

Dynamics in Highly Skilled Migration: A European Perspective

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Chapter 1

INTRODUCTION

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1 MOTIVATION

The UN estimates that over the past decades the number of international migrants increased by about 2.8 million a year, from 78 million in 1965 to 191 million in 2005. Given that this is only 3 percent of the world population, migration flows might seem small to some. However, their impacts are substantial in many countries. For example, one of the most obvious effects of international migration are remittances sent home by migrants from abroad. According to recent estimates by the World Bank, remittances flows in 2007 amounted to \$337 billion, of which \$251 billion were sent home by migrants from developing countries (World Bank 2008). The same source reveals that the flows of official remittances received by developing countries have more than doubled since 2000 (+118%) and constitute a substantial share of many developing countries' GDP.

Another important feature of international migration is that skilled migrants tend to particularly cluster in rich immigration countries. It is fairly evident from the literature that nations better endowed with human capital grow more rapidly, other things being equal (Lucas 1988, Romer 1990, Barro and Sala-i-Martin 1995). Stark (2004) even argues that poor human capital endowment is a major reason why poor countries remain poor. As a result, research has become particularly interested in the study of highly skilled migration. The topic is hotly debated among scholars and politicians. In this discussion rich countries are mostly concerned with receiving the "right mix" of immigrants. That is, they try to attract comparatively skilled migrants who productively contribute to their economies, fill skills gaps and, more generally, integrate better into host labor markets. Poor countries on the other hand fear a brain drain that may deprive them from their capacity to further develop their economies and improve their economic and political situation. Hence the debate in skilled migration very much centers on the question of the selection of migrants, i.e. on *who* migrates.

This is also the central question of this thesis. In particular the research will look at the causes of migration and what factors cause selectivity or selection of migrants. Even though this topic has been addressed in many studies, opinions vary widely and

more research is needed to fully understand the topic and the numerous impacting factors. This research will contribute to the discussion and bring new insights to the literature. It will analyze several particular aspects in this regard. The first aspect is the role of foreign education in the migration and subsequent integration processes. It will be investigated if the place of education has a uniform effect on migrants or whether there are selectivity differentials by place of education. Second, the impact of selective migration policies and their ability to effectively over-ride existing migration patterns will be studied. As it becomes clear that there are persistent factors that reinforce existing migration patterns, the third part of this study will analyze network effects and present evidence of a multiplier effect that is new to the migration literature.

It is evident that these questions are particularly relevant to the European Union (EU), which is a major player in international migration: According to UN data, 21 percent of the world migrants or 40 million live in the EU countries as of 2005. The EU receives relatively low skilled immigrants compared to other major migrant destinations like the US, Canada and Australia, and migrant networks have reinforced these patterns due to strong historical linkages with many sending regions. At the same time, the EU loses many highly skilled people to other countries, particularly the US. As a result, several EU countries have recently started to adopt selective migration policies to over-ride these trends. This paradox, which taken to an extreme would systematically reduce the relative skills level of workers in Europe, makes the EU an interesting subject for the study of highly skilled migration¹. Despite the regional focus of this thesis, the international nature of the topic of migration indicates that many of its findings may be applicable beyond the EU borders.

The purpose of this introduction is to review the literature in which these questions originate and thereby set the stage for the subsequent analyses. The following section will outline highly skilled migration in the broader migration context and examine existing research that has studied the dynamics of migration. Further, it will present the empirical evidence on the current migrant situation in the EU and discuss its drivers and

¹ Throughout this analysis the term highly skilled or *skilled* refers to people with at least a tertiary education.

consequences. Against this background, the final part of this introduction will show the contribution and new insights from this research and summarize the purpose and findings of each subsequent section.

2 THEORY AND EMPIRICAL EVIDENCE OF HIGHLY SKILLED MIGRATION

International migration has become a well-studied topic over the last decades. However, despite some previous attention, the sub-topic of skilled migration, i.e. the migration of persons with at least a tertiary education, has only begun to draw attention after Lucas (1988) introduced his endogenous growth model and human capital began to be acknowledged as a main driver for growth and development.² Consequently, the dynamics of skilled migration and its impacts on both origin and host countries have become major subjects of inquiry. The following section will look at research regarding the immediate (static) impact of skilled migration. Then, the dynamics of migration, including causes of migration, the process of migration itself and subsequent mechanisms will be discussed.

Throughout this review it is important to keep in mind that it has only recently become possible to even measure skilled migration, as comprehensive and comparable data has been, and still is for many countries, unavailable. It is well documented that – even when available - the official statistics in countries of origin do not give an accurate picture of emigration and that, therefore, the estimates on the scope of migration have to rely on data provided by immigration countries. A few international agencies disseminate data on stock and/or flows of the international migrants. However, even the information provided by these sources remains incomplete and inaccurate. For example, the United Nations Population Division provides information on the total stock of foreign-born population by country and region of residence but without any detail on the country of origin and education level of the immigrants. Similarly, the Eurostat statistics for European member states quantify the stock of foreigners (non-citizens)³ for the major

² Also see Aghion et Howitt (1998), Romer (1990) and de La Fuente and Ciccone (2002).

³ The concept of country of birth which is time invariant allows to identify immigrant population and thus to capture the decision to emigrate. By contrast, the criteria of citizenship which changes with naturalization generally underestimate migration.

sending countries without any information on the structure by educational level. Only very recently have more accurate sources of data emerged that provide details on the education level of migrants. Docquier and Marfouk (2006) were among the first to collect comprehensive bilateral data on immigrant stocks by education level for OECD receiving countries.⁴ This dissertation is based in part on the comprehensive data collected by Docquier and Marfouk as well as on additional expansions of this database by them and the author.

2.1 *Static Impacts of Skilled Migration*

Skilled migration can affect sending and receiving countries in various ways. These impacts relate primarily to development and growth, labor markets and public services. The first two are most cited in the brain drain literature and concentrate more on the side of (usually poorer) sending countries. They establish a detrimental effect of skilled emigration for poor countries with scarce human capital. In fact, studies have shown that the brain drain, measured as a demographic loss of skilled people, is indeed sizeable and the negative effects may be substantial (Carrington and Detragiache 1998, 1999, Adams 2003, Docquier and Marfouk 2005, 2006, Docquier et al. 2007).

Skilled emigration may harm development especially if countries are in a stage of transition where they start making more use of technologies that require human capital. Also, political transformation and democratization may require a critical mass of qualified people. For subsequent development stages the brain drain is likely to be of negligible importance as incentives to permanently leave may decrease and highly skilled migration may take more the form of a brain circulation (Wolburg 2001, Ellerman 2003).

With respect to growth considerations, models have been developed that try to describe migration flows distinguishing between low and high skilled labor in a setting of endogenous growth. Haque and Kim (1995) create an endogenous growth model with overlapping generations showing that migration from poorer to rich countries may lead to increased divergence in income levels and growth rates between the countries. Other studies using the endogenous growths framework also confirm the negative effects for

⁴ Improved and extended to gender by Docquier, Lowell and Marfouk (2009).

sending countries (Grossman and Helpman 1991, Miyagiwa 1991, Walz 1992, Wong and Yip 1999).⁵

Nevertheless, some researchers argue that the prospect of migration actually stimulates individuals to obtain better education. As not all individuals will eventually emigrate the overall stock of human capital in the sending countries may increase (Adams and Richard 2003, Beine et al 2001, Mountford 1997). Beine et al (2001, 2002, 2008) consistently find a significant positive effect of emigration on human capital formation (brain gain), albeit the size varies across countries. For example, brain gain is obtained in large countries (China, India, Brazil, Bangladesh) combining low levels of human capital with very low skilled emigration rates. However, it is also criticized that the brains may drain faster than they can be regenerated or that the newly acquired skills are more targeted towards the needs of receiving rather than sending countries (Lowell 2002a, Martin 2003b, Docquier, Faye and Pestieau 2008).

Labor market impacts are usually measured as income and employment effects. The effect on income for sending countries is usually seen as negative because the return to human capital, and also physical capital, is higher than that of (low skilled) labor; thus, the terms of trade of poorer sending countries that specialize in labor intensive sectors deteriorate. Further, income inequality increases as human capital becomes scarce in sending countries (Wolburg 2001, Lowell and Findlay 2002).

However, in empirical studies the effects on income and its distribution are found to be less severe. Adams and Page (2005) find, in fact, that the impact on income has a shape of an inverted U-curve and, while inequality increases slightly with migration, a 10% increase in the share of international migrants in a country's population is correlated with a 2.1% decline in the share of people living in poverty. Remittances may also be a reason why inequality increases because it is usually the better off who are able to afford migration in the first place and whose families subsequently benefit from remittances.⁶

⁵ Recent reports summarizing the effects of migration and highly skilled migration in particular have been conducted by the OECD (2007a, 2007b)

⁶ It is more likely that migrants send remittances to close family member (see Avato et al. 2006).

Over time however, networks of migrants in host countries will lower migration cost and thus reduce inequality (McKenzie and Rapoport 2004).

For receiving countries opinions are divided. Followers of Borjas (1999c, 2003, 2005) find that immigration, high and low skilled, decreases native wages and employment in host countries (Borjas, Freeman and Katz 1997, Filer 1992). On the other hand, Card and others point out that the effects should not be over-rated and wage effects would be moderate at most (Butcher and Card 1991, 2005, Card 1990, 2001, Hunt 1992).

Opinions are also divided on the relationship between international migration and unemployment. Bhagwati and Hamada (1974) initially point out that unemployment in sending countries may decrease, but migration prospects would stimulate too many to obtain education, which may increase unemployment in the long run. Schiff (1995), however, emphasized that the gains from relieving unemployment pressures in origin countries are greater. Also, recent studies see the overstimulation as a positive effect of emigration (see above). There are only few empirical studies looking at this issue and the evidence is inconclusive. Gosh (1996) for example finds a decrease of the unemployment rate from 6,5 to 5,5 % for the Republic of Korea between 1978 and 1991 due to migration.

For receiving countries the effect on employment depends on whether the immigrants complement or substitute native workers. A study by Angrist and Kugler (2003) finds that for the EU15 the effect of immigration on employment is more negative in countries with “rigid” institutions protecting the labor market. Muenz et al. (2007) find that immigrants mostly complement native workers.

The employment effect in host countries directly relates to effects on the welfare system and many host countries with relatively well-developed welfare systems are weary of the potential effects of migrants. Generally, there is evidence that immigrants make slightly more use of social assistance programs and tend to be less employed than the native born population (Borjas and Hilton 1995, Borjas 1999c, 1995). However, this is partly due to a higher proportion of immigrants being poor and relatively low-skilled. Highly skilled immigrants may be less likely to become a burden to host country welfare systems as they are more likely to be in employment (Research Perspective on Migration

1996, OECD 2008). In fact, especially if they have some education attained in the host country, their employment rates converge towards that of natives (OECD 2007b). The tax revenue from skilled immigrants for the government is thus likely to be higher than for low skilled immigrants.

Despite the favorable employment situation for skilled migrants one critical issue has recently drawn much attention—the so-called brain waste. That is the employment of skilled immigrants in occupations much below their skills due to failure of skill recognition or knowledge of foreign skills (Kapur and McHale 2005). For example a recent report of the Migration Policy Institute (Batalova et al. 2008) found that more than 1.3 million college-educated immigrants, i.e. one out of five skilled immigrants in the US labor force, are unemployed or working in unskilled jobs. Mattoo et al. (2008) find that this brain waste varies by country of origin and that it is particularly acute for certain specific sending countries.⁷ In general the immigrants from Eastern Europe, Latin America and the Middle East are less likely to end up in skilled jobs in the US labor market than immigrants from Western Europe. The reasons for brain waste often lie in country of origin characteristics that affect the quality and transferability of human capital of the immigrants such as education and language skills. Thus, a difference in the recognition of international degrees and the (perceived) applicability of skills acquired abroad to the US labor market

Related to welfare concerns and competition in the labor market are concerns about social integration. Anti-immigrant feelings and racist behavior tend to be geared more towards lower skilled immigrants (Bruecker et al. 2001). More generally, independent from economic demands for certain skills, it is usually easier politically to favor skilled immigration due to an easier economic and social integration of highly skilled laborers in the host society (OECD 2008).

As much as receiving countries may fiscally benefit, or at least not lose, from highly skilled migrants versus low skilled migrants, the effects on sending countries can

⁷ For example a Moroccan immigrant with a Bachelors degree who arrived in 1990s has a probability of 30% of obtaining a skilled job in the US labor market, while this probability reaches 69% for similarly educated immigrants from India and South Africa.

be significantly negative due to fiscal losses with respect to income taxes and education expenditures. Desai et al. (2009) estimate that the forgone tax revenue of the roughly 1 million Indian-born residents in the US ranged from 0.24% to 0.58% of Indian GDP in 2001. Further, Griffin and McKinley (1994) estimated that the education of the 90,000 highly skilled migrants who entered the US in 1990 may have originally cost their countries of origin US\$ 642 million. Such fiscal losses are even more critical when the above brain waste considerations are taken into account.

Finally, there may be sector specific impacts, in particular, if certain professions migrate in large numbers. In the brain drain literature especially the medical sector has been identified as such a vulnerable sector, which greatly suffers of a brain drain from poor to rich countries. Some smaller countries such as Grenada, Dominica, St. Lucia or Cape Verde have lost far more than half of the physicians trained in the country to emigration (World Bank 2008). Moreover, Docquier and Bhargava (2008) show that lower wages and higher HIV prevalence rates are strongly associated with the brain drain of physicians from Sub-Saharan African to OECD countries. In fact, where the HIV prevalence rate exceeds³ percent, adult deaths from AIDS are estimated to increase by 20 percent if the medical brain drain doubled.⁸

Summing up, the immediate and static impacts of skilled migration are likely to be detrimental for sending countries especially if emigration leaves the country with a shrinking, or stagnating, level of human capital. The impact for receiving countries is more neutral and is likely to be beneficial in many situations.

2.2 Dynamics in Skilled Migration:

As migration is a dynamic process composed by a chain of events or actions it is not enough to analyze the direct impacts of skilled migration. To the contrary, it is necessary to study determinants of migration that shape the composition of migrants flows on the one hand, and on the other hand the dynamic mechanisms that are triggered by migrants in the medium and long term. The latter have fueled many studies looking at characteristics that may offset or compensate negative brain drain effects.

⁸ Nevertheless, the generally low quality of public health provision in many African countries cannot generally and directly be related to the emigration of nurses and physicians (Clemens 2008).

2.2.1 Determinants of Migration

A large body of theoretical literature simulates the dynamics of migration with models of factor mobility and international trade. The central question treated by this theoretical literature has been if labor mobility is a complement or substitute to international trade. Such analysis started with a standard Heckscher-Ohlin model with factor price equalization in the steady state and eventual substitutability of labor and trade flows (Mundell 1957). However, this model was soon challenged by other models that relaxed the underlying assumptions of factor endowments, cost of mobility, economies of scale and technologies. These models such as the Ricardo-Viner model, specific factor models and models describing agglomerative forces, rather confirmed complementarities between migration and trade (Schiff 1996, Faini et al. 1999, Venables 1999, Krugman 1991). Empirically, however, the relationship remains unclear, hinting at the limitations of modeling such a complex and multivariate issue (Kugler and Rapoport 2007, Ranis 2007).

Within the setting of factor mobility, the process of highly skilled migration can lead to a vicious cycle of emigration tendencies being reinforced by the growing wage difference between sending and receiving countries because of externalities and network effects from human capital, e.g. under the assumption of productivity, and hence the wage of qualified work, increasing with the number of qualified persons (Wolburg 2001). Also, increasing returns to scale may increase incentives for skilled workers to follow others who have left their home country already, and countries may need a minimum critical mass of high skilled people in order to attract more (Markusen 1988, Ellerman 2003). Studies suggest that there is a negative correlation between a country's resources devoted to science and technology (S&T) and the emigration of scientists and knowledge creation tends to be geographically concentrated (Solimano 2002; Lowell 2002a).

With respect to factors that determine migration, studies usually distinguish between push and pull factors and network effects (Martin 2003a). Also, a distinction between economic and non-economic determinants is common. Economic determinants mainly refer to the differences among sending and receiving countries in terms of per capita incomes and GDP, return to skills, the composition of industry-, service-, and traditional sectors, unemployment and, more generally, the difference in opportunities

between the respective countries. Non-economic determinants refer for example to differences in security and human rights enforcement and geographic, language and historic proximities (Massey et al. 1993, Mayda 2005, 2007, Borjas 1999a, Clark et al 2002). With respect to the brain drain in particular, Docquier et al. (2007) find among other things that a brain drain is stronger in smaller less developed countries with low average schooling. Also, they confirm that countries with selective immigration policies contribute over-proportionally to a brain drain (measured as schooling gap, or difference, between emigrant and native population) by facilitating skilled migration while restricting the immigration of lower skilled migrants. Finally, networks influence migration patterns as they establish links between respective countries and reduce migration costs (Carrington et al. 1996, Pedersen et al. 2008, McKenzie and Rapoport 2007, Beine et al. 2009, Munshi 2003).

The question is consequently how migrants with different individual characteristics react to these determinants. In the context of skilled migration, individual characteristics that relate to human capital are of particular interest, i.e. whether there are positive or negative selection effects that drive migration.

2.2.2 Selection of Migration

This topic has been subject to many discussions and there is evidence for selection effects differing across the particular country pairs involved. Most importantly, Borjas (1987, 1991, 1999a) argues that a more unequal income distribution in the sending country leads to an adverse skill mix of migrants, thus, negative selection. This view is widely challenged; and Chiswick (1978, 1999, 2000) in particular, points out that positive selection can be expected—a higher income inequality in the sending country would only attenuate positive self-selection (see also Chicquiar and Hanson 2002, Jasso and Rosenzweig 1990, Liebig and Souza-Poza 2004). Other studies also come up with positive (Mora and Taylor 2005, Taylor et al. 2003, Adams 2005) or intermediate selection (Chiquiar and Hanson 2005, Orrenious and Zavodny 2005). Overall, the underlying selection in the migration decision is ambiguous and likely different with respect to specific sending and receiving countries as well as to motives of migration. Also, it should be noted that selection can occur in observable characteristics (e.g. education) and unobservable characteristics (e.g. ability).

Additionally when considering the composition of migrants in terms of their skills, selection in return migration must also be taken into account; thus, whether people with higher or lower skills are more likely to return home. Findings in this respect vary extensively and range from no selection (Chiswick 1978, Reagan and Olson 2000, Constant and Massey 2003) to positive selection (Jasso and Rosenzweig 1988, Barrett and Trace 1998) or negative selection (Borjas 1989, Massey 1987, Lindstrom and Massey 1987, Bauer and Gang 1998). Return selectivity likely also depends on the selection of initial immigration. According to Borjas and Bratsberg (1994) and Ramos (1992), if positively selected initially, return migrants tend to be the worst of the best and, if negatively selected, the best of the worst. Also, Stark (1996) claims that asymmetric information in host labor markets concerning the quality of education may lead to an adverse skill composition in the sending country's population because workers with lower abilities are more likely to return home.⁹

Overall it is important to keep in mind that immigrants can be selected in terms of who intends to migrate (self-selection) and in terms of who actually does so, and finally overcomes migration barriers such as travel costs and immigration policies (out-selection). Thus, actual migrants are in a way “double-selected” (Borjas 1999b). Moreover, given that skilled people do emigrate from their home country, the distribution of migrants across potential destinations also becomes relevant—particularly from the perspective of receiving countries who try to attract the best and brightest.

Many countries such as Canada and Australia have had selective immigration systems over many years which aim at reinforcing out-selection among the potential migrants. Further, major immigration countries like the US and most recently EU countries that traditionally had large family reunification schemes have also started adopting selective migration policies. International competition for skilled labor is strong particularly in wealthy developed countries. The fear is that the economies will fall behind quickly without continuous improvement of technologies that require very specific skills and personnel with strong experience in science and engineering (S&E). The demand for skilled personnel has consequently increased and often the education

⁹ Also see Katz and Stark (1987).

systems and subsequent trainings are not able to produce enough workers. Especially popular in terms of selective migration policies have been the so-called point systems, which select migrants with respect to education, occupation, professional experience, language and age. They can also be designed rather flexibly to respond to the needs of employers (Papademetriou 2007).

There are several prominent examples of this trend of recent extensions of selective migration policies. For example, Canada targeted skilled workers from China, India, Pakistan, the Philippines and South Korea, and increased the intake of skilled immigrants from these countries by 4.4% in 2002 (reference?). Also Australia's Migration 2001 program has been designed to attract 76,000 skilled migrants who qualify according to their education and talent (Lowell, 2002b). After the Immigration Act of 1990, the US introduced visas for immigrants with academic degrees or specific professional skills (H-1B and also O-1 visas) and the quotas for these visas have been raised many times over the past years.¹⁰ Most recently, New Zealand gave special exemption from passing the point system for immigrants who would invest in the country. In the EU, especially the UK, Ireland, France and Germany have started to develop preference schemes for certain skills, particularly in information technologies. Many of these countries have managed to attract a high number of skilled workers over the last decades.

Interestingly, and despite the wide implementation of selective immigration policies, this migration barrier has not explicitly been studied except by the work of Aydemir (2003). This is partly because data often does not allow distinguishing which part of the selection can be attributed to immigration policies. Thus, it is unclear if and under what circumstances such policies are effective. This work will contribute to filling this knowledge gap.

While the selective immigration policies certainly aim at influencing the selection of migrants through policies, there are other factors that clearly play a role in the decision

¹⁰ Interesting in this context is that in the recently passed amendment to the federal stimulus bill, companies participating in the Troubled Assets Relief Program will face more restrictions in hiring specialists via the H-1B visa program (The Harvard Crimson, March 4th 2009).

of migrants to choose a particular country. For educated migrants, the skill premium in the host country is among the top factors in this destination choice, which is likely to be followed by other favorable aspects such as tax considerations and political environment (Grogger and Hanson 2008, Belot and Hatton 2008, Bruecker and Defoort 2007). Also, migration networks play a major role in destination choice as they tend to lower migration costs for migrants following their peers. In this regard studies also found that this migrant cost reduction benefits lower-income individuals disproportionately, thus networks reinforce existing migration patterns and lower the “quality” of migrants (McKenzie and Rapoport 2006, 2007, Beine et al. 2009, Munshi 2003, Orrenius and Zavodny 2005, Petersen et al. 2008).

To sum up the selection of migrants is determined by various factors in sending and receiving countries and it is heterogeneous across migration flows. Policy makers are trying to influence the composition of migrants; it is unclear however, to what extent this is possible. The next part will move on reviewing migration dynamics that occur after initial migration.

2.2.3 The Feedback Effects

When looking at migration dynamics, it is important to consider effects that follow migration—not as an immediate impact but as subsequent continuous processes. In the migration literature these are often associated with the brain drain and refer to the feedback effects; effects related to remittances, return migration and diaspora externalities (FDI, trade and technology transfer) that could potentially compensate for lost human capital.

Remittance flows have become huge over the last decades, totaling more than US\$ 300 billion in 2007, with the US being by far the largest sender. India, China, Mexico and the Philippines alone received almost US\$ 100 billion in 2007. In countries like Tajikistan, Moldova and Tonga remittance amounted to over a third of the GDP in 2007 (World Bank 2008). There is a large body of literature looking into the motives of remitting that distinguishes mainly between altruistic versus contractual or ‘self-interest’ motives and numerous studies that search evidence on remittance flows and their impacts (Altonji et al 1992, Agarwal and Horowitz 2002, Vanwey 2004, Stark 1999, Lucas and Stark 1988, Massey and Basem 1992, Docquier and Rapoport 2005). Overall, studies

confirm that remittance flows have been rather stable over time and that they have a poverty reducing effect (Adams and Page 2005, Lowell and Findlay 2002, Martin 2004, Wickramasedara 2003). However, the effects of dependency on resources from outside and the questionable productive use of remittances are often debated. For example, Chami et al. (2007) find an inverse relation between a ratio of remittances to GDP and, government effectiveness, control of corruption and rule of law. Therefore, it is generally very difficult to assess in how far remittances of highly skilled can compensate for brain drain losses and the literature is inconclusive on this issue.

Further among the feedback effects is return migration. The underlying idea is that migrants return with capital and new skills to their home country and use these resources productively, for example to start a new business. The gains from return are likely to depend on the reason and timing of return (Dustmann and Kirchkamp 2002, Mesnard and Ravallion 2001, Carrion-Flores 2007). In order for the positive effects to unfold, migrants must be in a favorable position to return and see opportunities to improve their situation in their home country (Stark 1996). However, they may also return for retirement or when failing in the host country—which is likely to generate fewer benefits to the return country.

Data on return migration is scarce and not comparable because return migrants are usually not tracked by official statistics. Recent studies distinguish between return migration (going home) and secondary migration (going to a third country) with the latter being much smaller than the former. The OECD (2008) reports re-emigration rates (which includes return and secondary migration) for selected countries in the 1990s ranging from about 20 percent for the US, over 40 percent for the UK to 60 percent for Ireland for immigrants who had stayed abroad for 5 years. Miller (1998) estimated that about 23,000 workers with higher education have followed the call of the Taiwanese industry and returned to Taiwan in the five- year period from 1990 to the end of 1994. In fact, returnees from the US started half of all the businesses emerging from the scientific park in Taipei, the Hsinchu (the Taiwanese equivalent to Silicon Valley) (Solimano 2002).

Very important are also diaspora externalities. The diaspora is likely to have a

stronger interest in engaging in business activities with its respective home countries. The emigrants might be willing to take more risks and to invest, and know better about the local situation in their home countries, consequently they are well suited to establish business links, act as intermediaries between firms of each country and bring new technologies to their home countries (Kapur 2001). Also, they may create intensified trade and tourism links between the countries (Orozco 2005) and scientific networks that link to the home countries (Brown 2000).

Further there is a growing body of literature that looks at the link of skilled migration, FDI and transnational corporations (TNCs), which is likely to also benefit the sending countries. Findings suggest that TNCs are an efficient channel for skilled migration and that not only trade but also FDI complements migration flows (Globerman and Shapiro 2008, Docquier and Lodigiani 2007). Kugler and Rapoport (2007) find that current skilled migration flows are negatively correlated to FDI but past skilled migration increases FDI. Buch et al. (2003) finds a relatively strong link between German migrant and FDI stocks abroad. In fact, Mahroum (1999) points out that personnel sent abroad often turns into permanent migration indicating again complementarities between FDI and migration. From the above literature it seems likely that the diaspora fosters backflows of resources, technology and eventually also personnel.¹¹

In this context there is one diaspora externality that has been disregarded in migration literature. This refers to diasporas inducing not only subsequent migration but also counter-migration flows.¹² It could be that the diaspora tightens the link between sending and receiving countries and reveals opportunities in the home country that have previously not been evident or accessible to their host country residents and the latter are more likely to move the diaspora's home. This gap in literature will be addressed in this work as networks are one important factor driving migration that likely has the potential to over-ride any political efforts to positively select migrants. Overall, it is impossible to numerically quantify the gains from feedback effects and to what extent they compensate

¹¹ Note that above mentioned network effects, which tend to induce further migration (multiplier effect), are also part of diaspora externalities, but not part of feedback effects.

¹² Ravenstein (1985) contemplated such effect as one of his laws on migration, but the law was never tested partly due to the lack of suitable data on international migrants.

for the disadvantaged position of poor sending countries. However, the diaspora is likely to bear great potential and surely constitutes a valuable resource for sending countries.

Summing up, the above review presented the literature of skilled migration in the broader context of migration. It showed how the skills of migrants constitute a critical part in the migration process and the debate led in sending and receiving countries. The next section will consequently focus on the debate led in the EU. As mentioned earlier this region is particularly interesting when it come to migration patterns as it experiences both, immigration and emigration of skilled labor in large numbers. The governments of the member states became very anxious to improve migration management towards a more favorable skill composition of immigrants and to reduce the drain of many skilled Europeans, particularly to the US.

3 HIGHLY SKILLED MIGRATION AND THE EU

The EU has become an important player in the debate of international migration in general and highly skilled migration in particular.¹³ According to data of the UN, the stock of immigrants in the EU27 has reached 40 million people in 2005 (roughly 20 percent of world migrants) compared to 11 million in 1960. The debate in the EU is somehow different to the one led in other major receiving countries mainly for two reasons. First, the EU is destination to relatively lower skilled migrants compared to other traditional host countries (Australia, US, Canada, New Zealand). Second, despite having a net gain of immigrants it suffers from a brain drain to these other traditional host countries.

The data to demonstrate these characteristics has only recently been collected and is presented in this form here for the first time. It includes immigrants, 25 years old and older, in OECD countries plus EU-non-OECD countries.¹⁴ While the numbers for the OECD countries that were collected by Docquier and Marfouk have already been published and used in several studies (e.g., Docquier and Marfouk 2006a, Docquier, Lowell and Marfouk 2009), the numbers for EU-non-OECD countries as well as EU

¹³Note that in the following the EU will sometimes have definitions such as EU15 and EU25, EU27 and others. This will be used if the information given only refers to a certain number of EU countries, e.g., with or without new member countries, because the information was not available for all countries.

