group includes the immigrants from Asia, Eastern European countries outside the EU, Africa, Latin America and Oceania (except Australia and New Zealand). Afterwards the authors separate the individuals by age and gender into 36 groups altogether. According to them, out-migration rate is the highest for the first geographic group (Western European countries, North America, Australia and New Zealand). They find that macroeconomic factors have some influence on the return migration, but not as large as it

could be expected and not for all immigrants' groups. The out-migration of the individuals from the second group (Eastern Europeans in the EU) is influenced by the fluctuations of unemployment rate in Norway. However, the unemployment rate in their countries and the difference in GDP per capita between Norway and the source countries do not have any impact on their return migration¹.

Kornstad, Skjerpen and Stambøl (2016) conduct another research on return migration for Statistics Norway (SSB). They analyze the factors that affect immigrants to emigrate from Norway, as well as their decision to move to another region within the country or remain settled in the same region. The authors use micro data to reveal how the variables as age, gender, length of residence, educational level or attachment to labor market can influence individual's decision to move or stay. In this research authors do not provide any kind of theoretical framework, instead they base their analysis on previous reports from Statistics Norway and compare results. However, their findings are interesting in matters of better understanding of the out-migrated individuals' personal characteristics. First they use linear probability method to obtain certain results and then they conduct a logit model to confirm their findings. They conclude that male immigrants are more likely to emigrate than female; younger individuals of working age have higher probability to out-migrate than middle-aged or older immigrants; increasing length of residence decreases their chances to move away. They also consider the reasons for immigration and conduct that individuals with refugee status are less likely to emigrate, however they have a high tendency to move within the country. Those with education as the reason for emigration, as well as immigrants from Nordic countries, show the highest probability to out-migrate. Measured by attachment to labor force market, those who are outside the labor force and the educational system are most likely to leave the country, while employed individuals show the lower probability for out-migration. When it comes to domestic relocation, immigrants show the highest tendency to move from the least central municipalities, while most central ones remain settled in. This study differs from my paper by at least two important points. First, SSB conduct their research on all immigrants in general, while I focus on some particular regions. And more importantly, they do not use income in their model.

Kangasniemi and Kauhanen (2013) examine an economic assimilation of Estonian immigrants in Finland and their return migration. They argue that empirical literature does not

¹ I originally included the unemployment rate of the source countries and its interactions with the income in my model, but since I have not found any significant results, I decided not to keep this variable.

sufficiently cover the selective nature of out-migration, and its possible impact on distortion of assimilation measures. The authors measure economic assimilation of Estonian immigrants as they compare their earnings and employment with the natives. They are also interested in factors affecting out-migration. Their results show that poor labor market performance, as much as being outside the labor force, positively affects the out-migration from Finland. Younger people assimilate more easily as the wage gap between immigrants and natives in age group 18-24 is minimal. For women the wage gap is generally wider.

3. Data description

To perform my research I have been provided with panel data by Norwegian Centre for Research Data (NSD). Data contains information on 10% of Eastern European immigrants in Norway in period 2000 – 2013, in total 20,952 individuals. Due to anonymity protection source countries are divided into 6 regions. To simplify the further description I have named these regions as followed:

- Poland;
- Baltics (Lithuania, Latvia, Estonia);
- CIS² (Russia, Belarus, Ukraine);
- RoBuMo (Romania, Bulgaria, Moldova);
- Balkans (all countries of the Balkan peninsula);
- CzSloHun (Czech Republic, Slovenia, Hungary).

Poland has been given as a separate category since the amount of its immigrants is big enough to protect their anonymity.

The essential difference between given countries lies in the fact that not all of them are members of the EU. CIS and most of Balkans stay outside the group (except for Greece which has been the member since 1981 and Croatia which joined in 2013). Thus there is also a difference between their immigration patterns.

The citizens of the EU are not burdened with any bureaucratic obstacles to come and work in Norway. Actually, all they have to do is to find a job and sign a contract for it. There are no restrictions on industry sectors or level of their competence; any kind of legal job serves as a ground for them to stay in the country. Then they have to go to the police and get a residence permit based on the working contract. Afterwards they obtain an ID-number from a tax office.

² CIS - The Commonwealth of Independent States, also called the Russian Commonwealth, is a political and economic confederation of 9 member states and 2 associate members, all of which are former Soviet Republics located in Eurasia (primarily in Central to North Asia), formed following the dissolution of the Soviet Union.

When it comes to countries outside the EU, it is important to note that they have more restrictions to immigrate. Only educated and skilled professionals have an opportunity to work in Norway. Normally they must find a job first. Their employers have to thoroughly explain to the Norwegian Directorate of immigration the grounds for hiring a certain foreign worker. Then the newly - employed have to apply for residence permit for work. Another ground to legally come and stay in Norway is to get married to a Norwegian citizen or resident. In this case the receiving party has to prove to be financially able to take the responsibility for their spouse.

Even though the immigrants from the EU and non-EU countries have certain differences, it feels wrong to exclude the latter from the analysis as it would not be complete.

I possess the data of age, gender, date of immigration and out-migration (for whom it is relevant), marital status, amount of children under 18 years old, educational stage, yearly income (divided in intervals), industry sectors of employees. The information is updated yearly.

Data on income has been given to me in a form of intervals instead of concrete numbers in kroner. There are six intervals (or groups) altogether: no income, Income 0, Income 1, Income 2, Income 3 and Income 4, where Income 0 and Income 4 represents the lowest and the highest income groups, respectively. The amount of Norwegian kroner for each group have also been provided (the intervals are extending each year). Thus, Income 0 in year 2000 defines earnings between 1 – 98 thousand Norwegian kroner, and in the year 2013 the same interval is between 1 – 173 thousand NOK. I discuss the income statistics between different groups in the next subchapter.

Since years of interest in this particular study are 2009 and 2013, Table 1 provides the main features of the sample for years before the year of leaving (2008 and 2012 respectively). Individuals who still live in Norway in 2009 (or 2013) are defined as *stayers*, while those who have left the country in 2009 (2013) are *leavers*. The table gives us some information which makes it possible to foresee the results of estimation, conducted in Chapter 5. We can see that male immigrants' percentage is higher in *leavers* both years, especially in 2008-2009. Moreover, I would predict a stronger effect in 2009 since the percentage difference is bigger between *stayers* and *leavers* that year. The part of non-EU immigrants between *leavers* is more than twice less than *stayers* in 2009, while in 2013 the percentage is close for both groups. I would therefore predict that estimate coefficient on non-EU variable is negative in

2009. When it comes to education and industry sectors, there is a very significant difference between percentage of leavers and stayers: those who out-migrated miss substantially more information than those who stayed.

Table 1. Demographic characteristics of the sample, years 2008 and 2012

	2008-2009		2012-2013	
	Stayers	Leavers	Stayers	Leavers
Male	57%	83%	60%	72%
Non-EU citizens	28%	12%	18%	16%
Missing data on education	33%	98%	36%	70%
Missing data on industry	49%	73%	47%	80%
Married	46%	29%	48%	32%
Have at least 1 child under 18	27%	4%	30%	10%
Age 15 – 24	15%	15%	13%	15%
Age 25 – 35	47%	47%	46%	49%
Age 36 – 50	34%	33%	35%	29%
Age 51 – 74	4%	5%	6%	7%
Staying (mean) ³	3,2 years	1,8 years	3,3 years	2,3 years
No income	6%	25%	8%	42%
Income 0	24%	46%	25%	34%
Income 1	20%	15%	20%	11%
Income 2	25%	8%	25%	8%
Income 3	17%	3%	15%	2%
Income 4	7%	1%	6%	3%

2008: 5416 observations, where 307 out-migrated in 2009. 812 children (age under 15) have been excluded from the sample. 2012: 13473 observations, whereas 558 out-migrated. 1703 children excluded.

I can only assume that these immigrants came to the country for a short period of time and neglected/did not spend enough time to provide information about their educational level

³ Average migration duration in the sample for leavers and stayers.

because they were not planning to stay in Norway for a long period of time. In fact, the same reason about missing information on education is provided in SSB rapport mentioned in Chapter 2. Missing data about the industry sector may indicate that these immigrants have had sporadic or even undeclared jobs (especially between the out-migrated individuals). However, it is worth mentioning, that the biggest part of those whose data on industry sectors we do have, work in constructions, outsourcing companies, manufacturing, accommodation and food services. More than 75% of immigrants work within these industry sector in 2008 and 2012.

