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High-Skilled Female Migration and Gender Equality

Study of migration of highly educated women from Central and Eastern Europe

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Supervisor: Dr. Simone Bertoli

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Declaration

I hereby declare that this thesis "High-Skilled Female Migration and Gender Equality", which I submit as the pre-requisite for the Erasmus Mundus Joint Master's Degree Programme in International Development Studies, has been written by me and is a result of my own effort. All information and ideas that have been produced by others have been diligently referenced and acknowledged in the study.

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Zásady pro vypracování

In the past gender dimension was neglected in migration research. Traditionally it was believed that women rarely make a decision to move and even if they do, they move because of their family or spouse and do not make an independent decision to move themselves. However, as female migration rates are rapidly increasing, especially among highly educated and skilled females, it is important to focus more on gender dimension in migration research. Migration of highly educated and skilled individuals, also called „brain drain", is a great problem for a lot of countries, especially small open economies, as it shatters their potential for development and economic growth. If gender dimension is neglected while analysing the brain drain, the research may present an incomplete picture of decision making processes connected to migration. This thesis will aim to contribute to growing but still scarce amount of academic literature on female migration, specifically focusing on high skilled female migration.

The main aim of this thesis will be to analyse what significant variables afect the decision of high skilled females to move from their home country. The research will also aim to analyse the effect gender equality nad its promotion in a home country has on the woman's decision to move. This research will be focused on high skilled women from countries that are considered to be small open economies. Quantitative research methods will be used in order to test which variables have a significant effect on women's decision to move.

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Dumont, J.C., Martin, J. P., & Spielvogel, G. (2007). Women on the move: the neglected gender dimention of the brain drain.

Kofman, E. (2000). The invisibility of skilled female migrants and gender relations in studies of skilled migration in Europe. *International Journal of Population Geography, 6*(1), 45-59.

Naghsh Nejad, M. (2013). Instituionalized inequality and brain drain: an empirical study of the effects of women's rights on the gender gap in high-skilled migration. *Available at SSRN 2116618.*

Naghsh Nejad, M., & Young, A. T. (2014). Female brain drains and women's rights gaps: a gravity model analysis of bilateral migration flows. *Available at SSRN 2191658.*

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Abstract

This study aims to shed more light on the gendered dimension of international migration of the highly skilled by analysing migration of highly educated women from Central Eastern European countries that joined EU in 2004 and 2007. The study examines the effects of various conditions in destination countries that may affect migration flows of women, specifically focusing on gender inequality, expected income and existing migrant networks in destination countries. Gravity model for migration is used in the analysis. Gravity equations are derived using random utility maximization model and estimated with Poisson pseudo-likelihood estimator. The results of the study show that the effect of gender inequality on migration flows of highly educated women is closely connected to the effect of expected income. It is observed that highly educated women migrants tend to be more sensitive to gender inequality in high income countries, which may show that once the expectations regarding expected economic gain from migration are satisfied, gender inequality becomes important. However, the findings have to be considered with caution.

Keywords: female migration, CEE region, highly skilled migration, gender equality

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Abbreviations

CEE	Central Eastern Europe
EU	European Union
EEA	European Economic Area
GII	Gender Inequality Index
GDP	Gross Domestic Product
UNDP	United Nations Development Program
OECD	Organisation for Economic Cooperation and Development

1. Introduction

Central Eastern European (CEE) countries that joined the European Union (EU) in 2004 and 2007[1] can be described as fast growing emerging economies. During the 30 years since abolishing communism, these countries managed to develop into high-income economies (except Romania and Bulgaria, which are classified as upper-middle income) (World Bank, n.d.), with relatively high scores of Human Development Index (UNDP, 2019). Still, one of the main characteristics these countries are known for, especially in the rest of the EU countries, is their high emigration rates. Before 1989 emigration from the region was significantly limited. However, since 1990s, when travel ban for these countries has been lifted, migration in the region intensified and became more complex, and large numbers of highly skilled individuals have been leaving the CEE region (Tung & Lazarova, 2006, pp.1854). As countries have been going through socio-economic transition, migration can be seen as a by-product of that transition, and a response to various market failures and structural imbalances (Kaczmarczyk & Okólski, 2007). Emigration has both negative and positive effect on these countries.

Highly negative net migration, especially considering the highly skilled, may significantly hinder development of the countries in the region. It is argued that if the number of highly educated emigrants is too great, it may undermine the productive capacity of a country and contribute to poverty (Lowell & Findlay, 2001, pp.3-9). It is worrying as migration rates of the highly educated tend to be higher than average migration rates. For example, it is estimated that in poor countries a highly educated individual is 10-20 times more likely to emigrate than an individual with lower education (Docquier et al., 2012, p. 10). Moreover, countries lose not only their specialists, but also do not get the expected return from the resources spent on their education (Roudgar & Richards, 2015, pp.75-76). Still, studies show that emigration of highly educated individuals can also increase productivity in a sending country through the growth externality (Mountford, 1997). Possibility to migrate from small open economies encourages individuals to invest more in their education as that yields higher expected returns. It is because the individuals consider a potential increase in their income due to migration. In that case, as some people later decide to not to move, a country significantly benefits from the society with high human capital

[1] These countries include Czech Republic, Hungary, Poland, the Slovak Republic, Slovenia, Estonia, Latvia and Lithuania (joined the EU in 2004), and Bulgaria and Romania (joined the EU in 2007).

(Beine et al., 2001). Moreover, existence of the diaspora, which is engaged in the public life of the home country, is also very beneficial. Firstly, emigrants may send remittances to their relatives back home and invest to their native country. Secondly, if the emigrants retain their networks back home, they can transfer knowledge and technology through their connections and in that way boost economic growth of their origin country. (Lowell & Findlay, 2001, pp. 7–10). Furthermore, considering the countries analysed in this study, a trend of circular migration, which includes repeated emigration and return, is becoming one of the defining features of their migration flows (Žvalionytė, 2012, pp.92-99). This return migration is often seen as beneficial for the home countries as highly educated emigrants gain valuable international experience and connections that they can bring back to their native country when returning (Lowell & Findlay, 2001, pp. 8–9).

Considering migrant flows from the mentioned CEE countries after 1989, it is obvious that the complexity of migration increased as temporary and circular migration became more prominent (Kaczmarczyk & Okólski, 2007). With this increased complexity, the effect emigration has on the CEE countries is also becoming more complicated. As the result, a lot of these countries aim to improve their migration policies in order to facilitate returns and reap more benefits from emigration[2]. However, in order to better understand how the countries can improve their policies to benefit from emigration, increase immigration, or retain some of the highly educated individuals, it is also very important to thoroughly analyse what factors encourage individuals to migrate. This should be studied according to the specific characteristics of the migrants. One of very important characteristics to take into account while analysing migration is gender. Focusing on a gendered perspective of highly educated migration is crucial due to increasing feminization of migration (Dumont et al., 2007, p. 3). A failure to include a gender perspective into migration analysis may result in incomplete explanations of current migration patterns, unreliable conclusions, and inefficient policy recommendations (Pfeiffer et al., 2007, p. 3). However, gender dimension of migration is often not properly addressed in economic and sociological research (Curran et al., 2006). In the earlier literature on migration, women were neglected

[2] The author of this study was an intern in International Centre for Migration Policy Development while writing this paper and had an opportunity to work on the project "Talentas" aiming to improve talent management policies in Lithuania. From this practical experience the author is aware that a lot of the countries from discussed region, especially Baltic countries and Poland, see facilitating return migration as one of their priorities considering their migration policies.

completely or mentioned only alongside children, using the framework of family. In 1970s the framework was changed a little and a role of migrant women as wage workers was acknowledged. Still, the research highly homogenised the understanding of "migrant labour" and failed to properly explain the position of migrant women (Lazaridis, 2015, pp.61-63). As a result, this calls for a more detailed interdisciplinary analysis of the gendered perspective of migration of highly educated individuals, which this study aims to provide.

Considering migration trends in the 20th century, the share of women among migrants was indeed relatively low. This has formed a belief that migrants are mostly men, and women are usually passive followers (Dumont, et al., 2007, pp.3-8). However, as more women receive education, demand for labour of women in certain sectors increase and attitudes towards migrant women change, more and more women decide to migrate independently and they should not be considered solely as companion migrants (Docquier et al., 2009, pp.297-298). Studies show that migration rates of highly educated women in recent years tend to be, on average, 17% higher than the migration rates of highly educated men (Docquier et al., 2012, pp.8). However, in order to fully understand the effects increased migration of women may have on themselves, origin and destination countries, it is crucial to better understand what factors encourage them to migrate. These finding may aid the policy makers of the countries that wish to encourage immigration of women, including return migration, as well as those that aim to retain more educated women.

This study is contributing to filling the gap regarding gendered perspective of highly educated migration, which exists in migration literature. Emigration of highly educated individuals, focusing on women from CEE countries that joined the EU in 2004 and 2007, is analysed in this study in order to answer the research question – what factors affect migration of highly educated women differently than migration of highly educated men from CEE region? The study focuses on migration from 2000 to 2010, and specifically aims to analyse the effect of gender equality in a destination country, migrant networks and expected income after moving on female migration. In this study, in order to analyse the effects of these factors, gravity equation for migration is specified using random utility maximization (RUM) model. Poisson pseudo-maximum likelihood (PPML) estimator is used.

Chapter 2 presents the existing literature on the topic. The chapter presents main migration theories, with a focus on migration of the highly educated individuals and gendered perspective of migration. Chapter 3 discusses historic migration trends in CEE region. Chapter 4 introduces the data used in the study and the model implemented during the analysis. Chapter 5 presents and analyses the findings of the study, also outlining some limitations, which were encountered during the research. Chapter 6 outlines the conclusion of this study.

2. Literature review

As women move more and more on their own, as a part of a global workforce, their decision to migrate is often determined by similar economic factors as that of men (Ruyssen & Salomone, 2018, pp. 224–225). Still, importance of some of those factors may differ when only women migrants considered. However, the gendered aspect of high-skilled migration has been often overlooked. As a result, in order to better understand migration of highly educated women, this study analyses not only the literature that explicitly focuses on women, but also presents main migration theories. Sections 2.1-2.4 present the best known migration theories, with the focus on empirical studies analysing high-skilled migration and female migration. Section 2.5 analyses the literature that specifically focuses on the effect of gender inequality on migration flows of women.

Economic migration models rely on a utility function of a migrant. An individual faces a problem whether to migrate or not and aims to maximise his/her utility. The utility function includes potential benefits the individual may receive and potential costs the individual will face, if he/she migrates (Bauer & Zimmermann, 1999; Beine et al., 2016; Nejad & Young, 2014). The costs and benefits included in the function depend on the migration theory in question. They can represent not only monetary costs and benefits, but also the social ones, resulting from the loss of contact with the loved ones, differences in culture, and other factors. Cost-benefit analysis, that can be presented by the consideration of the utility function of a potential migrant, is, at least implicitly, the main focus of any economic model on migration decisions (Pfeiffer et al., 2007, pp. 4–5). The utility function is presented in more detail later in this paper as it is a starting point of the model used in this study as well.

2.1 Neoclassical Models of Migration

Neoclassical migration theory argues that migration can be explained by analysing differences in wages and economic development between a sending country and a receiving country (Bauer & Zimmermann, 1999, pp.13-15). The main argument of this theory is that individuals, aiming to maximise their utility, migrate from regions with low wages and a high number of workers to the regions, where the wages are higher and the labour supply is lower. Following this model, migration occurs until the wage difference between the sending region and the receiving region diminishes (Ravenstein, 1889). Even though this theory was developed to explain rural-urban migration, its main idea was later applied to analyse international migration (Lewis, 1954). It is argued that differences in income levels and economic development between the countries can significantly affect the migration decision of an individual. This is evident from empirical studies, which find that GDP differences between countries may, to some extent, explain migration flows, including migration flows of highly educated women. It was found that individuals tend to migrate from countries with lower levels of GDP per capita to countries with higher levels of GDP per capita (Peder et al., 2004). In a study analysing migration of the highly educated women to OECD countries it was also observed that GDP per capita is a more important factor for highly educated migrant women than it is for highly educated men. However, women may prefer a certain destination country not only because of the higher GDP per capita, but also due to the belief that richer countries have lower gender inequality (Dumont et al., 2007, p. 16).

This classical model later has been developed further. Firstly, it was criticized for not taking into account income inequality. It is believed that individuals base their decision on differences between their incomes and incomes of other individuals in a country rather than an average income level in a country (Stark & Taylor, 1989). As a result, income inequality in a country can be considered as an important factor for the migration decision and a number of immigrants can be expected to be lower in a country with high income inequality, even if the country is relatively wealthy. Harris and Todaro (1970) added that is important to consider not only differences in income levels between the countries, but also the probability that a migrant will find a job in a country of destination and the wage they can expect to receive (Harris & Todaro, 1970). Importance of this is also observed considering migration of highly educated women. Female

migration flows tend to be larger if, potentially due to existing gender-based discrimination, they struggle to find adequate employment in an origin country, and they move to the countries where their employment opportunities are better (Docquier et al., 2012, pp. 20–25).