¹⁴The reason of the age restriction is to exclude students who only migrated for the purpose of studies.

candidate countries Croatia and Macedonia are presented here for the first time.¹⁵ The dataset is based on information from receiving countries' national statistics, where information about the country of birth, age and educational attainment of the immigrants is available. Three levels of schooling were considered: immigrants with primary education (low- skilled: including lower-secondary, primary and no school); those with high school diploma (medium-skilled), and those with tertiary education (high-skilled).

3.1 *The composition of immigration to and emigration from the EU*

The difference in the skill composition of immigrants compared to other major immigration countries is demonstrated in Table 1, which shows the immigrant stocks in 2000, total and skilled, and puts these numbers in relation to the population size of the receiving countries (first 3 columns). The numbers show that the EU27 countries hosted 22,5 million immigrants in total in 2000 of whom 22 percent were highly skilled. Migrants make up 6 percent of the EU27's total population, while highly-skilled immigrants account for 1 percent. Comparing the EU15 ("old" EU member states) with the EU12 ("new EU member states as of 2007), the number of immigrants in the EU15 corresponds to 7 percent of the population and in the EU12 to only 2 percent. Also, the selection rate (share of skilled immigrants of all immigrants in column 4) was lower in the EU12 than in the EU15 (18 versus 22 percent). The US in contrast had received 29 million immigrants until 2000 of which 45 percent were highly skilled. Thus, the US hosted a number of total immigrants comparable to 14 percent of its population and to 6 percent for the highly skilled immigrants.

¹⁵ The two mentioned researchers and the author have jointly extended the dataset for the purpose of analyzing EU countries including all 27 countries.

Table 1 Immigrant composition by receiving country

Receiving Country	Total stocks in thousands - 2000				Share from OECD/EU27 - 2000		
	Pop 25+ (1)	Total immigrants (2)	Skilled immigrants (3)	Selection (4)	Pop 25+ (5)	Total immigrants (6)	Skilled immigrants (7)
N. America	204369	29002	13134	45%	25%	48%	63%
Canada	20805	4635	2724	59%	3%	8%	13%
USA	183564	24366	10410	43%	22%	41%	50%
EU27	393030	22528	4917	22%	47%	38%	24%
EU15	267448	20009	4466	22%	32%	33%	21%
Austria	5802	816	103	13%	1%	1%	0%
Belgium	7233	917	181	20%	1%	2%	1%
Denmark	3748	229	40	17%	0%	0%	0%
Finland	3580	91	22	24%	0%	0%	0%
France	40418	3710	609	16%	5%	6%	3%
Germany	60269	4689	1021	22%	7%	8%	5%
Greece	7750	432	65	15%	1%	1%	0%
Ireland	2309	281	116	41%	0%	0%	1%
Italy	42627	924	143	15%	5%	2%	1%
Luxembourg	303	100	22	22%	0%	0%	0%
Netherlands	11109	1793	394	22%	1%	3%	2%
Portugal	6889	148	27	19%	1%	0%	0%
Spain	28839	1586	294	19%	3%	3%	1%
Sweden	6219	762	196	26%	1%	1%	1%
U. Kingdom	40353	3530	1234	35%	5%	6%	6%
EU 12	125582	2518	452	18%	15%	4%	2%
Bulgaria	5605	77	26	34%	1%	0%	0%
Cyprus	672	43	17	40%	0%	0%	0%
Czech Republic	7465	410	47	11%	1%	1%	0%
Estonia	7901	233	73	31%	1%	0%	0%
Hungary	7270	108	13	12%	1%	0%	0%
Latvia	3644	411	69	17%	0%	1%	0%
Lithuania	3927	204	43	21%	0%	0%	0%
Malta	2558	19	9	45%	0%	0%	0%
Poland	24771	742	103	14%	3%	1%	0%
Romania	39037	78	28	36%	5%	0%	0%
Slovakia	17935	154	18	12%	2%	0%	0%
Slovenia	4797	39	6	15%	1%	0%	0%
Rest OECD	233969	8310	2754	33%	28%	14%	13%
Australia	12521	4076	1641	40%	2%	7%	8%
Total	831368	59839	20806	35%	100%	100%	100%

Note: Selection=share of skilled immigrants of total immigrants

Source: Author's data collection with Docquier and Marfouk (2006) and UN Population Database.

The table further shows the share of immigrants that each receiving country hosted of all immigrants coming to the OECD/EU27 (column 5-7). Notably, the US alone hosts 41 percent of all immigrants going to these high-income countries and even 50 percent (in 2000) of all skilled immigrants, while being home to only 22 percent of the

OECD/EU27 population (over age 24). All EU27 countries together only host 38 percent of all, and 24 percent of highly skilled immigrants. For the EU15 the numbers are not much different, the EU15 hosts 33 percent of total and 21 percent of highly skilled immigrant stocks. 47 percent of the OECD/EU27 population (25+), however, lives in the EU27 countries.

Among the EU15 countries Ireland and the UK have the highest selection rates—41 and 35 percent—and Austria and Italy the lowest—13 and 15 percent. Some EU12 countries have notably high selection rates. These are Malta, Cyprus, Romania and Bulgaria. Still, their total immigrant stocks are relatively small and so is the proportion of immigrants compared to the population (except in Cyprus).

For the EU it is particularly important to take a comparative look at the regions or countries of origin that migrants in receiving countries come from. Table 2 accordingly presents highly skilled immigrants by sending region (columns) and receiving regions or countries (row). Within this pattern the first row for each destination presents the number of skilled immigrants from a certain region. The second row shows the share of this number of all skilled immigrants from that region; and the third row shows the selection rate by origin region, that is the proportion of skilled immigrants of all immigrants. The regions of origin are total OECD; EU15 and EU12; Africa; Asia, Middle East and Eastern Europe (except OECD countries); and Latin America (except Mexico). The table reveals several interesting aspects:

First, it is confirmed that North America receives a much higher proportion of highly skilled immigrants than the EU, both in terms of its selection and in terms of the share that it attracts from all highly skilled immigrants (except for immigrants from Africa). Second, it reveals that there are actually very high numbers of skilled migrants who have moved from the EU15 and EU12 to the US. The selection for both origin regions is 52 percent and 54 percent. Moreover, roughly half of the highly skilled migrants from the EU go to North America. In fact, the skill composition of intra-EU migration is very low. The selection of EU15 migrants staying within the EU27 is in the low 20s (percent). In contrast, there is a higher selection for EU12 emigrants moving to the EU15, 27 percent, and a lower selection for intra EU12 mobility, 14 percent. In

addition, only roughly a third of EU27 highly skilled emigrants stay within the EU27—primarily in the EU15. The low mobility of people within the EU is a characteristic also shown in other studies (e.g. Peri 2005).

Table 2 Skilled migration by selected regions of origin and destination, 2000

Region of origin		Region of destination				Total
		North America	EU15	EU12	Rest OECD	
OECD	<i>Skilled immigrants</i>	5012493	2167319	103971	1458496	8742279
	<i>Regional share</i>	57%	25%	1%	17%	100%
	<i>Selection</i>	37%	22%	16%	35%	31%
EU15	<i>Skilled immigrants</i>	2217081	1401874	49086	927455	4599608
	<i>Regional share</i>	48%	30%	1%	20%	100%
	<i>Selection</i>	52%	22%	20%	32%	33%
EU12	<i>Skilled immigrants</i>	591434	365260	61269	166668	1190371
	<i>Regional share</i>	50%	31%	5%	14%	100%
	<i>Selection</i>	54%	27%	14%	27%	33%
Africa	<i>Skilled immigrants</i>	614425	659668	3901	131981	1410149
	<i>Regional share</i>	44%	47%	0%	9%	100%
	<i>Selection</i>	71%	20%	9%	55%	32%
Rest Asia/ M. East/ Eastern Europe	<i>Skilled immigrants</i>	5750617	1410118	314349	1157421	8708385
	<i>Regional share</i>	67%	16%	4%	13%	100%
	<i>Selection</i>	62%	21%	13%	38%	41%
Rest Lat. America	<i>Skilled immigrants</i>	3242209	328859	912	113043	3685323
	<i>Regional share</i>	88%	9%	0%	3%	100%
	<i>Selection</i>	26%	25%	35%	35%	26%

Note: Selection=share of skilled among the total immigrants

Regional share=share of skilled immigrants from the respective region of all skilled migrants originating from that region.

Source: Docquier and Marfouk (2006a) and author.

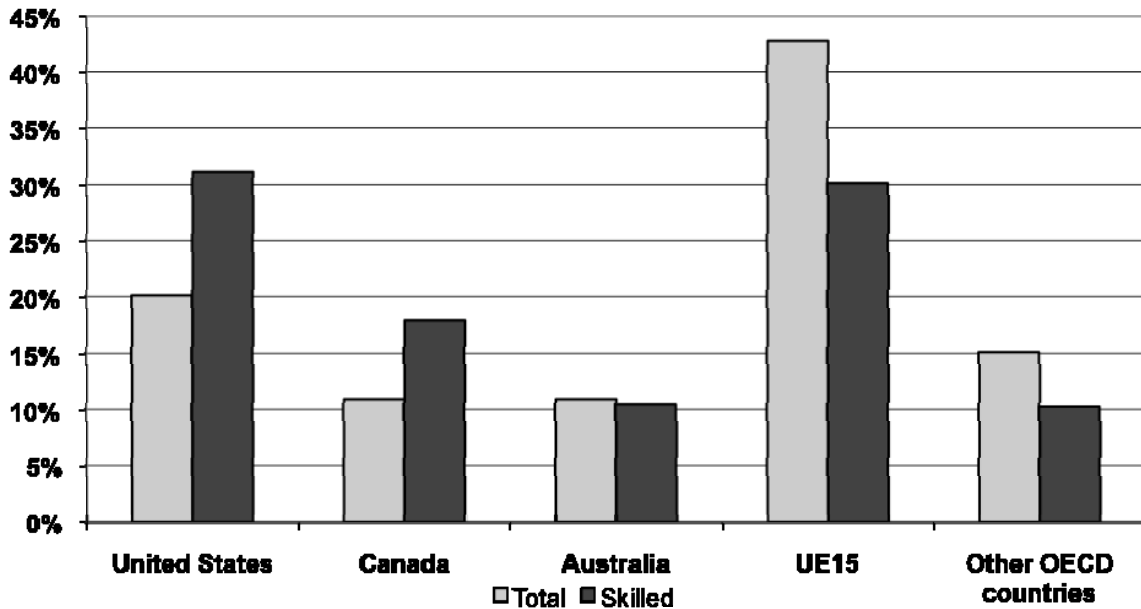
Third, the EU15 recruit a particularly high number of highly skilled immigrants from Africa. From all skilled Africans who emigrate, 47 percent go to the EU15—the EU12 receives practically no highly skilled migrants from Africa (North America receives 44 percent). This being said, the selection is comparatively unfavorable, 70 percent of African immigrants in North America are skilled compared to 20 percent in the EU15. Clearly, determinants like distance and humanitarian migration schemes contribute to the composition of these stocks.¹⁶ Finally, most skilled Asians and migrants from the Middle East, Eastern Europe and Latin Americans go to the US rather than to the EU27 (primarily EU15). The selection rate for Asians to North America is

¹⁶ Docquier, Lohest and Marfouk (2007) and Marfouk (2008) analyze the contribution of the EU to the African brain drain in great detail.

particularly high (62 percent) and for Latin Americans comparatively low across all destinations.

Figure 1 summarizes the choices immigrants from the EU27 make for their destinations and gives information about the major receiving countries, the US, Canada and Australia. The figure shows that more than 30 percent of skilled Europeans choose the US as destination and about 60 percent go to either the US, Canada or Australia. In contrast, the EU15 as a major recipient only receives about 30 percent of skilled immigrants while the share of total immigrants from the EU27 is 43 percent.

Figure 1 Destinations of emigrants from the EU27 by skill level, 2000



Source: Docquier, Lowell and Marfouk (2009) and author.

Given this composition of migrants stocks, what are the net gains or losses that the EU countries experience? Table 3 presents bilateral skilled migration stocks and the entries and exits of each EU country towards other countries or regions. With respect to intra EU mobility the table shows that the EU15 is clearly the winner compared to the new EU members. Still, the picture is very diverse across the different countries. Within the EU15 the two large countries UK and Germany are clearly the winners of intra-EU skilled mobility and Italy and Portugal the losers. Within the EU12 only the Czech Republic sends less highly skilled people than it receives from other members.

Overall, the EU has many countries, particularly among the EU15, which have a positive net gain of highly skilled immigrants. However, in total, and for EU15 and EU12 alike, the EU has more skilled EU born people abroad in other OECD countries than it receives from all over the world. While this net drain is relatively small (about 150 000) for the EU15, which is only 0.05 percent of its population, it is well above 600 000 for the EU12, corresponding to half a percent of its population (above 25). While the loss particularly for the EU15 might be considered as small, the pattern of outflows and inflows are quite striking. The net gain shows a negative balance with the traditional and more selective immigration countries—the US, Canada and Australia—across *all* EU countries.

Thus, the EU has a substantial amount of replacement migration at this skill level. It loses large numbers of skilled migrants to these three high-income countries while it attracts skilled migrants from all over the world. Still, these highly skilled immigration flows from all over the world do not entirely compensate for the emigration to the three mentioned countries only. This result emphasizes how precarious the situation of the EU in maintaining and increasing its human capital is compared to major competitors. It loses more skilled people than it receives and most importantly, it is questionable whether the skills of immigrants who often come from less developed countries truly replace the emigrants as they may face problems in the transferability of their skills to the EU labor market and may also come with a lower quality of education. This result requires to further explain potential reasons for the situation of the EU and to explore possible options that the EU has, to bring about change.

Table 3 Net Brain-Gain/Brain-Drain of the EU27, 2000

	Origin	Host														
		AUT	BEL	DEN	FIN	FRA	GER	GRE	IRE	IT	LUX	NET	POR	SP	SWE	UK
Intra EU	EU15	35902	88973	13973	6324	188583	306234	9323	76353	37909	17401	165870	10904	86600	62500	295025
	EU12	28757	8275	3443	7230	36683	149486	9744	2977	12155	542	11187	824	10150	24440	59367
Immigrants from	EU27	64659	97248	17416	13554	225266	455720	19067	79330	50064	17943	177057	11728	96750	86940	354392
Emigrants to	EU27	62286	75111	24977	45409	133685	307976	65124	115512	136397	5375	77862	72144	91939	28237	208926
Net gain:	EU27	2373	22137	-7561	-31855	91581	147744	-46057	-36182	-86333	12568	99195	-60416	4811	58703	145466
All Immigrants from	US	2363	3882	1595	535	15994	44401	2250	7612	6797	420	5322	681	7560	5400	65408
	CAN	413	1173	326	248	5571	4708	618	1681	997	118	1274	168	1100	810	31257
	AUS	292	317	138	97	1335	0	729	2081	668	41	1805	52	700	760	41665
	Other	33342	78612	19895	6109	360998	516035	42079	20917	84013	3228	208509	14866	181890	97730	740818
All Emigrants to	US	35509	21806	19990	13601	93769	387067	56518	71697	132333	1647	63054	37536	41139	31520	418794
	CAN	14535	11395	10950	7685	46830	111710	19315	14990	80600	250	65655	31845	5295	4625	365420
	AUS	6999	2405	3720	2724	9379	38440	18947	22801	28401	64	30259	2642	4052	3517	381348
	Other	11967	6893	8577	3842	36417	105345	6575	3529	23745	497	22041	2028	13538	13286	113477
Net gain towards:	US	-33146	-17924	-18395	-13066	-77775	-342666	-54268	-64085	-125536	-1227	-57732	-36855	-33579	-26120	-353386
	CAN	-14122	-10222	-10624	-7437	-41259	-107002	-18697	-13309	-79603	-132	-64381	-31677	-4195	-3815	-334163
	AUS	-6707	-2088	-3582	-2627	-8044	-38440	-18218	-20720	-27733	-23	-28454	-2590	-3352	-2757	-339683
	US, CAN, AUS	-53975	-30234	-32601	-23130	-127078	-488108	-91183	-98114	-232872	-1382	-150567	-71122	-41126	-32692	-1027232
	Other	21375	71719	11318	2267	324581	410690	35504	17388	60268	2731	186468	12838	168352	84444	627341
	All (incl EU)	-30227	63622	-28844	-52718	289084	70326	-101736	-116908	-258937	13917	135096	-118700	132037	110455	-254425

Source: Docquier, Lowell and Marfouk (2009) and author

To be CONTINUED on next page

CONTINUED	Origin	Host												EU15	EU12	EU27
		BUL	CYP	CZE	EST	HUN	LAT	LIT	MAL	POL	ROM	SLV	SLO			
Intra EU	EU15	5299	7463	3440	1065	2833	837	498	4251	12583	8589	223	2005	1401874	49086	1450960
	EU12	1540	1267	27651	1862	2115	2900	2824	429	16392	746	3294	249	365260	61269	426529
Immigrants from	EU27	6839	8730	31091	2927	4948	3737	3322	4680	28975	9335	3517	2254	1767134	110355	1877489
Emigrants to	EU27	27463	27145	28968	10822	34345	7753	21259	9853	149049	57123	39828	12921	1450960	426529	1877489
Net gain: All Immigrants from	EU27	-20624	-18415	2123	-7895	-29397	-4016	-17937	-5173	-120074	-47788	-36311	-10667	316174	-316174	0
All Emigrants to	US	1477	321	866	89	0	88	219	344	677	1629	54	82	170220	6082	182148
	CAN	238	79	165	36	0	24	12	549	139	0	14	59	50462	1449	53226
	AUS	63	73	46	5	0	24	4	763	86	0	4	43	50680	1349	53140
	Other	17745	7893	14297	69537	1346	64548	38869	2188	69816	16438	1160	15381	2409041	395442	3123701
	US	15366	5515	22056	5019	45788	15976	14739	2878	182300	59695	16690	4062	1425981	390084	2206149
Net gain towards:	CAN	5635	2260	11880	3765	27915	4430	3300	3495	92000	36260	6355	4055	791100	201350	1193800
	AUS	1409	5937	3915	1157	11133	3136	1340	6530	27241	6048	1600	1727	555698	71173	698044
	Other	64767	2804	4350	205	5367	430	217	431	7622	5694	2165	1443	371757	95495	562747
	US	-13889	-5194	-21190	-4930	-45788	-15888	-14520	-2534	-181623	-58066	-16636	-3980	-1255761	-384002	-2024001
	CAN	-5397	-2181	-11715	-3729	-27915	-4406	-3288	-2946	-91861	-36260	-6341	-3996	-740638	-199901	-1140574
All (incl EU)	AUS	-1346	-5864	-3869	-1152	-11133	-3112	-1336	-5767	-27155	-6048	-1596	-1684	-505018	-69824	-644904
	US, CAN, AUS	-20632	-13239	-36774	-9811	-84836	-23406	-19144	-11247	-300639	-100374	-24573	-9660	-2501417	-653727	-3809479
	Other	-47022	5089	9947	69332	-4021	64118	38652	1757	62194	10744	-1005	13938	2037284	299947	2560954
All (incl EU)		-88278	-26565	-24704	51626	-118254	36696	1571	-14663	-358519	-137418	-61889	-6389	-147959	-669954	-1248525

Source: Docquier, Lowell and Marfouk (2009) and author

3.2 *Why is the EU different?*

There are two main reasons why the situation in the EU regarding migration has developed into what was described above. The first is that the EU's investment in research and development (R&D) and its performance in science and engineering (S&E) has been lacking behind that of major competitors and the labor market environment for researchers and other highly skilled workers has been less appealing. The second regards its history of immigration which mainly allowed in migrants through family reunification, refugee and asylum seeker and guest worker schemes while other countries had point systems in place (Canada, Australia) or temporary worker schemes geared toward skilled people (US). Only recently have selective immigration policies gained momentum in the EU. The following section will explain these two components by first looking at the EU education system and labor market in R&D and then outlining the EU history of migration after World War II.

3.2.1 Research and Development (R&D) in the EU

Regarding the research environment, the EU education and labor market is subject to a striking paradox. The EU produces comparatively high numbers of graduates, particularly in the desired fields of S&E, but employs a comparatively low number of researchers. Data from the OECD show that of all graduates in the OECD countries, 39 percent graduate in the EU, 32 percent in the US and only 11 percent in Japan.¹⁷ Moreover, in 2002 the share of graduates in S&E of all graduates was 42 percent in the EU while the same share was 24 and 13 percent in the US and Japan. Further, the EU¹⁸ produced 50 percent of all doctoral degrees within the OECD and even 55 percent of the doctoral degrees in S&E (OECD 2005).

At the same time, the number of researchers in 2003 was 10.4 and 9.3 employed per 1000 working people in the US and Japan respectively, and only 5.8 per 1000 in the EU25 and 6.1 per 1000 in the EU15. This deficit in employment of researchers grows even further for researchers employed in enterprises with 3.2 researchers per 1000

¹⁷ The US and Japan were chosen as comparison group for R&D capacities to compare to the major knowledge based economies. As explained above, the US is also the major competitor in skilled immigration and the main cause of concern with respect to the European brain drain.

¹⁸ Countries that are member of the EU and of the OECD.

workers for the EU15 and 2.8 for the EU25 compared to 7 in Japan and 7.5 in the US (OECD 2005, 2006). Moreover, the European Commission noted in a memo that, compared to the US and Canada, the EU employs much less skilled foreigners, 1.7 percent of the total employed population versus 3.2 (US) and 7.3 (Canada) percent (EU 2007a). This shows that the EU labor market for researchers is much less developed than the one in the US and Japan and that researchers may see better opportunities elsewhere.

Many Europeans also graduate from US universities while only few Americans graduate from EU universities. The US has almost 600 000 foreign students of whom almost 60,000 come from the EU27, led by Germany, the UK and France, as well as Bulgaria and Romania from the new members (OECD 2006a). According to the Science and Engineering Indicators of the National Science Foundation (2006), the US hosted about 333 300 graduates in the field of S&E in 2003, who came from six European countries (the majority from UK, Germany and Poland). Further, foreign nationals constitute more than a third of doctorates in S&E and more than half of doctorates in information technologies. Many remain in the US, the stay rate of graduates 5 years after graduation is estimated to be as high as 70 percent in certain S&E fields (NSF 2006). The effect of such numbers of foreign students and graduates should not be underestimated. A recent study by Chellaraj et al. (2006) showed that in the US an increase in the number of foreign students is associated with a significant increase in patent applications, and university as well as non-university grants. Further, the Institute of International Education (IIE) found that one third of Nobel laureates from the US are immigrants and that there are 62 patent applications for every 100 foreign PhD graduates in S&E (IIE 2006). Further, according to NAFSA, the Association of International Educators, foreign students and their dependents contributed more than \$13 billion to the US economy in 2004-05 (NAFSA 2006).¹⁹

So why do so many European graduates in S&E find the US labor market much more appealing? Comparing the numbers in R&D investment highlights one of the major answers as they clearly show that the EU is lacking behind compared to nations such as

¹⁹ Borjas (2005), however, also finds that a 10 percent increase in the supply of doctorates lowers the wage of competing workers by about 3 percent, which doesn't speak against the overall welfare gain of additional doctorates but out that the topic is may also demand some adjustment cost.

the US and Japan (see Avato and Marfouk 2007). During the period of 1995 to 2006 the R&D expenditures grew by 34 percent in the US, 19 percent in Japan and 30 percent in the EU25, which corresponds to annual growth rates of 3.8, 2.2 and 3.3 percent. Table 5 shows the numbers in more detail and particularly the deficit of the EU towards the US. From 1995 to 2003 this deficit in R&D investment has steadily increased (see last two columns).

Table 4 Gross Expenditure on R&D (GERD) 1995-2006, in million (2000 dollars, constant prices and PPP)

Year	OECD	EU27	EU15	Canada	US	Japan	Gap: EU27 and the US	Gap: EU15 and the US
1995	478,643	151,496	144,885	12,099	199,884	90,253	48,389	54,999
1996	500,052	154,209	147,587	11,960	210,765	89,174	56,555	63,177
1997	523,040	158,689	151,748	12,520	222,936	92,644	64,247	71,187
1998	543,177	164,420	157,431	13,822	235,231	94,965	70,811	77,800
1999	572,281	174,207	167,128	14,891	250,901	95,339	76,693	83,772
2000	607,196	183,342	175,939	16,688	268,121	98,774	84,779	92,182
2001	625,683	189,645	181,875	18,548	271,694	101,562	82,049	89,819
2002	627,492	193,025	185,226	18,665	265,896	103,214	72,870	80,669
2003	640,641	194,533	186,544	18,919	272,253	105,780	77,720	85,709
2004	652,666	196,705	188,204	19,699	274,793	107,608	78,088	86,589
2005	682,363	202,089	192,596	19,937	286,465	115,087	84,376	93,869
2006	713,631	212,410	201,761	19,736	298,794	120,368	86,384	97,032

Note: Gap=US – EU27 (or EU15)

Source: OECD, Main Science and Technology Indicators, October 2008.

In terms of expenses as a percentage of GDP the EU25 spend 1.9 percent compared to 3.2 and 2.6 in Japan and the US. Thus, the EU is far from its Lisbon strategy goal to reach 3 percent by 2010. The European Commission (EC 2003) pointed out that the European brain drain to the United States is the main source of the deficit of the EU in terms R&D and has estimated that only for the EU15 it would take 550 000 to 835 000 new researchers to reach the Lisbon goal.

Moreover, the research environment seems to be much more productive and likely stimulating in the US compared to other countries. Table 5 shows that the output of scientific articles of the US is almost as high as the output from the entire EU27 which has obviously a much larger population (years 2005 and 1995). The US produced almost a third (28.9 percent) of scientific articles in the world in 2005.

Table 5 Scientific articles per million population, 2005

	2005	1995	Country share in total world scientific articles, 2005	Country share in total world scientific articles, 1995
OECD	493.3	450.4	81.4	86.9
EU27	477.4	410.3	33.1	34.7
United States	691.4	725.2	28.9	34.2
Japan	434.1	375.2	7.8	8.3
United Kingdom	756.8	784.1	6.4	8.1
Germany	535.3	461.0	6.2	6.7
China	31.8	7.5	5.9	1.6
France	482.5	485.5	4.3	5.1
Italy	420.5	314.5	3.5	3.2
India	13.3	10.3	2.1	1.7
New Zealand	727.4	664.3	0.4	0.4

Source: OECD, Main Science and Technology Indicators, October 2008.

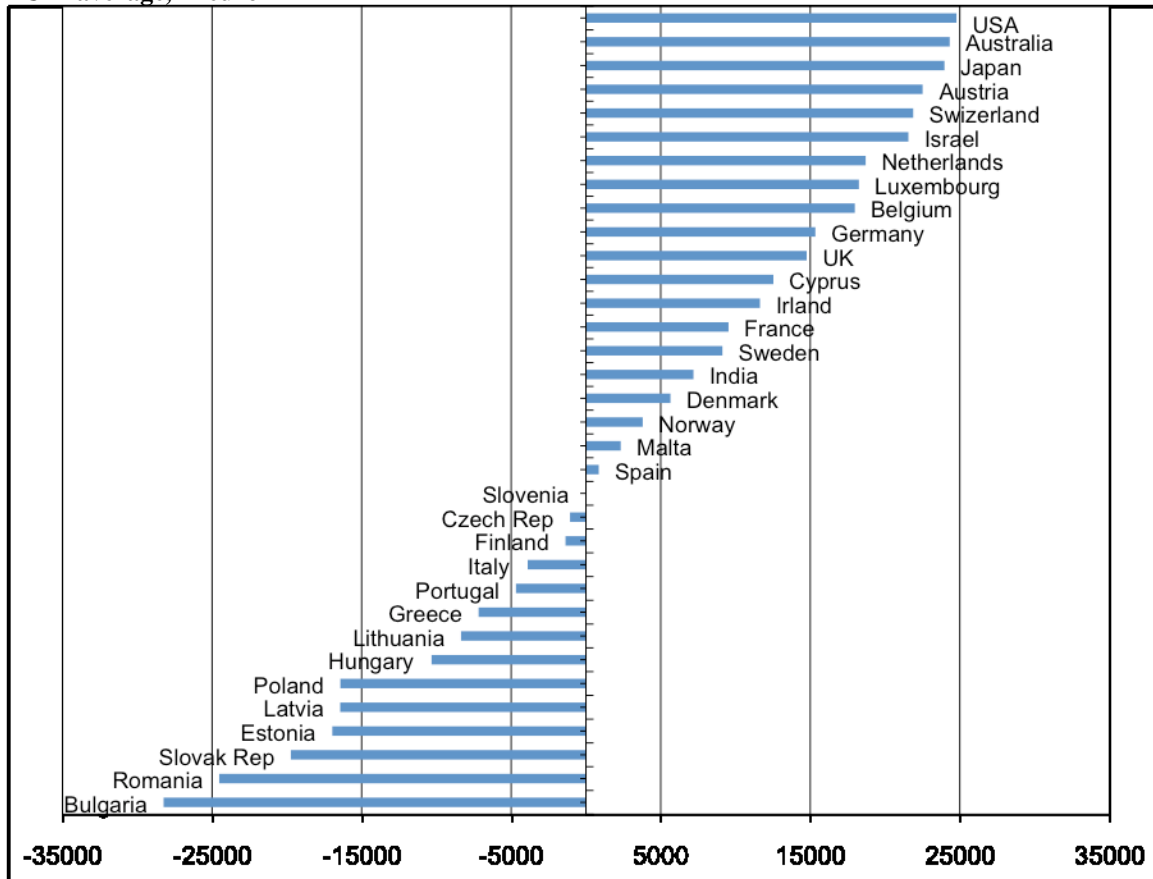
In addition to the R&D environment, there are other reasons why the US and other countries are more attractive. These reasons refer to differences in salaries and return to skills. Studies have shown that migrants choose their destination according to the expected wage they can receive (Grogger and Hanson 2008, Belot and Hatton 2008). And this wage is also based on the return to their particular skills, education and experience in that country. Consequently, migrants not only compare their home country with the destination but also the skill premiums across destinations. Further, tax incentives and the welfare state may play a role as mentioned in the previous section of this introduction. Countries that tend to equalize the income distribution by progressive tax systems like in many Western European countries may be a less desirable destination for skilled immigrants (Borjas 1999b). Finally, skill recognition and transferability plays a major role in destination choice as it clearly affects skilled migrants in particular, though there has been no study on skill recognition yet that comprehensively explores this link, except for the extent to which studies of brain waste touch upon this topic. Nevertheless, with respect to skill transferability the US and other English speaking countries have a major language advantage over the EU. Speaking the language of the host county greatly contributes to transferability of skills which is consequently reflected in earnings (Chiswick and Miller 1992, DeVoretz and al. 2000, Hiebert 2002). Still, there are no studies comparing this link across destination countries.