Being married and having children seems to have a negative impact on return migration: the amount of leavers is significantly lower for these individual. The percentage distribution between age groups is quite similar for both stayers and leavers. It is difficult to predict any effect here. Migration duration for stayers is approximately 1 year longer.

The percentage distribution between income groups shows some interesting patterns. Those are very similar for both years. The percent of leavers with no income or the lowest income is significantly higher between leavers. Starting from Income 1, however, the picture is reversed: there is a higher amount of stayers within these income intervals. Thus, my assumption is that the lowest income earners and those with no income at all have a higher probability to out-migrate.

The data has some imperfections which have to be mentioned. There is a certain amount of missing personal information when it comes to variables such as education, marital status and industry sectors. Thus, the analysis is based on provided data and the results might be affected by this missing piece of it. Moreover, missing part on education and industry between return migrants is too big to include it in the regression; the results might be much distorted.

Another issue concerns the inaccuracy of the out-migration date. After 2010 it became more complicated to track and register the process of moving out. According to the new EU legal guideline, the immigrants from EU, who are planning to stay in Norway for at least 3 months, need to get a residence permit from the police. The permit is valid for unlimited time period and does not need to be extended. Thus immigrants are free to leave the country without giving a notice to the state. After two or more years of being absent these individuals are considered moved out. This is called administrative out-migration. However, the out-migration date in these cases is always the date of administrative decision and not the actual moment of leaving. According to Vassenden (2015) the amount of administrative out-

migration has raised over time. In period 1971 – 2011 about 19% of yearly out-migration was considered administrative, while after 2010 those numbers went up to between 20 and 30. It is a common problem for many OECD countries, according to the out-migration report by Dumont and Spielvogel (2008).

3.1. Descriptive statistics of income distribution

In this subchapter I discuss the summary information about immigrants' yearly earnings. This deeper description helps to gain a better understanding of immigrants' income situation in Norway. It gives me also an opportunity to compare the earnings between different demographic groups. These groups are included in my model, presented in Chapter 5. Tables 2 and 3 provide the amount of individuals (percentage) within each income group for the years 2008 and 2012. All individuals with missing data on income from the table (less than 1% of all observations) were excluded, as well as children younger than 15 years old.

Table 2. Descriptive statistics of income in EU and non-EU regions, by gender and marital status, in 2008 (%)

	No income	Income 0	Income 1	Income 2	Income 3	Income 4
EU area	7,5	23,2	21,0	25,5	16,8	5,9
Male	5,0	17,7	19,6	30,1	20,6	6,9
Female	12,7	35,2	24,2	15,5	8,9	3,5
Single	6,7	20,7	20,7	29,2	16,9	5,7
Married	3,8	16,3	17,2	28,9	24,7	9,2
Non-EU area	8,8	33,3	17,6	19,7	13,7	6,8
Male	7,1	29,6	14,6	18,5	19,1	11,2
Female	9,7	35,4	19,2	20,4	10,8	4,6
Single	9,0	46,9	14,0	12,7	11,4	6,0
Married	3,3	24,8	20,9	26,2	16,4	8,5

In thousand NOK: Income0: yearly income 1–151, Income1: yearly income 152–251, Income2: yearly income 252–349, Income3: yearly income 350–465; Income4: yearly income 466–1020.

First I examine the year 2008. On average, most of the EU citizens (almost 26%) earn within interval 2 (yearly income 252000–349000 NOK), 8% does not have any income, and only 6% earn within the highest earnings interval. It is worth mentioning that the average gross salary in Norway in 2008 is around 410 thousand NOK, which falls into the interval Income 3 in this range. Thus we can conclude that more than 77% of citizens from EU area earn less than average.

Women from the EU-area make a highest percent within the lowest income interval. Men earn more: they make a higher percentage in groups Income 2, Income 3 and Income 4 (EU citizens). This could be explained by a traditional woman's role of a housekeeper and babysitter, which is still a common pattern for Eastern European families. Despite the fact that women, on average, earn less, the percentage of men between leavers is considerably higher (as Table 1 shows).

CIS region stands out from others in one particular way. In comparison to other regions mentioned above, where men immigrants prevail over women, in this particular region substantially bigger part of immigration is female: 68% against 32%. As we know, countries of CIS are not members of EU, which makes it a lot more complicated for their citizens to get a job in Norway. However, a lot of Russian and Ukrainian women get married to Norwegian citizens and come to the country for family reunion. In addition, many students come to Norway to complete a master degree.

Balkan region is not a part of EU either. I can assume that part of its immigrants came as refugees during the conflict in Balkan Peninsula in late 90's. There also might be students, wives and working immigrants. We cannot exclude working immigrants from these two regions. Usually it is high-skilled individuals who get job offers in IT or oil industries. As the table shows, 11% of men from non-EU earns within the highest income group, while EU men make 7%.

However, the most individuals (both male and female) from non-EU area earn within the lowest income group. A curious fact; 46% of single non-EU immigrants are in the lowest income group. I can assume that this part of the table is mostly represented by students, who are legally permitted to work no more than 20 hours a week.

Single people earn less than married: this is common for both areas. Besides, there is the lowest percent of individuals with no income between married people.

As Table 3 shows, in 2012 income distribution between regions and groups is very similar to that in 2009. In fact, all patterns discussed above are the same here. Most of the EU citizens earn within Income 2, while those from non-EU make the biggest part of Income 0. Again, single individuals prevail in intervals 0, 1 and 2, while the most of married individuals earn within intervals 2, 3 and 4. However, the difference in earnings between men and women is much smaller in non-EU area, compared to EU and both regions in 2008.

Table 3. Descriptive statistics of income in EU and non-EU regions, by gender and marital status, in 2012 (%)

	No income	Income 0	Income 1	Income 2	Income 3	Income 4
EU area	9,5	24,5	20,5	25,8	14,9	4,9
Male	8,0	19,0	18,9	29,5	19,0	7,9
Female	12,0	34,9	23,5	18,8	7,2	3,8
Single	10,4	23,9	20,8	27,0	13,7	4,2
Married	6,3	17,5	19,0	29,8	20,4	7,0
Non-EU area	9,6	28,1	18,9	19,4	14,7	9,3
Male	8,4	25,2	18,8	19,0	15,3	13,3
Female	10,5	29,9	18,9	19,5	14,2	7,0
Single	8,7	35,2	18,5	16,7	11,8	9,0
Married	4,4	21,5	20,1	24,2	18,8	10,9

In thousand NOK: Income0: yearly income 1-173; Income1: yearly income 174-286; Income2: yearly income 287-398; Income3: yearly income 399-535; Income4: yearly income 536-1609.

Chapter 5.3 presents the results of an out-migration analysis for the EU and non-EU citizens separately. It allows us to see how the income distribution, described in this subchapter, reflects the out-migration between different demographic groups.

3.2. Economic growth by regions

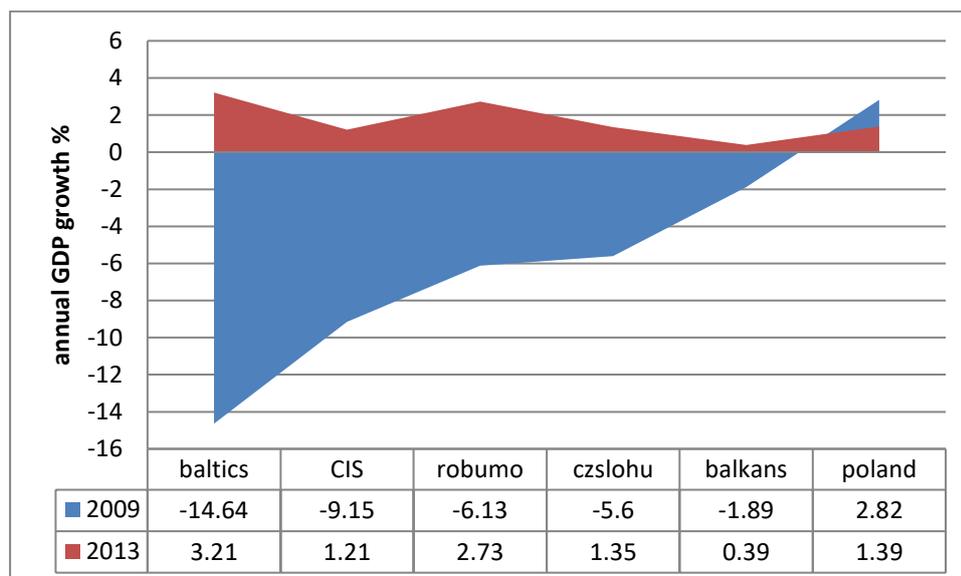
The conditions in economy of the source country are interesting in terms of return migration. Previous researches have clearly shown that it has an effect on the intensity of out-migration. To analyze this effect Borjas and Bratsbeg (1996) have used GDP per capita, while Bijwaard and Wahba (2013) included GDP per capita, economic growth (GDP%) and unemployment rate. In the sample provided to me, it is more complicated to include macroeconomic factors of the source country: due to the fact that immigrants are divided by regions instead of countries⁴. Nonetheless, there is a way to address this problem. Since I know exactly how many immigrants have come to Norway in each particular year (Statistics Norway provide this information), I can estimate a weighted average percent for GDP growth of each region.