2.2. Human Capital Theory

Human capital theory presents a model in which migration is seen as an investment that potentially allows a person to increase his/her human capital, as well as use it in a way that yields higher returns. Following this theory, migration depends on the expected returns from migration and the costs of moving. Potential monetary returns may depend on the field and position an individual hopes to be employed in, as well as the already accumulated human capital. At the same time, potential non-monetary returns depend on preferences of an individual. For example, a person may prefer climate conditions or cultural environment in one country over the other. Potential costs may include not only travel costs or additional expenses due to higher living costs in a country of destination, but also psychological costs that come from leaving their home country (Sjaastad, 1962).

Following this model of international migration it can also be argued that self-selection of migrants occur. An individual, before making a decision to migrate, will evaluate potential returns from and costs of migration that depend on specific characteristics of an individual, such as education, age, and gender. For example, younger highly educated individuals are more likely to migrate (Bauer & Zimmermann, 1999, pp. 15–16). An analysis of emigration from Palestinian refugee camps in Gaza strip showed that majority of those who were highly educated were migrants, while individuals with lower education tended to stay in the refugee camps (Elnajjar, 1993, pp. 40–41). Selectivity and sorting of migrants across different countries of destination may also occur. Migration to a country may depend on skill-related wage differences, language, historic ties with sending country, and migration policies in a receiving country. For example, countries that offer higher returns on skills may attract more educated migrants (Grogger & Hanson, 2011, pp. 35–39). Studies show that higher returns on skills and schooling also attract more highly educated women, as they prefer moving to the destinations where the return is higher (Docquier et al., 2012, pp. 20–25). Moreover, an analysis of high-skilled migration from developing countries to OECD countries shows that geographical proximity to a country as well as shared history makes a country a more attractive destination (Docquier et al., 2007). However,

this is not necessarily the case while analysing female migration. In an empirical study of migration flows of highly educated individuals it is observed that there are larger migration flows of highly educated women to the countries that are further away from their home countries. It is believed to be the case if gender-based discrimination is prevalent in an origin country. Logically it is likely that the situation is the same in the closer countries, so moving to the farther destinations ensures lower discrimination (Docquier et al., 2012, pp.24-25).

2.3 Network Theory

Network migration theory states that migration can be seen as a self-perpetuating process. As first migrants move to a certain country, they may establish social and informational networks that lower the potential costs and risks for the individuals moving from the same country (Bauer & Zimmermann, 1999, p. 19). An analysis of migration flows to 27 OECD countries shows that the network effect, measured by existing migrant stocks in a receiving country, has a significant positive impact on further migration flows (Peder et al., 2004). Moreover, prior migration may also cause socio-economic and cultural changes in both sending and receiving countries. As a result, cumulative effect from previous migration can appear. For example, culture of migration may develop in a sending country, encouraging more people to migrate (Massey et al., 1993, pp. 451–454).

The notion that the past migration is causing higher future migration is, however, often criticised. It is argued that network theory often fails to explain various mechanisms that may undermine the network effect for migration. While the network effect on future migration can be positive in the beginning, in the long-run the effect tends to diminish or even become negative. After a while migration may cause increased competition among migrants for various resources, such as jobs or remittances and, instead of perpetuating more immigration to a specific country, discourage it. Network effect may also be not as important for highly educated individuals. These individuals, as they have higher human capital, are better able to migrate independently, without any assistance from existing migrant networks (de Haas, 2010). The study by Beine and Salomone (2013), which analyses the importance of networks and takes into account dimensions of both gender and education, also shows that while diasporas and existing networks are important for the low-skilled migrants, its importance diminishes significantly with higher education level.

It is often argued that women tend to rely more on the existing migrant networks (Docquier et al., 2009, p. 299). However, at the same time it is argued that this effect diminishes if women are more educated and the effect of networks on female migration and male migration does not differ when educational attainment is accounted for (Beine & Salomone, 2013).

2.4 Push and Pull Factors of Migration

A more general view to migration is the analysis of push- and pull-factors, which influence the decision to migrate. In a way, this view integrates the theories discussed before. As defined by Zimmermann (1995), demand-pull and supply-push migration can be defined by aggregate demand and supply in a country of destination. Demand-pull migration is influenced by changes in the aggregate demand caused by internal factors. Supply-push migration results from changes in the aggregate supply that may appear due to various internal and external factors. Traditionally it is considered that the pull-factor is an increase in wages that is caused by an increase in aggregate demand. At the same time, worse conditions in a country of origin compared to those in a country of destination can be seen as push-factors (K. F. Zimmermann, 1995, pp. 314–316).

Considering this general view of what influences a decision to migrate, specifically for the highly educated, various non-economic factors causing dissatisfaction with the country of origin or making a potential receiving country more attractive can also be considered. People tend to consider family related factors, lifestyle and cultural environment in a destination country (Roudgar & Richards, 2015, pp. 76–78). Moreover, restricted political freedoms and authoritarian regimes may be seen as important push factors for migrants, including the highly educated (Solimano, 2002, pp. 10–11). Considering migration of highly educated women, they tend to be attracted to countries where gender-based discrimination is less prevalent and they have more opportunities (Dumont et al., 2007, p. 16; Roudgar & Richards, 2015, pp. 76–78).

2.5 Effect of gender inequality on migration of highly educated women

In the previous sections in the literature review chapter it is mentioned that some factors influence migrant women differently than men. The effect of some of them may indirectly show the importance of gender inequality for migration of highly educated women. For example, women may be more attracted by a higher GDP per capita due to the fact that richer countries

tend to have more gender equality (Dumont et al., 2007, p. 16). The effect of distance between origin and destination countries may be positive on female migration flows as conditions for women are likely to be better in the farther countries (Docquier et al., 2012, pp. 24–25). Some of the existing studies focus specifically on the effect of gender-based discrimination on migration flows of highly educated women by including various variables showing gender inequality. However, the results of the existing studies seem to be contradicting.

First of all, it is claimed that women are motivated to emigrate if they face gender inequality. It is also argued that highly educated women are more capable of migrating in order to escape gender-based discrimination than less educated women. Highly educated women are also more motivated to move from countries with high rates of gender-based discrimination than highly educated men, who do not notice gender inequality in sexist societies (Docquier et al., 2009, p. 299). Another study shows that less bias in access to economic opportunities may result in lower emigration rates of educated women. However, the study also shows that while the inequality in access to opportunities affect the emigration rate, outcomes of these inequalities, such as unequal labour force participation, have no significant effects (Bang & Mitra, 2011). A study on a micro-level data, examining the effect of gender-based discrimination on intentions and preparations of women to migrate, shows that perceived gender-based discrimination significantly increases the intention for women to move. However, moving, which in the study is presented by already made preparations to migrate, is more influenced by other factors, such as existing networks or expected income (Ruyssen & Salomone, 2018).

A study analysing South-South migration flows presents the findings that migration of women is lower if in both country of origin and country of destination there exists a high level of gender-based discrimination. This works as a selection process, as high gender inequality in a country of origin makes it harder for women to migrate, and discrimination in a country of destination restricts their opportunities to move even further. However, the study also shows that restrictions on civil liberties of women may encourage them to migrate to escape these restrictions (Ferrant & Tuccio, 2013, pp. 17–20). Results of another study, using gravity model to analyse determinants of migration for men and women, also show that gender bias among migrants can be explained by gender inequality. Consequently, if the situation regarding gender-based

discrimination improves, more women emigrate, especially the highly educated (Baudassé & Bazillier, 2014).

A study by Nejad and Young (2014), aims to reconcile the contradicting findings on how gender inequality may affect migration rates of highly educated women by arguing that the relation between gender-based discrimination and female migration is non-linear. It is argued that if access to the rights for women is very restricted, an increase in access to the rights increases migration, as before women may have been repressed to the level where they could not even leave the country. However, after a certain point an increase in access to the rights of women starts resulting in a decrease in migration flows of highly educated women (Nejad & Young, 2014).

To sum up, many various factors may affect migration. While economic factors are believed to play an important role in migration decisions, cultural, political, and geographical factors, as well as past migration, may also be important. While all these factors are seen as important for an overall migration, it is evident that certain factors may influence migration of highly educated women differently. Women may be more affected by expected income and existing migrant networks in a receiving country. Moreover, while larger distance between countries negatively affects migration flows of men, according to the analysed literature it may have a positive effect on migration flows of women. Evidence regarding the effect of gender-based discrimination on migration flows of highly educated women is contradicting. Some scholars argue that an increase of gender equality results in a decrease of migration flows of educated women, while others argue that it results in an increase of their migration. It is also believed that these observations can be reconciled considering non-linear effect of gender inequality on female migration. This shows that there is a clear need to better analyse the effect gender inequality has on migration flows of highly educated women. Contradicting evidence on the effects of migrant networks on these migration flows also needs to be addressed. As a result, this study, with a focus on CEE countries, aims to further analyse the effects various conditions in destination countries, especially gender inequality, expected income and migrant networks, may have on migration flows of highly educated women compared to the effect on migration flows of highly educated men.

3. Migration in Central Eastern European Countries

This study focuses on emigration of highly educated women from CEE countries that joined the EU in 2004 and 2007. These countries were chosen due to interesting historical and current migration patterns, and rapid socio-economic development. During the time period analysed in this paper (years 2000-2010), these countries were rapidly developing economically and socially. Moreover, due to various bilateral and multilateral agreements and the accession of the analysed countries to the EU, the citizens of these countries were exposed to less travel restrictions and their migration possibilities were increasing during the concerned time frame. Consequently, an analysis of migration flows from CEE countries that joined EU in 2004 and 2007 during the chosen time period may provide valuable insights on what trends may be expected from recently increasing migration flows from other CEE countries, such as Ukraine or Albania. This chapter briefly presents historical migration patterns of these countries, primarily focusing on immigration to Western Europe.

Before 1989, movement from CEE countries was strictly controlled. Consequently, migration used to stem from unexpectedly arisen opportunities when individuals had to make a quick decision whether to move without prior planning. A large number of emigrants from CEE countries were refugees, or were able to leave the region due to their affiliation with other ethnicities, mainly German or Jewish (Okolski, 1998, pp. 12–13). Ethnically-driven migration was prominent especially from Poland and Baltic States (Kaczmarczyk, 2006, p. 2).

The fall of communism and the following socio-economic transition caused significant changes in the migration trends. A vast number of individuals emigrated due to political reasons as the movement between the East and the West became less restricted. For example, a lot of ethnic Germans from post-Soviet countries, especially Poland and Romania, moved to Germany in the beginning of 1990s (Zimmermann, 1999, p. 5). A large number of ethnic Russians and individuals speaking Russian have departed from Baltic States after the States gained independence (Mansoor & Quillin, 2007, p. 32). Furthermore, creation of the Schengen area and visa-free travel agreements between CEE and Western European countries made it easier for citizens of CEE countries to migrate. Individuals, who entered the Schengen area, were able to easily move across Schengen states and look for employment (Barcevičius, 2012, pp. 32-33).

After the analysed CEE countries joined the EU, transitional provisions were applied by the majority of old member states, limiting access of citizens of CEE countries to their labour market (European Comission, n.d.) Still, the number of migrants from CEE region in EU-15 increased from almost 900 thousand in 2003 to more than 1.9 million in 2007. Majority of migrants from the CEE countries that joined the EU in 2004 moved to the UK and Ireland. This sorting may have occurred due to the fact that the UK and Ireland were two out of three EU member states that did not apply transitional provisions limiting access to labour market for migrants from CEE after 2004 accession, and labour shortage in the UK and Ireland resulted in demand-driven migration. Moreover, increased proficiency of English language in the sending countries may have encouraged migrants to choose these destination countries. Considering Bulgaria and Romania, main destinations in the EU for the citizens from these countries have been Spain and Italy. This sorting may be caused by geographical proximity and existence of bilateral agreements between these sending and receiving countries. Increase of migrants from all ten CEE countries analysed may also be, at least to some extent, caused by the fact that previously illegal migrants have officially registered in a destination country and a large increase in the number of migrants appeared in statistics, when in reality this increase was smaller (Kahanec et al., 2010).

Main reasons for migration for women from CEE countries tend to be similar to those for men. Before the collapse of the socialist systems, women tended to migrate for economic reasons, if an opportunity permitted, or were able to leave their countries and claim refugee status. More often than men women also migrated following their spouses, which was especially prominent shortly after World War II. After 1989, female migration from CEE countries became more complex and heterogeneous, and women were more and more capable to move across borders. Lack of prospects and high unemployment in home countries, and shortage of labour in potential destination countries, especially in industries where workers are mainly women, such as healthcare, domestic and care sectors, encouraged them to migrate (Slany, 2008).