A study by the European Commission (2007c) highlighted the differences of wages

for researchers across countries. The average gross salary in the EU (38,015 Euros) is much lower than in the US (62,791 Euros), Japan (61,991 Euros), Australia (62,342 Euros) or Israel (59,580 Euros). Figure 2 shows the difference of selected countries towards the EU27 average. It is evident that the wages are much lower in the new member countries but also vary largely among all EU countries. Most importantly, the average is well below the US, Australia and Japan.

To sum up the section on the R&D environment in the EU it has to be concluded that while the EU produces many graduates in key S&E fields it fails to integrate them into the labor market. The US R&D labor market in contrary offers a much more stimulating and rewarding environment and many highly skilled people follow these incentives—people from all over the world and the EU itself.

Figure 2 Difference between gross salaries of researchers for selected countries compared to the EU27 average, in euro



Source: Avato and Marfouk (2007)

3.2.2 EU History of migration and skill composition

The post-war immigration to Europe has been marked by several characteristics. First of all, people needed to resettle and return to normal life after the turmoil of World War II. Also, many people had the opportunity to migrate from (former) colonies to the respective European countries. With the economies recovering from the war and large reconstruction programs, many countries had high demands for low skilled labor which they satisfied by introducing guest worker agreements. Many of these temporary migrants became permanent residents and--despite the termination of the guest worker programs in the wake of the oil crises in the 1970s—many more migrants followed through family reunion schemes. In addition, Europe allowed very high rates of humanitarian immigration compared to other countries. Against this history of relatively low-skilled migration, work programs geared towards favoring skilled immigrants only emerged in the 1990s/2000s.²⁰ The following section will describe these EU migration characteristics in more detail to provide another answer on why the EU ended up with a composition of immigrants so different to other major receiving countries.

3.2.2.1 Post War Migration and Guest Worker Programs

After WWII about 20 million people were displaced, among them 12 million Germans of whom many moved from East to West. Even more Germans moved westwards with the set up of the Berlin Wall in 1961 (Zimmermann 1995). The UK had increased migration from the New Commonwealth with many immigrants coming from the Caribbean countries and India (Hatton and Price, 1999). More than a million Algerians moved to France and also Belgium, the Netherlands and Portugal received large numbers of immigrants from their (former) colonies. While their skill composition is unknown, these migrants were predominantly non-economic migrants and not likely to be selected in terms of their skills.

In the mid 1950s many European countries, in particular Germany, Switzerland, France, the UK, Belgium and the Netherlands, started recruiting foreign labor from Southern Europe ((Italy, Greece, Portugal, Spain, Turkey, Yugoslavia) and North Africa (Morocco, Tunisia). This total net migration from South to North is estimated to include about 5 million people (Zimmermann 1995). A prominent example is Germany due to its

²⁰ See Bruecker et al (2001) for a detailed overview.

magnitude of the recruitment program; the number of guest workers in Germany reached 2.6 million people in 1973. Still also France and Switzerland had very sizable guest worker programs recruiting mostly from Italy and Spain. While most countries considered these workers as permanent migrants, Germany and a few other countries allowed immigration only on a temporary basis. , As a consequence, of the 18.5 million migrants who came to Germany between 1960 and 1973 ‘only’ 25 percent stayed in Germany permanently—still a number that Germany, which considered itself as a non-immigration country, evaluated as far too high (Honekopp, 1997). The flow of guest workers in basically all countries was rather low skilled but – given the large demand -- they integrated well into the labor market. Employment rates sunk dramatically only after the 1970s and particularly in Germany guest workers became associated with high unemployment (Martin 2001, 2005).

3.2.2.2 Family Reunification and Humanitarian Migration

With the oil crises in the 1970s, Northern European countries started to cease the worker programs. As a consequence, Southern European countries with laxer immigration policies became the next best option for immigrants from Africa and Asia and their share of foreign born population increased considerably in the 1980s (Bruecker et al 2001). The EU followed a policy that eased labor migration within the community through free labor mobility among EU members and protected the labor markets from outside the EU.²¹ This had the effect that non-EU migration and migration from EU members that were not part of the free mobility were mainly channeled through family reunification, humanitarian schemes and illegal channels, resulting in a mix of lower skilled immigrants (Chiswick 2000, Bruecker et al 2001).

In fact, according to the OECD (2000), family reunion accounted for 50 percent of the inflow in 1992 and 70 percent in 1998. Since the early 1970s the share of migrants within the EU stagnated at 1.5 percent while the share of third country immigrants increased from 1.5 percent to 3.3 percent of the EU population. As a result two thirds of the stock of the foreign born population in the EU came from non-EU countries in 1998.

²¹ Note that free mobility was only possible for EU member states at that time (Belgium, France, Germany, Italy, Luxembourg and the Netherlands). For the countries entering in the 1970s and 1980s no transitional periods were imposed for Northern European countries (Denmark, Ireland and UK) while Southern European countries (Greece, Spain, Portugal) had transition periods which expired in the 1990s.

Most of these migrants originated from lower income countries with high income inequality and were low skilled—with the exception of immigrants in the UK (Bruecker et al 2001).

Thus the temporary work programs had allowed entrance to many lower skilled people and subsequently proved unsuccessful in restricting the duration.²² The option of family reunification allowed immigrants to also bring along their families and network effects could unfold and reinforce migration patterns. Moreover, the well developed welfare systems many EU countries made it also attractive for family members to follow.

As indicated, the migration barriers towards non-EU nationals also provoked substantial flows of undocumented migrants.²³ In Germany for example different indicators, such as border apprehensions and undocumented migrants detected at their working places, suggest that undocumented migration had increased by between 150% and 300% in the 1990s (Lederer, 1998). Undocumented migration affected particularly countries at the Southern EU boarder. Many EU countries also passed amnesties that legalized large numbers of undocumented migrants (e.g. Italy, France, Portugal, Spain, and Greece). With these amnesties undocumented migration indeed became an “immigration scheme” for many and they added to the adverse skill composition of immigrants in the EU (Bruecker et al. 2001).

Moreover, immigration to the EU was also characterized by a large inflow of refugees and asylum seekers compared to other large immigration countries like the US. Particularly the collapse of the Soviet Union and the War in former Yugoslavia resulted in large immigration flows from Eastern and Central Europe to Western and Northern Europe during the early 90s. Germany received by far the largest share of these inflows increasing its foreign population by about 2 million people. Between the years 1980 and 2003, it received twice as many asylum seeker applications as the US (UNHCR). Also the Nordic countries like Sweden, Finland and Denmark allowed many refugees and asylums seekers into their countries (Katseli et al. 2006).

²² See Martin 2001 on the “permanence of temporary migrants”.

²³ This phenomenon was also found in the US, after the extensive guest worker program, the Braceros from Mexico, had come to an end, undocumented migration from Mexico increased dramatically (Martin 2003).

Table 6 shows that the EU27 (plus Norway and Switzerland) absorbed 77 percent of the asylum seekers who came to the OECD between 1980 and 2006. Germany alone allowed entry of 27 percent of all asylum seekers during this time.

Table 6 Total Inflow to the OECD of Asylum Seekers from 1980 to 2006

Country/Region	Inflow	% of Inflow to the OECD
OECD	11009 730	100%
EU-25, Norway and Switzerland	8454 068	77%
Germany	2958 579	27%
North America	2292 402	21%
United States	1621 799	15%
United Kingdom	1008 424	9%
France	931 821	8%
Canada	670 603	6%
Netherlands	525 230	5%

Source: OECD 2008.

Table 7 Scope of Refugee flows in selected countries, averages from 1960 to 2005

	Int. Migrants as a % of population	Refugees as a % of population	Refugees as a % of migrants
World	2.54%	0.20%	7.75%
Northern America	8.63%	0.23%	2.98%
Australia/New Zealand	19.70%	0.41%	2.01%
Northern Europe	6.26%	0.31%	14.35%
Southern Europe	2.70%	0.15%	4.63%
Western Europe	8.59%	0.47%	5.47%
Eastern Europe	4.60%	0.01%	0.08%

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, Trends in Total Migrant Stock: The 2005 Revision <http://esa.un.org/migration>.

Table 7 further compares refugee flows that occurred between 1960 and 2005 for major immigration regions. The table shows averages during this period and compares the scope of refugees to the population size and immigration size in the respective regions. Northern America received a number of immigrants that corresponds to 8.6 percent of its population on average. At the same time, refugees constituted only 0.23 percent of the population (on average) and only 3 percent of immigration. In contrast, Western and Northern Europe hosted immigrants that corresponded to 8.6 and 6.3 percent of their populations and refugees accounted for 0.47 and 0.31 percent of the population. On average, 5.5 and 14 percent of immigrants to Western and Northern Europe were refugees.

The above discussion of immigration patterns to the EU shows how the comparatively low skill composition of migrant stocks has developed over the last decades. It should be noted that other major immigration countries, and in particular the US, have also had large family reunification schemes. However, they have limited the number of such visas resulting in long waiting periods which constituted a large disincentive to apply for family reunification and thus increased the barriers of this scheme (Martin 2005b). Further, the absence of colonial ties and the sheer magnet effect for skilled workers have favored a positive selection of migrants in terms of their education levels also among immigrants that came through the family reunion. Moreover, distances between the US and its sending countries are likely to have sorted immigrants and privileged wealthier and often better educated migrants. Indeed, the main source of unskilled immigrants in the US has stemmed from the bordering Mexico and people who did not have to cross Oceans to reach the US. Moreover, the point systems in Australia, New Zealand and Canada clearly shaped the composition of immigrants in these countries. Despite having no such system, the US complemented its immigration schemes by temporary visas for skilled workers (H1-B and O1) already early in the 1990s, while the EU developed such ideas only later.

In short the above concludes that the EU is in a particular situation compared to major competitors because i) it is producing many skilled people but fails to integrate them in the labor market and ii) it attracts and allows to enter comparatively low skilled migrants while the skilled migrants (many of them from Europe) seem to favor countries like the US. This is partly because other countries offer more attractive opportunities in the R&D environment and partly because the EU is falling behind these countries in terms of its R&D capacities and stimulation of R&D environment. As a consequence, the EU fills hardly any skill gaps through immigration and the question arises about what options the EU has to change this development and to reach its self-imposed goals (established in Lisbon) of improving as a knowledge-based economy.

3.3 *Policy Options*

The EU has already engaged in many initiatives that aim at bringing it back on track. These regard primarily the improvement of the higher education system, increased

investment in R&D and introducing selective migration schemes while restricting low skilled migration. These options will be discussed in this section.

3.3.1 Options in Higher Education

Regarding the changes in the higher education system, the Bologna Process that has been started 1999 is the most comprehensive initiative. The process included several high-level meetings among EU policy makers and was joined by 29 European countries (it is not an EU initiative alone). It aims at equalizing the various higher education systems in the member countries and move European countries towards a degree structure of bachelor, master and doctoral degrees found in most English speaking countries. This should ensure similar quality standards and higher mobility of students among European countries. Also, it will improve skills recognition within the EU and with several other countries and make EU higher education more comparable internationally, thus may easy the transition from university to the job market (Keller 2004). Other measures of improvements are increased funding for universities in many countries and stronger competition among universities to create incentives for improved teaching and curriculums.²⁴

While these measures certainly have to be acknowledged as steps into the right direction, it is unlikely that they will have a large immediate impact on the labor market and the R&D sector. It has to be emphasized that the EU already produces many graduates in desired fields but actually fails to take them beyond universities and integrate them into the labor market. The question is rather how the transition into the labor market is managed and how transferable education is to the labor market. Introducing the Anglo-Saxon university system will certainly help many EU countries in terms of skills recognition within and outside the EU as it develops common standards. Possibly, the current differences among education systems impact on transition into the labor markets, hence, the member states are affected differently. Still, if equal quality standards are to be achieved for all members, the EU needs mechanisms to better compare and evaluate education systems in terms of transferability of the education to job markets. The mere introduction of a new system can only be the beginning but will not

²⁴ For example Germany selected “Elite” universities that received special funding from the government.

solve the problem of transition by itself. And while the extra funds European have started receiving in recent years are a good first step, funding amounts are still far behind the resources many elite institutions in the US have available.²⁵

Part of the research undertaken in this study addresses the question of differences in the evaluation of European education and the transferability to the labor market. Specifically, it analyzes Europeans in the US labor market and how their higher education impacts on their integration into the labor market. The study shows that there are indeed large differences in the way education obtained in the EU is evaluated by the labor market. Immigrants from some countries do very well and often better than graduates from US schools while others lag behind.²⁶ Thus, the study sheds light on the differences within the EU with respect to education and helps the implementation and evaluation of the measures laid out in the Bologna Process.

3.3.2 Options in R&D

An important factor that may slow down emigration of graduates and students to the US—or have them come back—is the expansion of the R&D sector, both within universities and outside in the private sector. As mentioned before the European Commission (2003) estimated that 550 000 to 835 000 researchers are needed to increase the R&D intensity to 3 percent of GDP. The number of emigrants is almost the same stressing the importance of increasing incentives for researchers to remain in the EU.

The EU is indeed going in this direction and extended the scope of its so-called Framework Programs which were established to promote research within the member states. The Sixth framework Programme (2002-2006) had a budget of 17.5 billion Euros and addressed seven key areas to improve research and knowledge: genomics and biotechnology for health; information society technologies; nanotechnologies and nanosciences; aeronautics and space; food safety; sustainable development; and economic and social sciences. It aimed at scientific excellence, improved competitiveness and innovation to be promoted by increased co-operation, greater complementarity and

²⁵ For example the Johns Hopkins University and Stanford University were able to mobilize US\$ 3.7 billion and US\$ 3.8 billion, respectively, only from donors (alumni and friends) over the last five years (Johns Hopkins Magazine February 2009.) These figures do not include research grants and other funding from the government and other institutions.

²⁶ Also see Saint-Paul (2004) and Peri (2005).

improved co-ordination between relevant actors, at all levels; thus creating centers with critical mass of research capacities and mobility of researchers across the member states. The the Seventh Framework Program, spanning from 2007 to 2013, is already well under way with a budget of 53.2 billion Euros. Its main target areas are similar to the previous but it emphasizes improvement of collaboration and more efficient access and execution of research projects (EC 2009).

3.3.3 Immigration Policy

The third remedy that the EU is following is the introduction of selective immigration policies and many countries have already tried to implement schemes aimed at filling particular skills gaps. In 2006, France followed the trend of countries like the Canada and Australia to attract more foreign students by allowing them to stay beyond graduation through a comprehensive program to recruit more “skills and talent.” At the same time, the program restricts family immigration and introduces tougher measures against unauthorized migration (Murphy 2006). The UK introduced a point system in 2006 which divides immigrants into 5 different tiers: high skilled, skilled with job offer, low skilled, students and miscellaneous; to attract more skilled immigrants while simultaneously gaining more control over unwanted immigration (UK Home Office 2006).²⁷ Also, Ireland and the UK have both created labor-shortage occupation lists to better inform about immigration needs. In 2000, Germany introduced a temporary program to attract up to 20,000 specialists in information technologies, followed by the Immigration Act in 2005 which made it easier for skilled foreigners to work in German, especially if they were willing to invest in Germany or earned above a certain threshold.²⁸

Besides the country level efforts there is also the response on the EU level. The recent research initiative under the Portuguese EU Presidency released its final report in September 2007 calling for EU member countries to forgo restrictive rhetoric and create more legal channels and flexible options for immigration. In particular the report gave recommendations regarding how to improve access to the labor market to attract more

²⁷ See Somerville (2007) and Hopwood Road and Dhananjayan (2005) an overview.

²⁸ The investment threshold started at 1 million Euro but was subsequently adjusted to half a million and just recently to 250 000. The salary threshold is, and remains, 85 000 Euro, which the private sector regards as too high.

skilled people, how to improve integration and how to mitigate detrimental effects for sending countries (OECD 2007a).²⁹

Overall, there have been many recent reports to support the Framework Directive of the “Policy Plan on Legal Migration” laid out in the Hague Programme, which call for moving towards a common migration framework within the EU—the EU Immigration Pact.³⁰ In this line, Franco Frattini, the European commissioner for Justice, Freedom and Security, proposed the European Blue Card in 2007 that would complement the national immigration schemes and be geared specifically towards highly skilled immigrants. However, these programs also meet opposition among EU members who are already well ahead of policy tools such as the blue card (e.g. the UK). Moreover, new members object that such a scheme is inappropriate when transitional arrangements limiting the labor mobility within the EU are still in place (Collett 2008b).

In the policy discussion it is important to bear in mind that people and their education and experience are not homogeneous. Thus, there are costs of replacing skilled emigrants with skilled immigrants. The EU receives a high share of skilled immigrants from African countries and, given the differences in development levels and the transferability of education and experience gained in these countries, it is likely that productivity losses due to skilled emigration cannot be fully compensated by skilled immigration from elsewhere³¹. In fact, a study by Coulombe and Tremblay (2006) analyzes the differences in the quality of education between Canadians and immigrants to Canada and find that the quality of notionally “identical” degrees indeed varies largely.

Also, selective immigration policies raise ethical questions because, as described earlier, they have detrimental effects for many sending countries and affect poor countries disproportionately. It should be noted that despite the clear shift towards selective immigration policies, there are several studies on how to include development

²⁹ More recommendations are e.g. made by Muenz et al (2007) and Katseli et al. (2006).

³⁰ See Kyrieri (2007) and Collett (2008a) for a summary.

³¹ In addition, there are considerations regarding social and political implications with respect to large inflows of immigrants and their cultural integration into host countries, which however go beyond the scope of this study.

considerations with respect to poor sending countries into EU policies. However, whether these “win-win” concepts work can only be evaluated in the long term.³²

In sum, the previous two sections, presented the current state of the migration literature as it relates to the determinants and consequences of skilled international migration. Dynamics of highly skilled migration were explained with special emphasis on the questions of selection of migrants and the dynamics of diaspora externalities. Further, the situation of the EU in the global network of migration flows was presented. On the basis of new and original data, the importance of understanding the economic drivers and effects of highly skilled migration to and from the EU was explained with respect to developing successful policies in education, R&D and immigration. This study aims to make a contribution to the understanding of these issues. Its structure is presented in the following section.

4 STRUCTURE OF THE RESEARCH

This study consists of three main chapters. The first will empirically address the issue of emigration from the EU and the transferability of EU education internationally. The second chapter will look at the counter part, the immigration to the EU from four EU neighboring countries and respective immigration policies. The final chapter develops a theoretical model that captures network effects of diasporas and estimates a long run multiplier of migration flows, then being used to predict emigration flows in the long run. Overall, these chapters make a contribution to better understanding causes and selection of migration by studying aspects of European emigration and immigration. More specifically the chapters present the research of the following:

The first chapter will analyze EU emigrants and look at their assimilation patterns in the US labor market. As has been shown above this is a group of substantial size and importance to the EU. The main questions asked regard their integration and performance. Does the EU lose its best and brightest? How transferable is their education to the US labor market? Is it valued internationally? Do EU educated immigrants perform differently than US educated EU immigrants? Are there differences

³² See Muenz et al. (2007), Katseli et al. (2006) or OECD (2007a) for more detailed information on the development component in (recommended) EU immigration policies.

in their performance resulting from the particular EU country they obtained their education in? The answers to these questions will help the EU to better understand its emigration of skilled personnel. The analysis will shed more light on the characteristics of these emigrants which the literature has not yet studied with respect to their education. It will show how European education is evaluated internationally and contribute new insights on the transferability of foreign skills. The findings emphasize the diversity of European countries and that they cannot be treated as one homogenous group. They stress the high performance of some emigrants from some countries while others perform at comparatively lower levels. Overall, the study points out that the European education is well valued internationally. Consequently, from the perspective of the Lisbon agenda, it seems most important to focus on creating incentives for highly skilled people to remain in the EU or only leave it temporarily and only focus on university reforms in selected countries.

The second chapter will analyze whether selective immigration policies are in fact effective in channeling skilled migration and if they can compensate for lost human capital in the EU. It will look at the impact selective migration policies can have given the migration pressures that exist in sending countries. The analysis is based on new data from four EU neighboring countries collected by the European Training foundation, which is unique in the detail that it offers regarding the migration process. The study will shed light on determinants of migration pressures, the impact of immigration policies, the selection of immigrants and the determinants of destination choice. The findings confirm that one has to distinguish between self-selection and out-selection as explained in the first section, in order to understand the full selection process of migrants. This distinction has not been accomplished by most studies looking at selection of migrants. The results stress that while selective immigration policies may indeed have their desired impact, the EU should nevertheless remain moderate in its expectations because other factors that reinforce migration, e.g. networks, may not be offset sufficiently by such policies.

The third chapter picks up the dynamics of networks in migration flows by testing a previously disregarded diaspora externality. A theoretical model is developed and the existence of counter-flows is empirically tested for. Based on new bilateral data findings show evidence of significant counter-migration effects at the international level. The

study relies on a new database which captures the structure of education in migration flows. This data constitutes an extension of the database by Docquier and Marfouk (2006) that was collected by the author and the mentioned researchers. It allows analyzing immigrants moving to and within OECD, EU27 and EU candidate countries. While the traditional network effect of diasporas in the host country has been well-studied, the literature disregarded the effect of the counter-diaspora in inducing migration flows. In this scenario the diaspora actually induces counter-migration flows that are independent from return flows. Many countries have both, sizable diasporas and counter-diasporas that affect migration in both directions and consequently must determine a long-term equilibrium of migration. The study develops a theoretical model that allows testing this diaspora effect and estimates the multiplier effect of migrant networks. Based on this empirical finding long run scenarios of migration flows are presented simulating exogenous migration shocks (e.g. a change in migration policies). The net effect of the shock on the long run volume of bilateral net emigration clearly depends on the relative size of diaspora and counter-diaspora. For some countries a shock can reverse the pattern of migration from net emigration to net immigration, this is especially the case for attractive countries, receiving many migrants from abroad (United States, Canada, Australia, New Zealand, Luxembourg or Switzerland). The study confirms the importance of diasporas in migration dynamics. The idea of diaspora effects on migrant flows and counter flows is new and interesting to all countries, but particularly interesting to the EU because the EU allows (almost) free mobility among its member states. Theoretically free mobility would allow the tested diaspora effects to freely unfold.

Before moving on to the chapters, the following notes should be added as background information on the chapters presented in the following. Despite the linkages between them, they each constitute single research papers that can be read independently from each other. Each analysis includes its own detailed review of literature, motivation and conclusion. Except for the last chapter, which was concluded most recently, the papers have already been presented at conferences. The first at the meeting of the Economic Society of Population Economics (ESPE) in Verona in 2006 and the second at the Migration Meeting at the Institute for Labor Economics (IZA) in Bonn in 2008. Moreover, the first chapter has already been published in the Georgetown Public Policy

Review³³ and the second is forthcoming as a World Bank Working Paper. The versions presented in the following have been edited to fit a coherent format for this thesis. Also, the first chapter appears slightly shortened in the published version; the specific part will be indicated in the chapter. Each chapter includes an abstract for an additional overview. With respect to the methodologies used to answer the questions of each chapter it should be noted that Chapter 2 and 3 primarily apply econometric methods for the quantitative analysis of migration data. Micro data was used as individual characteristics of migrants were the primary focus. Conversely, Chapter 4 develops a substantial theoretical model which is only subsequently tested empirically and using simulation techniques. This approach was driven by the need to capture the dynamic effects of networks and the desire of the author to complement a substantial body of empirical work with a new theoretical approach.

³³ Reference: Avato, J. 2007. "Highly Skilled Europeans in the US Labor Market: Lessons for the US Immigration System." *Georgetown Public Policy Review*, 12(1).

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Chapter 2

HIGHLY SKILLED EUROPEANS IN THE US LABOR MARKET¹

Abstract:

This paper analyzes the differences in earnings among college-educated immigrants from different European countries in the United States. While most studies treat European immigrants as a single successful group in the United States labor market, this paper suggests that there is reason to assume differences in labor market integration among migrants from European countries. Indeed, idiosyncratic sociopolitical structures and heterogeneous education systems in European countries lead to significantly different regional results. Moreover, economic linkages between European countries as well as the US immigration system seem to affect immigrant earnings. Along the lines of economic assimilation theory, this analysis of 1993 microdata from the National Survey of College Graduates (National Science Foundation) in combination with various data sources on education, trade and the US immigration policy finds that immigrants educated in Eastern or Southern European countries earn less than native-born Americans. In contrast, and controlling for relevant variables, immigrants from Western or Northern Europe earn up to 10 and 19 percent more than comparable native-born Americans. These findings suggest differences in integration of European immigrants due to regionally diverse education systems, economic ties with the US and immigrants' legal status when entering the US. The results highlight new aspects on the transferability of foreign skills and how European higher education is valued in international labor markets. Thus, it may provide valuable support for shaping US policy towards highly skilled immigrants as well as inform European education policy about international competitiveness of their graduates.

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1 INTRODUCTION

At one time, Europeans were the largest group of migrants to have crossed the Atlantic to find political, economic and social freedom, and, as a result of their migration, they helped to develop the US into a powerful nation and vibrant economy. Their proportion among all foreign-born US residents has declined immensely within the last five decades, from 75 percent in 1960, to 22.9 percent in 1990 to 15.8 percent in 2000 (Dixon 2005). However, immigration from Europe still remains very important, as European immigrants have a long history of rather successful integration and have brought in skills that have positively contributed to the US economy.

The political discussion about the immigration of highly skilled people with college degrees has gained momentum recently in various high income immigration countries. Many governments in developed countries try to implement immigration systems that select immigrants who offer skills that are particularly valued in the home economy. This is often a difficult task given the heterogeneous background of the foreign-born population. Even controlling for the particular college degree or years of professional experience, there are differences in the adaptability of such skills to the US economy because these skills are very much a product of the specific educational system and economic structure in the respective sending countries. These differences have important implications for how well different immigrants can assimilate into the US system.

In most of the literature on US immigration, Europeans have been treated as a rather homogeneous group that integrates very well into the US labor market. Still, Europe comprises a very diverse set of countries and, therefore, the characteristics that European immigrants bring to the US differ substantially by country of origin. This wide variance in backgrounds raises the question of whether there are differences in Europeans' integration into the US labor market that can be explained by differences in the various European countries. Are there differences in assimilation that can be linked to a particular tertiary education system or to the intensity of economic interaction between the US and the sending country? Such analysis could reveal very interesting information on the types of foreign skills that are especially transferable to the US labor market and

thereby contribute to effectively shaping the policy towards highly skilled immigration. Conversely, for the European sending countries it will shed further light into the sizeable emigration of highly skilled people from Europe to the US.

This paper argues that there are indeed differences in the integration of European immigrants due to the idiosyncratic characteristics of education systems and economic structures in these sending countries. The following analysis will focus on identifying and explaining interregional differences in the transferability of European skills to the US. Special attention will be given to the differences in tertiary education systems as they seem to be crucial for the migrant's labor market performance in the US economy. This focus will paint a new picture of the transferability of European skills against the background of US immigration policy.²

The following part of this paper will outline the underlying theory of assimilation in detail and develop the hypothesis. Foreign education and economic linkages between the US and Europe as well as US immigration policy will provide the starting point for propositions on differences in the labor market performance of highly skilled Europeans. Descriptions of and findings from the data comparing European immigrants who entered the US before the 1990s—with the oldest migrants coming as early as the 1950s—will then be presented, followed by the policy implications of the results. Throughout the analysis Europe will be grouped into four geographic regions, Northern, Western/Central, Southern and Eastern Europe (see appendix for more details), and it should be noted that this study is limited to tertiary-educated individuals only. Therefore, when the terms education and highly skilled are used, they always refer to tertiary education and college-educated individuals.