Let us take Baltics as an example, including three countries: Lithuania, Latvia and Estonia.

Thus:

$GDP \text{ in Baltics} = (\text{percentage of Lithuanian immigrants} * GDP \text{ growth in Lithuania}) + (\text{percentage of Latvian immigrants} * GDP \text{ growth in Latvia}) + (\text{percentage of Estonian immigrants} * GDP \text{ growth in Estonia}).$

Figure 1. Weighted annual GDP growth (%) by regions, years 2009 and 2013



⁴ Except for Poland.

Figure 1 presents the weighted GDP growth in percent for each region, counted by formula above. As we can see, in 2009 each region (except for Poland) has experienced a significant decrease in economic growth. The most significant recession was faced by Baltic region (all Baltic countries have had about 14% decrease in annual GDP), followed by CIS (-7% in Russian, -14% in Ukraine and +0.2% in Belarus). Poland, however, experienced a growth.

After several years the economic situation in Europe has settled down. In 2013 all regions have had a positive economic growth. In this case, again, Baltics are ahead of others with 3% annual GDP growth. Poland, on the contrary, faces a decrease in their growth, compared to 2009.

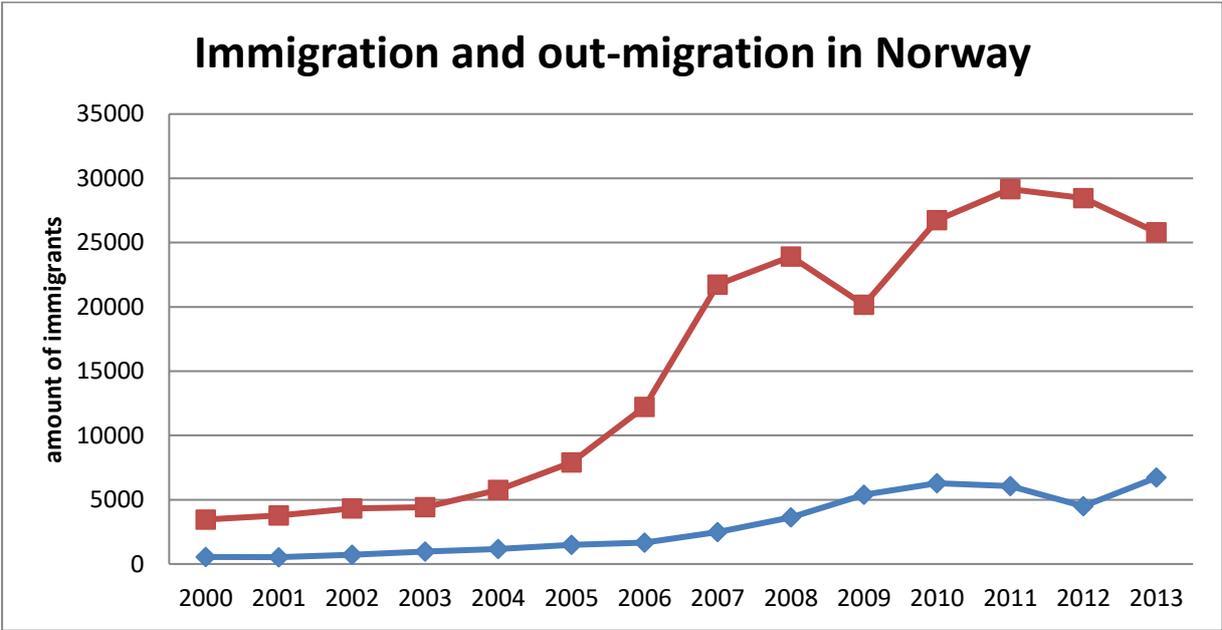
4. Immigration and return migration statistics in Norway

This chapter discusses the immigration and out-migration flows from East Europe to Norway (and vice versa). The data is collected from Statistics Norway web-site. Figure 2 shows the immigration and out-migration rates for all regions from my sample in years 2000 – 2013.

We can see that a red immigration line continually increases from 2000 to 2008, and in 2009 there is a significant drop. Below the detailed description of immigration is provided.

Year 2001 shows the lowest amount of immigrants who moved out from Norway. All the way until 2009 we can see that out-migration rates grow in accordance to growing immigration rates. If we compare years 2000 and 2008 (the year before the significant drop in immigration) we see that amount of immigrated has increased by 7 times (3460 and 23920 respectively), while the amount of out-migrated has grown by 6 times (from 600 to 3620). It is quite logical since a big part of the migration is temporary. We assume that despite the growing immigration to a host country, the percentage part of temporary immigration remains the same.

Figure 2. Immigration and out-migration rates of Eastern Europeans in Norway years 2000 – 2013



The red line shows the immigration rates, the blue is for out-migration rates.

The first difference from the described pattern is seen in 2009 when immigration drops considerably, while the out-migration grows by 50%. However, there is nothing surprising about the situation. Year 2009 has been economically unsuccessful for the host country which explains the fact that the out-migration has not dropped, but significantly increased instead. It continued growing in 2010, and then in 2011 and 2012 the trend has slightly diminished. The year 2012 reveals a high increase in immigration comparing to 2009, while the out-migration is 30% lower in comparison. This fact reveals that economic situation in the host country has improved which reflects the migration trends. The trend changes again in 2013 which is the latest year in my data sample. We can see from the chart that so called net-migration (immigration minus out-migration) drops again. Even though I do not have an access to the micro data in later years, Statistics Norway provides the data on common trends on the topic. Starting from 2013 immigration rates drop, out-migration steadily grows, which implicates diminishing net-migration every year.

There might be at least two reasons for that. First, an enhanced process of legalization took place after the amount of immigrants significantly raised. Newly arrived immigrants are tend to accept any job they can find. They often get a temporary job with an opportunity to prolong the employment after it ends. Another example is a job with a restricted (small) amount of working hours. In these cases immigrants usually get a permanent D-number instead of an ID. The main difference between these two is that the D-number has to be prolonged every 6 months, while the ID is permanent. Another reason is the notorious oil crisis that started in 2014, when the oil prices began to drop drastically (however this fact does not explain a net-migration drop in 2013). As an oil country, Norway has been considerably influenced by the crisis. Unemployment rate has been growing in years 2013 – 2017. Even though the oil sector has suffered the most, it has had the influence on overall employment in the country. However, the migration situation after 2013 is outside this particular study.