It is important to separately analyse migration flows of women, specifically highly educated women, from CEE countries due to its significant effect on women themselves and the sending countries. Firstly, some positive effects tend to stem specifically from migration of women, as women tend to send remittances more regularly than men, and they also increase their human

capital during migration (Slany, 2008, p. 43). Secondly, as the human capital of highly educated women is believed to be more important for the socio-economic development of a country (Docquier et al., 2012, pp. 2–8), increase in the human capital of women due to migration can significantly benefit a sending country if they return. However, some important negative consequences also have to be mentioned. Even though both men and women migrants are often employed in less prestigious jobs, women experience de-skilling on a larger scale than men (Praszalowicz, 2008, p. 257). This means that their migration results in higher losses in development potential. Moreover, as women migrants tend to work predominantly in domestic sector (Lazaridis, 2015, p. 65), they in a way help to perpetuate existing gender hierarchies for a price of their own social status. While more equal opportunities arise between men and women in the labour market in Western countries, inequality among women increases. Local women are transferring their domestic tasks to the migrant women in order to pursue their careers. Consequently, migrant women from CEE countries, who are often educated and middle-class at their home countries, are de-classed in a destination country in order to keep in place traditional arrangements in a host society (Morokvasic et al., 2008, pp. 16–18). Moreover, studies also show that emigration of educated women negatively affects infant and under-five mortality as well as secondary school enrolment rate by gender (Dumont et al., 2007, p.19). Due to these important consequences of female migration, specifically from CEE countries, it is obvious that it should be better analysed in the academia and thoroughly addressed by policy makers.

4. Methodology and data

Chapters 2 and 3 show that there is a need, stemming from the gap in academic literature, to better analyse gendered dimension of high-skilled migration, especially focusing on CEE countries. As a result, the main aim of this study is to answer the research question: what factors affect migration of highly educated women differently than migration of highly educated men from CEE countries? In order to answer this question, characteristics of destination countries, identified in the existing studies as having a significant effect on migration, are included in the analysis. In order to examine what factors affect female migration flows differently than male migration flows, the model presented in this chapter is estimated separately for men and women.

4.1 Hypotheses

The literature presented in chapter 2 provides grounds for the following hypotheses. The main focus of this thesis is to analyse the effect of gender inequality on migration flows of highly educated women, focusing on migration from CEE countries that joined EU in 2004 and 2007.

Existing literature states that women migrate to countries where they can have more opportunities due to less gender inequality (Dumont et al., 2007, p. 16). This gives the basis for the first hypothesis:

H_1: Gender inequality in a country of destination has a negative effect on migration flows of highly educated women

Moreover, existing studies show that while gender inequality may affect migration flows of highly educated women, it has no effect on migration of highly educated men (Docquier et al., 2009, p. 299). This provides grounds for the second hypothesis:

H_2: Gender inequality in a country of destination has an effect on migration flows of highly educated women, but has no effect on male migration flows

While the effect of gender equality is an important focus of the study, effects of other variables are also observed. In the literature it is stated that the effect of expected income is greater on migration flows of highly educated women than it is on migration flows of highly educated men, as women tend to migrate to countries where expected return on their education is higher (Docquier et al., 2012, pp. 20–25). This gives basis for the third hypothesis:

H_3: The effect of expected income is greater on migration flows of highly educated women than on male migration flows

The effect of migrant networks on migration flows of women is observed to be the same as the effect on migration flows of men in some studies (Beine & Salomone, 2013). However, it is also argued that women tend to rely on the migrant networks more than men do (Docquier et al., 2009, p. 299). This serves as a basis for the following hypothesis:

H_4: The effect of existing migrant networks in a country of destination is greater on migration flows of highly educated women than on migration flows of highly educated men

4.2 Data

This study focuses on migrants from CEE countries in both OECD and non-OECD destinations in year 2000-2010. This time period was chosen due to availability of the data.

4.2.1 Dependent variable

The dependent variable shows the migration flows of highly educated individuals. Unfortunately, the annual data that shows migration flows by gender and education level is not available. This problem has been tackled by Ferrant and Tuccio (2013). The authors use the difference between migration stocks as a proxy for migration flows (Ferrant & Tuccio, 2013, p.9). The same method is applied in this study. The difference between migration stocks in 2000 and 2010 is used as a proxy for migration flows between 2000 and 2010. For some pairs of countries the difference between emigrant stocks in 2000 and 2010 is negative. It was decided to replace all negative values of these differences by 0. Lower number of migrants in 2010 than in 2000 may signal that the migrants are discouraged to move to a specific destination country due to certain internal conditions. As a result, the absence of migration flows is also important and has to be included in the study. The migration flows are separated by a country of origin, country of destination and gender. As this study focuses on migration decisions of highly-educated individuals, only data for individuals with tertiary education is considered.

The data for bilateral migration stocks has been taken from Database on Immigrants in OECD and non-OECD Countries (DIOC-E) for 2010 and 2000 (OECD, n.d.). In these datasets a country of origin is defined as a country of birth. In analysed studies it was pointed out that it makes sense to analyse migration flows of adults who are older than 24. In that case, minors, who migrate with their families and do not make independent decisions to move, and students, who move abroad temporarily for studying, are excluded from the analysis (Artuc et al., 2015, p. 10; Docquier et al., 2009, p. 304). However, in this study it is not a case. A significant number of countries of destination do not specify the age of immigrants, so taking into account only the immigrants older than 24 would result in excluding the data from these countries from an already relatively small dataset. Instead, in this study the total number of migrants, regardless of the age,

is considered[3]. Moreover, as a proxy for migration flows is a difference between migration stocks in 2000 and in 2010, it is difficult to distinguish between the highly educated migrants and those, who moved without higher educated and attained their education in a country of destination. If it was possible to distinguish between these two groups of migrants, only the individuals who were highly educated before moving would be considered. However, as it is not done, this has to be kept in mind as one of constrains stemming from the lack of migration data.

4.2.2 Explanatory variable showing gender inequality

First of all, in order to test the first two hypotheses outlined in this study, a variable showing gender inequality in a country of destination is added to the model as independent variable. Gender Inequality Index (GII) from United Nations Development Program (UNDP) is used as a proxy for gender inequality. This index measures the existence of gender inequality in three important dimensions – health, empowerment, and labour market. The health dimension is analysed looking into adolescent birth rates and maternal mortality ratio. Empowerment dimension is measured by female and male population who obtained at least secondary education and shares of parliamentary seats occupied by women and those occupied by men. Labour market inequalities are measured using labour force participation rates for both women and men. The values of the index may range from 0, meaning perfect equality between men and women, to 1, meaning complete inequality. Data was taken from UNDP data base (UNDP, n.d.-b). The values for year 2000, 2005 and 2010 are used to create averages for gender inequality in a country of destination. As the dependent variable represents migration flows during the years 2000-2010, it was decided to use an average of GII values for these years as well. It is believed that the averages represent the circumstances under which the analysed migration flows took place better than values from one specific year.

4.2.3 Explanatory variable showing expected income

Neoclassical migration theory, presented in section 2.1, states that expected income in a destination country has a significant effect on migration flows. It is also argued that income has a higher effect on highly educated women than on men when considering migration (Dumont et al., 2007, p. 16). As the result, it is obvious that income variable has to be included in the

[3] Before any data transformation it was observed that a number of immigrants with tertiary education, who are younger than 25, is actually not large compared to other age groups, so their inclusion should not affect the results significantly.

analysis. Such variable also helps to test the hypothesis H_3. Few different measurements are used as proxies for expected income.

First of all, GDP (USD, PPP adjusted) for receiving countries has been included. It was decided to use the logarithmic expression of the GDP per capita instead of regular values as it is believed to have less skewed value distribution. The value presented shows a natural logarithm of an average of GDP per capita (USD, PPP adjusted) from years 2000-2010. As mentioned above, it is believed that the averages for these years represent the situation under which the analysed migration flows occurred better. The data has been taken from World Bank Data base (World Bank, n.d.-a).

Secondly, estimation is made using a computed variable showing the expected income highly educated individuals may receive in a destination country. As the data on earnings for individuals with specific education attainment is not available for majority of countries, it was decided to combine Gini index with the GDP per capita to construct the estimates of income for different percentiles in Gini coefficient, as it is done by Grogger and Hanson (2011). Grogger and Hanson (2011) construct the income for bottom 20th percentile of the population to use it as estimation for the income received by low-skilled migrants and then the income for top 20th percentile to use it as estimation for the income received by highly skilled migrants. In this study GDP per capita and Gini index values for years 2000-2010 are used. The authors assume that log GDP per capita has a normal distribution, meaning $\ln X \sim N(\mu, \sigma^2)$, so the same is assumed in this study. The relationship between Gini index and σ is:

$$\sigma = \sqrt{2}\Phi^{-1}\left(\frac{Gini + 1}{2}\right)$$

Here Φ^{-1} stands for the inverse normal cumulative distribution function. Standard deviations σ are found for each Gini value over the years 2000-2010 and the average of all of them is taken. Quintiles of income can be calculated using the formula:

$$x_{\propto} = \exp(\mu + z_{\propto}\sigma)$$

This can be rewritten:

$$x_{\propto} = E(x)\exp\left(\sigma z_{\propto} - \frac{\sigma^2}{2}\right)$$

This formula is used to estimate the income of top 20th percentile, as it is done by Grogger and Hanson (2011). This is used as a proxy for the expected income for highly educated migrants. The formula is used to estimate top 40th percentile as well, as it can be believed that women are likely to get lower wages due to gender wage gap and lower estimation of expected income may better represent the expected income of highly educated women. The variables show calculated expected income in thousands.

Gini coefficient, which is used together with GDP per capita values to construct the estimates of wages, compares income distribution in a country with perfectly equal distribution. It can take values from 0 to 1, where 0 represents perfect income equality in the country and 1 means perfect inequality when one person in a country owns all the income (Haughton & Khandker, 2009, pp. 104–105). The data for Gini coefficient is taken from World Bank Data base (World Bank, n.d.-b). The averages of Gini coefficient for years 2000-2010 were taken. The GDP per capita (USD, PPP adjusted) averages were taken for years 2000-2010, and the data has been taken from World Bank Data base (World Bank, n.d.-a). Grogger and Hanson (2011), while computing their estimation as proxies for wages, also subtracted the average taxation. However, as the tax data for a large number of countries is missing, taxation is not considered in this study.

4.2.4 Explanatory variable showing migrant networks

In order to test hypothesis H_4 and determine whether migrant networks have a different effect on migration flows of women than on those of men, the number of migrants in a specific destination country from 2000 is included as a proxy for migrant networks. The data was taken from Database on Immigrants in OECD and non-OECD Countries (DIOC-E) for 2000 (OECD, n.d.). The values used in the analysis are in thousands.

4.2.5 Other explanatory variables

Other explanatory variables are included as control variables and also to check whether they have a different effect on migration flows of highly educated women compared to that of highly educated men.

It is evident from theory that individuals also base their migration decision on political conditions in a country (Solimano, 2002, pp. 10–11). Consequently, Freedom House Index, aiming to report on civil liberties and political rights, is included as a proxy for political conditions in a destination country. The score can range between 0, country being not free, and 100, country ensuring all civil liberties and political rights to its citizens. When calculating the score, 15 indicators of civil liberties and 10 indicators of political rights are analysed. A country can be awarded a maximum of 4 points for each question and score maximum of 40 for political rights and maximum of 60 for civil liberties, making it a total of 100 if all rights and liberties are respected (Freedom House, n.d.). The data for the year 2010 is taken. It was decided to take the values for one year instead of averages over few years for a few reasons. First of all, the methodology used by Freedom House has changed over the years and taking the averages may cause some inconsistencies. Secondly, it was observed that the data does not fluctuate too significantly over the years, so it is believed that there is no significant difference between taking the average and the values for 2010.

Some geographic variables, as well as those showing ties between sending and receiving countries, are included in the analysis, as they are seen as important for this study. It has been shown that landlocked countries, or those distant from OECD countries have lower rates of emigration of the highly educated (Docquier et al., 2009, pp. 14–17). It has also been observed that while general migration rates tend to be higher between the countries close to each other, the effect for highly educated women is opposite (Docquier et al., 2012, pp. 20–25). As a result, a variable showing the distance between countries is included. The variable included is calculated using the formula that uses coordinates of the most populated cities in the countries. Natural logarithm of the distance variable is used as it provides less skewed value distribution. Moreover, dummy variables were added to show if a country of origin and a country of destination are neighbouring countries, if they were a same country in the past, if they used to have colonial relationship, and if they were colonised by the same state. Moreover, a common second language dummy is added and it is equal to 1 if at least 9%, but not more than 20% of the population in both sending and receiving countries speak the same language[4]. A dummy for landlocked

[4] A dummy variable showing if more than 20% of the population in both countries is speaking the same language is not included in the data analysed as none of the pairs of countries analysed have more than 20% population speaking the same language.

countries of destination are also included. All this data is retrieved from CEPII's distances and geographical databases (Mayer & Zignago, 2006).