2 FOREIGN SKILLS AND ASSIMILATION

Three aspects regarding the integration of European immigrants are of special relevance for this analysis. The first relates to the individual skills offered by each

² When speaking of European born immigrants, the following analysis strictly refers to the group of European countries that in 2006 formed the European Union (EU). These include the EU 15 of the Maastricht Treaty-Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom -and the 2004 accession countries-Poland, Hungary, Estonia, Latvia, Lithuania, Malta, Czech Republic, Slovakia (in the data still former Czechoslovakia). For Cyprus and Slovenia there was no available data.

immigrant, based primarily on college education. The second explores the role of economic ties between the host and sending countries. The last addresses the influence of the US immigration system. While the first issue concentrates on individual characteristics, the second focuses more on macroeconomic components that may affect individual characteristics, and the third relates to policy issues. The latter two can also be viewed as potential mechanisms for the selection of certain kinds of immigrants crossing the border to the US.

2.1 *Theory of Assimilation*

The theory of earnings assimilation explains how immigrants typically have relatively low earnings initially but subsequently enjoy faster wage growth than native workers with comparable skills in the host country (Chiswick 1978, 2005; Lowell 2004; Borjas 1985, 1995). The initial wage disadvantage of immigrants is due to differences in their general and country-specific sets of skills. Human capital theory indicates that a worker's education and work experience are crucial to his or her earnings (Mincer 1974). Additionally these characteristics are mostly country-specific skills (Bratsberg and Terrell 2002; Friedberg 2000; Zeng and Xie 2004). The substance of education may differ across countries, and a worker's alma mater may not signal potential productivity to employers abroad as effectively as in the home country. As a result, the initial earnings disadvantage of immigrants can partly be explained by the lower value that the host country attributes to human capital obtained in a foreign country.

For the highly skilled Europeans in the United States, education is a crucial variable used to differentiate among groups of European immigrants. *Where* Europeans received their degrees may be of central importance to their earnings. Yet some observers have argued that European immigrants do fairly well in the US labor market regardless of where and in what economic environment they acquired their skills – thus assimilation theory would not apply to this group (Dixon 2005; Saint-Paul 2004; Bratsberg and Terrell 2002).

Nevertheless, several studies confirm wage differences by place of education (POE) rather than by country of origin. For example, highly skilled immigrants from Asia do not suffer from an initial wage disadvantage compared to natives when they have a US

college degree (Zeng 2004). Conversely, Bratsberg and Ragan (2002) find that education received abroad is not remunerated as well as US education.

Additional research finds an unexpected advantage in European POE, although the explanation is not clear. Regets (2001) analyzes the impact of a foreign degree for highly skilled immigrants in the US who either work in science and engineering (S&E) or hold a S&E degree. He confirms lower wages for immigrants educated abroad. However, he shows that Europeans from English speaking countries actually have higher earnings than US natives while Europeans from other countries earn less. Similar findings were made by Friedberg (2000) for immigrants to Israel.

Indeed, these studies stress that there are differences in return on education received by European immigrants in their country of origin versus the host country, but they do not give a full picture of important components shaping the earnings for immigrants from Europe, nor do they offer a set of explanations as to why Europeans differ in terms of their ability to assimilate or integrate into the US economy. This study argues that there are notable differences between immigrants from different European countries owing to significant variation in educational systems and economic structures of the European countries. In fact, this research shows that the idea of education being a country-specific attribute is a remarkably important point in explaining the earnings of European immigrants from different regions

2.2 Propositions on Intra-European Differences

This section will make propositions on intra-European differences that result from differences in education systems, economic structure and linkages and immigration policies, factors which may differently affect the labor market integration of Europeans in the US.

2.2.1 Place of Education (POE)

The importance of *where* a degree has been received for subsequent outcomes in the US labor market may indeed be complex. In fact, the research reviewed above suggests that there may be differences in the quality of education, such as the form of teaching, tertiary expenditure or importance of English as a foreign language, that are

sometimes hard to measure but could cause education from particular European regions or nations to be favored in the US labor market. It is important to note that quality of education in this context primarily relates to the transferability of skills to the US labor market.

The structure of higher education systems can vary greatly among the various European countries.³ Northern countries, which make up almost a third of the European immigrant pool in the US, tend to have a system that is somewhat similar to the system in the United States and benefit from a significant language advantage, as English is either their mother tongue or widely used in the media. Therefore, we might expect Northern Europeans to do rather well in the US labor market.⁴

For countries in Western and Central Europe, whose college-educated immigrants to the US comprise another third of all Europeans, the picture is more diverse. The higher education systems differ considerably from one another and from the US in terms of the length of study and types of degrees available, as well as in the funding of education. Nevertheless, Western and Central European universities are generally regarded as high quality institutions and traditionally enjoy favorable reputations. Also, many universities offer overseas exchange programs that are facilitated by a wealth of funding institutions specializing in furthering student exchanges, such as the German Academic Exchange Service (DAAD) in Germany for example. These student exchanges may play a role in helping to better prepare Western Europeans for the US labor market and ensure that US employers have a greater familiarity with Western European education systems. Consequently, Western European immigrants may experience comparatively better earnings.

Conversely, immigrants from Eastern European countries, during the period analyzed here, most likely received their education in a communist system, which differs notably from the US system. These differences, unlike those of Western and Central Europe, are not offset by factors that would act as benefits for foreign workers in the US, e.g. English language skills. Thus, Eastern European immigrants, who make up almost

³ See European Commission (2005) for a detailed description of each system.

⁴ Also see Regets (2001).

17 percent of all European immigrants, would be expected to experience an earnings disadvantage in the United States.

Countries of Southern Europe may also have an education system that is less comparable to that of the US than others. There is a lot of literature about the existence of a brain drain from Southern Europe, especially from Italy, which is the main Southern source country of immigrants in the US. These studies suggest that the education systems, which have been described as modeled after those that emerged in the Middle Ages, may provide a less favorable environment for research and confer less value to advanced degrees (Morano-Foardi 2004; Becker et al. 2003). The transferability of Southern European education to the US may consequently be relatively poor, and US labor market outcomes for immigrants from the region are expected to be less successful.

2.2.2 Economic Factors in the Home Country

Economic interaction between sending and receiving countries, such as factor and trade flows, has always been prominent in migration theory. A vast amount of literature has been produced to assess questions of macroeconomic relevance and in particular whether migration and trade are substitutes or complements (Mundell 1957; Solimano 2001; Schiff 1996; Faini, et al. 1999). Empirical studies have mostly agreed on a complementary relationship between trade and migration (Head and Ries 1998; Stalker 2000). Krugman (1991) proposes a model of agglomerative forces that roughly states that regions with high international economic activity attract migrants. Moreover, it is especially likely that highly skilled migrants will follow the dynamics of agglomeration and thus concentrate in stimulating environments (Ellerman 2003).

As this study is not focused on the numbers of immigrants per se, but rather in the quality of the immigrants' skills in terms of transferability to the host US labor market, this literature is of secondary importance. However, it should be noted that when looking at migration and trade flows, it takes only one step further to propose that intensive trade flows and lively economic interaction among countries also influences the skill transferability for immigrants and the privileges they receive in their host country. Such proposition underlies this analysis.

Potential differences in the value that is given to foreign skills of immigrants from countries with varying international economic activities may, on the one hand, become evident at the individual level in the quality of professional work experience. On the other hand, such international interaction increases the knowledge about the sending country's economy and workers. This contact may improve credential recognition and remuneration of immigrants from countries that are more active internationally compared to workers from countries where such information is lacking because of weaker business linkages.⁵ Especially in highly skilled migration where a large proportion comes as "economic" migrants, this issue is likely to be very relevant.

Moreover, economic interaction between Europe and the US is even more important because trade and investment flows are immense, and there are many multinational corporations (MNCs) operating in both regions. Consequently, this analysis hypothesizes that the intensity of economic linkages between host and home country affects the assimilation of the respective immigrants. For European immigrants, this circumstance will cause them to have differential labor market outcomes due to their countries or regions of origin.

Countries in Northern Europe, particularly the United Kingdom, do have very close relations to the US. The same is true for Western and Central European countries, especially France, Germany and the Netherlands. Trade and investment flows and the degree of internationalization tend to be high in these regions. Thus, highly skilled emigrants to the US are likely to perform quite well even if carrying very country-specific skills.

For Southern European countries, postulations are harder to make. While these countries are indeed very integrated in the international economy, the degree to which they are integrated may vary compared to Northern, Western or Central Europe. This means that to the extent to which these inter-country relations matter, Southern Europeans find it harder to assimilate. Therefore, as in the case of education, the ease with which Southern Europeans are prepared to integrate into the US labor market is more questionable.

⁵ This argument also refers to the theory of signaling.

Linkages between the US and Eastern European countries are likely to be different in many aspects. In fact, the iron curtain prevented trade and business relations from developing between these two regions for many years. Economic activities only started after the fall of the Soviet Union. Consequently, the unfamiliar business environment from which many Eastern Europeans originated may adversely affect their earnings in the US.

2.2.3 Aspects in Immigration Policy

The final component analyzed in this study concerns the US immigration system. Foreigners enter the US under different admission classes that have implications for their labor market performance. The admission classes can be divided into employment-based (EB), family-based (FB) and refugees. Immigrants entering in the EB category hold specific skills that are valued in the US and therefore should theoretically receive the greatest economic reward among the three classes. While this hypothesis is supported by some empirical research (Cobb-Clark 1990, 1993; Duleep and Regets 1996), other studies suggest that EB advantages relative to FB immigration may not be that significant (Lowell 1994, 1995; Sorenson 1992). Mostly, it is refugees-i.e. “non-economic” migrants-who tend to earn less than other immigrants (Fix and Passel 1994; Passel and Clark 1998).

For the set of countries analyzed in this study, the consideration of admission class is of particular interest because unequal proportions in admission classes among immigrants from different European countries may be a reason for different assimilation patterns. Specifically, attention needs to be given to immigrants from Eastern European countries, from which many fled in the 1980s and entered the US as refugees (Passel and Clark, 1998; INS various years).

To sum up the main propositions, it is very likely that labor market assimilation, in terms of earnings, differs according to the European country of origin. There is reason to believe that education systems and economic relations favor immigrants from Northern, Western and Central Europe, while the labor market outcomes for immigrants from Southern Europe are more questionable. Due to their countries’ political developments

during the Cold War, Eastern Europeans are likely to suffer a disadvantage, especially if they entered the US as refugees.

3 DATA

Due to the complexity of the question at hand and the need to find data for many different countries, it is not possible to address the issues by using a single microdata set alone, which would be most precise. Thus, the data used to assess the propositions above are taken from various sources.

In order to describe the group of European immigrants in the US, microdata are taken from the 1993 National Survey of College Graduates (NSCG) and from the 1990 US Census.⁶ The primary purpose of the NSCG is to capture detailed information on the education and occupation of the college-educated population. For Europeans with degrees received either in the US or an EU country, the assimilation benchmark, i.e. the sample of natives to which immigrant earnings are compared, is restricted to white Americans with a degree received in the US.⁷ This comparison is in line with most previous assimilation research, is the highest standard for comparison and logically compares mostly European-origin native Americans with European immigrants. The sample is further constrained to individuals who are employed full-time and earn a positive (non-zero) income.⁸ The dataset will therefore allow for both descriptive and econometric analysis (using OLS) of earning differences among skilled Europeans. The data allows distinguishing immigrants with foreign education from immigrants who hold a US degree. The former are obviously the ones with the “most foreign” characteristics and are of primary importance.

Further, data from the Organization for Economic Cooperation and Development (OECD), the United Nations Conference on Trade and Development (UNCTAD), Barro and Lee (2000) and the World Bank are used to analyze differences in European education systems and transatlantic trade flows. At the aggregate level, this data provides

⁶ The NSCG 1993 is a follow up survey of the 1990 US Census including only college educated individuals.

⁷ Additionally, those few Europeans who completed their highest degree from a place other than the US or Europe but now work in the US are dropped from the sample.

⁸ Self-employed individuals are dropped from the sample.

more general information on the origin of immigrants. It should be noted that due to the timeframe of the NSCG, this analysis includes only immigrants who arrived in the US before the 1990s, with the oldest immigrants coming around 1950. Accordingly, it is attempted to restrict other data sources to this timeframe.

Finally, data on the entrance status of immigrants is gathered from the US Department of Immigration and Naturalization Services (INS), which publishes an annual Statistical Yearbook. Unfortunately, it is not possible to obtain consistent data for each country in every year, and the data is not disaggregated for college-educated immigrants. However, the reports do provide detailed information on who entered the US in what admission class and thus portrays a reasonably accurate picture of how European immigrants differ from each other.

4 RESULTS

Using this data, the following section first looks at the individual characteristics of European immigrants in the US and distinguishes them according to their place of education (POE). Regional differences among those with foreign education and data on differences in educational systems are shown as a set of explanations. Then, data describing the economic relations and labor flows between Europe and the US is presented. Subsequently, data by the INS is used to demonstrate the role of admission class for immigrants. Finally, the discussion is concluded by showing estimates from a regression analysis that attempts to capture these elements.

4.1 *Stylized Facts*

With regard to the distribution of their college education, European immigrants tend to have higher levels of education than college-educated US natives (see appendix Table 1). Across the board, workers educated in Europe are more likely to hold a master's or doctoral degree. It is only among Northern Europeans that the number of immigrants with bachelor's degrees is greater than those with a master's degree. The reason for the higher number of master degrees could be that in many European countries students only have the option to do a 5-year degree and nothing below (at least until recently), which is usually translated into a master degree as the equivalent. Altogether,

the share of those holding a foreign degree increases proportionately with the level of the degree. Thus, the higher the degree, the higher is the proportion of foreign degrees. This is true for all groups except Eastern Europeans (see appendix Table 2).

Table 1 Socio - demographic Characteristics by Region of Education and Birth

	Region of Education		
	EU (EU born)	US (EU born)	US (US born)
Mean yearly salary in \$US	63,036.40	55,202.80	49,792.07
Mean years of work experience	23.14	21.06	18.57
Mean age	46.35	44.08	41.3
Mean years in US	15.37	30.55	-
Proportion Male	0.7405	0.6769	0.6863
Proportion Married	0.7873	0.7175	0.7186

Source: NSCG 1993.

Nominal earning differences with respect to foreign education are presented in Tables 1 and 2. The comparative split by POE reveals interesting information about these respective groups. Table 1 shows that nominal earning differences are quite large among US-born and EU-born individuals. Additionally, those with foreign education tend to have higher salaries. The split by region of education in Table 2 underlines that there are even more significant differences, and the region or place of education seems to be a crucial aspect that differentiates between immigrants from Europe.

Table 2 Socio-demographic Characteristics by Region of Education and Birth

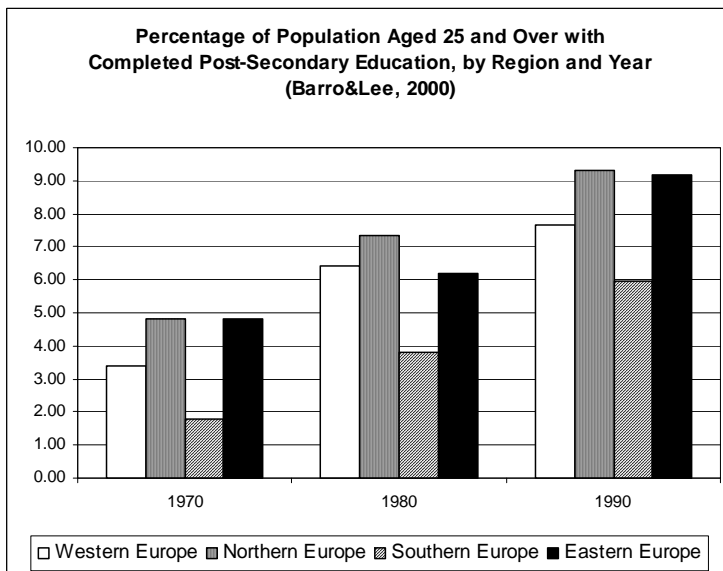
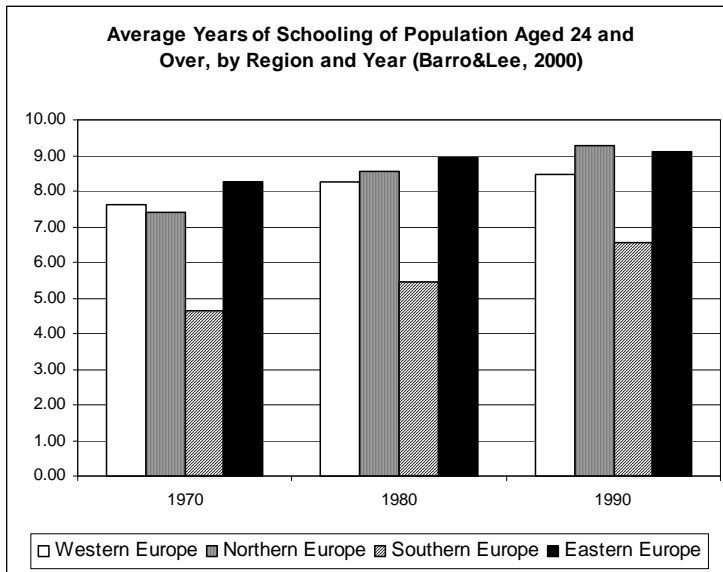
	Region of Education				US (EU born)	US (US born)
	Western/Central EU	Southern EU	Northern EU	Eastern EU		
Mean yearly salary in \$US	67293	49299	71685	40860	55202	49792
Mean years of work experience	24.67	21.3	23.45	21.31	21.06	18.57
Mean years in US	18.9	15.39	14.53	13.61	30.55	-
Mean age	47.81	44.74	46.45	45.03	44.08	41.3
Proportion Male	69%	81%	83%	54%	68%	69%
Proportion Married	82%	78%	76%	81%	72%	72%

Source: NSCG 1993.

The numbers support the propositions made earlier. Not only are Europeans different from each other with respect to their foreign education; in addition, their earnings do not simply follow the theory of assimilation. As expected, Eastern and Southern Europeans have lower average earnings relative to Americans. Northern and Western Europeans gain a wage premium due to their foreign education. Thus, it can be speculated that degrees received in these education systems are more than transferable to the US labor market. Of course, these figures should be regarded with caution, as these are nominal wage differences and may still be driven by variables other than POE. Such variables are, on the one hand, observable characteristics like the ones discussed below, but may, on the other hand, also include unobservable elements like the underlying selection inherent in the migration decision—a problem that has not yet been unambiguously solved by the research.

Education systems: However, there is adequate support in the data on why POE may affect earnings differently. Education systems are fairly diverse in the respective

Figure 1 (Higher) Education by Region and Year



European countries; and data indicates that degrees may therefore transfer differently to the US labor market. Data on educational attainment in a particular country gives a general indication of how higher education is positioned in the country of origin. Figure 1 shows the percentage of the population that has completed a university degree as well as the total years of schooling by region. Southern Europe appears to have much lower totals and differs strongly from Northern and Western Europe in this respect. Eastern Europe shows comparatively high numbers. However, at this point it should be noted that

Eastern European immigrants educated in the communist system, which promoted higher education, focused on skills not necessarily transferable or demanded by the US labor market.

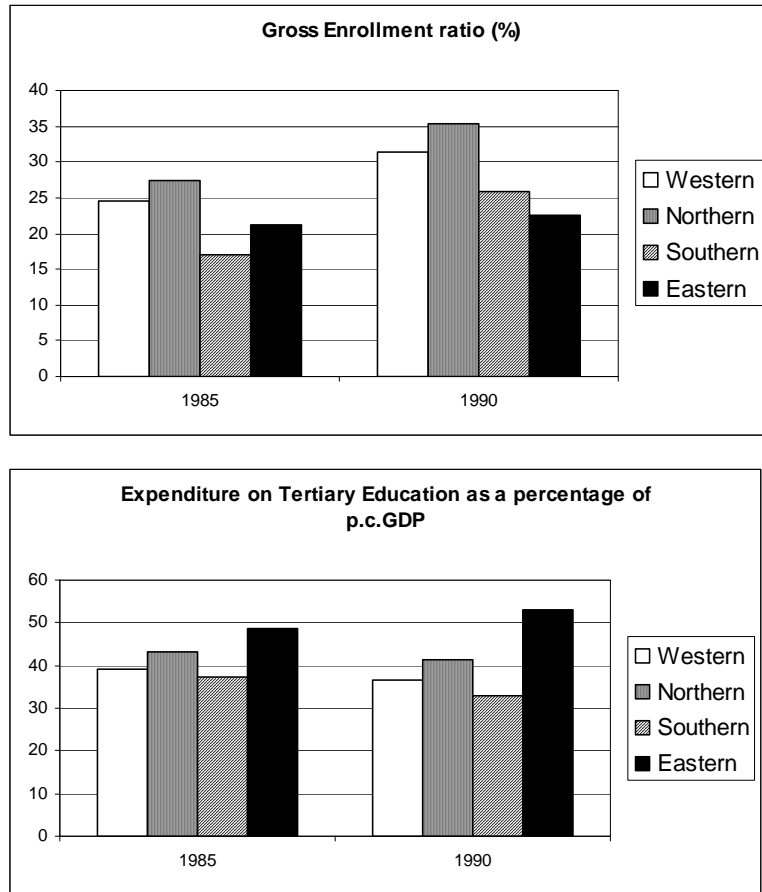
A country's or region's enrollment ratio for higher education is one measure of the level of human capital in a population. Figure 2 shows that these numbers vary across regions; Southern and Eastern Europeans have much lower rates than Western and especially Northern European countries.

Furthermore, Figure 2 illustrates the expenditure on tertiary education in each region. Again, the pattern is similar to previous analysis; expenditure in Southern Europe is relatively lower. The case of Eastern Europe is likely to be unique, as mentioned previously.

Economic relations: The proposition is made that differences in earnings among European immigrants occur because

the degree of economic interaction between host and home country may affect integration in the host labor market.

Figure 2 Enrollment in Higher Education

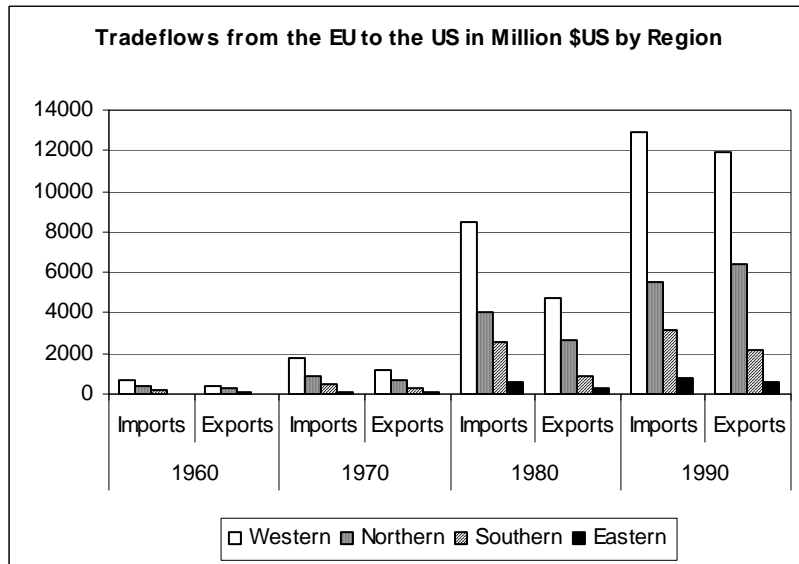
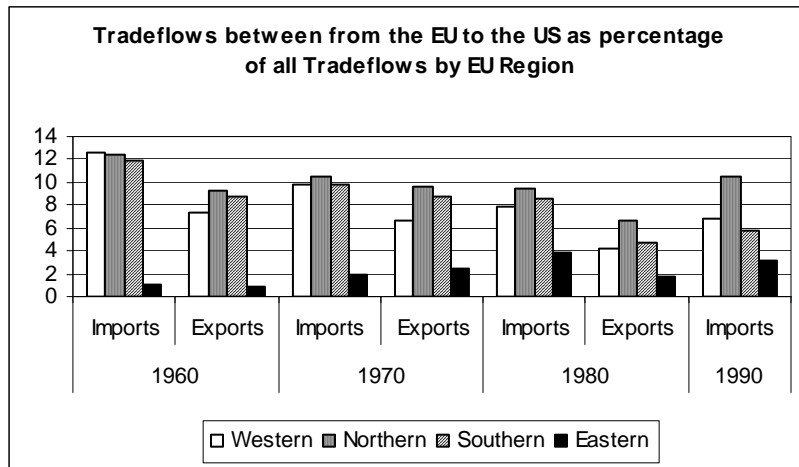


Source: World Bank, various years.

Trade and investment data present a broad idea of the extent to which the economies are globally integrated. Figure 3 shows bilateral import and export flows between the EU and the US over the period 1960 to 1990. All regions except Eastern Europe maintain a

high share of their trade with the US economy. Absolute numbers reveal that the large economies in Northern and particularly Western Europe trade most actively with the US.

Figure 3 Trade Flows



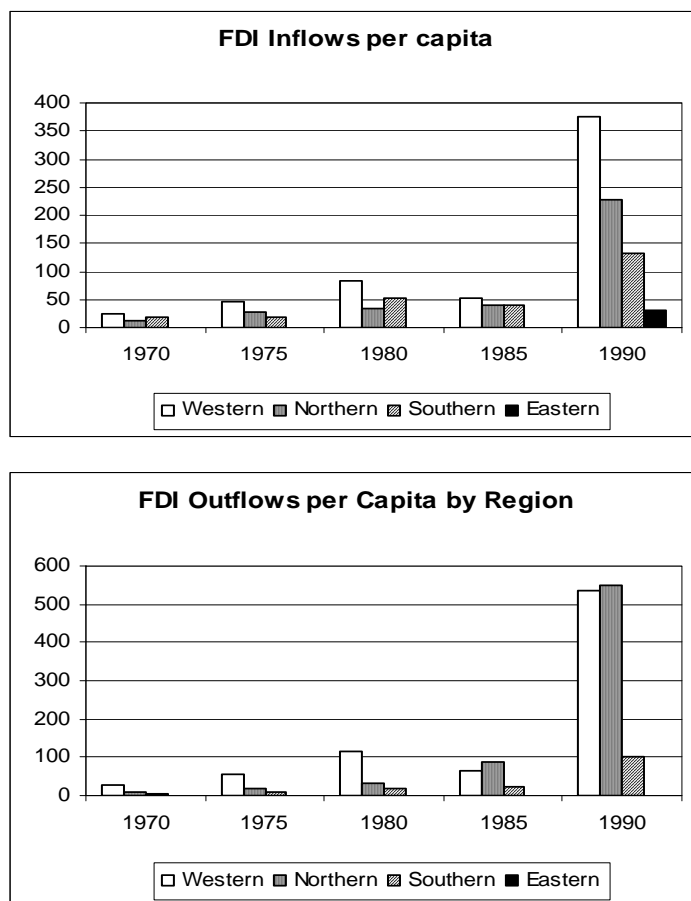
Source: UNCTAD, various years.

Similar observations can be made by looking at the foreign direct investment (FDI) of the regions (Figure 4). FDI flows clearly express the leading role of Western and Northern European countries and confirm the political and economic isolation of Eastern Europe during the Cold War.

Furthermore, the global activity of a country can be analyzed by looking at the intensity with which its companies participate in international mergers and acquisitions. Figure 5 shows purchases and sales made by companies from the different European regions in the early 1990s. The results support the patterns mentioned above.

Multi-national corporations (MNCs) are crucial entities connecting countries' labor markets by operating across countries and transferring employees between different sites. In many cases, the company transfers high level staff with highly desirable skill sets to the host country. These transfers can therefore cause differential selectivity into higher positions for immigrants from countries with many MNCs. Data from the INS shows that intercompany transfers—currently possible under the L-visa program—have gained increasingly in

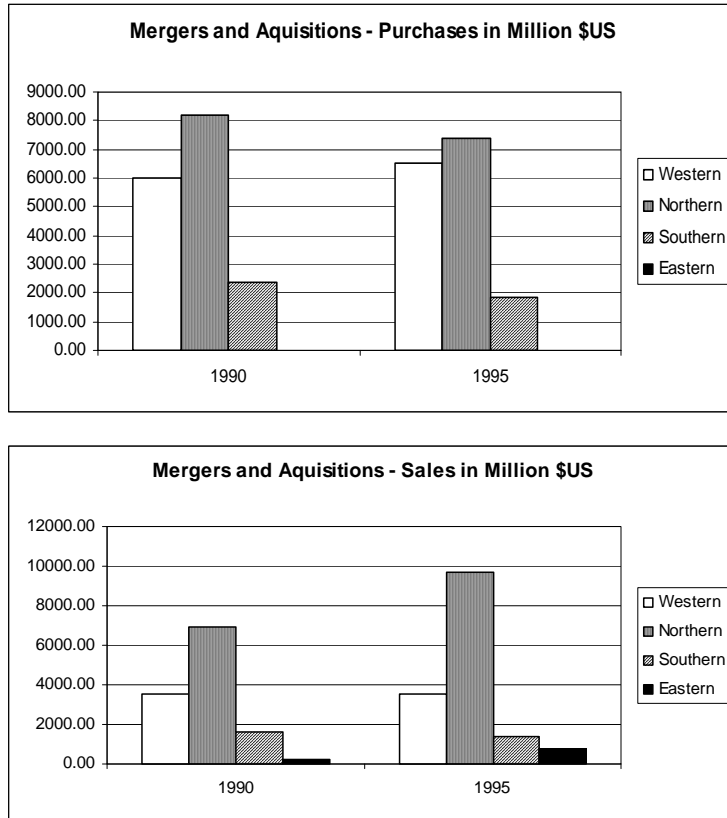
Figure 4 FDI Flows



Source: UNCTAD, various years.

importance since the mid 1980s. Many individuals from Northern and Western Europe migrate in this category.