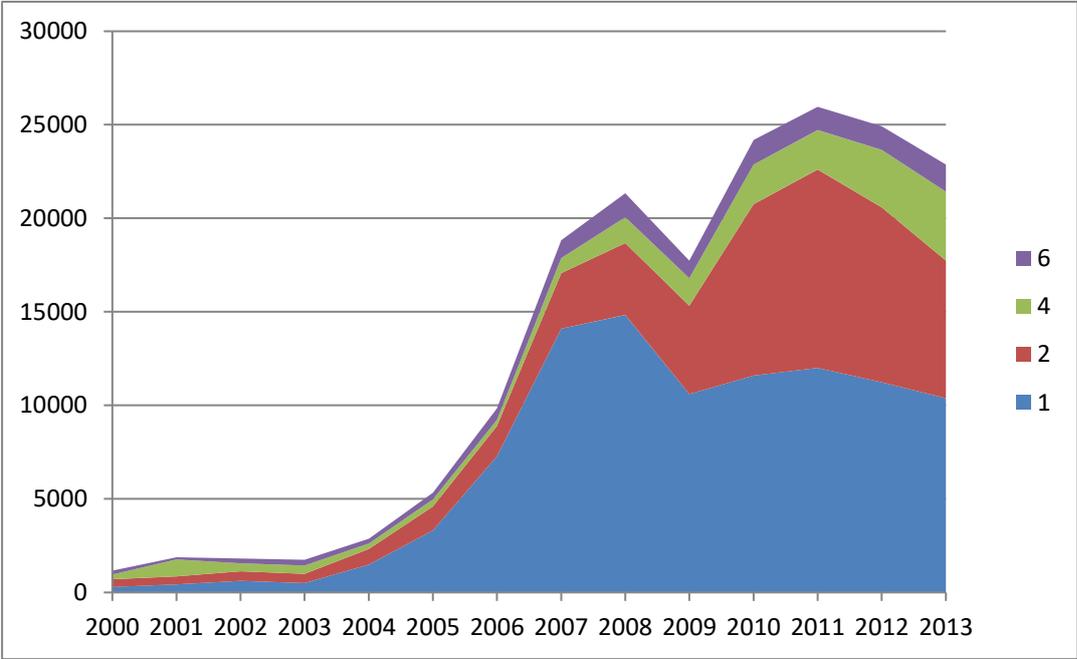
Further I present Figures 3 and 4 which show the distribution between immigrants divided by EU and Non-EU regions.

As we can see from Figure 3, years 2000 - 2004 have been steady; immigration rate from Eastern Europe did not exceed 2000 individuals a year. However, starting from 2004, the situation begins changing. As the EU expended with 10 new members⁵ the immigration flow started to grow rapidly. It is especially noticeable for Poland and Baltic countries. In year

⁵ Lithuania, Latvia, Estonia, Poland, Cyprus, Czech Republic, Hungary, Malta, Slovakia, Slovenia

2007 the immigration flow from Poland was twice as big comparing to year before (from 7280 to 14110).

Figure 3. The immigration rates for EU area, years 2000 - 2013



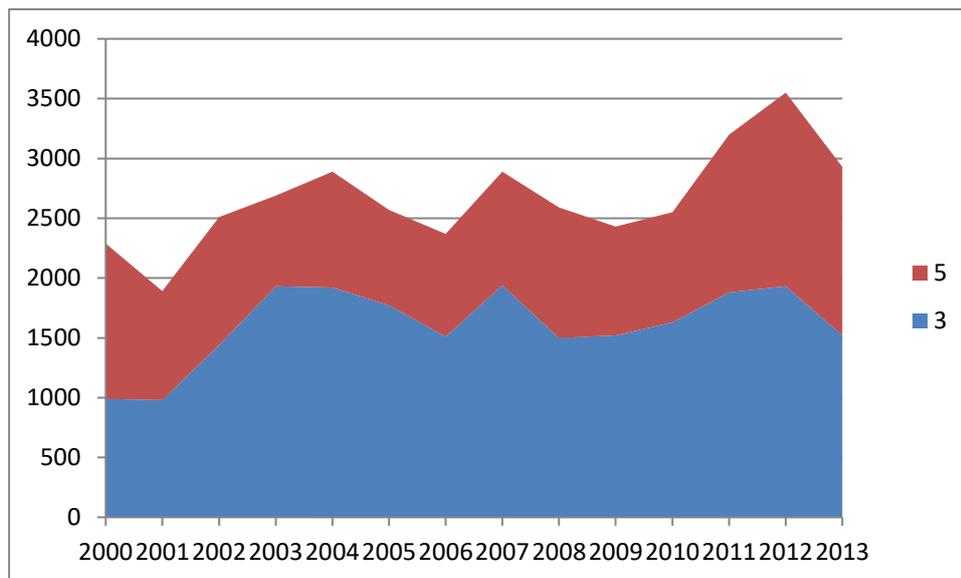
1 – Poland, 2 – Baltics, 4 – RoBuMo, 6 – CzSloHun

However, in 2009 there is a 30% reduction in Polish immigrants, leading to a significant reduction in immigration that year (even though the numbers for Baltics and RoBuMo have increased). This can be explained by the fact that year 2009 has been economically bad for Norway itself. GDP is negative for the first time in several years and unemployment rate has grown. We can assume that it was harder for new immigrants to find a job and for those who immigrated earlier – to keep their current jobs. In year 2010 the situation changes again and the amount of arriving starts to grow again until it drops slightly in years 2012 and 2013.

Baltics is the second largest group of immigrants in Norway. The continual growth of the immigration flow started in 2004, and in 2011 it reaches its peak – around 11 000 (comparing to year 2007 it has tripled). The trend changes its direction in 2012, when the immigration rate drops and then continues diminishing in 2013.

Regions 4 and 6 have also shown a growth in immigration rates since their countries have joined the EU (2007 and 2004 respectively). However, the flow from these countries is remarkably lower comparing to the first two regions. This can be explained by the fact that the majority of these countries have comparatively low emigration rates (numbers fluctuate around 1-4% while in Baltics they are around 12-18%). In addition, these countries are much further from Norway comparing to Baltics and Poland. We can assume that Western European countries might look more attractive geographically.

Figure 4. The immigration rates for EU area, years 2000 - 2013



3 – CIS, 4 - Balkans

Now take a look at the Figure 4. When it comes to region 3 and 5 (mostly not members of EU), we can see that immigration flows from there have been steady over the observed time period with a little increase from Balkans in 2012. According to Statistics Norway, in 2012 there was a significant growth of immigration from Greece and Serbia, which caused a growth in the whole Balkans region. The immigration from Greece is most likely caused by Greek government-debt crisis, which started with the Great Recession in 2008 and got a significant evolvement in Greece after 2010. Interestingly, immigration from CIS and Balkan prevail over other regions in period 2000-2004.

5. The out-migration analysis

5.1. Model design

To conduct my research I use linear probability (LPM) model. LPM is a multiple linear regression model with a binary dependent variable (Wooldridge: Introductory econometrics, 4th edition). In other words, dependent variable y takes on only two values: zero or one. If y is a binary outcome, then we expect that

$$P(y=1|x) = \beta_0 + \beta_1 x_1 + \dots + \beta_k x_k = x'\beta + \varepsilon,$$

which implies that, in my specific setting, the probability of out-migration, $p(x) = P(y=1|x)$, is a linear function of the x_j . Thus, the probability of out-migration is linear in the parameters β_j . In the LPM, β_j measures the change in the probability that $y=1$ when x_j changes, holding other factors fixed:

$$\Delta P(y=1|x) = \beta_j \Delta x_j.$$

The identifying assumption in the model is that $E(\varepsilon_j|x_j) = 0$, such as $E(y_j|x_j) = x'\beta$.

This implies that

$$E(y_j|x_j) = 1 * P(y=1|x) + 0 * P(y=0|x) = P(y=1|x) = p(x) = x'\beta.$$

The LPM implies that $x'\beta$ is a probability and it is supposed to lie between 0 and 1. The main problem of the LPM is that this is not always the case in practice.

Another issue with LPM is that its variance is heteroskedastic (depending on x):

$$\text{Var}(y|x) = E(y|x)^2 - [E(y|x)]^2 = (1^2 * p(x) + 0 * p(x)) - (p(x))^2 = p(x)(1 - p(x)) = x'\beta(1 - x'\beta).$$

Nonlinear binary choice models such as *logit* and *probit* do not face issues the LPM faces. However, I have chosen the linear probability model for the following reasons. First, the issue of heteroscedasticity can be solved by using robust standard errors. Second, when it comes to probability outside (0, 1) interval, this is not necessarily an issue, according to Angrist and Pischke (2009). In their book, "Mostly harmless econometrics", they argue that marginal effects of LPM are in practice very close to those of logit and probit. The estimates of nonlinear models are not possible to interpret directly: we have to compute their marginal

effects. Moreover, there are some decisions which have to be made before the estimation, such as the weighting scheme or derivatives versus finite differences. If we are mostly interested in marginal effects of the variables, the LPM is an easier way.

In the LPM, β_j measures the change in the probability of observing 0 or 1 when x_j changes, holding other factors fixed, it implies that β_j has a *causal effect* on dependent variable. This effect is easily computable. If independent variable is a dummy, the probability of out-migration increases by $\beta_j * 100$ percentage points if $x_j = 1$. For quantitative variables 1 unit increase in x_j also increases the probability by $\beta_j * 100$ percentage points.