Countries of origin that are analysed became EU member states during the time period in focus. As a result, two control variables focusing on that are added in the estimations. A dummy is added to show whether a country of destination is in EU or European Economic Area (EEA). It is equal to 1 if the country is in EU or EEA. The variable is also equal to 1 for Switzerland, as it is a part of common market with EU and EEA countries and it is easier for the nationals of the EU to move there. Moreover, according to European Union Accession Agreements, old member states are allowed to restrict the right to work for the citizens of new member states for the maximum of first 7 years after new member states join the EU (European Comission, n.d.). This restriction was applied by some of the old member states for the countries that signed accession agreement in 2003 and 2005 for the EU enlargement in 2004 and 2007. Even though the citizens of these countries were allowed to travel freely after the countries joined the EU, they faced restrictions in the labour markets of the old member states. Existing theories of migration state that one of the main reasons motivating individuals to migrate is expected economic gain from migration (Harris & Todaro, 1970; Lewis, 1954), which, most of the time, results from a better paid job in a country of destination. As a result, it can believed that mentioned restrictions on the right to work for the citizens from new EU member states also had the effect on migration flows from these countries to other EU member states. A variable has been added to take this into account. This variable can take a value from 0 to 3. The value is equal to 3 if the citizens of newly joined member states had the free access to the labour market in a destination country straight after joining the EU. The value is equal to 2 if the restrictions in a destination country were lifted during the second phase of accession (2006-2009 for the countries that joined the EU in 2004 and 2009 for Romania and Bulgaria). The value is equal to 1 if the restrictions in a country of destination were lifted during the third phase of accession in 2009, considering the countries that joined the EU in 2004, or the restrictions had simplifications, considering Bulgaria and Romania that joined the EU in 2007. The value is 0 if a country of destination is not in the EU or if the restrictions on the right to work were still in place during the analysed time period (2000-2010).

The variables showing specific conditions in the countries of origin separately are not included due to the selected method of estimation. However, a variable for an origin country is included in order to control for the conditions in an origin country. It is also expected that including origin country variable will account for population differences between the countries.

4.2.6 Interaction effect between gender inequality and expected income

As discussed in the chapter 2 that presents the existing academic literature relevant to this study, the effect of gender inequality on migration flows of women, especially highly educated ones, seems to be unclear, as various studies present different results. One of the possible reasons for that may be the fact that the existing studies do not take into account the interaction effect between gender inequality and other important variables, specifically income. The neoclassical model of migration states that an expected increase in income is one of the main reasons why an individual migrates (Lewis, 1954). Moreover, migrant women also tend to be more affected by GDP per capita than migrant men. One of the explanations for that is that gender-based discrimination tends to be less prevalent in richer countries (Docquier et al., 2012, pp. 24–25). Considering this, it may be believed that the effects of gender inequality and expected income are interlinked. It is likely that migrant women, especially those who migrate due to economic reasons, will firstly consider the expected return from migration that may manifest itself through higher expected income, and will see gender inequality in a country as of secondary importance. This study aims to take this into account and includes interaction effect between the variable showing gender inequality and a proxy used for the expected income.

4.3 Method

In order to identify what factors affect women more than men when deciding whether to move, answer the research question and test the hypotheses raised, gravity model for migration is used. The specification of the gravity equation is derived from a RUM model. Gravity equations are suitable for analysing bilateral flows of migration.

Considering the theory, an individual will make a decision whether to migrate taking into account his/her expected utility from the decision (Beine et al., 2016; Ferrant & Tuccio, 2013). As this study is concerned with the factors affecting the migration decision of highly educated individuals, specifically highly educated women, the model used in the paper includes only one level of education (highly educated), and separate estimation for men and women are made. The

utility (*U)* that a highly educated individual whose gender is g is expected to derive from migrating from country *i* to country *j* can be described by a function:

$$U_{ij,g} = W_{ij,g} - C_{ij,g} + \in_{ij,g}$$

In this equation ($W_{ij,g}$ – $C_{ij,g}$) is a deterministic component of the utility. This deterministic component includes variables that motivate a person to move ($W_{ij,g}$) and, hence, increases his/her utility, as well as the costs ($C_{ij,g}$) encountered due to migration that reduce the utility of individual. The deterministic component can be described as a linear function of $x_{ij,g}$, namely:

$$(W_{ij,g} - C_{ij,g}) = \beta x_{ij,g}$$

$x_{ij,g}$ represents all explanatory variables described in the section 4.2. $\in_{ij,g}$ represents a stochastic term in the utility function. Following the utility function, migration flows can be expressed as:

$$migration\_flows_{ij,g} = \exp(\beta x_{ij,g})\,\eta_{ij,g}$$

$\eta_{ij,g}$ represents the error term. The equation showing migration flows is estimated using PPML estimation. This estimation is seen as appropriate when the dependent variable includes a significant number of values equal to zero (Silva & Tenreyro, 2006). However, this estimation has its limitations, as it requires including time and origin dummies, and, as a result, it is not possible to clearly determine what specific conditions in the country of origin significantly affect migration flows (Beine et al., 2016, pp.503-504). Time dummies are not included as the data used in the model is only from one time period. Separate estimations are made with different variables used as proxies for expected income. The model is estimated separately for men and women and the results are compared in order to see what factors affect a decision to migrate for women differently than that for men. The study focuses on the effect of gender inequality, expected income, and migrant networks in a destination country.

4.4 Descriptive statistics

Considering tables 1 and 2, it can be seen that out of 824 bilateral migration flows observed, 396 represent male migration and 428 represent female migration flows. Moreover, the maximum

value and mean for migration flows for women is higher than that of men[5]. As a result, it can be assumed that highly educated women from CEE countries may indeed be more migratory than highly educated men. This is in line with the previously made observations that in developing countries average migration rates of highly educated women tend to be higher (Docquier et al., 2012, pp. 8–11).

Table 1. Descriptive Statistics for male migration flows

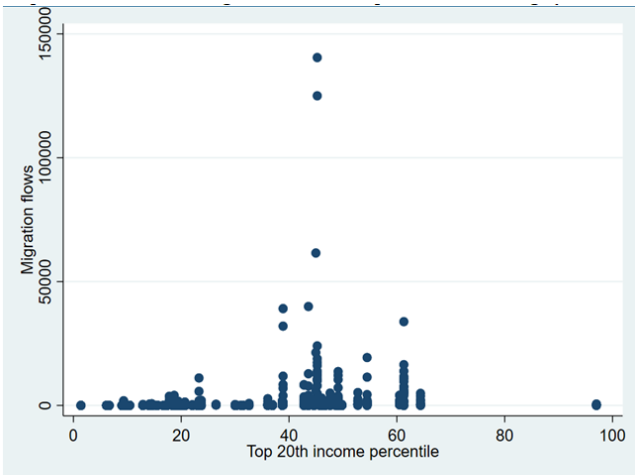
Variable	Obs	Mean	Std.Dev.	Min	Max
Migration flows	396	1161.924	6886.856	0	125025
Gender inequality	390	0.232	0.134	0.054	0.608
Migrant networks	363	15.481	70.317	0	1027.479
20th percentile	396	32.778	19.358	1.393	97.02
40th percentile	396	23.234	14.207	0.803	69.718
Log of GDP	396	9.898	0.675	6.89	11.168
Log of distance	396	7.668	1.174	4.394	9.821
Freedom House	396	83.902	21.298	15	100
Origin country	396	5.371	2.854	1	10
Shared border	396	0.096	0.295	0	1
Same language	396	0.018	0.132	0	1
Coloniser	396	0.025	0.157	0	1
Same coloniser	396	0.03	0.172	0	1
Same country	396	0.045	0.209	0	1
Landlocked	396	.152	.359	0	1
EU or EEA	396	0.52	0.5	0	1
EU restrictions	396	0.694	1.082	0	3

Table 2. Descriptive Statistics for female migration flows

Variable	Obs	Mean	Std.Dev.	Min	Max
Migration flows	428	1759.18	8435.094	0	140465
Gender inequality	415	0.233	0.134	0.054	0.608
Migrant networks	384	14.672	68.449	0	1027.479
20th percentile	428	32.441	19.11	1.393	97.02
40th percentile	428	23.058	14.002	0.803	69.718
Log of GDP	428	9.892	0.675	6.89	11.168
Log of distance	428	7.694	1.176	4.088	9.821
Freedom House	428	84.196	20.834	15	100
Origin country	428	5.409	2.836	1	10
Shared border	428	0.091	0.288	0	1
Same language	428	0.016	0.127	0	1
Coloniser	428	0.023	0.151	0	1
Same coloniser	428	0.028	0.165	0	1
Same country	428	0.042	0.201	0	1
Landlocked	396	.152	.359	0	1
EU or EEA	428	0.519	0.5	0	1
EU restrictions	428	0.675	1.069	0	3

[5] Maximum of 140465 migrants and mean of 1759.18 for female migration flows and maximum of 125025 migrants and mean of 1161.92 for male migrants

Figure 1. Relation between migration flows and expected income for the highly educated



High maximum value for the variable showing migration flows of both men and women, compared with its mean and standard deviation, shows the existence of the outliers in the data set. Figure 1, which shows relation between migration flows and top 20th income percentile used as a proxy for expected income, shows that there are indeed a few significant outliers considering the migration flows. Two data points which are maximum values and can be considered to be outliers represent the migration flows for men and women from Poland to the United Kingdom. It is believed that some of the main reasons why so many Polish nationals have emigrated to the UK during the analysed period are shortage of workers in certain sectors in the UK, mismatch between demand and supply in labour market in Poland, relatively high human capital of Polish migrants, and a general awareness by the Polish of their privileges as EU citizens, among other reasons (Okolski & Salt, 2014). The model constructed in this study should, at least to some extent, take this into account. As a result, there is no justifiable reason to exclude these data points.

The variable showing migrant stocks in 2000, which is used as a proxy for migrant networks, also has some outliers. The mean for the variable is equal to 15.48 thousand migrants with the standard deviation of 70.32 thousands, while the maximum value is equal to 1027.48 thousands. This value represents migrants from Poland in Germany and is distinctively higher than other values for migrant stocks. Historically there have been significant outflows of workers from Poland to Western Europe, especially Germany, even despite repressive socialist regime after WWII. It is estimated that in 1980-1989 around 1 million Polish citizens immigrated to Germany (Okolski, 1994, pp. 51–52). A large number of individuals migrated to Germany not only because of economic reasons, but also on ethnic basis or for a family reunification (Iglicka, 2000, pp. 5–10). According to the network theory (Bauer & Zimmermann, 1999, p. 19), these large

migrant flows may have an effect on the more recent migration trends. As a result, there is no reason to exclude these data points.

Three different variables are used as proxies for the expected income an emigrant may receive in a country of destination. The variable for top 20th income percentile, computed combining Gini coefficient and annual GDP per capita, used as a proxy for upper expected annual salary of highly educated migrants, varies from minimum of 1.39 thousands to maximum of 97.02 thousands per year, with a mean of 32.44 thousands per year. At the same time, the variable for top 40th income percentile, used as a proxy for a slightly lower wage in the country that highly educated women may expect due to the gender pay gap, varies from minimum of 0.8 thousands to maximum of 69.72 thousands per year, with the mean of 23.06 thousands per year. Considering two constructed variables for the expected income, values for one country, Luxembourg, are significantly higher. This is also visible from Figure 1 that shows correlation between migration flows and top 20th income percentile, and figures 2 and 3 that show Kernel density estimation for top 20th and top 40th income percentiles. This shows that individuals in Luxembourg can expect to earn significantly more money, which is likely considering that the country is a high income economy. As it is likely that these outliers affect the estimated coefficients, additional estimation without Luxembourg as a destination country is included in this study.

Figure 2. Distribution of top 20th income percentile estimator

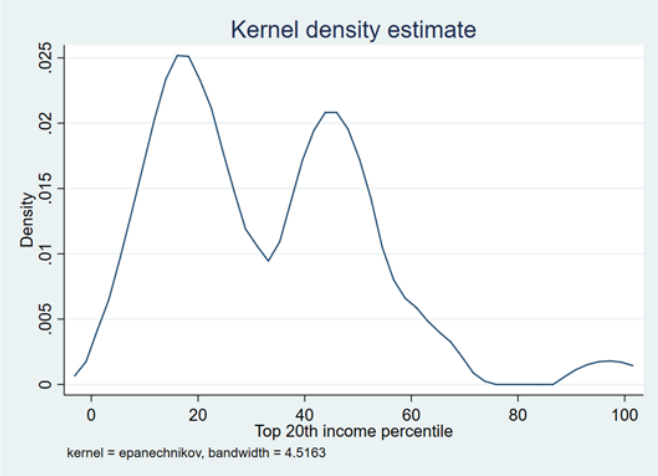
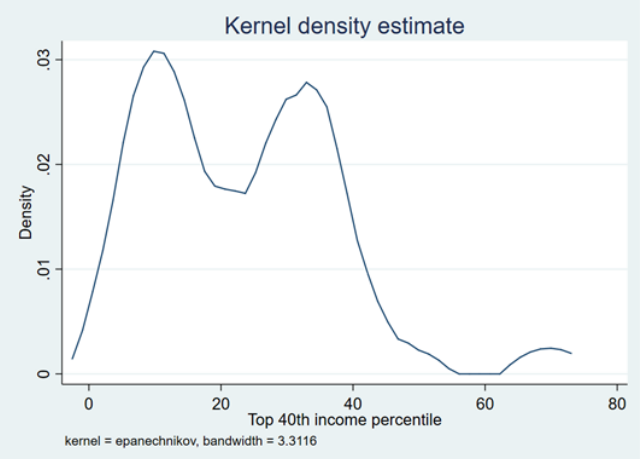


Figure 3. Distribution of top 40th income percentile estimator



A variable that represents the index by Freedom House, used as a proxy for political situation in a destination country, as it can be seen in tables 1 and 2, has a mean of 84.2 with the standard

deviation of 20.83. Its maximum value is equal to 100 and its minimum value is equal to 15. The minimum value represents a country of destination Belarus, which has low civil liberties and political rights. Even though the value for this country of destination is significantly lower than for others, it is important to include it in the analysis, as it shares a border and historic ties with some of the origin countries analysed in this study. Excluding Belarus as a destination country for highly educated migrants may result in unrealistic observed effects of some control variables, such as distance between sending and receiving countries, shared border, and historic ties.