Figure 5 Mergers and Acquisitions



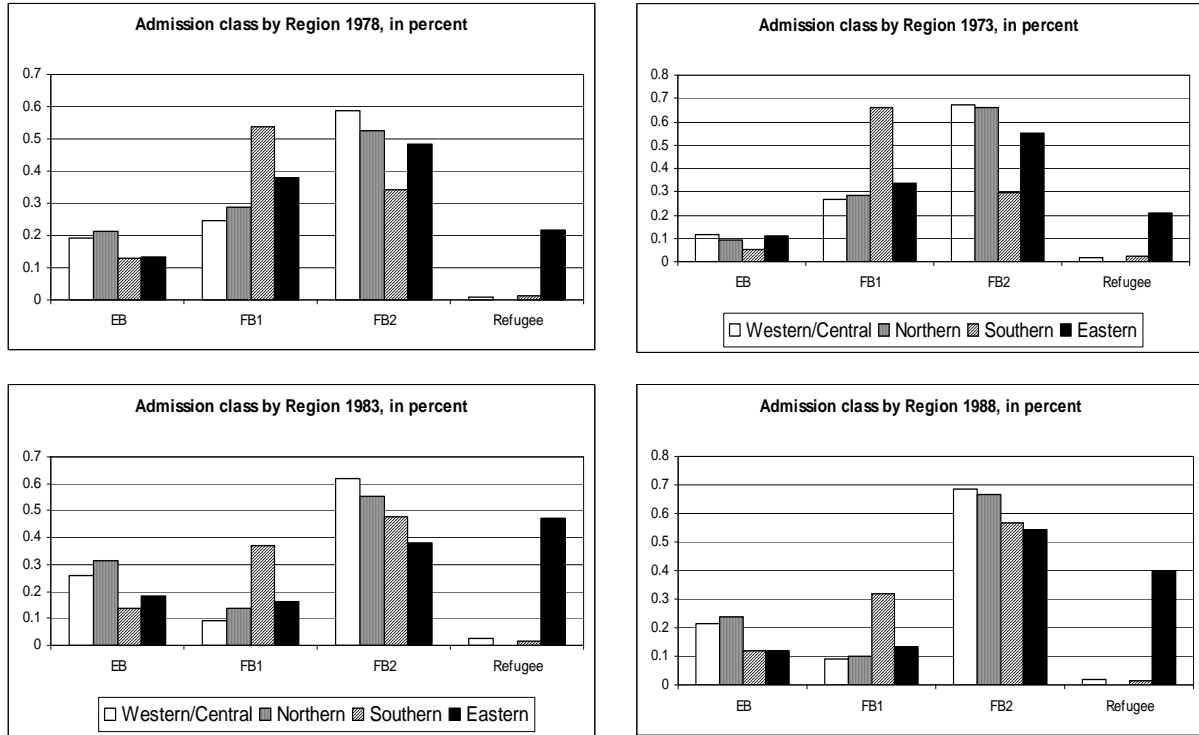
Source: UNCTAD, various years.

appears not only to be caused by higher management remuneration but is already observed in upper level positions.

US immigration policy: The US immigration system constitutes one mechanism by which immigrants with certain characteristics are selected, and these characteristics in turn influence their earnings. Figure 6 reports the percentage of immigrants migrating in a particular class by region of origin. While family-based (FB) immigration is the most important category for all immigrant groups, Eastern Europeans clearly have the highest share of refugees. Thus, the differential earnings observed among Europeans are likely to be connected to the immigration policy in the case of Eastern European immigrants. The other three regions show roughly the same pattern.

Indeed, support can also be found in the microdata of the NSCG. Appendix Table 3 shows that *all* European educated immigrants are overrepresented as managers, but particularly Europeans from the Western and Northern regions. Furthermore, managers with Western and Northern European education receive higher compensation than others on average. Thus, the earnings advantage of immigrants educated in Northern or Western Europe

Figure 6 Admission Class by Region



Source: INS, various years.

Note: There are two different kinds of FB immigration. FB1 is subject to numerical limitations while FB2 is exempted.

4.2 Regression Analysis⁹

To underline the findings from the descriptive data above, regression analysis was undertaken using the NSCG microdata. Using ordinary least square (OLS), yearly earnings were regressed on relevant socio-economic variables, including dummies for POE, each capturing the group of migrants with college education from one of the European regions or from the US with native-born Americans as the base category. The model for testing the above hypotheses builds on the basic structure of the human capital wage equation (Mincer, 1974) and research on immigrant assimilation. The main factors explaining earnings are education and experience, as well as assimilation factors specific

⁹ This section had to be shortened in the published version.

to immigrants. The base equation used for estimation is as follows:

$$\ln(y) = \beta_0 + \beta_1 \text{exp} + \beta_2 \text{exp}^2 + \beta_3 \text{ysm} + \beta_4 X + \beta_5 E + \beta_6 \text{POE} + u$$

The dependent variable is the natural log of wage, exp are the years of professional experience, exp^2 is experience squared, and ysm is the years since migration to the U.S. (U.S. experience), X includes a vector of demographic variables such as marital status and gender; and E represents a vector of variables for skills especially college completion and English ability. Finally, POE is a dummy variable for the region in which an individual completed their highest level of education. The regions are Western, Southern, Northern, Eastern Europe, and the United States. Native-born Americans educated in the U.S. are the base or omitted category for POE. Additionally, a control variable for holding a manager position was included as another specification. Other controls that incorporate the assumptions of the effect of economic relations between host and home country could not be included, unfortunately. Such information is hard to report in microdata; hence, a more intuitive interpretation of the available numbers has to suffice. Nevertheless, admission classes were also included as a third specification. Technically this addition analysis bears some difficulties because the NSCG data – like most microdata sets – does not report the class of admission. For that reason, it was necessary to proxy for this information from the Statistical Yearbook of the U.S. Immigration and Naturalization Service (INS). Following the approach of other research, the admission status is proxied by assigning the proportion of EB, FB and refugee admission for each cohort and country to the foreign born population in the NSCG data.¹⁰

All variables that have been included as well as their coefficients are shown in Table 3. In exploratory regressions the coefficient of the U.S. educated Europeans is insignificant and they do not differ from the native born. As a result, U.S. educated Europeans are omitted from the regression (they become part of the native comparison). Additional notes regarding the method and peculiarities of the data are explained in the appendix. Column (1) reports the basic model; column (2) includes the variable of holding a

¹⁰ This imputation is associated with some impreciseness because the INS does not always provide information for all counties in the same way over the years. Also see Cobb-Clark, 1990 and Duleep and Regets, 1996 for this technique.

manager position; and column (3) includes four the four admission classes: Employment based (EB), refugee (REF), family based 1 and 2 (FB1 and FB2, as explained above).

The results of this analysis confirm the nominal earning differences that split Europeans by POE after controlling for other relevant factors. The estimates for Western and Northern Europeans are positive and large with a high level of significance. According to these estimates Western Europeans earn 10 percent more than U.S. natives and Northern Europeans even 19 percent more (see column 2). Thus, the nominal results reviewed above survive controls for confounding variables.

At the same time, European immigrants educated in Southern and Eastern Europe are expected to experience disadvantages in the return on education. Indeed, Eastern Europeans especially experience a large wage disadvantage in the U.S. labor market after controlling for confounding variables. They earn 19 percent less than U.S. natives. For Southern Europeans the regression also reveals lower returns to education. They earn 14 percent less than U.S. natives.

Further, as predicted, the manager variable shows a positive and significant coefficient across all models. Still, the inclusion of this variable does not have much effect on the regional earnings differences in POE, also indicated by descriptive data analysis.

The admission class, however, could be incorporated with the INS data. The estimation is run on only the subsample of European immigrants thus the omitted variable for POE are the US educated Europeans—which are similar to the US born population as explained earlier. The reason for the use of the subsample is that the admission class variables are all zero for the US native born observations and the effects would likely be underestimated assuming a linear relationship. The inclusion has little effect on the coefficients of the POE variables, except for Northern Europe, where the coefficient drops to 0.14. The EB coefficient is close to zero and insignificant and the refugee coefficient negative and at the edge of significance at the 10 percent level. The FB coefficients are both negative and significant, with the numerically unrestricted category of FB2 having the larger effect. Not too much weight should be given to the size

of these coefficients as they only proxy for admission class.¹¹ However, the variables show that immigrants entering in a category other than “employment based” have to accept a lower wage. Unfortunately, interactions with the POE dummies were not possible due to sample size and collinearities, however, the estimations indicated that the POE dummy of Eastern Europeans varies with the refugee variable and that some of the negative earning effect might be due to this group being over-proportionally represented among the refugees.

Summing up, the findings from regression differential earnings of European educated immigrants are confirmed after controlling for relevant factors. Differences in the education systems are very likely to be the main reason. Descriptive data supports the interpretation that economic relations positively affect labor market outcomes; the incorporation of such control into regression analysis is not possible given the available data and therefore is not included here. The admission class seems to adversely affect immigrant earnings if they enter in a non-employment based class, as expected.

¹¹ Percent of immigrants admitted from the particular country over various years.

Table 3 Natural log of yearly earnings: estimated coefficients for college-educated EU immigrants and U.S. natives

	(1)	(2)	(3)
Work experience in years	0.026*** (32.199)	0.023*** (29.070)	0.022*** (4.955)
Work experience squared	-0.000*** (-22.722)	-0.000*** (-20.763)	-0.000*** (-3.766)
Years since migration1)	0.002*** (4.064)	0.002*** (4.154)	0.002 (1.166)
Male	0.221*** (51.263)	0.212*** (49.782)	0.273*** (11.202)
Married	0.161*** (37.239)	0.149*** (35.211)	0.141*** (6.192)
Masters degree	0.423*** (50.252)	0.430*** (51.212)	0.368*** (12.178)
Doctorate or other professional degree	0.102*** (23.036)	0.093*** (21.326)	0.110*** (4.342)
Educated in Western/Central EU	0.129*** (3.129)	0.097** (2.455)	0.090** (1.983)
Educated in Southern EU	-0.157* (-1.895)	-0.151* (-1.893)	-0.156* (-1.860)
Educated in Northern EU	0.205*** (8.158)	0.183*** (7.632)	0.141*** (3.812)
Educated in Eastern EU1)	-0.234*** (-5.709)	-0.207*** (-5.085)	-0.209*** (-3.949)
In a manager position		0.231*** (43.683)	0.256*** (9.002)
% EB			0.008 (0.054)
% REF			-0.252 (-1.630)
% FB1			-0.251** (-2.144)
% FB2			-0.332*** (-2.584)
Constant	10.122*** (1321.006)	10.135*** (1334.197)	10.355*** (84.796)
Number of observations	54449	54449	1892
F-stat	1041.31	1140.50	47.42
R-Square	0.179	0.207	0.291

Note: * p<0.10, ** p<0.05, *** p<0.01

5 POLICY IMPLICATIONS

This study has analyzed earnings differences for highly skilled European immigrants in the United States at the outset of the 1990s. Based on the theory of economic assimilation and previous empirical research on the transferability of skills received in the sending country, it was proposed that foreign education is rewarded less than US education in the US labor market. However, the results of this study contradict this commonly held view by indicating that European immigrants educated in various European countries have differing wages due to their foreign skills and that some even earn more than native-born Americans. This notion is new to the existing body of literature and offers new insights for policies in both Europe and the US.

From the point of view of the receiving country, i.e. the US, three main policy implications can be drawn. First, under the assumption that the US labor market correctly prices foreign skills, i.e. that higher wages for various groups of immigrants are warranted by higher labor productivity, the results of this study imply that it may be in the interest of economic efficiency to adapt US immigration policy to differences in foreign skill transferability. Consequently, as the US labor market appears to value immigrants who have been educated in Northern, Western and Central Europe higher than those in Eastern and Southern Europe, it would be in the economic interest of the US to favor immigrants from the better performing countries through immigration policy. In light of the fact that highly skilled immigrants from these regions even outperform US-educated highly skilled workers, immigration policy could be further relaxed to increase the overall number of immigrants with these backgrounds. More generally, policy makers may be well advised to gain and absorb more knowledge about education systems in sending countries to assure better integration and ultimately a more efficient contribution to the US economy overall.

Second, adding to the ongoing discussion about the role of increasing numbers of foreign students enrolled in American universities, this study confirms that these students integrate very well into the US labor force. Consequently, the US immigration policy should account for the productive potential of incoming foreign students by easing visa policies for students and facilitating their access to the US labor market. For example,

this adjustment would entail shortening or even abolishing the time that foreign students have to work on H-1B visas before they can gain legal permanent residency. In fact, empirical research has shown that the H-1B status puts them in a disadvantaged situation and that it is not before gaining legal permanent residency that their earnings increase to a level comparable to US workers.¹²

Third, the finding that refugees encounter particular difficulties in the US labor market—even when they are highly skilled—stresses the fact that they may need extra support to integrate in order to minimize the considerable brain waste that occurs when highly skilled refugees are only integrated marginally into the labor market. Concrete policies could focus on integration programs such as accelerating language training or further familiarization with the US system to help to transform their skills into valuable input to the US economy. Also, the results indicate that family based immigration may be less responsive to labor market demand in the US, even though the result refers to highly skilled immigrants.

From the perspective of European sending countries, two major policy implications can be drawn from the findings of this study. First, the different performances of European immigrants in the US, depending on their region of education, provides an important benchmark for the transferability of education and shows how the quality of European education systems are perceived internationally. Apparently, highly skilled workers who have been educated in Northern, Western and Central European countries are able to integrate more easily into the US labor market than Eastern and Southern Europeans, and the greater transferability of their skills is valued by the labor market. Considering that companies increasingly operate in international markets, this finding could be used by education policy makers as one indicator for differences in the quality of education. Factors that characterize the more successful education systems, like funding, enrollment rate and number of graduates, could therefore be used to improve the education systems of those countries from which emigrants perform more poorly. Consequently, the findings are valuable input for the policies summed up under the Bologna Process – a policy initiative that is part of the EU’s goal to increase international

¹² Lowell and Avato (2006).

competitiveness by 2010 and aims at equalizing and improving the quality (and quantity) of the highly skilled labor force – and provide empirical evidence on which countries or regions lag behind in their quality of education. Considering that education policy is still a national domain not directly influenced by the EU, it would be useful to undertake the analysis performed here not only accounting for regional but also for country-level differences. While this breakdown was not possible here due to sample size issues, it would certainly be a valuable to policy makers if future studies could be undertaken at this level.

In addition, the findings of this study suggest that the EU's focus on tertiary education policy as part of the Lisbon Agenda to improve the community's performance as a knowledge economy could be shifted more towards enhancing opportunities after graduation. While of course improvements and increased funding for higher education are very welcome, at least in some countries the quality of education appears to be fairly good already as demonstrated by the success of migrants in the US labor market. In these countries, one could argue that relatively more emphasis should be put on improving the research conditions for science and technology professionals after graduation, i.e. in the labor market, to improve the transition into the labor market, increase their productivity and reduce incentives for emigration. This indicates a very interesting area for further research, to focus on the relative effectiveness of various measures and policies to increase the level of R&D in the private sector, including tax credits, research grants to the private sector as those offered in the Small Business Innovation Research Program¹³, and closer cooperation programs between academic research and the private sector.

Finally, a note of caution is warranted regarding the performance of immigrants in this study. In fact, at least some of the success in US labor markets may be explained by a positive selection bias, i.e. the fact that emigrants may be among the best and brightest in their countries. Discussions of such a brain drain currently dominate many debates about labor markets and education policy in Europe, and the results of this study imply that, at least in part, all European countries may be subject to it. EU governments anxiously look at the increasing number of researchers leaving Europe for the US as they fear the loss of

¹³ For more information see <http://www.sbir.gov/>

human capital and the impact on economic growth. The high reward that some emigrants obtain in the US should not calm such concerns as this situation might draw even more skilled people. It should rather encourage politicians to speed up the establishment of a research friendly environment as well as labor market conditions that provide attractive opportunities to highly qualified people.

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7 Appendix

7.1 Regions

Northern EU: United Kingdom, Ireland, Sweden, Denmark, Finland

Western/Central EU: Netherlands, Germany, France, Belgium, Luxembourg, Austria

Southern EU: Italy, Spain, Portugal, Greece, Malta,

Eastern EU: Poland, Hungary, Estonia, Latvia, Lithuania, Czech Republic, Slovakia (in the data still former Czechoslovakia).

For Cyprus and Slovenia there was no available data.

7.2 Tables:

Appendix-Table 1 Distribution of the Most Recent Degree among Highly Skilled European Immigrants and US Americans, in percent

Place of Education by Region	Bachelor	Master	Doctorate	Prof. Degree /Other	Total
All European immigrants	58.98	27.65	7.9	5.47	100
Western/Central EU	61.27	25.5	7.85	5.38	100
Southern EU	63.64	27.31	4.75	4.3	100
Northern EU	59.66	25.89	8.88	5.57	100
Eastern EU	48.38	35.67	9.31	6.64	100
European educated EU immigrants	56.05	27.42	10.56	5.96	100
Western/Central EU	56.93	28.83	11.76	2.48	100
Southern EU	51.06	25.66	10.5	12.78	100
Northern EU	65.31	19.07	10.55	5.07	100
Eastern EU	33.11	47.81	9.29	9.79	100
US educated EU Immigrants	60.38	27.76	6.62	5.24	100
Western/Central EU born	62.27	24.96	6.66	6.12	100
Southern EU born	66.01	27.55	3.69	2.75	100
Northern EU born	53.54	32.88	7.43	6.15	100
Eastern EU born	57.46	27.82	9.63	5.08	100
Native Born US educated	71.43	20.77	2.14	5.66	100

Source: NSCG 1993.

Appendix-Table 2 Percentage of EU immigrants educated in the EU or US within degrees by region

	Western/Central EU born	Southern EU born	Northern EU born	Eastern EU born	All Europeans
Bachelor					
EU educated	18.61	8.92	55.91	26.2	30.83
US educated	81.39	91.08	44.09	73.8	69.17
Master					
EU educated	20.54	12.13	36.72	50.77	32.17
US educated	79.46	87.87	63.28	49.23	67.83
Doctorate					
EU educated	31.27	28.54	59.02	38.2	43.38
US educated	68.73	71.46	40.98	61.8	56.62
Professional Degree and Other					
EU educated	5.38	34.31	44	53	35.35
US educated	92.24	65.68	56	47	64.65
All Degrees					
EU educated	20.27	12.9	51.03	41.94	32.44
US educated	79.73	87.1	48.97	58.06	67.56

Source: NSCG 1993.

Appendix-Table 3 Percentage in manager positions and mean yearly salary by region of education

Region	Manager status	Percentage	Mean yearly salary
Western/Central EU	Not a Manager	61.76	55245
	Manager position	38.24	86752
	Total	100	67293
Southern EU	Not a Manager	82.36	43899
	Manager position	17.64	74519
	Total	100	49299
Northern EU	Not a Manager	66.83	61724
	Manager position	33.17	91755
	Total	100	71685
Eastern EU	Not a Manager	94.16	40266
	Manager position	5.84	50428
	Total	100	40860
US educated and EU born	Not a Manager	79.9	50887
	Manager position	20.1	72355
	Total	100	55203
US educated and US born	Not a Manager	80.54	46169
	Manager position	19.46	64790
	Total	100	49792

Source: NSCG 1993.

7.3 Additional Notes for Regression Analysis:

Method

There are additional factors associated with the NSCG 1993 data which should be discussed when presenting the results. First of all the NSCG only permits the use of yearly earnings. It is preferable to analyze the hourly wage for the earnings model; however, the NSCG 1993 does not allow such an imputation lacking the hours and weeks that each individual worked. The wage in the NSCG data is captured by having the respondent state how much and in what time a certain amount was earned. Consequently, the yearly wage variable has to be constructed. In this the analysis the average hours and weeks worked from the 1990 Census data was used to create the variable of yearly salary. Such construction is surely not immune to criticism, but it clearly seems the best solution for the 1993 NSCG data. Furthermore, additional regressions were estimated using the wage variable from the Census to cross-check the results of the NSCG data supporting the yearly wage regression with the NSCG.¹⁴

The controls for English language skills are dropped from the equation, although important in the assimilation context for broad samples of immigrants.¹⁵ But among these college-educated European immigrants who reported their English skills just more than 98 percent reported either very good or good English language proficiency. There is little variation in this skill and not including the variable does not affect the other coefficients. This should not be surprising as these are college educated workers with 25 years of U.S. experience on average, so their wages reflect most of the accumulated value of their acquisition of English skills. This, in fact, makes the residual effect of POE all the more interesting.

¹⁴ The Census wage sample slightly reduces the sample because individuals who completed their degree between 1989 and 1993 are dropped from the sample. The reduction in sample is very small and introduces very little bias in the cross-check on how earnings are measured.

¹⁵ See Chiswick and Miller 1998; Jasso and Rosenzweig, 1990.

Robustness tests:

Two additional analyzes were undertaken to test the robustness of these findings. First, the sample is changed from the NSCG to the 1990 Census.¹⁶ The reason for this regression is to find out whether the results for POE are the same when earnings of the Census are analyzed. The coefficients for the different regions are of slightly different magnitude, but their sign and significance is similar to the previous analysis. Thus, these results confirm the overall hypothesis that European POE matters.

Second, the variable for Europeans educated in the United States was differentiated by region of European birth. A regression was run replacing this dummy for “European born” split into four dummies. That estimation found that the wage differences by place of education in Europe do not persist for those Europeans educated in the US. This suggests that other region specific characteristics do not drive the results of regionally varying POE and that there is little bias in the findings that might arise from the lack of missing control variables for unmeasured region-specific factors.

¹⁶ Note that in the NSCG 1993 the 1990 Census variables are available in the same dataset.

Chapter 3

MIGRATION PRESSURES AND IMMIGRATION POLICIES: NEW EVIDENCE ON THE SELECTION OF MIGRANTS

Abstract:

This paper aims to better understand emigration pressures in migrant sending countries by looking at the determinants of the propensity to migrate at the individual level. The analysis is based on survey data from Albania, Moldova, Egypt and Tunisia collected by the European Training Foundation (ETF) in 2006. Within this context the study focuses on (i) the self-selection of migrants in terms of skills and (ii) the impact of selective immigration policies on the migration process. The paper finds that migration pressures, or the intent to migrate, are not subject to any self-selection. However, immigration policies exert a strong out-selection that is likely part of the reasons why positive selection is found in many studies. Further, the study confirms that the EU attracts comparatively lower skilled migrants than other destinations.

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1 INTRODUCTION

The migration of skilled people has become a hotly debated issue in both sending and receiving countries. In the case of the European Union (EU), for example, efforts are under way to attract skilled labor through increasingly selective immigration policies. In order to counteract a trend in immigration statistics that has left the EU with a considerably higher share of low skilled immigrants than other regions, particularly the United States (US), policies favoring immigration of highly skilled workers have been introduced in a number of European countries, including France, Germany, Ireland and the United Kingdom. Moreover, in September 2007, Franco Frattini, the EU Commissioner for Justice, Freedom, and Security, proposed the introduction of a unified “Blue Card” which aims at attracting highly skilled migrants from outside the EU.

But effectively selecting immigrants and protecting borders against low skilled immigrants is difficult. Pressures to migrate are immense, due to enormous economic inequalities between sending and receiving countries, especially in South-North migration. Even less influence can be exerted by sending countries, as there is hardly a way to establish restrictive *emigration* policies. Hence, it is in the interest of both groups of countries to understand the factors that determine the decision of individuals to migrate. It is important to learn more about the characteristics of people who decide to move, why they go abroad and where. Understanding these determinants may ultimately help to better match supply and demand of migrant labor, to predict migrant flows and to boost the success for migrants in the host country.

Against this background this paper will look at the determinants of the propensity to migrate at the individual level. Geographically, it will focus on four sending countries that neighbor the EU: Albania, Moldova, Egypt and Tunisia. The analysis will be based on survey data collected by the European Training Foundation (ETF) in 2006. The survey was designed to study migration intentions and the characteristics of migrants (and non-migrants) in sending countries and thus provides a unique micro data set. The approach to analyze characteristics is based on the theory of intentions established by the work of Ajzen (1988). In addition, the detail in the ETF data allows to expand Ajzen’s model and to define degrees of likelihood of an

individual to migrate and to identify individuals who are just before migrating. Thus, the paper will also contribute to evaluating how well intentions predict migration behavior.

Within this context the study distinguishes two steps in the migration process of the individual. The first step where migration intentions are formed and the second where those intentions are actually realized. The study will analyze the self-selection of migrants in terms of education levels, other skills and in terms of integration in their home labor market. The second step refers primarily to the role that migration policies play in restricting (or allowing) actual migration, but also to the degree to which the individuals are determined to actually move abroad. Similar to the first step, selection—that is the out-selection—of migrants will be the primary interest of the analysis.¹ Other factors that may play into selection patterns such as network effects or country specific characteristics will be also considered.

The paper finds that the selection of migrants is indeed not clear-cut. There is no evidence that migration pressures are subject to any selection pattern. This means that it is not the highly skilled in particular who want to go abroad. Rather, unemployment and network effects are important determinants for migration intentions. For the second step of realizing migration intentions, the study finds a robust positive out-selection. Education seems to be indeed a factor that is associated with overcoming migration restrictions. In terms of the destination choice of migrants, the study clearly confirms the trend that the EU receives less skilled migrants than other destinations. There is no evidence for selection of those heading to the EU while there is positive selection for those heading elsewhere. This implies that migration policies are in principle effective in selecting migrants, but such policies have not yet been successful in the EU. It may be a slow process to change this pattern due to strong network effects that uphold the flow of less skilled migrants.

The paper is structured as follows. First, the theory of intentions, its application to migration and the literature of selection will be reviewed. Subsequently, the data and conditions in the survey countries will be presented and the models for estimation introduced. The results of the estimations will be presented in section four. The study concludes with a summary of findings and elaborates on policy implications that result from this research.

¹ The analysis will use the terms self-selection and out-selection to distinguish between selectivity that occurs in migration intentions (self-selection) and through subsequent migration barriers such as immigration policies (out-selection).

2 THEORY OF MIGRATION INTENTIONS AND SELECTIVITY

2.1 *Migration and Intentions*

Most economic literature on migration agrees that the main driving forces behind migration are differences in (expected) net returns between sending and receiving countries. Thus, a migrant holding certain characteristics and skills weighs expected gains in the potential host country against costs associated with migration and gains that can be obtained when staying in the home country (Harris and Todaro 1970, Hatton and Williamson 1998, Massey et al. 1993).² Some literature also stresses that this migration decision is not only evaluated by the migrating individual alone but rather by the whole family following a strategy of risk diversification (Stark and Bloom 1985, Stark 1991, Katz and Stark 1986, Lakshmansamy 1990, Findlay 1987).

Gains are widely defined by wage differences. Nevertheless, these differences are not the only important driver of migration as is demonstrated by the fact that the poorest countries are not the ones sending the largest numbers of migrants (Massey 2005, Hatton and Williamson 2005, Waddington and Sabates-Wheeler 2005). Consequently, gains may also originate from other inequalities in the political, economic, social, demographic and geographical environment (e.g. freedom, protection, better health care); or generally better living conditions than in the origin country.

Costs associated with migration vary and may include the actual migration costs (e.g. travel costs, visa), psychic cost of leaving the home country and family, adjustment costs in the host country or risks underlying migration decisions (Schwartz 1973, Carrington et al. 1996, Bauer et al. 2000, Gordon and Molho 1995, Drinkwater 2003, Langley 1974, Hart 1975).

Over the past years difficulties in finding adequate data to study the characteristics of migrants prompted economists to make more use of intentions data and thereby study migration behavior indirectly—an approach that is also followed by in this study (Hughes and

² Also see, Sjaastad (1992), Todaro (1969), Molho (1986), Borjas (1994), Chiswick (1999) or Bauer and Zimmerman (1998) for an overview of approaches.

McCormick 1985, Papapanagos and Sanfey 2001, Drinkwater 2003 Adams 1993, Bilborrow et al. 1987). This allows looking at individual characteristics that are important to determine migration at a time when the migrant is still in the country of origin and consequently allows to look at migration pressures in more detail. The problem in these samples could be that they might suffer from selection because those who have already left the country are not captured in the surveys. However, host country data do not give a full picture of migration pressures either as it includes only those people who succeeded in migrating and who have been selected due to factors such as immigration policies and proximities between sending and receiving countries (Jasso et al. 2000). While the survey used in this study may indeed suffer from the first kind of selection, it is nevertheless possible to analyze both migration pressures and the role of immigration policies, and to disentangle ‘self-selection’ (in migration pressures) from ‘out-selection’ (by immigration policies). The great detail of the variables available allows incorporating migration constraints despite using intentions-based data.