It is important to note that the identifying assumption $E(\varepsilon_j | x_j) = 0$ is likely not to hold in this case. In fact, it will hold in an ideal model, where absolutely all possible explanatory variables are taken into account. This is unlikely in most of the situations. We can think of other explanatory variables which are possibly correlated with the existing independent variables. It means that we face an omitted variable problem, and our explanatory variables are endogenous, i.e. x_j is correlated with ε . For example, the income of an out-migrated individual could be affected by health issues. Since we do not include health variable in the model, we can expect a correlation in the error term. Another example could be a purchasing power in the host country, which is clearly correlated with the income. If endogeneity is a case in this scenario, I cannot state that I estimate *causal effect* of explanatory variables on the income, but *correlations*.

In my model the dependent binary variable “leave” defines the probability of leaving the host country. The variable takes the value 1 for those who leave and 0 for those who stay.

Thus, the model is described as follows:

$$\text{Leave}_{i,t} = \beta_0 + \beta_1 \text{male}_i + \beta_2 \text{non-EU citizen}_i + \beta_3 \text{married}_{i,t-1} + \beta_4 \text{civil missing}_{i,t-1} + \beta_5 \text{kids}_{i,t-1} + \beta_6 \text{kids missing}_{i,t-1} + \beta_7 \text{lowest income}_{i,t-1} + \beta_8 \text{highest income}_{i,t-1} + \beta_9 \text{age25_35}_{i,t-1} + \beta_{10} \text{age36_50}_{i,t-1} + \beta_{11} \text{age51_74}_{i,t-1} + \beta_{12} \text{staying}_{i,t-1} + \varepsilon,$$

Where

i – each individual,

t – year of out-migration,

$t-1$ – one year before the out-migration.

Table 4 provides names and descriptions of each explanatory variable.

Table 4. Explanatory variables for the main model

Variable name	Variable description
Lowest income	dummy variable combining No income and Income 0 groups: individuals with the lowest earnings and those with no income at all,
Highest income	dummy variable for individuals with yearly income within interval Income 4,
Male	dummy variable for men,
Non-EU citizen	dummy variable for immigrants from countries outside EU (regions 3 and 5),
Married	dummy variable indicating if person is married,
Civil missing	dummy variable for individuals with missing information about their civil status,
Kids	dummy variable indicating if person have children,
Kids missing	dummy variable for individuals with missing information about children,
age25_35	dummy variable for individuals of age between 25 and 35 years old,
age36_50	dummy variable for individuals of age between 36 and 50 years old,
age51_74	dummy variable for individuals of age between 51 and 74 years old,
staying	quantitative variable indicating amount of years spent in Norway,
GDP growth	quantitative variable for annual GDP growth in the region,
GDP gr*LI	an interaction of variables Lowest income and GDP,
GDPgr*HI	an interaction of variables Highest income and GDP.

The analysis is designed as follows: I take independent variables for one particular year and check what influence they have on one's decision to leave the host country the next year, whether they increase or diminish the probability of out-migration. The estimation is conducted on individual level.

5.2. Main analysis

I have decided to base my research on out-migration in 2009 and 2013. There are some essential reasons for choosing these particular dates. 2009 is the year of economic crisis in Norway and other countries, caused by The Great Recession – general economic decline in markets started in 2008. As mentioned in previous chapters, this year has had a decrease in net-migration, most probably caused by increased unemployment rate in the host country. Year 2013 is a year of economic growth in Norway. My intention is to compare the return migration in different economic circumstances. It is also the latest year in my sample, which provides me more data for the analysis.

Table 5 shows estimation results and standard errors for year 2009 in two columns on the left side and 2013 on the right side. Regressions are conducted using independent variables for the years 2008 and 2012, respectively. I mark each estimation result with asterisks to provide t-values which indicate statistical significance for each particular variable. I use the following reference groups: youngest female immigrants to check for age and gender, single without children to check for civil status, within the middle⁶ income group to check for earnings, a resident of an EU country.

Estimation results for income variables are provided in the first two lines. As said before, all individuals in my sample are divided into intervals by income size: no income group, Income 0, Income 1, Income 2, Income 3 and Income 4⁷. *Lowest income* here is a combined variable for groups of immigrants with no income at all and those within the interval Income 0. It indicates the immigrants with lowest income. *Highest income* represents the individuals within the interval Income 4. Intervals Income 1, Income 2 and Income 3 are reference group and represent middle income.

As we can see from the table, the *lowest income* variable has a positive sign both years, implying that individuals with lowest income are more likely to out-migrate in comparison with the reference group.

⁶ A group combined of Income 1, Income 2 and Income 3.

⁷ For the year 2008: Inc 0: yearly income 1000 – 151000 NOK, Inc 1: 152000 – 251000 NOK, Inc 2: 252000 – 349000 NOK, Inc 3: 350000 – 465000 NOK; Inc 4: 465000 – 1200000 NOK.
For the year 2012: Inc 0: yearly income 1000 – 173000 NOK, Inc 1: 174000 – 286000 NOK, Inc 2: 287000 – 398000 NOK, Inc 3: 399000 – 535000 NOK; Inc 4: 536000 – 1609000 NOK.

Table 5. The estimation results for the performed regression, years 2009 and 2013

Leave	Year 2009		Year 2013	
	Coeff.	Std. Error	Coeff.	Std. Error
Lowest income	0,158***	0,0082	0,077***	0,0083
Highest income	-0,028*	0,0144	0,011	0,0162
Male	0,078***	0,0073	0,027***	0,0037
Non-EU citizen	-0,01	0,0087	0,013**	0,0055
Married	-0,010	0,0086	-0,018***	0,0042
Civil_missing	0,105	0,1171	0,041	0,0795
Kids	-0,043***	0,0087	-0,032***	0,0043
Kids_missing	-0,146	0,1170	-0,094	0,0794
Age 25 – 35	0,043***	0,0102	0,028***	0,00566
Age 36 – 50	0,045***	0,0111	0,026***	0,0062
Age 51 – 74	0,047**	0,0189	0,017**	0,0087
Staying	-0,008***	0,002	-0,003***	0,00076
GDP growth	-0,002***	0,0007	-0,002	0,0026
GDPg* LI	0,006***	0,001	0,006*	0,0039
GDPg* HI	-0,001	0,0022	-0,001	0,0088

*** 1% significance value, ** 5% significance value, * 10% significance value; 2009: 5416 observations in total, whereas 307 individuals out-migrated; 2013: 13473 observations in total, whereas 558 individuals out-migrated.

In 2009 the probability to leave is by 16 percentage points or 263% higher for the lowest income group. The estimates for both years are statistically significant. Moreover, the

estimate for 2009 is much bigger than for 2013: 15,8 versus 7,7 percentage points (or 263 versus 193%). It indicates that immigrants with little or no income are more vulnerable in the year of economic recession and therefore are more likely to leave the host country. However, those with the highest income are by 3 percentage points less likely to leave in 2009, compared to the reference group. The estimate for 2013 is not statistically significant, which means that people of highest income do not differ substantially from medium income group in their possible return migration decisions.

We can see that men have a higher probability to leave than women, keeping all the other variables fixed. The estimation result in 2009 is three times higher than that in 2013: 7,8 versus 2,7 percentage points.

Residents of the non-EU countries are more likely to out-migrate in 2013. However, in 2009 belonging to EU does not matter. This matter is discussed in next subchapter in more detail.

When it comes to civil status, I have to handle data more carefully since this particular information about the individuals in the sample is not complete (see previous chapter about missing data). To address the missing data issue, I have divided immigrants into three groups: *single* (divorced and widowers are included in this group), *married* and individuals with missing information on their civil status – *civil missing*. I keep *single* as the reference group. As we can see, married individuals are less likely to leave the host countries than unmarried ones in 2013. However, in 2009 this variable is statistically insignificant. Variable *civil missing* is statistically insignificant both in 2009 and 2013, which means that people with missing data on their civil status do not affect the probability of leaving.

Data on kids under 18 years old has the same complication as civil status. I handle this issue the same way as previously: including people with missing information on children in a separated group. Reference group is individuals without kids. Having children increases the probability to stay in the host country. The variable is strong and significant in both 2009 and 2013. People with missing information on kids do not affect the return migration.