Tables 3 to 5 show the correlation between the variables used in the analysis. High correlation between the estimates for expected income and logarithmic expression of GDP per capita can be disregarded, because these variables are not used together in the same estimation. However, high correlation can be observed between the variable showing gender inequality and the proxy for the income for top 40th percentile (correlation equal to -0.7322), as well as between gender inequality and logarithm of GDP (correlation equal to -0.7874). Consequently, in order to avoid potential issues of multicollinearity it has been decided to exclude gender inequality variable in the estimations where the top 40th income percentile or the logarithm of average GDP are used as proxies for expected income. Correlation between other variables seems in an acceptable range (below 0.7) and should not cause significant multicollinearity problems.

Table 3. Pairwise correlations (1)

Variables	Migrant flows	Gender inequality	Migrant networks	20th percentile	40th percentile	Log of GDP	Log of distance
Migrant flows	1.000						
Gender inequality	-0.074**	1.000					
Migrant networks	0.326***	-0.031	1.000				
20th percentile	0.134***	-0.691***	0.076**	1.000			
40th percentile	0.118***	-0.732***	0.064*	0.989***	1.000		
Log of GDP	0.138***	-0.787***	0.091**	0.911***	0.919***	1.000	
Log of distance	-0.026	0.549***	-0.074**	-0.227***	-0.260***	-0.268***	1.000
Freedom House	0.089**	-0.508***	0.031	0.563***	0.545***	0.620***	-0.095***
Origin country	0.058*	-0.004	0.049	0.000	0.005	0.010	0.002
Shared border	0.018	-0.020	0.272***	-0.145***	-0.135***	-0.095***	-0.479***
Same language	0.009	0.053	0.172***	-0.061*	-0.057*	-0.034	-0.171***
Coloniser	0.081**	0.034	0.401***	-0.045	-0.040	-0.024	-0.211***
Same coloniser	-0.026	0.023	-0.023	-0.152***	-0.150***	-0.168***	-0.201***
Same country	-0.029	-0.089**	0.060*	-0.056*	-0.042	-0.007	-0.375***
Landlocked	-0.054	0.069*	-0.001	0.104***	0.105***	-0.054	-0.229***
EU or EEA	-0.039	-0.649***	0.013	0.512***	0.536***	0.551***	-0.625***
EU restrictions	0.121***	-0.440***	-0.073**	0.417***	0.421***	0.428***	-0.293***

**** p<0.01, ** p<0.05, * p<0.1*

Table 4. Pairwise correlations (2)

Variables	Freedom House	Origin country	Shared border	Same language	Coloniser	Same colonizer	Same country
Freedom House	1.000						
Origin country	-0.007	1.000					
Shared border	-0.119***	0.001	1.000				
Same language	0.012	-0.018	0.280***	1.000			
Coloniser	-0.108***	-0.022	0.383***	0.345***	1.000		
Same coloniser	-0.209***	-0.044	0.242***	-0.023	-0.027	1.000	
Same country	0.065*	0.081**	0.441***	0.156***	0.275***	-0.037	1.000
Landlocked	-0.040	-0.030	0.113***	0.157***	0.067*	0.050	0.212***
EU or EEA	0.524***	-0.015	0.092***	0.089**	-0.006	-0.007	0.111***
EU restrictions	0.349***	-0.005	-0.158***	0.056*	-0.056*	-0.110***	-0.136***

**** p<0.01, ** p<0.05, * p<0.1*

Table 5. Pairwise correlations (3)

Variables	Landlocked	EU or EEA	EU restrictions
Landlocked	1.000		
EU or EEA	0.162***	1.000	
EU restrictions	-0.040	0.505***	1.000

**** p<0.01, ** p<0.05, * p<0.1*

5. Results and Discussion

This chapter aims to present and discuss the results of this study. Section 5.1 presents the results of the benchmark model. Section 5.2 describes the results of a model where an interaction effect between gender inequality and expected income is included. Section 5.3 presents and thoroughly analyses the effects of independent variables on migration flows separately. Section 5.4 describes some of the main limitations of this study and provides some suggestions for the future research on female migration in CEE countries.

5.1 Benchmark model

The first two columns of table 6 show the results of the first model, which is used as a benchmark model in this study. The first column shows the effects of independent variables on migration flows of highly educated men and the second column shows the effects on migration flows of highly educated women. Second two columns of table 6 show the model without some

control variables in order to check the robustness of the effects of the main independent variables.

As it can be seen, the effect of gender inequality on migration flows of both men and women is insignificant. The effect of the top 20th income percentile, which is used as a proxy for expected income for highly educated migrants in destination country, is positive and significant. The effect on male migration is equal to 0.036 ($p<0.01$), and the effect on female migration is slightly higher and equal to 0.039 ($p<0.01$). The effect of existing migrant networks in a specific destination country is equal to 0.005 ($p<0.01$) considering migration flows of both men and women.

Considering control variables, the effect of distance between sending and receiving countries on migration flows of both men and women is negative and significant. The coefficient showing the effect on male migration is equal to -0.497 ($p<0.01$), while the coefficient showing the effect on female migration is a bit smaller and equal to -0.454 ($p<0.05$). An effect of Freedom House Index, which is used as a proxy for political situation in a country, is positive and significant. The effect on migration flows of men is equal to 0.036 ($p<0.05$). The effect on migration flows of women is a little smaller, equal to 0.026 ($p<0.05$). If a destination country is landlocked, it negatively affects male and female migration. The coefficient of the effect of the dummy for a landlocked origin country on male migration is equal to -1.615 ($p<0.01$) and the coefficient of the effect of this dummy on female migration is equal to -1.546 ($p<0.05$). The effect of the dummy showing if a destination country is in the EU or EEA on migration flows is -2.538 ($p<0.01$) if male migration is considered, and -2.009 ($p<0.01$) if female migration is considered. The variable showing restrictions the EU countries applied for new member states has a significant positive effect, which is slightly larger for men than it is for women. The effect on migration flows of men is equal to 0.477 ($p<0.10$) and the effect on migration flows of women is equal to 0.407 ($p<0.10$). The variable indicating the countries of origin also has a significant effect on the migration flows of men (equal to 0.097) and women (equal to 0.089), which is significant at 10% level. A dummy showing if more than 9% but less than 20% of both sending and receiving populations speak the same language has a positive effect on male migration (equal to 1.767, $p<0.10$), but its effect on female migration is insignificant. The effects of other control variables are insignificant.

The effects of top 20th income percentile, migrant networks, distance between countries, Freedom House Index, and dummies for landlocked countries, EU and EEA countries, restrictions applied by EU countries on new member states, and origin countries on migration flows, which are observed in this model, can be considered as robust. As it can be seen in the last two columns of table 6, when other control variables are removed, the effects of these variables remain significant, and changes only slightly, while the pattern of differences between the effects on male migration and the effects on female migration remain the same.

Table 6. Benchmark model (PPML Estimation)

	Men Migration flows	Women Migration flows	Men Migration flows	Women Migration flows
Gender inequality	-0.829	-0.282	0.307	0.888
	(1.494)	(1.546)	(1.330)	(1.287)
20th income percentile	0.036***	0.039***	0.040***	0.042***
	(0.011)	(0.009)	(0.011)	(0.010)
Migrant networks	0.005***	0.005***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
Distance	-0.497***	-0.454**	-0.416***	-0.421***
	(0.188)	(0.200)	(0.133)	(0.128)
Freedom House	0.036**	0.026**	0.032**	0.024**
	(0.016)	(0.011)	(0.014)	(0.010)
Landlocked	-1.615***	-1.546**	-1.681**	-1.636**
	(0.619)	(0.606)	(0.844)	(0.818)
EU or EEA	-2.538***	-2.009***	-2.437***	-1.946***
	(0.652)	(0.615)	(0.654)	(0.612)
EU restrictions	0.477*	0.407*	0.517**	0.421*
	(0.256)	(0.241)	(0.253)	(0.230)
Origin country	0.097*	0.089*	0.089*	0.084*
	(0.057)	(0.047)	(0.053)	(0.044)
Shared border	-0.054	0.175		
	(0.633)	(0.588)		
Same language	1.767*	1.533		
	(1.009)	(0.997)		
Coloniser	-1.034	-1.232		
	(1.123)	(0.948)		
Same coloniser	0.557	0.198		
	(0.619)	(0.579)		
Same country	-1.187	-0.811		
	(0.904)	(0.764)		
_cons	6.338***	7.161***	5.720***	6.727***
	(1.436)	(1.454)	(1.239)	(0.996)
Obs.	360	378	360	378
Pseudo R^2	0.496	0.495	0.486	0.485

Standard errors are in parenthesis
**** p<0.01, ** p<0.05, * p<0.1*

5.2 Model with an interaction effect between gender inequality and expected income

Table 7 show the results of the second model, which includes the interaction effect between GII and the computed top 20th income percentile, which is used as a proxy for expected income. First column shows the effects of independent variables on migration flows of highly educated men and the second column shows the effects on migration flows of highly educated women.

As it can be seen from table 7, interaction effect is positive and significant. The average marginal effects of gender inequality and expected income then can be computed[6]. However, as the effect of top 20th income percentile on migration flows of highly educated men is insignificant, the average marginal effects of both gender inequality and 20th income percentile on male migration are insignificant as well. Still, these effects are significant considering migration of highly educated women. The average marginal effect in the marginal effect of expected income attributable to a change in gender inequality is -0.331. The average marginal effect in the marginal effect of gender inequality attributable to change in expected income (top 20th income percentile) is -0.0000428. This shows that women may be more sensitive to gender inequality when the expected income is higher.

In a model with the interaction effect between gender inequality and expected income the effects of other variables remain similar as in the benchmark model presented in section 5.1. The effect of migrant networks on migration flows of men and women is significant at 1% level and equal to 0.004. The effect of distance remains negative and slightly smaller considering the migration of women. The effect of Freedom House Index is positive and a little smaller for women. The observed significant negative effect of a dummy showing that destination country is landlocked remains negative and slightly smaller for women. The effect of a dummy showing if the destination country is in the EU or EEA is negative and significant at 1% level for male migration. This negative effect is slightly smaller and significant at 5% level considering female migration. The effect of origin country remains significant at 10%. In this model the effect of restrictions the old EU member states put in place during the accession period for the new EU member states analysed in this study becomes insignificant. The effect of the same second language dummy in this model becomes positive and significant at 1% for migration flows of

[6] The average marginal effects of both variables were computed using “margins” command in STATA.

both men and women. It is equal to 1.987 (*p<0.01*) considering migration of educated men and 1.807 (*p<0.01*) considering migration of educated women. The dummy showing whether the countries were the same country in the past is also significant in this model and, contrary to the observations of the analysed existing studies, is negative. The effect is equal to -1.646 (*p<0.05*) on male migration flows and -1.422 (*p<0.05*) on female migration flows. Effects of other control variables remain insignificant.