Obviously, it is arguable whether intentions are an adequate predictor of actual migration behavior. Thus, it is fundamental to explore the link between intentions and subsequent actions. The starting point for this analysis is the work on the ‘theory of reasoned action’ of Ajzen (1985, 1988). It does not differ essentially from economic theory but approaches the migration decision from the socio-psychological angle. Based on this theory the action (emigration) is taken after the consequences have been weighed against the present status—all based on individual conditions, perceptions and expectations. Manski (1990) and Burda et al. (1998) point out that although there is some informational content in intentions-based survey questions, researchers should not expect too much from such data. Manski (1990) stresses that there is no reason that differences on the individual level between intentions and behavior should “average out” in the aggregate. Also, Bertrand and Mullainathan (2001), hint at the general problem of using subjective variables as a dependent variable in econometric modeling.

However, many studies confirm that, ‘actions’ are very well predicted by intentions (Louviere et al. 2000, Böheim and Taylor 2002, Kule et al. 2002, Papapanagos and Sanfey 2001, Sandu and De Jong 1996). And numerous studies have emphasized the applicability of the theory of intentions or reasoned action to the migration context. Although, based on internal

migration, where following the migrant is much more practical than in international migration, they find a close relation between intentions and actions.³

It should be kept in mind, however, that the costs of international migration are higher; migrants face more obstacles and practical issues might dominate individual characteristics (e.g. need more resources, different language, getting a visa and work permit etc.). It may also be possible that the time between forming intentions and the actual action or emigration is longer in international migration. This may lead to an increased tendency of the individual adjusting her intentions until it comes to international migration, though empirical evidence for this is scarce. Gardener et al. (1986) for example finds that legal obstacles had been the main reason for Philippines abandoning their plans to migrate. Moreover, van der Erf and Heering (2002) analyze survey data from Morocco asking whether the significance of the characteristics that are said to predict intentions hold when these intentions are refined including timing of migration and actual steps already taken towards migration. They find that individual characteristics under these circumstances increasingly become less important predictors.⁴ These concerns about the discrepancies between intentions and behavior will be picked up in this study and tested to the extent possible. Due to the detail in the data underlying this study, these problems can, in fact, be mitigated as will be explained further below.

Most studies of intentions in international migration start with individual human capital or socio-demographic characteristics, such as gender, age, education, work experience, unemployment and language skills as essentially determining migration decisions (De Jong et al. 1996, Grasmuck and Pessar 1991, Bilsborrow 1993, Mora and Taylor 2005, Boyd and Grieco 2004, Stark and Taylor 1991). It is beyond the scope of this review to report all results of studies that have been done, the following will consequently focus only on literature that will be particularly important for the approach in this work which is the selection of migrants in the migration process distinguishing between self- and out-selection.

³ E.g. Fuller et al. (1986), De Jong et al. (1996); Sandu and De Jong (1996); De Jong, 2000 for Thailand; Fawcett (1986); Hughes and McCormick (1985), Gordon and Molho (1995) for the UK; Lu (1999), Yang (2000), Zohry (2005) for Egypt, Burda (1993) and Burda et al. (1998) for Germany, Ahn et al. (1999) for Spain and Faini et al. (1997) for Italy, Knight and Song (2003) for China, Drinkwater (2003), Liebig and Souza-Poza (2004) for EEC and EU countries.

⁴ However, their sample size becomes very small.

2.2 *Selection of Migrants*

A recurring question when it comes to characteristics of migrants is whether migrants are positively or negatively selected, and, as indicated, this is very controversial. Borjas (1987) argues that a more unequal income distribution in the sending country leads to an adverse skill mix of migrants, thus, negative selection. This view is widely challenged; and Chiswick (1978, 1999, 2000) in particular, points out that positive selection can be expected—a higher income inequality in the sending country would only attenuate positive self-selection (Chiquiar and Hanson 2002, Liebig and Souza-Poza 2004). For example, Mora and Taylor (2005), Taylor et al. (2003) and Adams (2005) all find that human capital variables have a significant positive impact on the decision to migrate. Finally, Chiquiar and Hanson (2005) and Orrenious and Zavodny (2005) come up with general evidence for intermediate selection in Mexican migration to the US. Chiquiar and Hanson (2005) also conclude, that migrants tend to positively self-select when the costs of migrating are high, and vice versa. Overall, the underlying selection in the migration decision is ambiguous and likely different with respect to specific sending and receiving countries as well as to motives of migration. Also, findings vary according to whether host or origin data was used (Constant and Massey 2002, Burda et al. 1998, Borjas and Bratsberg 1996, Beenstock 1996, Jasso and Rosenzweig 1988).

Asymmetric information may also affect the composition of migrants. In the absence of any signaling and screening mechanisms by the host country's employers, asymmetric information would lead to adverse selection of migrants (Katz and Stark 1987). Thus, if there were a screening mechanism in place, such as private recruitment firms, the skill level of migrants would increase because the additional information would be reflected in wages (Chau and Stark 1999). The basic model of asymmetric information has another application to the context of migration. Most importantly, the migrant also lacks information about conditions in the destination country.⁵ As a result, the migration decision has to be based on expectations (under asymmetric information) that may lead to a number and composition of people willing to leave that does not correspond to the capacities of host countries to absorb these migrants.

⁵ Also see Molho (1996).

High positive expectations may lead to large numbers of people emigrating regardless of their skills. A rather pessimistic perspective would dissuade highly skilled people to leave.⁶

It is obvious that expectations mainly impact on migration intentions and thus on migration pressures. In a study on internal migration in Thailand, De Jong (2000) incorporates expectations about gains when staying at home versus to leaving. He argues that these expectations are the main factor impacting (negatively) on migration intentions. He considers migration as a two-step procedure; first, the intentions are formed influenced by various individual characteristics; then actual migration behavior occurs which he tracks using internal migration data.

2.3 Immigration Policies and Selection

In the case of international migration the realization of intentions is subject to additional constraints. Immigration policies and the restrictions they impose impact on the migration process and may prevent many from realizing their intentions. It should be expected that countries such as Australia and North America with traditionally more selective immigration policies create a positive out-selection and that countries with no such policies attract immigrants with lower average skill (educational and professional) levels.

Recently, several European countries, including France, Ireland, Germany and the UK, have begun to increasingly promote selective migration policies.⁷ On the macro level, numbers on immigrant stocks by education level in OECD countries show that the share of skilled immigrants in countries with selective migration policies is much higher than in the EU, which primarily has received unskilled migrants. For example the share of skilled immigrants in 2000 was 42.5 percent for the US, 37.8 percent for Australia and 23.1 percent in the EU15 (Docquier and Marfouk 2006).

Based on modified version of the above-mentioned macro data, Grogger and Hanson (2008) explain positive selection of individuals into migration and positive sorting of migrants across destinations using a Roy (1951) model of income maximization. They find that the selectivity of migration by skill depends on the reward to skill in the source country while skill-

⁶ McKenzie et al. (2007) present an interesting empirical study on the role of expectations in the migration decision.

⁷ See Constant and Zimmerman (2005) for a more detailed discussion.

related wage differences are the dominant factor in explaining why some countries receive more skilled immigrants than other destinations. Further, they control for distance variables such as language, colonial ties and geographical distance and find significant impacts. For example English speaking countries seem to receive comparatively more skilled migrants. They also control for factors that are part of migration policies. For example they find that destinations with liberal refugee and asylum policies draw relatively low skilled immigrants. Unfortunately, their findings on the effect of immigration policies are limited due to lack of comparable data. Nevertheless, it is crucial to note that they find positive sorting for countries with skill-related wage differences that are mostly also those who have adopted selective immigration policies.

Belot and Hatton (2008) also find that the greater the return to skills in the destination as compared to the source country, the stronger will be the positive selection of immigrants by skill-level, but they also argue that other factors such as cultural differences, geographic distance, linguistic proximity and immigration policies play an important role. However, they are not able to measure the latter. Similarly Bruecker and Defoort (2007) find that a higher inequality in earnings in the host countries can increase the favorable selection bias, while the same holds true for the sending countries. Moreover, they control for the role of migration barriers using guest worker agreements and a free movement control and conclude that decreased migration barriers favor lower skilled migrants, which implies the opposite direction for migration policies that increase the barriers.

The latter can also be seen in a setting of migration cost reduction, which leads to the impact of migrant networks or the prevalence of diasporas on migration flows and their skill composition. Migration networks may lower migration costs and benefit lower-income individuals disproportionately (McKenzie and Rapoport 2006, 2007, Munshi 2003, Orrenius and Zavodny 2005, Petersen et al. 2004). Similarly, the size of networks also affects the use of family reunification programs, which generally allow for lower skilled migration. When migration constraints are less restrictive, traditional push and pull factors in migration are more at work, which correspond to migration pressures as Mayda (2005) finds in her comprehensive analysis of migration determinants.

While most studies fail to explicitly incorporate migration policies when analyzing selection, there is one study that focuses particularly on this issue. Aydemir (2003) analyzes the migration process using micro data of migrants going from the US to Canada where he matches data from both countries to include migrants and non-migrants in both countries. Using the Roy model as a starting point, he models two steps where he first captures the selection in the application for immigration to Canada and subsequently the selection out of the pool of applicants, thus those who have obtained a visa. He finds a negative selection in the first step and a positive selection in the second. He concludes that the selection most studies find is driven by the selection imposed by receiving countries policies. He also notes that receiving countries select from a pool of negatively selected migrants. The latter would imply that countries with no selective migration policies might in fact have negatively selected migrants.

Overall, from the theory and literature reviewed, it can be summarized that economic motives and conditions, and how they are perceived, are the primary cause of migration intentions. Economic prospects are important in both initiating and perpetuating migration. Networks are crucial in determining migration flows and their destinations, and may help reducing costs and risks for migrants and their families. At the individual level the characteristics of migrants are important as are the individual perceptions, which, based on the available information level, lead to expectations that result in particular migration intentions. Critical is to what degree intentions actually predict behavior. This is where migration policies have their impact and select migrants out of the pool of people willing to migrate. Largely, it seems that the composition of migrants in many host countries shifts towards relatively better educated people compared to the composition of people in the respective home countries, confirming a positive selection of migrants. But the studies also point out that the finding is not clear-cut and there are often many “buts” and “ifs”.

This study will contribute to this discussion by shedding more light onto migration pressures in sending countries and the role of migration constraints. It will follow the two-step approach of the previously mentioned study by Aydemir (2003) and distinguish between the willingness or intent to migrate and the realization of migration intentions. With the unique data that the study is based on, it is possible to disentangle self-selection from out-selection in these two steps and to incorporate the role that receiving countries play in the migration process. The study will also look at destination choices of migrants to find evidence of

selection patterns that have been prevalent in the past, that is in particular to test whether the EU is (still) receiving less skilled migrants than other destinations. Given that the EU has a large stock of low skilled immigrants this has implications for the effectiveness of its selective migration policies. An explanation is that the dominance of network effects and their tendency to reduce the skill composition in migration flows as well as the heavy use of the family reunification scheme may slow down the intended impact of such policies immensely. The next section will present the data that is used to analyze the above question and present the models used for the estimations.

3 DATA, STYLIZED FACTS AND ECONOMETRIC APPROACH

3.1 *The Survey Countries*

Four EU neighboring countries are included in the survey underlying this study; these are Albania, Moldova, Egypt and Tunisia. Table 1 presents their primary destination regions on the macro level showing that the EU is the main destination for Albanians and Tunisians; Moldavians primarily go to Russia and Egyptians to the Gulf region. Another table presenting the top-10 receiving countries is included in the appendix (A1). Thus, the tables show that the migrants from the survey countries go to a variety of different countries and migration flows from the sample countries are not skewed towards one region or country.

Table 1 Destination regions for immigrants from the survey countries

Host region	Albania	Moldova	Egypt	Tunisia
Latin America and Caribbean	0.5%	0.2%	0.3%	0.2%
EU27+	83.0%	10.8%	9.1%	76.4%
Eastern Europe and Central Asia	6.0%	78.1%	1.0%	2.3%
Middle East and North Africa	1.4%	3.9%	72.4%	11.7%
North America	5.6%	3.5%	7.4%	2.3%
Southern Africa	1.4%	1.6%	6.4%	5.1%
South Asia	1.2%	1.4%	1.4%	1.4%
East Asia and Pacific	0.9%	0.5%	2.0%	0.5%
Total	100.0%	100.0%	100.0%	100.0%

Source: Parsons, Skeldon, Walmsley and Winters (2007).

Turning to the each survey country in particular. The large majority of migrants from Moldova are young, married males who usually work in the Russian construction industry for a limited period. The proportion of women is higher within the migrant flows to Italy, Greece, Spain and Turkey, where they work primarily in domestic and care services. About 40 percent of Moldavians are seasonal migrants, many of them illegal. As in the rest of Moldova's working population, most migrants have secondary education and 20-25 percent of them completed university. Permanent migrants tend to be better educated than temporary ones. Based on data that is unfortunately only available for OECD countries (and not including Russia), 45.8 percent of Moldovan immigrants in OECD countries are skilled—they represent 3.4 percent of the tertiary educated labor force in Moldova (Docquier and Marfouk 2006).⁸ Moldovan migrants remit home about 56 percent of their earnings. The share of migrants in the total active age population is estimated to be 18 percent (Okólski 2004, Goerlich and Trebesch 2008, Ghenecea and Gudumac 2004, CBS AXA 2005).

The tradition of emigration from Albania goes back 15 years to the break down of the Former Soviet Union; in 2000 8.4 percent of the Albanian labor force lived in OECD countries. Albanian migrants tend to be young, disproportionately male, better educated, and the primary destinations are Greece and Italy. 9 percent of the Albanian tertiary educated labor force lives in OECD countries and 18.4 percent of all Albanian emigrants are highly skilled. Migrant remittances represent an important source of foreign exchange for Albania. Also, it was found that migrants are generally well positioned to find a job or establish a business on their return to Albania (Castaldo et al. 2005, Kule et al. 2002, Docquier and Marfouk 2006, Papanagos and Sanfey 2001).

A study by Giubilaro (1997) found that Tunisia had a migrant potential of 19 percent of the working age population and predicted that given the labor market pressures, emigration would increase (predicted for the time 2005-2010). Recently, increasingly significant numbers of qualified workers have emigrated from Tunisia, not only towards Europe (and France in particular) but also towards the Gulf States and North America. This is likely due to the considerable improvement in the levels of education of the Tunisian population over the past 30 years, and because of high levels of unemployment among higher education graduates.

⁸ The overall selection rate is likely to be lower as most Moldovans go to Russia and they tend to be less skilled (Goerlich and Trebesch (2008)).

Unemployment among young graduates is a huge problem and rose from 10.2% in 2004 to 14% in 2005. This rate is expected to increase further, in 2016 to 21.6% and in 2017 to 26.1% (European Training Foundation 2007, Docquier and Marfouk 2006, Giubilaro 1997). The share of tertiary educated Tunisians who reside in OECD countries is 12.5 percent and the selection rate (share of skilled emigrants to all emigrants) is 14.9 percent.

Unemployment is also a crucial factor for migration from Egypt. Official estimates placed unemployment at about 9 percent in 2004, but independent estimates are closer to 20 percent. Most migrants are males migrating to Arab Gulf countries such as Saudi Arabia, Libya, Jordan, and Kuwait. Estimates of number of migrants to the Gulf countries range from 1.5 to 1.9 million, of which 88 percent migrate to the aforementioned countries. Unfortunately estimates of the share of tertiary educated migrants to the Gulf countries do not exist, but the share of tertiary educated Egyptians heading to OECD countries was 4.6 percent in 2000. The selection rate of Egyptian emigrants to OECD countries is comparatively high with 58.9 percent. Recently Egypt has also witnessed massive immigration flows from neighboring African countries due to conflict and political instability in the Sudan and Sub-Saharan Africa (Zohry 2005, Docquier and Marfouk 2006, Adams 1993).

3.2 *The Data*

The following analysis is based on a survey of potential migrants, which was conducted by the European Training Foundation (ETF) in 2006.⁹ The underlying questionnaire of the survey has five sections. The first section gathers general demographic information of the individuals interviewed. The second section concentrates on work related variables. The third identifies who principally intends to migrate abroad. Subsequently, section four extensively interviews those who want to move abroad and asks a variety of questions determining a) how likely it is that they really will migrate, b) where to and why they want to leave and c) how they envision their migration process. Section five returns to the full set of respondents and asks questions regarding the household members, dwellings and additional income sources. The survey resulted in a total sample size of 3,834 respondents, 998 from Albania, 1,009 from Moldova, 812 from Egypt and 1,015 from Tunisia.

⁹ There was another survey undertaken simultaneously which targeted return migrants. Also, another country, the Ukraine, will be added soon.

Details about the survey design can be found in the appendix. What should be mentioned here are potential problems that arise from misrepresentation of the data of the respective national population, which may result in a bias of the estimates. This concerns primarily Egypt where some villages and governorates were over-sampled to increase coverage of potential migrants to Europe. In addition individuals outside the labor force who were not in full-time education were excluded. The latter added to the already existing problem of male overrepresentation.¹⁰ Overall, comparison with other data from the countries shows that national representation was not fully achieved (see appendix for more detail). This has to be kept in mind throughout the analysis. Also, it should be emphasized that this analysis is based on data from four particular countries and results may not necessarily apply to migrants from other countries.

3.3 *Econometric Approach*

The study employs various econometric models; the three main models will be presented in the following. They all analyze the selection within migration pressures, the role of migration policies in out-selecting migrants from the source countries, and the destination choice. All models assume a logistic distribution of the error term and make use of maximum likelihood estimation. The latent variable underlying the observations of the dependent variables y is y^* , with $y^* = \beta x + \varepsilon$. This section will first explain the variables that y takes in the three mentioned models and then explain the covariates in βx which are roughly similar in all models.

The general model will estimate the probabilities that y takes a certain value (m) conditional on the covariates x and can be expressed in terms of probabilities such as

$$\begin{aligned}
 & \Pr(y = m \mid x) \\
 &= \Pr(\tau_{m-1} < y^* \leq \tau_m \mid x) \\
 &= \Pr(\tau_{m-1} < \beta x + \varepsilon \leq \tau_m \mid x) \\
 &= \Pr(\varepsilon < \tau_m - \beta x \mid x) - \Pr(\varepsilon \leq \tau_{m-1} - \beta x \mid x) \\
 &= F(\tau_m - \beta x) - F(\tau_{m-1} - \beta x)
 \end{aligned}$$

¹⁰ Women are also underrepresented in Tunisia. In general, educated people tend to be overrepresented but there is no sign that this occurred in a systematic way. The survey was unfortunately not corrected by weights to lessen these issues.

with F being the cumulative distribution function (CDF) of the logistic function underlying the model. Further, $y=m$ if $\tau_{m-1} < y^* < \tau_m$ for $m=1 \dots J$ possible outcomes of y , where the τ 's are the thresholds or cut-off points that are mainly relevant in the ordered logit model and equal to zero for the binary logit.

The first model looks at factors that determine the probability of a person to have intentions to move to another country. Accordingly, the main purpose of this regression is to analyze the factors that determine the intent to migrate independent from any restrictions that these individuals may eventually face to actually leave the country and enter a host country. A binary (logit) model¹¹ with $m=1$ is used and therefore the model will estimate the probability of $y=1$ or the person intending to move:

$$\begin{aligned} \Pr(y = 1 | x) &= \Pr(\tau_0 < y^* < \tau_1 | x) \\ &= F(\tau_1 - \beta x) - F(\tau_0 - \beta x) \\ &= F(\tau_1 - \beta x) \end{aligned}$$

This model uses the full sample of potential migrants and non-migrants and has 1912 cases that intend to move and 1922 that don't.

The second model is estimated for the subsample of people who intend to move, thus, all results are conditional on this selection. The purpose is to identify the role of immigration restrictions resulting from migration policies in selecting migrants out of the pool of people willing to move. The model is an ordered logit model with 3 different outcomes, thus $m=3$.¹² The following probability expressions hold for each outcome:

$$\begin{aligned} \Pr(y = 1 | x) &= \Pr(\tau_0 < y^* < \tau_1 | x) \\ \Pr(y = 2 | x) &= \Pr(\tau_1 < y^* < \tau_2 | x) \\ \Pr(y = 3 | x) &= \Pr(\tau_2 < y^* < \tau_3 | x) \end{aligned}$$

Accordingly, the dependent variable measures the propensity to migrate in three increasing categories and the individuals who intend to move are further categorized by increasing likelihood that they will actually do so. The three categories follow the answer to the question: does this person actually intend to realize her intentions? The answers are

¹¹ For the purpose of identification τ is set to zero in a binary model and the model only includes the constant within βx .

¹² The model satisfies the proportional odds or parallel lines assumption.

y=1=Maybe, y=2=Likely and y=3=Certain. The calculation of the categories is not based on one question from the questionnaire only, but rather on a set of variables asked to determine how close potential migrants are to really migrating. For example, the questionnaire asks how likely it is that a person moves within the next 6 months or within the next two years. Further, individuals are asked about their ability to finance migration and about whether they know about, and already possess, certain prerequisites for migration such as passport, visa, health record, work contract or approval for study. The answers to this very rich set of questions allow a detailed classification that distinguishes between the degrees of likelihood of migration. Still, it should be kept in mind that this data is limited on a-priori intentions and that we do not observe who will actually migrate.

The third model is a multinomial logit where the choice of destination is explained. Individuals choose either to be a non-migrant, to go to the EU (as of 2006) or to go to another destination.¹³ The probabilities of the outcomes are defined by

$$\Pr(y = m | x) = \exp(\beta_m x) / \sum_{j=1}^M \exp(\beta_j x)$$

$\Pr(y=j)$ has to sum to 1 over all choices ($\sum_{j=1}^M \Pr(y = j) = 1$) and only M-1 of the probabilities can be determined independently, which can be solved by setting $\beta_1 = 0$, resulting in

$$\Pr(y = 1) = 1 / (1 + \sum_{j=2}^M \exp(\beta_j x))$$

$$\Pr(y = m) = \exp(\beta_m x) / (1 + \sum_{j=2}^M \exp(\beta_j x))$$

for each outcome. With M=3 outcomes like in this particular case, there are M-1=2 equations that are defined independently from each other. As the category of non-migrants forms a natural base category, both outcomes, EU and non-EU, will be compared to this base category.¹⁴ The dependent variables of all models are summarized in Table A2 in the appendix.

¹³ The sample size does not allow any further distinction.

¹⁴ The discrete set of choices in the model satisfies the Independence from Irrelevant Alternatives assumption (IIA), i.e., that the error term is extreme value distributed and not correlated across choices.

While the dependent variable to be explained and the sample choice vary across the models, the determinants are similar though not equal. For all models with the underlying latent variable $y^* = \beta x + \varepsilon$ the equation to be estimated is

$$\beta x = \beta_0 + \beta_1 D + \beta_2 E + \beta_3 LM + \beta_4 I + \beta_5 M + \beta_6 C$$

D represents a set of demographic variables such as age, sex, marital status, household (HH) size, number of children and relation to head of HH. These are the same across the models. E represents variables of education, which are of primary interest in this analysis. Included in E is a set of dummies with primary (and no education), secondary and post-secondary or tertiary education and language skills. The schooling level variable is the same across the models.¹⁵ In the data, looking at all countries the share of higher skilled people is higher among the “migrants” than among the general population. Additionally E includes language skills.¹⁶ The language variable is ‘speaking an additional language to the mother tongue’ for models 1 and 3 and. As more specific information is available for the subsample of migrants, the language variable in model 2 is ‘how well the person speaks the language of the intended destination country’.

LM represents a set of variables associated with labor market characteristics of the individuals and is the same across all models. It includes the labor market status, level of work performing and industry dummies. The descriptive data of the labor market status reveals that in total especially unemployed people intend to move, followed by casual workers and students. For people who intend to stay in their home country the number of professionals and those who work in middle and high management (high) is much higher. In general, most individuals work or have worked in the industry of public administration and utilities (not counting those who never worked or didn’t answer the question) followed by petty trade and agriculture. Nevertheless, among those who intend to move, construction seems to be the leading industry.

¹⁵ The construction of this variable attempts to harmonize across education systems corresponding to information from the World Higher Education Database by the International Association of Universities (IAU) and the UNESCO (UNESCO, IAU WHED).

¹⁶ Language skills are a very important factor for integration in the host country, see Chiswick and Miller (1995, 2003).

Further, the models control for several income related variables (I). The survey gives information on several income sources, including yearly salary¹⁷, income from other family members, rent, savings, pensions and social assistance, land, or remittances. Further, whether individuals consider their income as sufficient and finally how they compare to other households in the community. The remittance variable is also likely to capture migration network effects because those who receive remittances are more likely to migrate as they have links to the remittances sending country and are more exposed to the idea of migration.¹⁸

Other migration relevant variables are included in the control of M in the equation. For the first model this only includes the variable of having a family member abroad (network effect) which proved as a very important determinant in many studies and is relevant for 10 percent of the entire sample but almost 17 percent for those who have intentions to move; and whether someone is aware of a migration assisting program of private or governmental nature. The latter concerns 15 percent of the sample. As expected, this percentage is lower for those who intend to stay (7 percent) and higher for those who want to move (24 percent). It should be noted that the latter variable might be associated with endogeneity problems. Awareness of programs requires active involvement of the person, and as a result, there may be a tendency for people who intend to migrate to also be more aware of such programs. This technical problem could in principle be addressed by a two-step procedure using a suitable instrumental variable. A useful variable could be the distance of an individual's residence to such program or another characteristic of how (easy) an individual can access information about the program. Unfortunately, such a variable is not found in the data and could not be constructed as geographical information on respondents is practically absent. In the second model this variable further distinguishes between those who know about a program and those who also want to participate. Endogeneity is less problematic due to the use of the subsample, the coefficient should clearly be positive.

In the third model the variable of having a relative abroad is modified to having a household member in either the EU or other locations, which is obviously an important control

¹⁷ In Euro and adjusted by 2006 average exchange rates.

¹⁸ See Van Dalen et al. (2005b), Rapoport and Docquier (2005), Lucas and Stark (1985), Poirine (1997), VanWey (2004), Stark (1999) for more details.

when it comes to destination choice. This variable tests whether networks direct migration flows to a certain destination, which is most likely the case.

As mentioned before, the subsample used for the second model allows taking advantage of more specific migration information. Thus M includes more variables. The first is the source of information about the destination country. The idea is that sources, which give better information, will allow the information recipient to have an advantage in realizing migration, e.g., overcome migration constraints. The data shows that people mainly acquire information via friends abroad (if “other” is ignored). This is particularly prevalent in Egypt and Tunisia. Having been abroad, as a source of information, is comparatively higher in Albania and Moldova. Overall, formal institutions—i.e. schools, agencies, and other organizations—seem to have a minor role as an information resource. It is assumed that information from relatives, from having been abroad and from institutions offer the best or most accurate information.

Further, M includes reasons for migrating (personal, improve living standard, improve work, other). In the descriptive data the primary reason why people intend to migrate seems to be either to improve work options or, more generally, living conditions. By country it can be seen though that this is particularly the case in Albania and Moldova, while in Tunisia and Egypt personal reasons become more relevant. Included is also whether the migration decision is influenced by others, which is the case for about one third of migrants.

All models also control for country specific characteristics by including country dummies C.

4 RESULTS

Within the models presented above the analysis will primarily look at variables that are relevant in determining the selection of migrants. This does not only refer to educational variables but also variables with respect to labor market characteristics, income and network variables. Also it will be tested whether country specific characteristics are of importance when it comes to the selection of migrants. The analysis will start analyzing the first model and the intent to move. Then it will move on to presenting the results of the second model, which will be complemented by several additional estimations to check for the robustness of the results. Finally, results from the destination choice model will be presented which will emphasize the status of the EU in the selection discussion and her desire to increasingly select immigrants.

4.1 *The Intent to Move*

The results from the first model are presented in Table 2, which shows odds ratios and marginal effects for the full set of variables included in the model. This model explains the characteristics that individuals who intend to migrate abroad have compared to those who have no such intentions. Regarding the education variable, the probability of migration intentions significantly increases by about 6.7 percentage points for tertiary compared to primary educated people. The effect of secondary education is small and insignificant. This is in line with other studies,¹⁹ but already at this point, it should be noted that there is much less selection in migration pressures when country differences are taken into account (see further below). It appears that education is a variable that is significantly different across countries.

Language skills are positively associated with the intent to migrate.²⁰ While speaking two or more foreign languages proved insignificant and is excluded from the analysis, speaking more than one language, is significant with a marginal effect of 9 percentage points.

The labor market status of a person is categorized in six different categories: being an employee (base outcome), employer, casual worker, student, unemployed and unknown or never worked.²¹ Only unemployment seems to have an impact. Compared to employees, the odds of moving increase by 84 percent (the marginal effect is 15 percentage points). This is in line with problems identified in the labor markets of the respective countries. Many unemployed people—young ones in particular—see migration as a way (back) into employment (Castaldo et al. 2005, Zohry 2005).²² An interaction of education and labor market status reveals, in fact, that particularly higher educated people who are unemployed or have not yet worked, are more likely to be among the migrants. The result of this interaction is presented in Figure 1 showing the predicted probabilities of intending to move by education. This also adds to the notion that the education effect may not be clear-cut.