When it comes to age, I consider individuals of 15-24 years old a reference group. In comparison to the reference group, older people are obviously more likely to leave, which is quite explainable. Those between age 15 and 19 are most likely to come to Norway not on their own, but on the grounds of family reunion. In this case they may have more intentions to stay in the country if their families also live in Norway. Those in age of 25-35 show higher leaving probability than other listed groups in 2013, which is also quite expected. Younger

people usually have fewer obligations as family, kids, wealth or carrier, and are more motivated to search for another, probably better place to live before they settle down. However, the results are slightly different for 2009. I can assume that in the year of economic recession older people are more vulnerable in the labor force market.

It is reasonable to assume that longer migration duration may negatively affect the decision to return. Over the years people get adjusted to the new environment, learn the new language (which is a case for Eastern Europeans in Norway) and get used to a life in the new country. Variable *Staying* measures the impact of one year in immigration on the probability to return. The sign on the estimate is negative which is consistent with my speculations on the topic. It indicates that each additional year lived in Norway decreases the probability to out-migrate by 0.8 and 0.2 percentage points for years 2009 and 2013, respectively. Economically this variable is not strongly significant since after 10 years lived in Norway the probability to leave increases only by 8 and 2 percentage points respectively.

The analysis of GDP growth has shown quite unexpected results. The estimate of the economic growth has a negative sign in 2009 and is statistically significant at 1% significance level. It indicates that 1 percentage point growth in source country's GDP reduces the probability to leave by 0,2 percentage points. For the lowest income recipients, however, the impact of economic growth in origin land on return migration is positive. I can assume that those who earn within middle and high income groups are not motivated to return to the country of origin in times of economic recession, even though the economic growth in the home country is positive.

5.3. EU and non-EU

In first subchapter I presented the common model for all observed regions. However, it is reasonable to assume that immigrants from non-EU area may have different pattern in return migration. Here I intend to divide my model in two sub models for EU and non-EU citizens in order to describe their similarities and differences. Table 6 presents the estimation results of regressions, conducted for EU and non-EU immigrants separately, for the year 2013. Left column represents the results for common model. It is important to note that the amount of observations for non-EU immigrants is quite small, which might distort the picture.

It appears, that income effect is higher for EU residents. It is quite explainable because of demographic specifics of the non-EU group. As mentioned in Chapter 3, most of the non-EU immigrants are female. I assume that the majority of these women are not working immigrants, but wives and students. Thus they are less affected by their low incomes. The lowest income recipients from non-EU have 5,8 percentage points higher probability to leave, compared to the reference group, while for EU citizens this number is 8,7 (or 140 and 220%, respectively).

The estimation results on gender and children are similar for both groups.

Marriage, however, does not seem to affect the out-migration decision for non-EU citizens. Migration duration, on the other side, has a significant negative effect on leaving for non-EU citizens, moreover, the effect is higher than in common model. For EU immigrants this variable is not statistically significant. When it comes to age, the estimations for EU citizens are similar to those in main analysis, while they are insignificant for non-EU immigrants. The estimation of GDP growth did not show any significant results, same as in the main model.

Table 7 presents the estimation results of regressions, conducted for EU and non-EU immigrants separately, for the year 2009. Left column, again, represents the results for common model. The amount of observations for non-EU immigrants is even smaller than in 2013.

The income effect of non-EU citizens is once again smaller than of the EU. The difference in estimates on the lowest income makes 14 percentage points which is quite a lot. The estimate of EU citizens is larger than for the common model. It indicates that in times of economic recession the EU citizens are even more sensible to low incomes. The estimate on highest income is negative for EU immigrants, just as in the common model. Male seem to have a lower probability to out-migrate if they initially come from non-EU area. Married people from EU are less likely to out-migrate; while for non-EU citizens this estimate is insignificant. The estimates on kids are similar in all cases. Age is significant for EU immigrants, but estimates show slightly bigger gap between groups, especially for the individuals of older age.

The results of GDP growth estimation and its interactions are similar for the EU group and not significant for non-EU.

Table 6. Estimation results for year 2013: all regions, EU-citizens and non-EU citizens

Leave	Year 2013	Year 2013	Year 2013
	All regions.	EU	Non-EU
Lowest income	0,077***	0,087***	0,058***
Highest income	0,011	0,003	-0,002
Male	0,027***	0,027***	0,026***
Married	-0,018***	-0,021***	-0,006
Civil_missing	0,041	0,023	0,128
Kids	-0,032***	-0,035***	-0,022**
Kids_missing	-0,094	-0,081	-0,109
Age 25 – 35	0,028***	0,028***	0,011
Age 36 – 50	0,026***	0,028***	-0,004
Age 51 – 74	0,017**	0,02**	-0,01
Staying	-0,003***	0,0001	-0,005***
GDP growth	-0,002	-0,0003	0,008
GDPg* LI	0,006*	0,004	-0,003
GDPg* HI	-0,001	-0,0001	0,026

*** 1% significance value, ** 5% significance value, * 10% significance value; EU: 11078 observations in total, whereas 467 individuals out-migrated; non-EU: 2395 observations in total, whereas 91 individuals out-migrated.

Table 7. Estimation results for year 2009: all regions, EU-citizens and non-EU citizens

Leave	Year 2009	Year 2009	Year 2009
	All regions.	EU	Non-EU
Lowest income	0,158***	0,189***	0,046***
Highest income	-0,028*	-0,029*	-0,023
Male	0,078***	0,102***	0,024***
Married	-0,010	-0,019*	-0,0004
Civil_missing	0,105	0,105	0,074
Kids	-0,043***	-0,049***	-0,036**
Kids_missing	-0,146	-0,157	-0,112
Age 25 – 35	0,043***	0,040***	0,023*
Age 36 – 50	0,045***	0,044***	0,009
Age 51 – 74	0,047**	0,054**	-0,006
Staying	-0,008***	-0,009***	-0,009***
GDP growth	-0,002***	-0,002**	-0,0001
GDPg* LI	0,006***	0,004***	0,00009
GDP g* HI	-0,001	-0,0001	0,053

*** 1% significance value, ** 5% significance value, * 10% significance value; EU: 3963 observations in total, whereas 307 individuals out-migrated; non-EU: 1453 observations in total, whereas 51 individuals out-migrated.

6. Robustness analysis

According to Heckman (2005), empirical findings are a joint product of both the data and the model. When constructing a model, it is not completely clear which control variables should be used in that model or what a functional form should be like, since the “true” model is unknown. There are many different ways to test a theory, and the problem is, that certain differences in methods may affect the results substantially.

To check my main model for robustness I run a regression with slightly different independent variables. I keep demographic variables the same and use another income groups. I use all income groups from my sample and keep an interval Income 2 as reference.

Table 8. Explanatory variables for the robust model

Variable name	Variable description
no income	dummy variable for individuals with no income at all,
income 0	dummy variable for individuals with yearly income within interval Income 0,
income 1	dummy variable for individuals with yearly income within interval Income 1,
income 3	dummy variable for individuals with yearly income within interval Income 3,
income4	dummy variable for individuals with yearly income within interval Income 4.

The new model is designed as follows:

$$\text{Leave}_{i,t} = \beta_0 + \beta_1 \text{male}_i + \beta_2 \text{non-EU citizen}_i + \beta_3 \text{married}_{i,t-1} + \beta_4 \text{civil missing}_{i,t-1} + \beta_5 \text{kids}_{i,t-1} + \beta_6 \text{kids missing}_{i,t-1} + \beta_7 \text{noincome}_{i,t-1} + \beta_8 \text{income0}_{i,t-1} + \beta_9 \text{income1}_{i,t-1} + \beta_{10} \text{income3}_{i,t-1} + \beta_{11} \text{income4}_{i,t-1} + \beta_{12} \text{age25_35}_{i,t-1} + \beta_{13} \text{age36_50}_{i,t-1} + \beta_{14} \text{age51_74}_{i,t-1} + \beta_{15} \text{staying}_{i,t-1} + \varepsilon.$$

Table shows the estimation result for the changed model. The difference in the demographic variables is very small; the only change is in non-EU variable estimate: it is significant now, but only on 10% level.