Table 7. Model with gender inequality and income interaction (PPML Estimation)

	Men Migration flows	Women Migration flows
Gender inequality	-11.103***	-12.962***
	(3.397)	(2.614)
20th income percentile	-0.029	-0.040**
	(0.024)	(0.016)
GII x income	0.300***	0.375***
	(0.098)	(0.073)
Migrant networks	0.004***	0.004***
	(0.001)	(0.001)
Distance	-0.488***	-0.473**
	(0.177)	(0.189)
Freedom House	0.038**	0.026**
	(0.017)	(0.011)
Landlocked	-1.190**	-1.079**
	(0.467)	(0.458)
EU or EEA	-2.247***	-1.650**
	(0.714)	(0.668)
EU restrictions	0.436	0.349
	(0.270)	(0.253)
Origin country	0.100*	0.092**
	(0.056)	(0.047)
Shared border	-0.085	0.081
	(0.540)	(0.508)
Same language	1.987***	1.807***
	(0.687)	(0.653)
Coloniser	0.071	0.173
	(0.892)	(0.660)
Same coloniser	0.196	-0.240
	(0.685)	(0.614)
Same country	-1.646**	-1.422**
	(0.830)	(0.664)
_cons	8.473***	10.048***
	(1.338)	(1.454)
Obs.	360	378
Pseudo R^2	0.513	0.528

Standard errors are in parenthesis
*** *p<0.01*, ** *p<0.05*, * *p<0.1*

5.3 Discussion of the effects of different independent variables

5.3.1 Effect of gender inequality on migration flows

In the benchmark model, presented in the table 6, the effect of gender inequality on migration flows of both men and women is insignificant. This would allow rejecting hypotheses H_1 and H_2. However, evidence from the literature shows that the effect of gender inequality on migration may be interlinked with the effect of expected income (Docquier et al., 2012, pp. 24–25). Due to this reason a model with the interaction effect between gender inequality and expected income (using computed top 20^{th} income percentile as a proxy for it) has been added to the estimation, which results are discussed in section 5.2 and can be seen in table 7. As it can be seen from table 7, when the interaction effect between gender inequality and expected income is added, average marginal effect of gender inequality on migration flows of highly educated men is insignificant while the average marginal effect of gender inequality on migration flows of highly educated women is negative and significant. This gives grounds for not rejecting H_1, stating that gender inequality in a destination country has a negative effect on migration flows of highly educated women, and H_2, stating that gender inequality in a destination country has an effect on migration flows of highly educated women but no effect on male migration flows. The results of this study to some extent support the findings of the existing studies stating that gender inequality negatively affects migration flows (Bang & Mitra, 2011; Docquier et al., 2009).

The observed effect of gender inequality in a destination country on migration flows of highly educated women should be considered with caution, as the effect is significant only when interaction effect between gender inequality and expected income is added. The significant positive coefficient of an interaction effect shows that women are more sensitive to gender inequality considering destination countries where expected income is higher. This means that while gender inequality may affect a decision of highly educated women whether to migrate or not, it is not their primary concern and their migration firstly depends on more traditional determinants, namely expected income. Consequently, the situation regarding the rights of women in a destination country may be only an additional secondary factor to consider. This is in line with the results of Ruyssen and Salomone (2018), who in their study examining the micro-level data show that perceived gender inequality may affect the intention of women to move, but the actual migration action is in the end affected by other factors such as income.

Moreover, it is also important to keep in mind that the results showing that women moving to wealthier countries are more sensitive to gender inequality may be also caused by selectivity of destinations. Highly educated women migrating to countries with higher expected income may be wealthier, as they are able to afford higher living costs in those countries. Consequently, due to more resources those women may also afford to be more selective regarding a destination country and, hence, also consider gender inequality. At the same time, women moving to the countries with lower expected income may face financial constraints when migrating and may not afford to consider gender inequality in a destination country as an important factor. It is also important to remember that gender inequality can be defined in a vast number of ways and the results of any study that considers gender inequality may depend on a proxy used to show the situation regarding the rights of women in a country[7]. It is also important to keep in mind that different proxies for expected income can be used and this may also yield different results[8].

5.3.2 Effect of expected income on migration flows

Results of the benchmark model, presented in table 6, show that expected income has a significant positive effect on migration flows of both men and women, with the effect on female migration being slightly larger. The results of the model with interaction effect between gender inequality and expected income, presented in table 7, shows that the average marginal effect of top 20th income percentile on migration flows of men is insignificant, while the effect on female migration is significant and positive. Considering these results, hypothesis H_3, stating that effect of expected income in a destination country is greater on migration of educated women than on migration of educated men, cannot be rejected. The results are in line with the neoclassical migration theory arguing that migration can be affected by the differences of income levels between origin and destination countries (Lewis, 1954). Moreover, the results are in line with the analysed studies showing that expected income affect migration of highly educated women more than male migration, which may also be caused by the fact that in the richer countries gender-based discrimination tends to be less prevalent (Docquier et al., 2012, pp. 20–25).

[7] In order to test this, another variable, Gender Development Index by UNDP, presenting Human Development Index accounting for gender inequality, was used as a proxy for gender equality. However, the results followed the same patterns as in the model where GII is used, so it is not discussed in the study.

[8] In this study it was decided not to test interaction effect between gender inequality and expected income using different proxies used in other models in the study due to high correlation between the variables and potential multicollinearity problem.

In order to further test the effect expected income has on migration flows it was decided to include two additional proxies for expected income, namely the computed top 40th income percentile and natural logarithm of GDP per capita. Due to the fact that these proxies are highly correlated with GII, as seen in table 3, it was decided not to include the proxy for gender inequality in the models where these expected income proxies are used. In order to compare the results of these models with the results of the model where top 20th income percentile is used as a proxy for expected income, it was decided to add estimation with this proxy without a proxy for gender inequality. The results for these models can be seen in table 8.

As it can be seen from table 8, when gender inequality proxy is excluded, the effect of the top 20th income percentile on migration flows remains almost the same. The effect is positive and significant, and a little larger for female migration. The effect on male migration is equal to 0.037 ($p<0.01$), and the effect on female migration is slightly higher and equal to 0.040 ($p<0.01$). When the slightly lower estimation of the expected income is used (top 40th income percentile), the effect of it on migration flows is also significant and positive and slightly larger for migrant women. Top 40th income percentile effect is equal to 0.048 ($p<0.01$) for men and 0.05 ($p<0.01$) for women. Significant and positive effect of expected income on migration flows is also observed when the natural logarithm of GDP is used as a proxy. The effect of logarithm of GDP on male migration flows is 1.899 ($p<0.01$) and the effect on female migration flows is 2.073 ($p<0.01$). These results can be considered robust. As it can be seen from table 9, when some of the control variables are excluded, the results remain significant and change only slightly. It is also important to mention that the effects of other independent variables included in these models (presented in tables 8 and 9) do not differ significantly from the effects presented in the benchmark model (table 6).

Table 8. Models with different proxies for expected income (PPML estimation)

	Men Migration flows	Women Migration flows	Men Migration flows	Women Migration flows	Men Migration flows	Women Migration flows
Migrant networks	0.005***	0.005***	0.005***	0.006***	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
20th income percentile	0.037***	0.040***				
	(0.010)	(0.008)				
40th income percentile			0.048***	0.050***		
			(0.015)	(0.011)		
GDP per capita					1.899***	2.073***
					(0.400)	(0.319)
Distance	-0.526***	-0.471***	-0.503***	-0.449***	-0.537***	-0.487***
	(0.175)	(0.179)	(0.171)	(0.173)	(0.181)	(0.186)
Freedom House	0.039**	0.027**	0.040**	0.029**	0.025*	0.014
	(0.018)	(0.013)	(0.018)	(0.013)	(0.014)	(0.010)
Origin country	0.098*	0.088*	0.096*	0.086*	0.098*	0.087*
	(0.056)	(0.047)	(0.057)	(0.047)	(0.057)	(0.047)
Shared border	-0.056	0.179	-0.145	0.088	0.077	0.318
	(0.639)	(0.588)	(0.634)	(0.577)	(0.650)	(0.589)
Same language	1.616	1.502	1.692*	1.568*	1.687*	1.666**
	(1.012)	(0.918)	(0.918)	(0.813)	(0.894)	(0.832)
Coloniser	-1.027	-1.245	-1.222	-1.467*	-0.989	-1.180
	(1.162)	(0.961)	(1.115)	(0.889)	(1.089)	(0.880)
Same coloniser	0.534	0.209	0.627	0.299	0.649	0.373
	(0.632)	(0.577)	(0.636)	(0.581)	(0.620)	(0.594)
Same country	-1.200	-0.817	-1.169	-0.809	-1.157	-0.825
	(0.908)	(0.767)	(0.894)	(0.751)	(0.916)	(0.747)
Landlocked	-1.680***	-1.586***	-1.564***	-1.422***	-1.289***	-1.229***
	(0.590)	(0.551)	(0.544)	(0.489)	(0.465)	(0.432)
EU or EEA	-2.485***	-1.995***	-2.566***	-2.080***	-2.546***	-2.078***
	(0.637)	(0.599)	(0.641)	(0.597)	(0.639)	(0.592)
EU restrictions	0.468*	0.405*	0.477*	0.413*	0.428*	0.360
	(0.254)	(0.238)	(0.252)	(0.236)	(0.248)	(0.233)
_cons	6.083***	7.071***	5.973***	6.907***	-10.366***	-11.137***
	(1.648)	(1.682)	(1.566)	(1.597)	(3.548)	(3.011)
Obs.	363	384	363	384	363	384
Pseudo R^2	0.497	0.497	0.490	0.486	0.513	0.522

Standard errors are in parenthesis
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 9. Models with different proxies for expected income (PPML estimation). Robustness check

	Men Migration flows	Women Migration flows	Men Migration flows	Women Migration flows	Men Migration flows	Women Migration flows
Migrant networks	0.004***	0.004***	0.004***	0.004***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
20th income percentile	0.040***	0.041***				
	(0.011)	(0.010)				
40th income percentile			0.052***	0.052***		
			(0.017)	(0.014)		
GDP per capita					1.925***	2.031***
					(0.402)	(0.374)
Distance	-0.413***	-0.404***	-0.374***	-0.361***	-0.440***	-0.433***
	(0.122)	(0.115)	(0.117)	(0.109)	(0.134)	(0.127)
Freedom House	0.031**	0.022**	0.033**	0.025**	0.019*	0.010
	(0.014)	(0.010)	(0.014)	(0.010)	(0.011)	(0.008)
Origin country	0.088*	0.081*	0.087	0.080*	0.089*	0.080*
	(0.053)	(0.044)	(0.053)	(0.044)	(0.054)	(0.045)
Landlocked	-1.664**	-1.557**	-1.522*	-1.353*	-1.164*	-1.097*
	(0.803)	(0.765)	(0.794)	(0.727)	(0.624)	(0.596)
EU or EEA	-2.460***	-2.013***	-2.556***	-2.105***	-2.527***	-2.097***
	(0.640)	(0.592)	(0.653)	(0.599)	(0.641)	(0.584)
EU restrictions	0.521**	0.428*	0.532**	0.442*	0.473*	0.380*
	(0.251)	(0.229)	(0.249)	(0.227)	(0.246)	(0.223)
_cons	5.841***	6.996***	5.551***	6.602***	-10.798***	-10.724***
	(1.238)	(1.062)	(1.233)	(1.050)	(3.079)	(2.866)
Obs.	363	384	363	384	363	384
Pseudo R^2	0.487	0.486	0.479	0.474	0.504	0.511

Standard errors are in parenthesis
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

The descriptive statistics revealed that expected income variables are significantly higher for Luxembourg as a country of destination. As a result, in order to better determine the effect expected income may have on migration flows this outlier was excluded in some estimations. Results for the estimations without Luxembourg as a receiving country are presented in table 10. By comparing these results with the coefficients in table 8, it is evident that this outlier indeed affects the estimated effects of all three proxies for the expected income on migration flows of both men and women. When Luxembourg as a destination country is excluded, the effects of expected income on migration flows of both men and women increase significantly. However, the coefficients of the effects remain significant at 1% level, and the observed effects are positive and slightly larger when female migration is considered. Still, this means that it is important to keep in mind that the effect of expected income on migration flows may be larger than the one observed in the benchmark model or models presented in table 8.