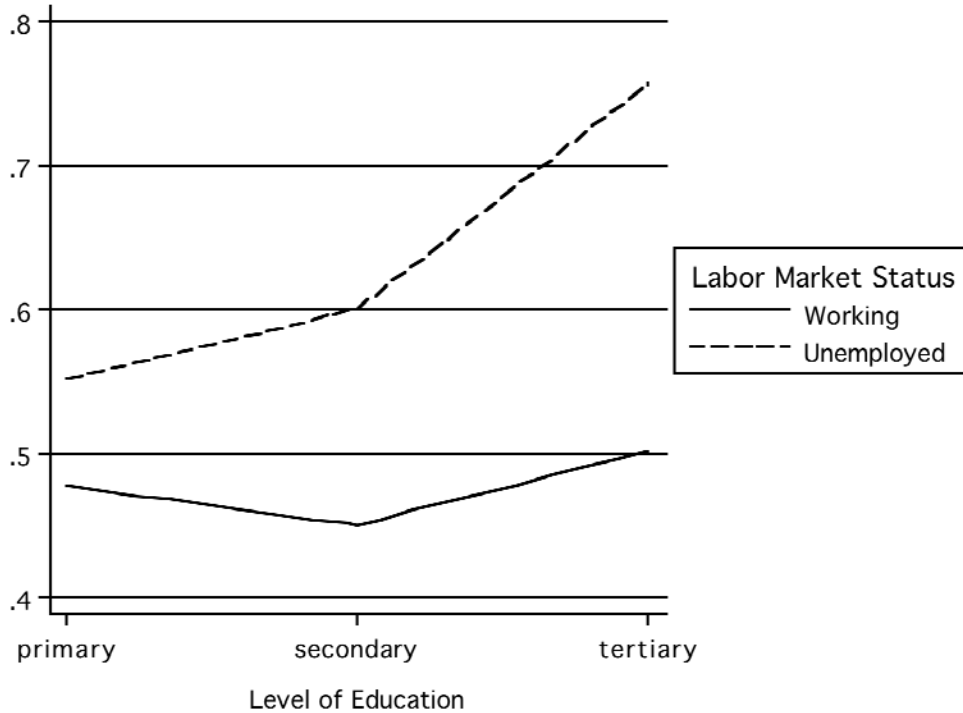
¹⁹ See Van Dalen et al. (2005a), Sadiqi (2007), Goerlich and Trebesch (2008), Hay (1980) and others.

²⁰ Also see Mora and Taylor (2005).

²¹ It should be noted that the latter is just a control for those for whom no answer or other information was given and has no value for interpretation. However, keeping the observations allows maintaining the sample size.

²² Running the model including an interaction of age and labor market status however, did not confirm this.

Figure 1 Predicted Probabilities of the Intent to Move: Effect of Education by Employment



The work level of people is of particular interest with respect to selection. People working in a higher work level seem to be less likely to move, which is intuitive as they are well established in their home country and are not as much subject to emigration pressures. This finding tends to be ignored by policy makers in receiving countries who develop visa policies such as the blue card, which target exactly this group. Evidence in the past has shown that while these visas sound appealing (e.g. the German “Green Card”) they do not necessarily attract many migrants.²³ The estimates from this model confirm such evidence.²⁴

There are a variety of variables with respect to a person’s financial resources. The income variables include salary and various income sources such as rent, savings or other family members. The overall tendency is that these resources are inversely related to migration intentions as previous research found, but the effect is not very large.²⁵ The big exception is income from remittances, which has a large positive impact. Remittances also capture network

²³ See Focus-Migration (2005) for the German Green Card.

²⁴ Note that even though one might suspect a collinearity problem in the estimates due to correlation between education and work skill level, this is not a problem in this model.

²⁵ Also see Stark (1991), Goerlich and Trebesch (2008), van Dalen et al. (2005b), Adams (1993), McKenzie and Rapoport (2004), (Skeldon 1997), Waddington and Sabates-Wheeler (2005).

effects, which have a positive impacts in most studies as they do in this data. This finding is reinforced by the strong effect of the variable “presence of a family member abroad”, which increases the odds of migration by 24 percent.

Table 2 Dependent: Intent to Migrate

Dependent: Intent to Migrate (Logistic Regression)		Odds Ratio	Marginal Effect
Demographics	Age	0.988 (0.010)	-0.003 (0.003)
	Female	0.495*** (0.046)	-0.173*** (0.022)
	Married	0.988 (0.150)	-0.003 (0.038)
	Number of children	0.820*** (0.053)	-0.050*** (0.016)
	Relation to household head (HHH) (HHH and spouse=base outcome)	Child, grandchild or other of HHH	1.181 (0.158)
HH Size	Family abroad	1.040 (0.028)	0.010 (0.007)
	Family abroad	1.242 (0.172)	0.054 (0.034)
	Family abroad	1.242 (0.172)	0.054 (0.034)
Education (primary=base outcome)	Secondary	0.988 (0.104)	-0.003 (0.026)
	Tertiary/Post-secondary	1.308* (0.180)	0.067* (0.034)
	Language	1.438*** (0.150)	0.090*** (0.026)
Labor market status (employed=base outcome)	Employer	1.007 (0.131)	0.002 (0.033)
	Casual worker	1.171 (0.162)	0.039 (0.035)
	Student	0.865 (0.156)	-0.036 (0.045)
	Unemployed	1.840*** (0.272)	0.150*** (0.035)
	Never worked/Unknown	1.142 (0.255)	0.033 (0.056)
Industry of work (public admin. and utilities=base outcome)	Petty Trade	0.958 (0.190)	-0.011 (0.049)
	Manufacturing and mining	1.350 (0.268)	0.075 (0.049)
	Construction	1.896*** (0.374)	0.157*** (0.046)

Dependent: Intent to Migrate (Logistic Regression)			
	Odds Ratio	Marginal Effect	
	Commerce	1.146 (0.219)	0.034 (0.048)
	Agriculture	1.139 (0.229)	0.033 (0.050)
	Hotel, restaurant and domestic services	1.696*** (0.333)	0.130*** (0.047)
	Transport and repair	1.700*** (0.326)	0.131*** (0.046)
	ICT and other	1.448* (0.278)	0.092* (0.047)
	Never worked/Unknown	0.866 (0.282)	-0.036 (0.081)
Skill level of work (high=base outcome)	Medium	1.660*** (0.228)	0.126*** (0.034)
	Low	1.740*** (0.265)	0.137*** (0.037)
	Never worked/Unknown	1.450 (0.436)	0.093 (0.074)
	Salary	0.997*** (0.000)	-0.001*** (0.000)
Income satisfaction ("ok"=base outcome)	Sufficient	1.096 (0.130)	0.023 (0.030)
	Not sufficient	0.706*** (0.070)	-0.087*** (0.025)
Income compared to others in the community ("same"=base outcome)	Better	1.165 (0.151)	0.038 (0.032)
	Worse	1.076 (0.110)	0.018 (0.026)
Income from	Remittances	2.254*** (0.283)	0.198*** (0.029)
	Other family member	0.861* (0.076)	-0.038* (0.022)
	Agriculture	0.839 (0.104)	-0.044 (0.031)
	Savings	1.028 (0.128)	0.007 (0.031)
	Rent	0.635*** (0.089)	-0.112*** (0.033)
	Social assistance and pension	1.102 (0.104)	0.024 (0.024)
	Land owner	1.002	0.000

Dependent: Intent to Migrate (Logistic Regression)		Odds Ratio	Marginal Effect
		(0.119)	(0.030)
Awareness of programs assisting migration		4.599***	0.345***
		(0.568)	(0.023)
Country dummies	Egypt	0.897	-0.027
(Albania=base outcome)		(0.120)	(0.033)
	Moldova	0.528***	-0.157***
		(0.078)	(0.035)
	Tunisia	1.469***	0.096***
		(0.208)	(0.035)
Number of observations		3618	3618
Log-likelihood		-2078.02	-2078.02
Chi-square		610.774	610.774
Pseudo R-Square		0.171	0.171

Note: * p<0.10, ** p<0.05, *** p<0.01, standard errors in parentheses

Overall, a first result is that better educated people who are less integrated in the home labor market (unemployed or working in lower skilled jobs) tend to migrate. However, testing the robustness of the result by estimating the model for each country separately, shows that education variable is different across countries. In fact, the result is driven by the sample from Egypt. Excluding Egypt from the sample results in an insignificant coefficient for tertiary (and secondary) education. The previously found selection in the model explaining the intent to move is consequently a special case of Egypt.²⁶ This finding requires introducing interactions to further investigate the effect of education. This allows specifically looking at the problem that education may be driven by the sample from Egypt, and simultaneously keeping the larger sample size.²⁷ The results are presented in Table 3.

²⁶ On the one hand the explanation may lie within the survey design, i.e. the special problems that interviewers faced in Egypt, which do not rule out that highly skilled people intending to migrate were systematically over-represented. However, according to other empirical evidence Egypt also has a high selection rate (share of skilled emigrants among all emigrants) of almost 60 percent in OECD destinations (Docquier and Marfouk (2006)).

²⁷ Sample size became more critical in the by country models.

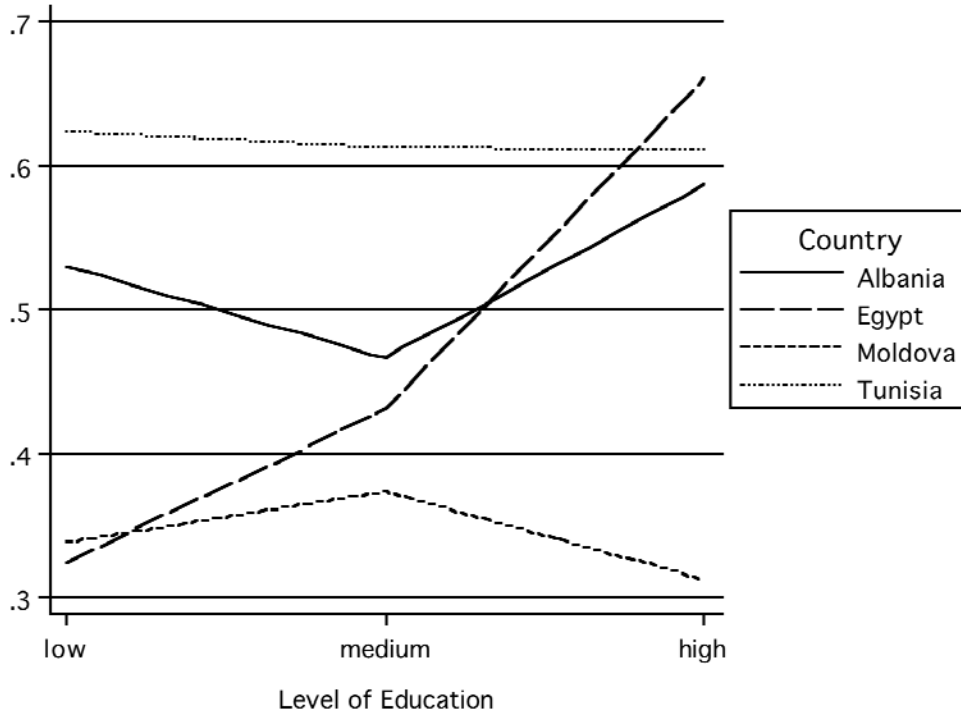
Table 3 Dependent: Intent to Migrate - Interactions between education and countries

Dependent: Intent to Migrate (Logistic Regression)		Odds Ratio
Education (primary=base outcome)	Secondary	0.774 (0.141)
	Tertiary/Post-secondary	1.258 (0.341)
Country dummies (Albania=base outcome)	Egypt	0.424*** (0.109)
	Moldova	0.452*** (0.101)
	Tunisia	1.474* (0.335)
Interactions	Secondary*Egypt	2.039** (0.580)
	Secondary*Moldova	1.506 (0.384)
	Secondary*Tunisia	1.228 (0.324)
	Tertiary/Post-secondary*Egypt	3.232*** (1.142)
	Secondary/Post-secondary*Moldova	0.707 (0.259)
	Secondary/Post-secondary*Tunisia	0.751 (0.244)
Number of observations		3618
Log-likelihood		-2061.33
Chi-square		629.193
Pseudo R-Square		0.178

Note: * p<0.10, ** p<0.05, *** p<0.01, standard errors in parentheses

The results show that the effect of tertiary compared to primary education on the probability to move is now insignificant. As Albania is the base outcome for the countries, this effect concerns tertiary educated Albanians. The interaction effects of Egypt with tertiary and secondary education are positive and significant. All other interaction effects are insignificant. All country dummies remain significant indicating that there are other country specific characteristics that they capture. What all this means for the predicted probability to move is visualized in Figure 2, which shows the effects of education by country.

Figure 2 Predicted Probabilities of Intent to Move: Effect of Education by Country



The results lead to the conclusion that the positive impact in the sample is indeed driven by Egypt and for the three other countries there is no selection when it comes to education of people intending to move. Thus, it is not the educated in particular who create migration pressures and want to move abroad. However, as the brain drain literature well documents, it is often the educated that arrive in the host country, which leads to the second step in the migration decision where not only intentions but also constraints such as those imposed by immigration policies are of concern. This step will be addressed in the next section.

4.2 Realizing Migration under Immigration Policies

The model describing this second step in the migration process is, as mentioned before, an ordered logit model that only includes the subsample of those who intend to migrate. The model takes migration intentions further, and identifies characteristics associated with people who are extremely likely to migrate in the near future (outcome “certain”), likely to do so (outcome “likely”) or uncertain in the realization of their migration intentions (outcome “maybe”). Again, the dependent variable is calculated based on answers from questions regarding (i) personal evaluation of the likelihood to migrate and (ii) requirements that have

already been fulfilled to actually migrate (e.g. having a visa). Also, it should be noted that the model is based on the “selected” subsample and thus it should be emphasized that the model compares within the group of intending migrants and does not include non-migrants. The results are reported in Table 4. The first column shows odds ratios and subsequent columns marginal effects for each outcome. The results are as follows:

Tertiary or post-secondary education has a positive impact on the propensity to migrate compared to primary education; the proportional odds increase by 85 percent. Thus, better-educated people who intend to migrate are more likely to actually do so. With respect to language skills, speaking the language of the country where the individual would move to fluently compared to ok does not increase the propensity to migrate; but having very poor language skills clearly seems to be an obstacle to moving. The proportional odds decrease by 33 percent compared to the reference group. It should also be emphasized that poor language skills are also problematic for transferring ones skills to the new host country.

The variable on labor market status brings new insights. The skill level of work has no significant effect and is in fact excluded from the model.²⁸ Unemployment is now insignificant. Unemployment may signal a lower ability to sustain in the workforce and therefore this group does have increased pressure to migrate. However, it could be speculated that unemployed people may face more obstacles when realizing migration intentions than working people and therefore they are not more likely to realize their intentions. The effect of being a student decreases the propensity to migrate significantly. The outcome for students could result from the possibility that students are usually still outside the labor market and at the beginning of their career. As a result, they may be less certain about their career path and consequently less sure about emigration.

Salary seems to matter much less. Subjective and relative income measures, or income satisfaction measures, however, seem to make more of a difference. Considering one’s income as sufficient is positively associated with the intensity of migration intentions. This may reflect the ability to better finance migration and make use of services facilitating migration. It should be stressed that this does not contradict the previous finding (and that of other studies) of

²⁸ The reason for this is that the fourth category of those who didn’t answer ‘don’t work or never worked’ is almost identical to the last category of the industry dummies (controlling for a similar group) and as it does not add to the explanatory power for the model while the industry dummies have, the variable can be dropped.

increased migration intentions among the less wealthy because the model addresses only those who intend to migrate.²⁹ The effect for people who feel relatively deprived compared to their neighbors is insignificant.

Income from remittances is again positive and significant, indicating that network effects are also important in the step of realizing migration intentions. It could be, for example, that the person sending remittances is a family member and facilitates migration through a family reunification scheme.

The reason why people migrate is interesting to look at, though only indirectly linked to the selection of migrants. Personal reasons seem to be of primary importance to realize migration intentions, the dummies comparing to this base outcome all have a negative coefficient (though not always significant). Personal reasons include people saying they generally did not see a future in their home country, they were following their family, or left to get married. Hence, this dummy may also capture some network effects and the finding could correspond to migration through channels of family reunification, a channel that has generally allowed migration of more low skilled people.³⁰

Another migration relevant variable is the source from which the individuals gather their information. Better information may make it easier to tackle migration requirements imposed by the host country. The variable of information source in the model has seven categories: information from the news media, institutions, friends abroad, immediate family abroad, having been abroad, and other. It is assumed that the information from institutions, family abroad and having been abroad results in “better” and more credible information.³¹ Indeed, compared to news, which is the base outcome, these three categories have a significant positive effect. Having been abroad has the strongest impact and increases the odds by 124 percent. It should be noted that the share of return migrants in this group is likely to be very small due to the

²⁹ See Adams (1993), Burda et al. (1998) and McKenzie and Rapoport (2004).

³⁰ Note that the significance of personal reasons does imply that economic reasons (better work and eventually better living) are not major reasons for people to migrate but they seem to be less relevant for realizing migration intentions and are possibly more important for forming migration intentions.

³¹ Also see McKenzie et al. (2007).

survey design; so these people are mostly visitors.³² This variable also captures network effects as it incorporates the category of having a relative abroad.³³

Table 4 Dependent: Propensity to Migrate

Ordered logit model		Odds ratio	Certain Marg.Effect	Likely Marg.Effect	Maybe Marg.Effect
Demographics	Age	0.979 (0.013)	-0.004 (0.002)	-0.001 (0.001)	0.005 (0.003)
	Female	0.777* (0.106)	-0.041* (0.021)	-0.016 (0.010)	0.057* (0.031)
	Married	1.463** (0.283)	0.067* (0.035)	0.016** (0.006)	-0.083** (0.041)
	Number of children	0.954 (0.095)	-0.008 (0.017)	-0.003 (0.005)	0.011 (0.022)
Relation to household head (HHH) (HHH and spouse=base outcome)	Child, grandchild or other of HHH	0.968 (0.158)	-0.005 (0.028)	-0.002 (0.009)	0.007 (0.036)
	HH Size	0.949* (0.030)	-0.009* (0.005)	-0.003* (0.002)	0.012* (0.007)
Ability to speak language of potential destination country ("ok"=base outcome)	Very well	0.936 (0.111)	-0.011 (0.020)	-0.004 (0.007)	0.015 (0.027)
	Hardly	0.664*** (0.086)	-0.065*** (0.019)	-0.029** (0.012)	0.094*** (0.031)
Education (primary=base outcome)	Secondary	1.046 (0.133)	0.008 (0.021)	0.002 (0.007)	-0.010 (0.028)
	Tertiary/Post-secondary	1.853*** (0.302)	0.112*** (0.032)	0.018*** (0.005)	-0.130*** (0.032)
Labor market status (employed=base outcome)	Employer	0.928 (0.147)	-0.012 (0.026)	-0.004 (0.010)	0.017 (0.036)
	Casual worker	1.206 (0.201)	0.033 (0.030)	0.008 (0.005)	-0.041 (0.035)
	Student	0.592*** (0.113)	-0.079*** (0.026)	-0.043** (0.021)	0.123*** (0.046)
	Unemployed	0.996 (0.148)	-0.001 (0.025)	-0.000 (0.008)	0.001 (0.033)

³² In fact, respondents were asked whether they had been abroad for more than six months and had returned more than 3 months and less than 10 years ago; if this was the case they were asked the „partner“ survey on return migrants which is not touched upon in this paper.

³³ It should be noted that literature also shows that network effects lower the migration cost and make the migration option more feasible to poorer and less educated people. Consequently they may disproportionately benefit lower skilled migrants and reduce the selection. Unfortunately this hypothesis could not be tested with this data due to sample size issues. (see Massey et al., (1994, 1998); Munshi (2003); Winters et al. (2001), Bauer et al. (2000), Hugo (1981), Taylor (1986), Gurak and Caces (1992), Groenewold (2001), McKenzie and Rapoport (2004)).

Dependent: Propensity to Migrate

Ordered logit model		Odds ratio	Certain Marg.Effect	Likely Marg.Effect	Maybe Marg.Effect
Industry of work (public admin. And utilities=base outcome)	Never worked/Unknown	2.289*** (0.574)	0.167*** (0.058)	-0.010 (0.020)	-0.157*** (0.039)
	Petty Trade, Commerce, hotel, restaurant	1.241 (0.241)	0.037 (0.035)	0.010 (0.007)	-0.047 (0.042)
	and domestic services	1.572** (0.337)	0.083* (0.043)	0.011*** (0.004)	-0.095** (0.042)
	Manufacturing, mining and agriculture	1.359 (0.277)	0.054 (0.038)	0.012** (0.005)	-0.066 (0.042)
	Construction, transport and repair	1.076 (0.221)	0.012 (0.035)	0.004 (0.010)	-0.016 (0.045)
	Other or never worked/Unknown	1.001*** (0.001)	0.000*** (0.000)	0.000** (0.000)	-0.000*** (0.000)
	Salary	0.988 (0.146)	-0.002 (0.025)	-0.001 (0.008)	0.003 (0.033)
Income satisfaction ("ok"=base outcome)	Not sufficient	1.537*** (0.182)	0.073*** (0.020)	0.022*** (0.007)	-0.095*** (0.026)
	Sufficient				
Income compared to others in the community ("same"=base outcome)	Worse	1.259 (0.188)	0.041 (0.027)	0.009** (0.004)	-0.050 (0.031)
	Better	1.029 (0.128)	0.005 (0.021)	0.002 (0.006)	-0.006 (0.028)
Income from	Remittances	1.334** (0.170)	0.051** (0.023)	0.012*** (0.004)	-0.062** (0.027)
	Other family member	0.840* (0.087)	-0.030* (0.018)	-0.009* (0.005)	0.039* (0.023)
	Agriculture	1.007 (0.158)	0.001 (0.027)	0.000 (0.009)	-0.002 (0.035)
	Savings	1.277 (0.208)	0.043 (0.030)	0.009** (0.004)	-0.053 (0.034)
	Rent	1.094 (0.206)	0.015 (0.033)	0.004 (0.008)	-0.020 (0.041)
	Social assistance and pension	0.950 (0.112)	-0.009 (0.019)	-0.003 (0.007)	0.012 (0.026)
	Land owner	1.101 (0.168)	0.016 (0.026)	0.005 (0.008)	-0.021 (0.034)
Reason for leaving	Improve living	0.752**	-0.047**	-0.018*	0.064**

Dependent: Propensity to Migrate

Ordered logit model		Odds ratio	Certain Marg.Effect	Likely Marg.Effect	Maybe Marg.Effect
conditions					
(personal=base outcome)		(0.098)	(0.021)	(0.009)	(0.030)
	Better work	0.802 (0.109)	-0.036* (0.022)	-0.014 (0.009)	0.050 (0.031)
	Other	0.975 (0.183)	-0.004 (0.031)	-0.001 (0.011)	0.006 (0.042)
	Migration decision influenced by others	0.795** (0.091)	-0.038** (0.018)	-0.014* (0.008)	0.052** (0.026)
Information about destination country via:					
(news=base outcome)	Institution	1.784* (0.593)	0.112 (0.072)	0.003 (0.015)	-0.116** (0.058)
	Family at home	0.811 (0.201)	-0.033 (0.037)	-0.015 (0.021)	0.048 (0.058)
	Friends abroad	1.117 (0.195)	0.019 (0.030)	0.006 (0.008)	-0.024 (0.038)
	Been abroad	2.245*** (0.541)	0.161*** (0.055)	-0.004 (0.017)	-0.157*** (0.039)
	Other	0.523*** (0.089)	-0.104*** (0.026)	-0.043*** (0.014)	0.147*** (0.039)
	Family abroad	1.519* (0.356)	0.077 (0.047)	0.010** (0.004)	-0.087* (0.045)
Migration assisting programs					
	Would participate	1.622*** (0.237)	0.089*** (0.029)	0.012*** (0.004)	-0.101*** (0.028)
	Is aware but no participation intend	1.151 (0.189)	0.024 (0.029)	0.006 (0.006)	-0.031 (0.035)
Country dummies (Albania=base outcome)					
	Egypt	1.674*** (0.304)	0.094*** (0.036)	0.015*** (0.004)	-0.109*** (0.036)
	Moldova	1.807*** (0.326)	0.109*** (0.036)	0.015*** (0.005)	-0.124*** (0.035)
	Tunisia	0.634** (0.117)	-0.073*** (0.028)	-0.031** (0.015)	0.104** (0.043)
	Cut1	0.347** (0.177)			
	Cut2	2.533* (1.292)			
Number of observations		1762	1762	1762	1762
Log-likelihood		-1726.1	-1726.1	-1726.1	-1726.1
Chi-square		317.985	317.985	317.985	317.985
Pseudo R-Square		0.093	0.093	0.093	0.093

Note: * p<0.10, ** p<0.05, *** p<0.01, standard errors in parentheses

The country dummies are significant in all models, which implies that there are country specific characteristics that play a role in the likelihood of migration. Again, it could be that the result of a present selection could be driven by Egypt as it was in the first model. However, interactions between country and education variables do not confirm this and the results are robust towards excluding Egypt from the sample. Thus, it can be concluded with relative confidence that the selection of migrants does not happen in the willingness to migrate, but in the willingness and ability to realize ones intentions. It is in this second step that selective immigration policies are of importance as they indeed seem to affect the probability of migration.

Now, it is possible to argue that the way the dependent variable in the ordered logit model has been computed is arbitrary and results may not be true. This problem can be addressed by estimating models for the variables that are included in the calculation of the categories in the dependent variable. This is not possible for all of the variables due to sample size issues but it is for most of them. The results are presented in the appendix in Table A3.

In the first of such models the dependent is the number of documents that a person has and that are necessary to emigrate. The variable can take the values 1 to 5 and takes the features of count data. The model is thus estimated using a poisson regression (column 1) and, despite its small data range, also estimated using OLS regression (column 2). The results confirm the positive selection of migrants and are robust to excluding Egypt.

Further, the model is estimated applying a number of logit models measuring the probability of having a certain document: more than one document (column 3); more than two documents (column 4); a passport (column 5); a health record (column 6). Finally, a logit on whether migration can be financed or not is estimated (column 7). Except for the last model, all the models confirm the positive selection of the second model (also when excluding Egypt).

Having estimated the model with respect to migration requirements, it is also necessary to estimate a model on the variable that lets the respondents evaluate their likelihood of migration within the next 6 months because it is also part of the calculation of the dependent in

the model of the previous section.³⁴ However, the results should confirm the outcomes from the first model as it captures the willingness to move rather than migration policies. The results are presented in the appendix Table A4. The model is estimated as an ordered logit with 5 categories ranging from ‘very unlikely’ to ‘very likely’ in the dependent variable (see column 1). As not all variables satisfy the parallel lines assumption, the same model is also estimated as a general ordered logit model allowing multiple equations (column 2 – 5). It turns out that education is insignificant and the models do not show any selection.

More generally, it should be noted that all models above do not control for destination specific characteristics or “pull” factors such as for example return to skills in the destinations. While these are certainly important determinants for the selection of migrants they are not subject in this analysis and cannot be captured with this data.

Summing up the results, the additional regressions confirm that migration policies seem to induce a positive out-selection of migrants from a pool of people that is willing to migrate and that is not selected. The question is subsequently what this implies for the EU of which many countries have introduced selective immigration policies, or are about to do so.

4.3 Destination Choice and Selection

The following analysis will study destination choice of potential migrants on the individual level. It will distinguish between the EU as one destination and non-EU as a second destination, which includes several Gulf countries, Russia, North America, Australia and Turkey.³⁵ The analysis will primarily focus on the question whether the level of education is indeed different for migrants heading to the EU than for those heading to non-EU destinations.