Table 9. Estimation results for the changed model, years 2009 and 2013

Leave	Year 2009		Year 2013	
	Coeff.	Std. error.	Coeff.	Std. error
No income	0,224***	0,014	0,186***	0,0065
Income0	0,129***	0,0095	0,06***	0,0049
Income1	0,037***	0,0096	0,016***	0,005
Income3	-0,023**	0,0101	-0,008	0,0055
Income4	-0,023	0,0142	0,012	0,0078
Male	0,084***	0,0072	0,029***	0,0037
Non-EU citizen	-0,014*	0,0085	0,011**	0,0048
Married	-0,008	0,0085	-0,017***	0,0041
Civil_missing	0,098	0,1167	0,076	0,0783
Kids	-0,042***	0,0087	-0,027***	0,0043
Kids_missing	-0,142	0,1165	0,127	0,0782
Age 25 – 35	0,050***	0,0102	0,030***	0,0056
Age 36 – 50	0,051***	0,0110	0,026***	0,0061
Age 51 – 74	0,050**	0,0187	0,016*	0,0086
Staying	-0,006***	0,002	-0,002**	0,0008

*** 1% significance value, ** 5% significance value, * 10% significance value; EU: 3963 observations in total, whereas 307 individuals out-migrated; non-EU: 1453 observations in total, whereas 51 individuals out-migrated.

The results on the income estimation are generally consistent with the main model: i) the lower income earners are more likely to out-migrate than those of middle and higher income; ii) the estimates for 2009 are almost twice higher than in 2013 (for No income, Income 0 and Income1).

The immigrants with no income at all are by 22,4 percentage points or 370% more likely to leave than the reference group (year 2009). Those with the lowest income have a 12,9 percentage points or 320% higher probability to out-migrate than the reference group (year 2009). We can see that the likelihood of return migration becomes smaller as income increases up to Income 3 in 2009 (or income 1 in 2013). Those who earn within the group Income 3 in 2009 have 2,3 percentage points or 40% smaller probability to leave. The estimates on higher income groups in 2013 are not statistically significant. Thus, again, I cannot confirm that the highest income earners have higher probability to leave in comparison with other groups.

6.1. LOGIT model

In this subchapter I proceed with the robustness analysis. Here I present the estimation results, obtained by using a LOGIT model, and keeping the same variables as in the main analysis. To make the comparison easier, Table 1 shows the estimates for both LPM and LOGIT.

To test a consistency of the estimates in the main model, I compare its' signs and significance levels with those in LOGIT.

For the main part, the estimates of the LOGIT are consistent with the LPM. There are several small differences. The estimation result of the highest income variable in 2009 is stronger in LOGIT model: it is statistically significant on 5% level. It indicates a stronger association between high income and presence in the host country.

Non-EU variable in 2013, on the contrary, is less significant in LOGIT. In chapter 3 I made some assumptions on the estimation outcomes, based on the percentage proportions between the stayers and the leavers. I expected to find a minimal or non-existing effect of non-EU in 2013 on the return migration. Obviously, we cannot trust this hypothesis more than the estimation results. However, 10% significance level makes room for a mistake opportunity.

Table 10. Estimation results for LPM and LOGIT models, years 2009 and 2013

Leave	Year 2009		Year 2013	
	LPM	LOGIT	LPM	LOGIT
	Coeff.	Coeff.	Coeff.	Coeff.
Lowest income	0,158***	2,34***	0,077***	1,896***
Highest income	-0,028*	-1,52**	0,011	0,650
Male	0,078***	1,56***	0,027***	0,659***
Non-EU citizen	-0,01	-0,146	0,013**	0,237*
Married	-0,010	-0,232	-0,018***	-0,416***
Civil_missing	0,105	13,022	0,041	11,524
Kids	-0,043***	-1,651***	-0,032***	-1,192***
Kids_missing	-0,146	-14,453	-0,094	-12,787
Age 25 – 35	0,043***	0,371**	0,028***	0,373***
Age 36 – 50	0,045***	0,332*	0,026***	0,283*
Age 51 – 74	0,047**	0,532*	0,017**	0,148
Staying	-0,008***	-0,561***	-0,003***	-0,104***
GDP growth	-0,002***	-0,017	-0,002	--0,15
GDPg* LI	0,006***	0,021	0,006*	0,134
GDPg* HI	-0,001	0,001	-0,001	0,069

*** 1% significance value, ** 5% significance value, * 10% significance value; 2009: 5416 observations in total, whereas 307 individuals out-migrated; 2013: 13473 observations in total, whereas 558 individuals out-migrated.

All age variables make less significant estimates in LOGIT, especially within the group of 51-74. When it comes to GDP growth and its interactions, these variables seem to be not

significant in LOGIT. Thus, I cannot confirm the theory about the influence of economic growth in the host country on the probability to out-migrate. I have also checked the average marginal effects (AME) for the LOGIT model. The coefficients on all statistically significant variables in AME are very close to those in the LPM.

6.2. Different years

Even though I base my main analysis on two years (see the previous subchapter), it is also worth discussing, what the situation with out-migration is like in previous years. Are there many distinguishing features in different years, or does the out-migration have the same trends? To address this question, I intend to review the estimation results for years 2004, 2007, 2010, 2011 and 2012. The analysis is built in the same way as in previous subchapter. I use the independent variables for the year before, to check how they affect the probability of leaving in that specific year.

2004 may be the year of interest for out-migration since it is the first year of EU expansion, thus, the independent variables for 2003 have been used to perform a regression analysis. It is interesting to see how it worked before the expansion of the EU when the immigrants in my sample all had the same immigration rules. The first thing to mention is that income probability distribution has been similar to the years in main analysis, implying that the lowest income groups are more likely to out-migrate. The variable *highest income* has not been statistically significant. Looking ahead, this variable is not statistically significant in any other years that I have checked with only exception for 2009. It means that beyond the recession year, the highest income does not affect the probability to out-migrate. Further, there has been no significant difference in return migration probability between male and female in comparison to all the other years. In 2003 there was a larger part of female immigrants in Norway. I can presume that those women came to Norway either for marriage or to study. This leads to an assumption that the part of working immigrants that year was quite small. It is more usual that men, not women, go abroad looking for better economic perspectives. Even if men are married, they usually emigrate alone first, find a job, settle and then expect their spouse to come for family reunion. That's why after 2004 male and female proportion changes significantly, which also leads to higher probability for men to out-migrate. I assume that the main reason in higher out-migration rates between men in

following years is not the gender itself, but being a part of working immigration cohort. Other variables like civil status, migration duration and children have shown very similar effects on dependent variable to those in main analysis.

In 2007 there has already been a considerably higher amount of working immigrants, and the proportion of men and women has been equal. However, men showed the higher likelihood to leave. Again, I assume that this likelihood is mainly a reflection of the fact that working immigrants are more likely to leave. This trend remained in all following years. The estimates on variables for having kids and migration duration have been the same as in main analysis (civil status is not statistically significant which is also the case in 2009). When it comes to income, the picture is similar to other years. The estimate on lowest income variable, however, is much smaller than that in 2009 and 2004.

Years from 2010 to 2012 have some difference in income variables compared to the main analysis. *Lowest income* estimate for 2010 is slightly higher than in previous year, meaning that the lowest income group has a higher probability to leave than in 2009. This can be explained as a reaction to the recession, the economy has not fully recovered from crisis shock. Nonetheless, in 2011 and 2012 there is a growth in economy again, and the probability to out-migrate is the lowest throughout all the previously discussed years. This also confirms the fact that in 2013 the return migration starts increasing again. Marriage is a statistically significant variable only in 2010, which clearly indicates that married and unmarried people usually face the same out-migration probabilities. Having kids, however, has been a strong statistically significant estimate throughout all the mentioned years. Variable for migration duration has also been negative and statistically significant, but not large economically speaking.

An interesting trend has been noticed regarding EU-citizenship. As we can see from the main analysis table, the estimates on this variable are different, which makes the pictures quite ambiguous. On one hand, there are several reasons to assume that non-EU citizens would leave faster. They obviously face more legal issues when first coming and then staying in Norway. Students are given quite a short period of time to find a job after they have finished the studies (here it is also worth mentioning that only the job reflecting their education allows them to stay in the country). These who do not succeed finding a job are obligated to leave, even though they are willing to continue living in Norway. Women who get married to Norwegian citizens or residents have to live in Norway for a certain amount of time, staying

married, until they get a permanent residence permission or citizenship. Those who get divorced before this term have no legal right to stay in Norway and thus leave. Also those individuals who come with work purpose have to stay in a country for several years in order to get a permanent right of working and living in Norway. On the other hand, we know that EU citizens have a higher mobility within the Schengen area, thus they can travel around Europe without any bureaucratic complications. If they do not succeed in one country, they can always try another (especially if the initial plan is temporary migration). Considering the arguments it is hard to predict, what will the estimation results look like. After checking other years, I discovered that the causality of EU-citizenship has changed from negative to positive in 2011. It implies that before 2011 the non-EU citizens have had a lower probability to leave than EU-citizens, but starting from 2011 their likelihood for out-migration prevailed.