Table 10. Models with different proxies for expected income excluding Luxembourg (PPML estimation)

	Men Migrant flows	Women Migrant flows	Men Migrant flows	Women Migrant flows	Men Migrant flows	Women Migrant flows
Migrant networks	0.004***	0.004***	0.005***	0.005***	0.004***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
20th income percentile	0.057***	0.063***				
	(0.014)	(0.011)				
40th income percentile			0.079***	0.084***		
			(0.024)	(0.018)		
GDP per capita					2.342***	2.573***
					(0.527)	(0.415)
Distance	-0.550***	-0.489**	-0.516***	-0.452**	-0.552***	-0.498***
	(0.183)	(0.190)	(0.179)	(0.183)	(0.185)	(0.190)
Freedom House	0.027*	0.014	0.027*	0.017	0.018	0.007
	(0.015)	(0.011)	(0.015)	(0.011)	(0.013)	(0.010)
Origin country	0.099*	0.089*	0.096*	0.085*	0.097*	0.086*
	(0.057)	(0.048)	(0.058)	(0.048)	(0.058)	(0.048)
Shared border	0.089	0.302	0.011	0.227	0.076	0.282
	(0.610)	(0.577)	(0.618)	(0.577)	(0.593)	(0.549)
Same language	0.961	0.950	1.051	1.034*	1.203*	1.272**
	(0.681)	(0.657)	(0.642)	(0.608)	(0.631)	(0.611)
Coloniser	-0.434	-0.562	-0.658	-0.834	-0.578	-0.715
	(0.847)	(0.686)	(0.852)	(0.686)	(0.834)	(0.662)
Same coloniser	0.521	0.252	0.601	0.338	0.770	0.575
	(0.549)	(0.565)	(0.549)	(0.567)	(0.601)	(0.617)
Same country	-1.335*	-1.138*	-1.273*	-1.080*	-1.294*	-1.166*
	(0.782)	(0.621)	(0.772)	(0.610)	(0.783)	(0.622)
Landlocked	0.039	0.033	0.078	0.082	0.090	0.071
	(0.515)	(0.459)	(0.517)	(0.451)	(0.531)	(0.466)
EU or EEA	-2.538***	-2.060***	-2.686***	-2.221***	-2.597***	-2.139***
	(0.649)	(0.600)	(0.673)	(0.613)	(0.650)	(0.593)
EU restrictions	0.477**	0.431**	0.481**	0.431**	0.433*	0.377*
	(0.233)	(0.217)	(0.230)	(0.215)	(0.233)	(0.217)
_cons	6.512***	7.336***	6.388***	7.107***	-14.148***	-15.541***
	(1.463)	(1.613)	(1.395)	(1.537)	(4.712)	(3.990)
Obs.	353	374	353	374	353	374
Pseudo R^2	0.520	0.534	0.512	0.520	0.527	0.545

Standard errors are in parenthesis
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Considering the effect of expected income on migration, the results of the models presented in tables 8-10 are similar to the effects observed in the benchmark model (table 6). The effect of expected income remains significant and positive, and slightly larger when female migration is considered, regardless what is used as a proxy for expected income. The effects observed are larger when the outlier with significantly larger expected income (Luxembourg) is excluded, but they remain positive and significant. The results of models presented in tables 8-10 do not provide evidence for rejecting the hypothesis H_3 and further shows that expected income may

indeed be an important determinant of migration flows. Moreover, in this study top 20th and top 40th income percentiles were computed as proxies for the expected wage for highly skilled migrants and slightly lower expected wage for migrant women due to allegedly existing gender gap in wages. As these two variables have a significant effect on migration flows for both men and women, this also supports the expanded neoclassical migration model, stating that migration depends not on overall income level in a country, but more on the expected income taking into account income inequality (Stark & Taylor, 1989). Another interesting finding considering the income effect on migration flows is that top 40th income percentile has a greater effect than top 20th income percentile. The effect of the lower estimated wage is larger for both men and women. This may indicate that this lower estimation of the expected income better represents realistic expected income for all migrants, as even if they are highly educated, they may expect to earn lower income in a host country due to possible discrimination against migrants or de-skilling (Praszalowicz, 2008, p. 257).

5.3.3 Effect of migrant networks on migration flows

The results of the benchmark model, presented in table 6, show that existing migrant networks in a destination country have a significant positive effect on migration flows. However, the effect is the same for men and women. As it can be seen from tables 6-10, the effect does not change significantly when some variables are excluded or different proxies for income are used, and the difference between the effect on male migration and female migration cannot be observed. In the light of these results, hypothesis H_4, stating that the effect of existing migrant networks in a country of destination is greater on migration flows of highly educated women than on migration of men, can be rejected. The results are also in line with the results of the study by Beine and Salomone (2013), who find that if both gender and educational attainment of migrants are taken into account, the effect of migrant networks is the same for male and female migration flows. The observed effects of migrant networks on migration flows of educated men and women are also relatively small. This is in line with the existing studies stating that while migrant networks may be important for less educated migrants, its importance diminishes when highly educated migrants are considered. Due to higher human capital of highly educated migrants, migration for them seems to be less costly and they are more capable of migrating independently without relying on existing migrant networks (Beine & Salomone, 2013; de Haas, 2010).

5.3.4 Effect of control variables on migration flows

A number of control variables included in the models utilised in this study have a significant effect on migration flows of highly educated men and women. As a result, it is important to separately discuss these significant effects. The benchmark model (table 6) and the model showing interaction effect between gender inequality and expected income (table 7) are main models referred in this sub-section.

Firstly, the results of the benchmark model, presented in table 6, show that a distance between origin and destination countries negatively affects migration flows of highly educated men and women. The negative effect is slightly larger on male migration than it is on female migration. The effect of distance on migration flows remains negative and significant at 1% or 5% levels in all different models considered in this study (tables 6-10). The results are not in line with the analysed literature, which states that if women try to escape gender-based discrimination in their home country, they will move to the countries that are farther as it is likely that the situation regarding rights of women is better in those countries (Docquier et al., 2012, pp. 24–25). One of the explanations for the fact that the findings of this study are not in line with the existing literature may be the proximity of analysed countries to other EU countries. Gender equality, at least in theory, is seen as a fundamental right in the EU and should be applied in all areas of the EU law, ensuring equal opportunities for both genders (Masselot, 2007). It is argued, however, that this gender mainstreaming has not been included in the policies forwards CEE countries during their accession to the EU, so the situation regarding gender equality is significantly worse in the CEE region compared to the old member states (Bretherton, 2011). As conditions for women are believed to differ significantly even though these countries are in close proximity, it is likely that women from CEE countries prefer to move to other EU countries rather than to farther destinations. Moreover, these results are in line with previous studies showing that geographic proximity between countries increases migration, as smaller distance ensures availability of more reliable information about the destination country and reduces migration costs (Docquier et al., 2007; Zimmermann & Bauer, 1999, pp. 15–16).

It is observed that Freedom House Index, used as a proxy for political rights and civil liberties in a host country, has a positive effect on migration flows of men and women. The effect appears to be slightly smaller when female migration is considered. These results are, to some extent, in line

with the analysed literature, stating that political stability in a country of destination may be important for the migration flows of the highly skilled (Roudgar & Richards, 2015, pp. 76–78; Solimano, 2002, pp. 10–11). However, as the effects decrease when different proxies for expected income are used or control variables are excluded (tables 6-9), it is evident that political rights in a destination country may not be as important for potential migrants. It may be the case that political rights can influence the intentions to migrate, but the actual migration is caused by more traditional variables, such as income.

It is mentioned in the section 5.1 describing the benchmark model that the dummy showing if a destination country is landlocked has a significant negative effect on migration flows of both men and women. The effect remains significant and negative in all analysed models and becomes insignificant only when Luxembourg as a destination country is excluded. Considering the models where the effect of landlocked dummy is significant, the coefficients fluctuate slightly across models, but the overall trend, that it is negative and slightly larger for men, remains. This shows that migrants are less likely to migrate to the landlocked countries and it is in line with the existing literature (Docquier et al., 2009, pp. 14–17).

In all the models presented in this study without the interaction effect (tables 6, 8-10), the variable accounting for the restrictions EU countries applied for new member states have a positive effect on migration flows, which is a bit larger for men than it is for women, and is significant in all models at least at 10% level. A higher value of this variable means that a destination country had fewer restrictions for the citizens from new member states to enter their labour market. Consequently, as the coefficient is positive, it means that countries with less restriction also had higher migration flows from CEE during the observed period. According to the theory, individuals decide whether to migrate not only considering the income level in a potential country of destination, but also a probability that they will find a job after migrating (Harris & Todaro, 1970). The results of this study support this theory. The probability that the migrants are able to find employment in the countries without restrictions for the citizens of new EU member states to enter their labour market is likely to be higher. Hence, this also positively increases migration flows to those countries.

Considering the effect of the variable showing restrictions old EU member states applied to the new member states, it can be expected that a dummy showing if a destination country is a

member state of the EU would also have a positive effect on the migration flows of both men and women. However, it is not a case. In all the models included in this study (tables 6-10), the effect of this dummy on migration flows is significant and negative. The negative effect is slightly smaller for migration flows of women than it is for migration flows of men. This is unexpected, considering that in the literature it is stated that migration flows tend to be higher between countries that are in close geographic and cultural proximity (Ferrant & Tuccio, 2013, p. 12), as analysed CEE countries are with other EU member states. Furthermore, it can be expected that freedom of movement in the EU would increase migration flows from EU CEE countries to other EU member states. However, this negative effect may be caused by a few reasons. Firstly, migration from CEE countries after the fall of socialism has become more complex – while permanent migration in the region as the whole seems to be less prominent, seasonal migration and daily cross-border mobility have become defining features of migration from CEE countries. For example, in 2004 more than 330 thousand seasonal workers were employed in Germany and more than 90% of these workers were coming from eight countries that joined EU in 2004. Also, it is estimated that in 2000 around 13 thousand Slovenians were crossing borders with Italy and Austria for work reasons on a daily basis (Kaczmarczyk, 2006, pp.1-3). Less restrictions on labour movements in the EU also means that it is easier for migrants not only to leave, but also to return to their home country, so this facilitates high levels of mobility (Barcevičius, 2012, pp.38-42). Due to the fact that in this study difference between migration stocks in 2000 and 2010 is used as a proxy for migration flows, it is very likely that these patterns of high mobility are not captured and only permanent migration is represented in this study. It is likely that since CEE countries analysed in this study joined the EU the permanent migration to other EU states decreased due to an easier temporary migration. The negative effect of this variable can also be a result of unreliable statistics. Due to free movement of labour it is much easier for the EU citizens to move to other member states and little official registration is required. For example, a survey in Lithuania has shown that a significant number of individuals have not registered their migration (Žvalionytė, 2012, pp. 85-92).

The effect of a dummy, showing if a second language is the same in both origin and destination countries, is significant at 1% level and positive in the model with the interaction effect (table 7), considering the migration of both men and women. The effect is also positive and significant at 10% level when the male migration is considered in the benchmark model (table 6). The effect

for women also becomes significant when the top 40th income percentile or natural logarithm of GDP is used as proxies for expected income. The significant positive effect on migration flows is in line with the analysed literature (Ferrant & Tuccio, 2013, p. 12).

The effect of a dummy, showing if a sending and a receiving country were the same country in the past, is insignificant in the benchmark model (table 6) and becomes significant only when the interaction effect between gender inequality and expected income is included (table 7), or Luxembourg as a destination country is excluded from the analysis (table 10). The significant effect is negative and slightly smaller for female migration than for male migration. This is unexpected when parallels are drawn with the previously analysed literature. In the previous studies it is observed that migration flows between countries that have shared history tend to be larger (Docquier et al., 2007). However, the negative effect observed can be explained considering the history of the countries analysed. CEE countries analysed in this study have shared history with each other or the countries that are less developed and less wealthy than they are. As a result, it is likely that even though countries have shared history, migrants will be more attracted by richer and more developed countries. The incentive to move to the countries with which the analysed CEE countries share history with may be further diminished by the fact that migration to Western European countries, which are more developed and wealthier, is relatively easy.

The variable indicating the countries of origin also has a significant effect on the migration flows of men and women at 10% level. This means that conditions in the sending countries also significantly affect migration. However, effects of specific conditions are not within the scope of this study. Finally, the effects of other control variables (dummies showing if origin and destination countries are neighbouring countries, if they had colonial relationship or were colonised by the same country) are not significant.

5.4 Limitations of the study

This study aims to contribute to the understanding of a role of highly educated women as independent decision makers in the field of migration. However, the study has some limitations. Some of these limitations are rather difficult to overcome, while others should be addressed in the future research.

First of all, a lack of reliable data on migration is a major limitation for this study. Recent data is often unavailable and countries often do not monitor the migration flows in detail. As a result, in this study differences between migration stocks in 2000 and 2010 were used as a proxy for migration flows. This does not allow taking into account all the fluctuations which may have occurred over the decade. Moreover, it is important to keep in mind that the official data about migration may often be unreliable, as some countries do not report migration, and definition of a migrant may vary from country to country (Kahanec et al., 2010, p. 6). Official statistics also do not capture illegal migration, which appeared on a regular basis between CEE and Western Europe, especially before 2004 (Dobson, 2009, p. 124). As a result, captured migration flows and stocks may be an underrepresentation of an actual number of migrants.

It is also important to keep in mind that trends of migration from CEE countries have become more complex, including significant increase in seasonal migration and frequent cross-border movements. This is often underrepresented in the official statistics, or permanent and temporary migrants are not distinguished. Considering this, another important limitation of this study is that it does not account for temporary migration and return migration that is a very common trend considering migration from CEE countries and treats all migration observed as permanent.

Finally, this study focuses on the specific factors in the countries of destination. The conditions in the countries of origin are controlled for in this study, but the effects of specific factors cannot be distinguished and analysed, as it is not within the scope of this research. Still, including conditions in both origin and destination countries would allow to better analyse not only what attracts highly educated women in destination countries, but also what factors encourage them to leave.

6. Conclusions

Increasing number of independent female migrants has been registered in the last decades and the term “feminization of migration” has been coined by a lot of scholars in the migration field. However, the body of academic literature on a gendered aspect of migration is still significantly scarce, as the gender dimension is often not properly addressed in economic and social research of migration. This study aims to contribute to the better understanding of gender dimension of migration considering highly educated migrants while focusing on CEE countries that joined EU

in 2004 and 2007. The main aim of the study is to determine what factors affect migration of highly educated women differently than they affect migration of highly educated men from CEE region. The effects of various characteristics of destination countries on migration flows of highly educated men and women between 2000 and 2010 are included. The research focuses on the effect of gender inequality, expected income, and existing migrant networks in destination countries. Gravity model for the international migration is implemented, RUM model is used to derive gravity equation, and PPML estimator is used.