7. Discussion and concluding remarks

The main goal of this research is to examine the relationship between the immigrants' income and the probability of out-migration. The results of the main analysis in chapter 5 reveal a correlation between the lowest income group and the return migration. Moreover, the impact of the low income is considerably stronger in the year of the economic recession. The analysis results in Chapter 5 indicate that the probability of low earning workers leaving Norway in 2009 is 263% higher compared to the middle income group. In 2013 this probability makes 193%. The analysis of the higher income recipients is less defined. In 2013, when the economy was thriving, the immigrants with the highest earnings did not reveal any correlation with the return migration likelihood. However, in 2009 they have 50% less probability to leave, compared to the middle income group. I assume that in times of economic crisis and uncertainty about the future people are more likely to hold on to their income and do not appreciate the risks of losing it. The robustness analysis, performed in chapter 6, confirm these results. In addition, the analysis outputs indicate that growing income decreases the likelihood of return migration for both years. Nonetheless, the estimates of all income groups under Income 2 are higher for 2009, indicating the higher probability to out-migrate.

Non-EU citizens are less affected by low income, as indicates the analysis performed in Chapter 5.3. The lowest income earners among non-EU citizens are 153% more likely to-out-migrate in 2013, compared to the middle income group. The same income group among the immigrants from the EU area shows 208% higher likelihood to leave. Another interesting implication reveals that in times of crisis the EU citizens with the lowest income are more likely to out-migrate than in times of economic growth (245 versus 208%). However, this is not the case for the immigrants' from non-EU area. In fact, they seem to show slightly lower probability to out-migrate in 2009 (131% versus 153%, years 2009 and 2013 respectively). As I discussed in chapter 5.3, this can be explained by the demographic differences between the EU and non-EU. There is considerably lower part of working immigrants among non-EU citizens, as discussed earlier in this thesis. This leads to a conclusion, that economic fluctuations have a strong impact on working immigrants, but it does not seem to affect the other types of immigrants (like students and wives).

The results provided in Table 5 (main analysis) are mostly consistent with earlier studies. Some of them are consistent with Bijwaard and Wahba (2013). The demographic variables,

such as gender, presence of children and civil status, have the same effect in both studies. However, the most important question addressed is whether my findings of income effect on return migration are consistent with this research. The answer is: partly, as they reveal that the income of migrants in Netherlands has U-shaped effect on the probability to out-migrate, which means that both high and low income recipients are most likely to leave. Those with the lowest income show highest intensity of leaving. In my case, individuals within the lowest income group are clearly more likely to out-migrate than others. However, I cannot confirm that the highest income earners have higher probability to out-migrate than other income groups in between.

The lowest income earners can be at least partly considered as people, who have not succeeded in the host country. It confirms the theory of Borjas and Bratsberg (1996) about the reasons of return migration. Nonetheless, I cannot confirm the skill selection theory. In my opinion, the immigration flow from Eastern Europe to Norway is mostly negatively selected while low-skilled immigrants are clearly more tended to leave. As I discussed in Chapter 3, more than 75% of immigrants with known employment information (50% of the sample) work within industry sectors like constructions, outsourcing companies, manufacturing, accommodation and food services. It allows me to assume that the Eastern European immigrants are mostly low-skilled. Although I do not possess a lot of data on the returners (about 80% of them miss the information about the industry sectors), I do not have reasons to assume that they were high-skilled, since a big part of them earned within the lowest income group.

My findings of the macroeconomic factors' influence on the return migration are inconsistent with those from the studies, mentioned above. However, I confirm the results of SSB rapport (2015) which reveal no effect of GDP per capita and unemployment rate in the source country on the probability to out-migrate for Eastern Europeans specifically. They find, however, that this impact exists for other cohort of the immigrants: those from developed countries. It implies that Eastern Europeans have certain behavioral differences, compared to other regions.

The analysis in Statistics Norway rapport on return migration (2016), conducted using the data for 2012, show similar results about gender, age and education. In particular, men tend to leave more often than women, which is the case throughout all years after EU expansion including the observation window 2012. People in young age (25-35) are more likely to leave

than middle-aged (35-51) and older (51-74) immigrants. My results on length of residence are also consistent with SSB findings, although we used different measurement methods. In their study they divided migration duration in groups 0-2, 3-5, 6-10 and 11-15 years and used them as dummy variables. I used the migration duration as a quantitative variable. The conclusions are similar: length of residence affects the probability of return migration negatively. Furthermore, in order to check the impact of the family on the return migration I have used civil status and presence of children, both of the variables decrease the probability of leaving. In their study the number of family members has been used. Estimation shows a negative link between increase in family members and likelihood to out-migrate. SSB obtains full data on immigrants, thus they are able to measure the effect of educational level on return migration. I have received the information on educational level as well; however, the amount of observations provided on educational level was insufficient to develop a reliable regression model. However, there are indications that individuals with missing data on education are more likely to out-migrate, as discussed in Chapter 3. SSB confirms this outcome. In their analysis the immigrants with missing data on education have the highest probability to leave.

There are some essential differences between my study and the rapport of SSB, nonetheless. First of all, Statistics Norway conducted their research on all immigrants in general, while I have examined some particular regions. However, many of the demographic characteristics appeared to be the similar for all immigrant groups. Furthermore, to measure “the level of success” in host country they use a labor market attachment and find that individuals with no labor market attachment leave faster. Finally, they investigate the impact of initial immigration reason on the return migration likelihood.

There are several shortcomings in my research which have to be mentioned. First, the number of out-migrated individuals is quite limited. In 2012 it was 4% of immigrants who left, compared to 6% in 2009 (558 and 307 individuals respectively). This sample can provide a common picture of the immigrants’ behavior but cannot guarantee accuracy in details. This problem could be addressed by using the full sample, which is unfortunately not provided to students. Secondly, I am not able to use variables as educational level and industry sector due to missing observations. The latter could be useful in the income analysis. It would be also very useful to know more about the immigrants’ closest family: either the family members are left in the source country or are they also in Norway, what is the nationality of the immigrants’ spouses. These details may have a significant effect on the out-migration. Further, disadvantage is that the data provided by SSB covers regions instead of actual

countries. Forming the EU and non-EU areas, I attach the RoBuMo region to the EU and Balkans to the opposite site, while these regions are, in fact, mixed: Greece is a member of the EU, while Moldova is not. Finally, the administrative out-migration, discussed in Chapter 3, by construction provides incorrect dates of moving out. This is a common problem for all collected data on immigrants in SSB. Unfortunately, the issue is not easy to address. New rules of registering the immigrants must be implemented to fix this.

This study has important policy immigration implications. On the one hand, my findings show a quite beneficial picture for the Norwegian society. I find that least successful and presumably low-skilled individuals are more likely to leave Norway, especially when the economy is down. It means that stayers are most likely labor market participants and tax payers, which also implies lesser burden to welfare systems. On the other hand, the assimilation of the immigrants does not seem to be perfect. As discussed in Chapter 3.1, about 80% of East European immigrants earn less than Norwegian average income level. Perhaps new immigration policy instruments are required to help the least “successful” ones to make their way to the labor market and to turn into successful and useful society members. As SSB informs, the unemployment rate for the immigrants is twice as high as for natives⁸. The fact that high-skilled immigrants (I assume that the earners of the highest income could be positively skill-selected) do not tend to return, benefits the host country. However, the loss of skilled labor (brain drain) should be a reason for concern to the source countries.

The time period between 2014 and 2018 must be an interesting field for the future researches. It is a period of economic recession which has had negative implications especially for Norway as an oil country; while other European countries have not been affected (the unemployment rate in Norway in this period has grown, while in most of the EU countries it decreased). It may reveal some new patterns in immigration behavior of Eastern Europeans under the new economic circumstances.

⁸ Statistics Norway homepage, facts on immigration.
<https://www.ssb.no/innvandring-og-innvandrer/faktaside/innvandring>

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