This study shows that the effect of gender inequality in a destination country on migration flows of women is closely connected to the expected income in a destination country. Even though the effect of gender inequality seems to be insignificant at first, the effect becomes significant and negative when interaction effect between gender inequality and expected income is added. As the interaction effect is positive and significant, women seem to be more sensitive to gender inequality when high income destination countries are considered. It shows that gender inequality may be important for migrant women from CCE countries, but they tend to prioritise expected monetary gains when considering whether to migrate or not. However, this effect may also show the self-selection of migrant women across destinations.

The observed effect of expected income of migration flows of highly educated women seems to be significant and positive. This effect is also larger than the effect of expected income on migration of highly educated men. This observed difference can by caused by the belief that in wealthier countries gender-based discrimination is less prevalent and thus women may have more opportunities in those countries. This is in line with the neoclassical migration theory outlining the importance of expected income when migrating.

The study finds that, contrary to some of the existing academic literature, the effect of migrant networks on migration of highly educated women is not different from the effect on migration of highly educated men. This is in line with more recent studies showing that the difference in network effect while considering migrant men and women may disappear when educational attainment is properly taken into account.

The study shows that, contrary to analysed existing studies, distance between sending and receiving countries does not affect migration of women differently from migration of men. This

may stem from the fact that, while this difference is often explained by expected better conditions for women in farther countries, analysed sending countries are close to the old EU member states which are believed to have good conditions for women, so it would not make sense for them to move further and encounter more costs due to distance. It is also important to mention that in this study a negative effect of the fact that destination country is in the EU on migration flows of both men and women has been observed. This can be caused by an increase in temporary migration, which is not necessarily captured in this study, and decrease in permanent migration between old EU member states and CEE countries in the analysed time period.

The results of this study in a way confirm a common belief that expected income in a destination country is one of the main factors attracting highly educated migrants, both men and women. However, the study also shows that highly educated women tend to become more concerned with gender inequality in a country when considering high income destination countries. This shows that in order to attract or retain more highly educated women policy makers should focus on improving economic conditions in a country, but also not overlook gender equality. Considering that in the current time more and more countries are trying to attract highly educated specialists to ensure development and growth of their economies, high expected income may help some countries to be grouped alongside other countries which highly educated women from CEE countries are considering as their potential next destination, but other conditions in a country may be the determinant factor whether they decide to move to a country.

Future research on the migration of highly educated women from CEE countries should aim to distinguish between temporary and permanent migration, and focus more on return migration. Additionally, future research should also factor in specific conditions in both destination and origin countries in order to consider not only the factors that attract women, but also the factors that encourage them to migrate.

References

Artuc, E., Docquier, F., Özden, Ç., & Parsons, C. (2015). A Global Assessment of Human Capital Mobility: The Role of Non-OECD Destinations. *World Development*, *65*, 6–26.

Bang, J. T., & Mitra, A. (2011). Gender bias and the female brain drain. *Applied Economics Letters*, *18*(9), 829–833.

Barcevičius, E. (2012). Emigracija ir grįžtamoji migracija Vidurio ir Rytų Europoje: sėkmės istorija ar žlugusi svajonė? in E. Barcevičius, D. Žvalionytė (red.). *Užburtas ratas? Lietuvos gyventojų grįžtamoji ir pakartotinė migracija*, 31–46

Baudassé, T., & Bazillier, R. (2014). *Gender Inequality and Emigration : Push factor or Selection process ?*

Bauer, T. K., & Zimmermann, K. F. (1999). Assessment of Possible Migration Pressure and its Labour Market Impact Following EU Enlargement to Central and Eastern Europe. *IZA Research Report*, *3*, 1–108.

Beine, M., Bertoli, S., & Fernández-Huertas Moraga, J. (2016). A Practitioners' Guide to Gravity Models of International Migration. *World Economy*, *39*(4), 496–512.

Beine, M., Docquier, F., & Rapoport, H. (2001). Brain drain and economic growth: Theory and evidence. *Journal of Development Economics*, *64*(1), 275–289.

Beine, M., & Salomone, S. (2013). Network Effects in International Migration: Education versus Gender. *Scandinavian Journal of Economics*, *115*(2), 354–380.

Bretherton, C. (2011). *Gender mainstreaming and EU enlargement: swimming against the tide?*

Curran, S. R., Shafer, S., & Donato, K. M. (2006). Mapping gender and migration in sociological scholarship: Is it segregation or integration? *International Migration Review*, *40*(1), 199–223.

de Haas, H. (2010). The internal dynamics of migration processes: A theoretical inquiry. *Journal of Ethnic and Migration Studies*, *36*(10), 1587–1617.

Dobson, J. R. (2009). Labour mobility and migration within the EU following the 2004 Central and East European enlargement. *Employee Relations*, *31*(2), 121–138.

Docquier, F., Lohest, O., & Marfouk, A. (2007). Brain drain in developing countries. *World Bank Economic Review*, *21*(2), 193–218.

Docquier, F., Lowell, B. L., & Marfouk, A. (2009). A gendered assessment of highly skilled emigration. *Population and Development Review*, *35*(2), 297–321.

Docquier, F., Marfouk, A., Salomone, S., & Sekkat, K. (2012). Are Skilled Women More Migratory than Skilled Men? *World Development*, *40*(2), 251–265.

Dumont, J., Martin, J. P., & Spielvogel, G. (2007). Women on the Move: The Neglected Gender Dimension of the Brain Drain. *World Development*, *34*(4), 411–445.

Elnajjar, H. (1993). Planned emigration: the Palestinian case. *International Migration Review*, *27*(1), 34–50.

European Comission. (n.d.). *Enlargement - transitional provisions - Employment, Social Affairs & Inclusion - European Commission*. Retrieved May 15, 2020, from https://ec.europa.eu/social/main.jsp?catId=466&langId=en

Ferrant, G., & Tuccio, M. (2013). *South-South Emigration and Discriminatory Social Institutions : a Two-way Relationship*.

Freedom House. (n.d.). *Freedom in the World Research Methodology | Freedom House*. Retrieved April 24, 2020, from https://freedomhouse.org/reports/freedom-world/freedom-world-research-methodology

Grogger, J., & Hanson, G. H. (2011). Income maximization and the sorting of emigrants across destinations. *Niational Bureau of Economic Research Working Paper*, *13821*.

Harris, J. R., & Todaro, M. P. (1970). *Migration , Unemployment and Developmnent : A Two-Sector Analysis*. *60*(1), 126–142.

Haughton, J., & Khandker, S. R. (2009). *Handbook on Poverty and Inequality*.

Iglicka, K. (2000). *Migration movements from and into Poland in the light of the East-West European migration Migration movements from and into Poland in the light of the East-West European migration Krystyna Iglicka*.

Kaczmarczyk, P. (2006). Highly skilled migration from Poland and other CEE countries - myths and reality. *Brain Drain or Brain Gain: A Global Dilemma*, *22*, 33–64.

Kaczmarczyk, P., & Okólski, M. (2007). *International Migration in Central and Eastern Europe - Current and Future Trends*. *July*, 1–31.

Kahanec, M., Zaiceva, A., & Zimmermann, K. F. (2010). Lessons from migration after EU enlargement. *EU Labor Markets After Post-Enlargement Migration*, 3–45.

Lazaridis, G. (2015). International Migration into Europe. In *International Migration into Europe*. Palgrave Macmillan UK.

Lewis, W. A. (1954). Economic Development with Unlimited Supplies of Labour. In *The Manchester School* (Vol. 22, Issue 2, pp. 139–191).

Lowell, B. L., & Findlay, A. (2001). Migration of highly skilled persons from developing countries: Impact and policy responses. *International Migration Papers*, *44*(September 2015), 1–41.

Mansoor, A., & Quillin, B. (2007). *Migration and Remittances: Eastern Europe and the Former Soviet Union*.

Masselot, A. (2007). The state of gender equality law in the European Union. *European Law Journal*, *13*(2), 152–168.

Massey, D. S., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A., & Taylor, J. E. (1993). Theories of International Migration : A Review and Appraisal. *Population and Development Review*, *19*(3), 431–466.

Mayer, T., & Zignago, S. (2006). *GeoDist: the CEPII's distances and geographical database*. *January 2006*.

Morokvasic, M., Metz-Göckel, S., & Münst, A. S. (2008). Gendered mobilities in an enlarged

Europe. In *Metz-Göckel, S., Morokvasic-Müller, M., Münst, A. Senganata (ed.) Migration and mobility in an enlarged europe: a gender perspective* (pp. 9–23).

Mountford, A. (1997). Can a brain drain be good for growth in the source economy? *Journal of Development Economics*, *53*(2), 287–303.

Nejad, M. N., & Young, A. T. (2014). *Gravity Model Analysis of Bilateral Migration Flows*.

OECD. (n.d.). *Database on Immigrants in OECD and non-OECD Countries: DIOC - OECD*. Retrieved April 25, 2020, from https://www.oecd.org/els/mig/dioc.htm

Okolski, M. (1994). Poland. In *Arditis S. (ed.), The Politics of Est-West Migration* (pp. 51–67).

Okolski, M. (1998). Regional Dimension of International Migration in Central and Eastern Europe IN CENTRAL AND EASTERN EUROPE on JSTOR. *Genus*, *54*(1/2), 11–36.

Okolski, M., & Salt, J. (2014). Polish Emigration to the UK after 2004, Why Did So Many Come? *Migration Research Unit*, *3*(2), 11–37.

Peder, J. P., Mariola, P., & Nina, S. (2004). Selection or Network Effects? Migration Flows into 27 OECD Countries, 1990-2000. *European Economic Review*, *52*(7), 1160–1186.

Pfeiffer, L., Richter, S., Fletcher, P., & Taylor, J. E. (2007). Gender in economic research on international migration and its impacts: A critical review. *The International Migration of Women*, *June*, 1–36.

Praszalowicz, D. (2008). Migration and mobility in an enlarged europe: a gender perspective. In *Metz-Göckel, S., Morokvasic-Müller, M., Münst, A. Senganata (ed.) Migration and mobility in an enlarged europe: a gender perspective* (pp. 249–280).

Ravenstein, E. G. (1889). The Laws of Migration Author. *Journal of the Royal Statistical Society*, *52*(2), 241–305.

Roudgar, I., & Richards, C. (2015). The policy challenge of the global brain drain: Addressing the dilemmas of contributing push-pull factors. *International Journal of Public Policy*, *11*(1–3), 73–85.

Ruyssen, I., & Salomone, S. (2018). Female migration: A way out of discrimination? *Journal of Development Economics*, *130*(July 2016), 224–241.

Silva, J. M. C. S., & Tenreyro, S. (2006). The Log of Gravity. *The Review of Economics and Statistics*, *88*(4), 641–658. https://doi.org/10.1080/00036846.2011.599786

Sjaastad, L. A. (1962). The Costs and Returns of Human Migration. *Journal of Political Economy*, *70*(5), 80–93.

Slany, K. (2008). Female migration from Central-Eastern Europe: demographic and sociological aspects. In *Metz-Göckel, S., Morokvasic-Müller, M., Münst, A. Senganata (ed.) Migration and mobility in an enlarged europe: a gender perspective* (pp. 27–51).

Solimano, A. (2002). *Globalizing talent and human capital: implications for developing countries* (Issue August).

Stark, O., & Taylor, J. E. (1989). Relative deprivation and international migration. *Demography*, *26*(1), 1–14.

Tung, R. L., & Lazarova, M. (2006). Brain drain versus brain gain: An exploratory study of ex-host country nationals in Central and East Europe. *International Journal of Human Resource Management*, *17*(11), 1853–1872.

UNDP. (n.d.-a). *2019 Human Development Index Ranking | Human Development Reports*. Retrieved March 11, 2020, from http://hdr.undp.org/en/content/2019-human-development-index-ranking

UNDP. (n.d.-b). *Gender Inequality Index (GII) | Human Development Reports*. Retrieved April 21, 2020, from http://hdr.undp.org/en/content/gender-inequality-index-gii

World Bank. (n.d.-a). *GDP (current US$) | Data*. Retrieved April 23, 2020, from https://data.worldbank.org/indicator/NY.GDP.MKTP.CD

World Bank. (n.d.-b). *GINI index (World Bank estimate) | Data*. Retrieved April 23, 2020, from https://data.worldbank.org/indicator/SI.POV.GINI

Zimmermann, K., & Bauer, T. (1999). Assessment of Possible Migration Pressure and its Labour

Market Impact Following EU Enlargement to Central and Eastern Europe. *IZA Research Report*, *3*.

Zimmermann, K. F. (1995). *European Migration: Push and Pull*. 313–342.

Zimmermann, K. F. (1999). *Ethnic German Migration since 1989-Results and Perspectives*.

Žvalionytė, D. (2012). Grįžtamosios ir pakartotinės migracijos tendencijos. in Egidijus Barcevičius ir Dovilė Žvalionytė (red.), *Užburtas ratas? Lietuvos gyventojų grįžtamoji ir pakartotinė migracija*, 75-100.