The results from estimating the multinomial model of destination choice are presented in Table 5. Estimation results are shown as relative risk ratios (RRR) and marginal effects. Generally, the relative risk ratio states that for a unit change in the predictor variable, the relative risk ratio of outcome *m* relative to the reference group is expected to change by a factor of the respective parameter estimate, given that all other variables in the model are held constant (at the mean). Thus, they are somehow similar to odds ratios and an a more intuitive way to present results from multinomial logit models than the bare coefficients. Consequently,

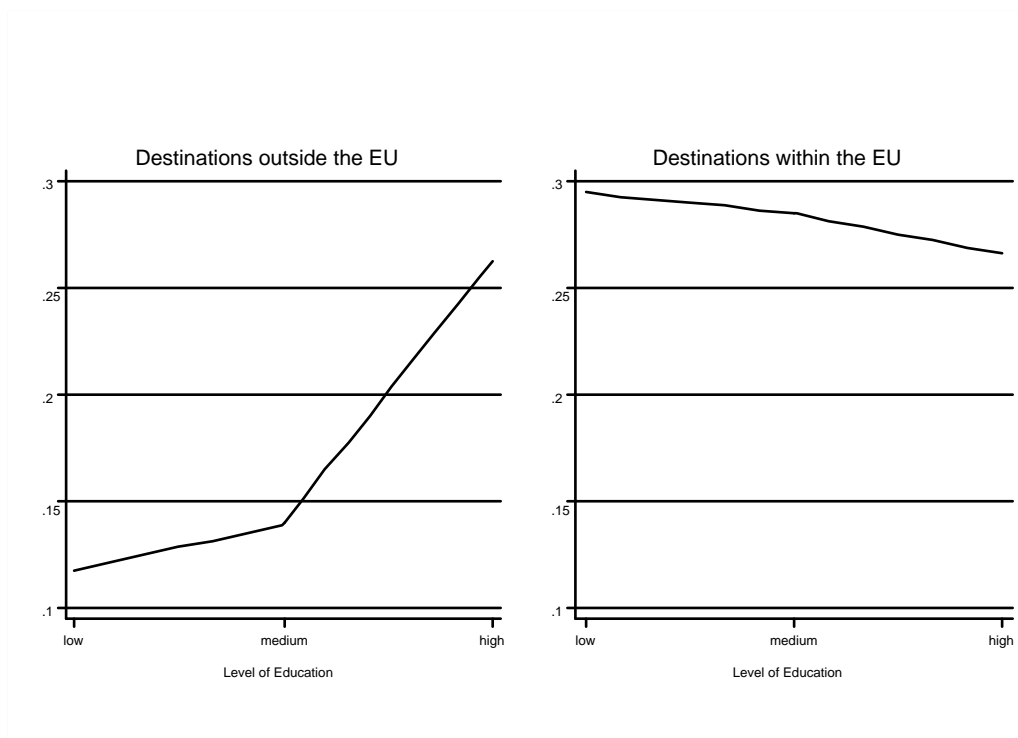
³⁴ There is also a similar variable taking the next 2 years as a time frame.

³⁵ The destinations had to be combined due to sample size issues.

for this specific model, EU and “other” are both compared to the reference group of non-migrants and special attention should be given to variables where these ratios are different for both choices (each compared to the reference group).

The selection in terms of the education level of migrants who choose non-EU destinations, is much stronger compared to the EU. Tertiary education versus primary education has a much higher relative risk ratio for non-EU than the EU outcome, which is insignificant. This translates into an increase in the odds of choosing non-EU over EU of 143 percent when changing from primary to tertiary education. This does not mean that there are no highly skilled people deciding for the EU but it suggests that migrants to the EU are not positively selected and rather exhibit similar levels of education to their home country. Figure 3 illustrates the effect of education by presenting the predicted probabilities for each destination.

Figure 3 Predicted Probabilities of Destination Choice: Effect of Education



With respect to the labor market status, unemployment is a significant push factor for migration. Still, the relative risk ratio for choosing one of the destination alternatives versus the other when being unemployed compared to employed is roughly the same. This also applies to

the negative and significant effect of a higher work level (managerial or professional) versus low skilled, though the effect is a bit smaller for the non-EU destination.

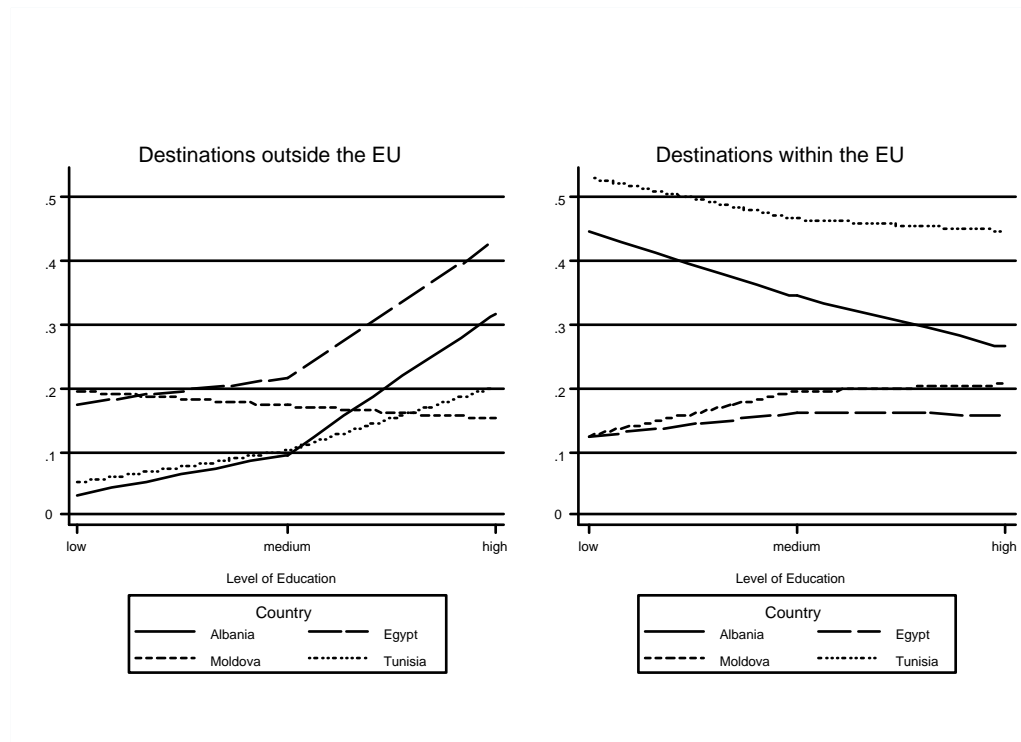
Regarding salary and other income sources the two choices compare pretty similar to the non-migrant group. This also extends to income from remittances, which is also a strong indicator for existing migration networks. The more important network variable is the location of a HH member living abroad—in the non-EU region or in the EU. The coefficients show exactly the expected signs and are highly significant. For the non-EU outcome the relative risk ratio for a HH member in the EU is 0.44 and in the non-EU region 1.66. For the EU outcome it is the other way with relative risk ratios of 1.87 for a HH member in the EU, and 0.49 for a member in non-EU countries. Consequently, existing networks or links between people in sending and receiving countries greatly impact on the destination choice.

To sum up the results, it can be said that higher education is especially important for non-EU destination countries. The latter result is to some extent driven by migrants going to North America and Australia which have the strongest selective migration policies.³⁶

The above results also show significant country dummies and make again a strong case to look at the impact of education by including potential differences across countries, as this has been important in the first model. Hence, the next model includes interaction effects of the country and education variables. The results are presented Figure 4, which shows how the predicted probabilities of both outcomes vary by education and country.

³⁶ This result was indicated by another model where “other” was further split up into North America and “other”. It is not presented here as it did not satisfy all assumptions (IIA) and the sample size of the North America choice was critical.

Figure 4 Predicted Probabilities of Destination Choice: Effect of Education by Country



The figure shows that except for Moldova the predicted probabilities of outcome non-EU strongly increase with increasing education. The curves are rather flat for the EU outcome, or even decrease in education (Tunisia and Albania). Thus, the interaction model confirms the result of selection among people heading towards non-EU destinations and no selection of those heading to the EU.³⁷ The notion from macro data on immigration stocks—unfortunately only available for OECD countries—that the EU has been receiving a greater proportion of low skilled immigrants than other destinations is consequently confirmed and selective migration policies in EU countries have not yet been effective.

³⁷ Obviously, also excluding Egypt does not change the results.

Table 5 Dependent : Destination Choice: EU versus Non-EU

Dependent : Destination Choice: EU versus Non-EU						
Multinomial Logit Model		Non-EU	EU	EU	Non-EU	Non-Migrant
		RRR	RRR	Marg.Effect	Marg.Effect	Marg.Effect
Demographics	Age	0.991 (0.014)	0.989 (0.011)	-0.002 (0.002)	-0.001 (0.002)	0.003 (0.002)
	Female	0.422*** (0.052)	0.492*** (0.053)	-0.104*** (0.019)	-0.079*** (0.014)	0.184*** (0.021)
	Married	1.069 (0.207)	0.995 (0.167)	-0.004 (0.032)	0.009 (0.025)	-0.005 (0.036)
	Number of children	0.919 (0.080)	0.752*** (0.056)	-0.054*** (0.015)	0.002 (0.011)	0.053*** (0.016)
Relation to household head (HHH) (HHH and spouse=base outcome)	Child, grandchild or other of HHH	1.189 (0.206)	1.211 (0.180)	0.031 (0.028)	0.014 (0.021)	-0.046 (0.032)
	HH Size	1.015 (0.038)	1.070** (0.032)	0.013** (0.006)	-0.001 (0.005)	-0.012* (0.007)
Family living abroad (no family abroad= base outcome)	In EU	0.436*** (0.130)	1.868*** (0.319)	0.174*** (0.040)	-0.106*** (0.019)	-0.068* (0.041)
	In other	1.660** (0.354)	0.491** (0.137)	-0.142*** (0.035)	0.115*** (0.039)	0.027 (0.048)
	Speaks more than one language	1.532*** (0.216)	1.404*** (0.165)	0.050** (0.022)	0.040** (0.016)	-0.090*** (0.024)
Education (Secondary=base outcome)	Primary	1.199 (0.177)	0.991 (0.111)	-0.010 (0.022)	0.025 (0.019)	-0.015 (0.025)
	Tertiary/Post-secondary	2.753*** (0.488)	1.130 (0.172)	-0.031 (0.028)	0.152*** (0.030)	-0.121*** (0.033)
Labor market status (employed=base outcome)	Employer	0.934 (0.161)	0.882 (0.123)	-0.022 (0.027)	-0.004 (0.022)	0.026 (0.029)
	Casual worker	1.199 (0.212)	1.180 (0.181)	0.026 (0.030)	0.017 (0.023)	-0.043 (0.034)
	Student	1.121 (0.227)	0.606*** (0.114)	-0.099*** (0.030)	0.038 (0.029)	0.061 (0.038)
	Unemployed	1.505** (0.268)	1.530*** (0.233)	0.069** (0.032)	0.035 (0.025)	-0.104*** (0.033)
	Never worked/Unkno	0.899	0.862	-0.025	-0.008	0.033

Dependent : Destination Choice: EU versus Non-EU						
Multinomial Logit Model		Non-EU	EU	EU	Non-EU	Non-Migrant
		RRR	RRR	Marg.Effect	Marg.Effect	Marg.Effect
	wn	(0.283)	(0.196)	(0.042)	(0.039)	(0.050)
Industry of work (public admin. And utilities=base outcome)	Petty Trade, Commerce, hotel, restaurant and domestic services	0.927	1.855***	0.137***	-0.039*	-0.098**
		(0.180)	(0.366)	(0.043)	(0.023)	(0.041)
	Manufacturing, mining and agriculture	1.116	1.739***	0.116**	-0.014	-0.102**
		(0.239)	(0.367)	(0.047)	(0.026)	(0.044)
	Construction, transport and repair	1.286	2.615***	0.203***	-0.019	-0.184***
		(0.273)	(0.540)	(0.047)	(0.025)	(0.043)
	Other or never worked/Unkno wn	0.747	1.649**	0.119***	-0.060**	-0.059
		(0.149)	(0.356)	(0.045)	(0.023)	(0.044)
Skill level of work (low=base outcome)	High	0.745*	0.556***	-0.099***	-0.015	0.115***
		(0.127)	(0.090)	(0.027)	(0.021)	(0.031)
	Medium	0.973	0.881	-0.025	0.002	0.023
		(0.138)	(0.101)	(0.023)	(0.018)	(0.025)
	Salary	0.998***	0.997***	-0.000***	-0.000***	0.001***
		(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Income satisfaction ("ok"=base outcome)	Not sufficient	1.140	1.285**	0.046*	0.006	-0.052*
		(0.163)	(0.162)	(0.025)	(0.018)	(0.027)
	Sufficient	0.797*	0.719***	-0.057***	-0.015	0.072***
		(0.101)	(0.077)	(0.021)	(0.016)	(0.023)
Income from	Regular remittances	2.556***	3.118***	0.195***	0.061	-0.256***
		(0.847)	(0.957)	(0.069)	(0.052)	(0.058)
	Occasional remittances	2.325***	2.325***	0.133***	0.074***	-0.207***
		(0.414)	(0.356)	(0.034)	(0.028)	(0.032)
	Other family member	0.884	0.828*	-0.033*	-0.008	0.041*
		(0.098)	(0.083)	(0.020)	(0.014)	(0.021)
	Agriculture	0.593***	1.048	0.032	-0.066***	0.034
		(0.075)	(0.108)	(0.021)	(0.013)	(0.022)
	Savings	1.126	0.829	-0.042	0.025	0.017
		(0.172)	(0.126)	(0.028)	(0.022)	(0.030)

Dependent : Destination Choice: EU versus Non-EU						
Multinomial Logit Model		Non-EU	EU	EU	Non-EU	Non-Migrant
		RRR	RRR	Marg.Effect	Marg.Effect	Marg.Effect
	Rent	0.658** (0.120)	0.666*** (0.100)	-0.063** (0.026)	-0.036* (0.020)	0.099*** (0.030)
	Social assistance and pension	1.264* (0.157)	1.035 (0.108)	-0.004 (0.020)	0.031* (0.017)	-0.027 (0.023)
Country dummies	Egypt (Albania=base outcome)	2.195*** (0.393)	0.378*** (0.059)	-0.204*** (0.021)	0.170*** (0.032)	0.034 (0.034)
	Moldova	1.428* (0.288)	0.376*** (0.061)	-0.190*** (0.023)	0.094*** (0.031)	0.096*** (0.035)
	Tunisia	1.280 (0.257)	1.686*** (0.249)	0.099*** (0.031)	0.007 (0.026)	-0.106*** (0.034)
	Constant	0.264*** (0.133)	0.760 (0.322)			
Number of observations		3626		3626		
Log-likelihood		-3086.86		-3086.86		
Chi-square		924.632		924.632		
Pseudo R-Square		0.16		0.16		

Note: * p<0.10, ** p<0.05, *** p<0.01, standard errors in parentheses

5 CONCLUSION

The purpose of this paper was to generate new insights for the discussion of the migration decision and selection patterns that occur within the migration process. The study finds that migrants are not self-selected in their intentions to move abroad. Rather, migration intentions, or pressures to migrate, arise among unemployed people or people working in lower skilled jobs. However, there is a strong positive out-selection when it comes to the realization of intentions. The findings support that this out-selection is mainly created by restrictions imposed by migration policies. This means that policies have no impact on the development of migration pressures but on the propensity to realize migration intentions.

Further findings show that there is no selection among people intending to go to the EU but there is strong selection among those heading to other destinations, which refer to North America and Australia, countries that have traditionally had very selective immigration

schemes, and the Gulf countries, the main destination for Egyptians where numerous temporary migration programs between these countries induce a rather high skilled migration. Consequently, the data confirm the trend of macro data that the share of highly skilled immigrants is indeed much higher in countries with selective immigration policies than in countries with no such policies. The EU has only recently started to introduce more selective policies and in the past migration, has primarily allowed immigration through family reunification schemes.

These findings have several implications for EU immigration policies. The data, which was collected in 2006, shows that the selective schemes that many EU countries have recently introduced have not yet been successful. Thus, the data confirm the concerns about the composition of immigrants of many EU countries. The reason for this may be found in the strong network effects, also shown in this analysis, and in the fact that EU countries have comparatively large family reunification schemes that seem to dominate the selective immigration schemes. The EU already has a lower skilled composition of migrants compared to North America or Oceania. As a result these immigrant stocks may induce a similar composition of migrants, in particular when migration barriers are lower such as is the case of family reunification schemes. In addition, the migration cost reducing effect found in many studies disproportionately affects lower skilled migrants.

Also, countries with selective migration policies are often those with labor markets offering higher skill premiums to highly skilled workers. As shown by very recent research such as Grogger and Hanson (2008), these labor market opportunities immensely impact on the kind of immigrants the respective countries attract. In addition, the language advantage that these mainly English speaking countries have over the EU with its diverse languages, make the skills of migrants more transferable to the host labor market. Thus, selective immigration policies in these countries dominate other immigration schemes and are complemented by sound labor market opportunities.

Given these observations, it is unlikely that the EU will compensate her emigration of researchers and other skilled people as well as her skills gaps by immigration of highly skilled people. The EU has to be more realistic and acknowledge that it will take quite some time to change the trend of lower skilled immigration. It will also be necessary to intensify efforts to

fill skill gaps from within, for example by increased activity in research and development, more opportunities for researchers in the EU and improved incentives to get educated in fields that are in great demand. The EU has already started to move in this direction and it needs increase these efforts to reach up to its competitors.

Also, it would be useful to conduct a more honest debate about immigrants and their skills, as it should not be forgotten that many sectors rely on immigrant labor particularly for low skilled jobs. Thus, the EU's demand in these sectors corresponds to migration pressures. It may be worth looking into options to select migrants within the low skill level. For example, governments could identify sectors that clearly depend on immigrant labor and make immigration into these sectors easier while increasing barriers elsewhere.

For highly skilled migrants, it must be kept in mind that while they are indeed effective in selecting migrants it takes more than the mere selective migration policies. Governments must create incentives in the labor markets so that migrants actually make use of (existing) selective migration schemes. While it is hard to tell firms to offer more attractive wages, they could come up with tax incentives and other privileges. Also, they could better inform employers about visa procedures of hiring foreign skilled workers. Another important issue is also to improve the recognition of foreign skills that has proved to be inadequate in many countries. In fact, there is an emerging body of literature that deals with so-called brain waste.³⁸ Difficulties in approving their skills create additional barriers to enter the country and might drive migrants to other destinations where they can actually perform in their profession.

In any case, no matter what migration policies the EU engages in, the policies should also be communicated to the sending countries also. This is where people decide to move and choose their destination based on the information they have. The EU should ensure that people who have the intent to migrate know about the opportunities in the EU. If migrants keep thinking in traditional patterns that good education is the ticket to the US, Canada or Australia, it is even less likely that the composition of skills in migration flows will shift.

³⁸ See e.g. Kapur and McHale (2005) and Mattoo, Neagu and Ozden (2008)

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7 Appendix

7.1 *The ETF Survey*

The survey is designed to represent the national population in the age range of the 18 to 40 year-old people. In each country, a 2-stage cluster sample was selected, in which first-stage clusters were a minimum of 4-6 regions chosen to represent the geographical diversity of the country, and second-stage clusters were villages, communes or municipalities chosen to represent the geographical diversity of the selected regions. The detail of this cluster selection had been agreed with the respective local service providers who carried out the interviews, such that at both stages (selection of regions, and selection of villages, communes or municipalities), areas with high and low levels of development, areas of high and low levels of international migration, and both rural and urban areas were included. Initially, it was anticipated that 1000 interviews would be conducted in each country with interviewers following random routes for their interviews and certain procedures in choosing the interviewee within the respective households to minimize any selection bias.

The analysis of representation of the respective national population in the survey data was undertaken by comparing the data to other data sources from the country (Census and Surveys) and UN population data. For Egypt comparison with other data shows that men are highly overrepresented – a problem already mentioned. Further young people are strongly overrepresented for both men and women. With respect to Tunisia men in general are highly overrepresented compared to the Tunisian population. Further, based on UN data, men are overrepresented in their mid 20s and women in the early 20s while census data shows comparable ages for men and only women tend to be younger. Education was not possible to assess (due to lack of comparable data) except that the illiteracy rate in the census is much higher than in the sample indicating that the people in the sample are better educated.

Also, the sample of Albanians differs from its population but not to such an extent. The analysis shows that men are overrepresented in the sample. The comparison of the age-distribution illustrates that individuals in the sample tend to be younger than the national population. This is caused by a high overrepresentation of young men in the sample; women are slightly older than the national population. With respect to education primary educated men

and especially women are underrepresented, hence the individuals in the survey are better educated than the Albanian population of the respective age group.

Representation in the sample from Moldova is much better with respect to age and gender and more questionable when it comes to education. Educated people are overrepresented and individuals with general secondary education are underrepresented. Splitting by gender reveals that men with vocational education are highly oversampled and that females are highly underrepresented in primary education and overrepresented in vocational and university education

7.2 Tables

Appendix-Table 1 Top 10 Host Countries of Migrants from the Survey Countries

Host country	Albania	Host country	Moldova	Host country	Egypt	Host country	Tunisia
Greece	403856	Russian Federation	277527	Saudi Arabia	1015124	France	364498
Italy	167439	Ukraine	222478	Jordan	127018	Germany	61508
Germany	92415	Romania	27679	United States of America	123192	Libyan Arab Jamahiriya	15689
United States of America	39861	United States of America	20674	Occupied Palestinian Territory	103457	Israel	9949
TFYR Macedonia	25001	Germany	14845	Libyan Arab Jamahiriya	55681	Saudi Arabia	9545
Serbia and Montenegro	13451	Israel	14305	United Arab Emirates	48652	Serbia and Montenegro	8851
Pakistan	8568	Kazakhstan	9531	Lebanon	45602	Syrian Arab Republic	8509
Canada	6281	Pakistan	7941	Oman	42090	United States of America	8458
Kuwait	4158	Greece	6358	Germany	40852	Democratic Republic of the Congo	8167
Switzerland	3426	Latvia	6216	Italy	38706	Belgium	7995

Source: Parsons, Skeldon, Walmsley and Winters (2007).

Appendix-Table 2 Intent to move abroad by country, N=3834

	Albania	Egypt	Moldova	Tunisia	Total
Non-Migrant	56%	53%	56%	37%	50%
Migrant	44%	47%	44%	63%	50%
of whom					
- maybe	38%	29%	28%	45%	36%
- likely	38%	40%	42%	37%	39%
- certain	25%	31%	30%	17%	25%
Total	100%	100%	100%	100%	100%

Migrants and non-migrants by destination, N=3838

	Albania	Egypt	Moldova	Tunisia	Total
Non-migrant	56%	53%	56%	38%	50%
Other	8%	31%	22%	12%	18%
EU	36%	16%	22%	50%	32%
Total	100%	100%	100%	100%	100%

Appendix-Table 3 Dependent: Immigration Requirements

Dependent: Immigration Requirements		# of doc IRR	# of doc Coef.	Doc_1+ Odds Ratio	Doc_2+ Odds Ratio	Passport Odds Ratio	Health record Odds Ratio	Finance Odds Ratio
Demographics	Age	1.006 (0.005)	0.007 (0.005)	1.046** (0.019)	1.001 (0.017)	1.069*** (0.019)	0.952** (0.020)	0.975* (0.015)
	Female	0.894** (0.047)	-0.103** (0.051)	0.844 (0.153)	0.796 (0.147)	0.887 (0.157)	0.644** (0.142)	0.768* (0.123)
	Married	1.205** (0.092)	0.186** (0.080)	1.880** (0.495)	1.363 (0.385)	2.014*** (0.522)	1.266 (0.441)	2.245*** (0.516)
	Number of children	0.954 (0.035)	-0.057 (0.036)	0.833 (0.117)	0.800 (0.111)	0.703** (0.104)	1.077 (0.211)	0.887 (0.102)
Relation to household head (HHH) (HHH and spouse=base outcome)	Child, grandchild or other of HHH	0.957 (0.070)	-0.040 (0.074)	1.181 (0.255)	0.624* (0.169)	1.150 (0.252)	0.897 (0.315)	0.960 (0.194)
	HH Size	0.957*** (0.013)	-0.035*** (0.011)	0.870*** (0.035)	0.910* (0.050)	0.910** (0.036)	0.894 (0.064)	0.989 (0.039)
Ability to speak language of potential destination country ("ok"=base outcome)	Very well	0.971 (0.045)	-0.024 (0.044)	1.016 (0.152)	0.873 (0.152)	0.968 (0.142)	0.875 (0.183)	1.297* (0.183)
	Hardly	0.898* (0.053)	-0.086* (0.050)	0.715** (0.116)	0.767 (0.162)	0.752* (0.120)	1.025 (0.245)	0.891 (0.137)
Education (primary=base outcome)	Secondary	1.057 (0.052)	0.050 (0.043)	1.024 (0.158)	1.357 (0.268)	0.878 (0.135)	1.915*** (0.429)	0.982 (0.140)
	Tertiary/Post-secondary	1.376*** (0.087)	0.289*** (0.060)	2.638*** (0.572)	2.633*** (0.639)	1.999*** (0.419)	2.174** (0.678)	1.147 (0.214)
Labor market status	Employer	0.927	-0.074	1.078	0.624* (0.169)	1.112	0.828	0.980

Dependent: Immigration Requirements		# of doc	# of doc	Doc_1+	Doc_2+	Passport	Health record	Finance
		IRR	Coef.	Odds Ratio	Odds Ratio	Odds Ratio	Odds Ratio	Odds Ratio
(employed=base outcome)		(0.061)	(0.065)	(0.235)	(0.151)	(0.238)	(0.242)	(0.198)
Industry of work (public admin. And utilities=base outcome)	Casual worker	0.982 (0.060)	-0.006 (0.060)	1.403 (0.304)	0.885 (0.218)	1.111 (0.237)	0.983 (0.260)	0.696* (0.135)
	Student	0.791*** (0.061)	0.173*** (0.067)	0.685* (0.154)	0.652 (0.184)	0.647** (0.143)	0.582 (0.206)	0.498*** (0.111)
	Unemployed	0.994 (0.063)	-0.013 (0.062)	1.157 (0.229)	0.774 (0.176)	0.870 (0.170)	0.564** (0.163)	0.637** (0.116)
	Never worked/Unk nown	1.045 (0.088)	0.027 (0.082)	2.206** (0.778)	0.536 (0.234)	1.476 (0.482)	0.823 (0.358)	1.388 (0.442)
	Petty Trade, hotel, restaurant	1.103	0.082	1.559*	1.073	1.787**	0.920	0.854
	and domestic services	(0.086)	(0.081)	(0.410)	(0.287)	(0.460)	(0.305)	(0.221)
	Manufacturing, mining and agriculture	1.117 (0.093)	0.095 (0.086)	1.286 (0.357)	1.480 (0.427)	1.421 (0.390)	0.951 (0.334)	0.976 (0.270)
	Construction, transport and repair	1.024 (0.083)	0.012 (0.082)	1.628* (0.440)	0.702 (0.209)	1.919** (0.510)	0.623 (0.224)	0.895 (0.241)
	Other or never worked/Unk nown	0.932 (0.076)	-0.062 (0.082)	1.092 (0.307)	0.700 (0.201)	1.481 (0.413)	0.572 (0.213)	0.688 (0.185)
	Salary	1.000 (0.000)	0.000 (0.000)	1.001 (0.001)	1.001 (0.001)	1.001 (0.001)	1.000 (0.001)	1.003*** (0.001)
Income satisfaction ("ok"=base outcome)	0.984 (0.056)	-0.011 (0.050)	1.192 (0.221)	0.893 (0.195)	1.114 (0.195)	0.558** (0.148)	0.456*** (0.079)	
Income compared to others in the community ("same"=base outcome)	Sufficient	1.165*** (0.057)	0.143*** (0.047)	1.482** (0.229)	1.237 (0.218)	1.631*** (0.247)	0.786 (0.173)	1.558*** (0.214)
	Worse	0.927 (0.054)	-0.054 (0.051)	0.855 (0.169)	0.844 (0.205)	0.946 (0.181)	1.223 (0.338)	0.887 (0.166)
	Better	0.954 (0.050)	-0.041 (0.051)	0.852 (0.144)	1.025 (0.190)	0.733* (0.121)	1.215 (0.281)	1.350** (0.205)
Income from	Remittances	1.055 (0.053)	0.053 (0.051)	1.255 (0.218)	1.297 (0.237)	1.186 (0.199)	0.975 (0.199)	1.262 (0.196)
	Other family member	1.026 (0.046)	0.026 (0.042)	1.128 (0.160)	1.010 (0.165)	1.060 (0.144)	0.795 (0.158)	0.766** (0.099)
	Agriculture	1.104 (0.071)	0.097 (0.061)	1.247 (0.240)	1.298 (0.309)	1.128 (0.215)	1.486 (0.366)	1.058 (0.191)

Dependent: Immigration Requirements		# of doc IRR	# of doc Coef.	Doc_1+ Odds Ratio	Doc_2+ Odds Ratio	Passport Odds Ratio	Health record Odds Ratio	Finance Odds Ratio	
Reason for leaving (personal=base outcome)	Savings	0.936 (0.066)	-0.066 (0.066)	0.904 (0.193)	0.832 (0.191)	0.832 (0.176)	1.254 (0.338)	2.975*** (0.653)	
	Rent	1.022 (0.084)	0.020 (0.080)	0.868 (0.214)	1.095 (0.290)	0.832 (0.204)	1.603 (0.466)	1.086 (0.245)	
	Social assistance and pension	1.052 (0.050)	0.041 (0.046)	1.178 (0.178)	1.122 (0.191)	1.192 (0.177)	1.097 (0.218)	1.019 (0.144)	
	Land owner	0.970 (0.059)	-0.039 (0.058)	1.009 (0.192)	0.909 (0.209)	0.826 (0.156)	1.198 (0.292)	1.465** (0.260)	
	Improve living conditions	0.989 (0.048)	-0.008 (0.047)	0.691** (0.115)	1.066 (0.205)	0.664** (0.108)	1.681** (0.406)	0.761* (0.115)	
	Better work	0.942 (0.049)	-0.047 (0.047)	0.652** (0.110)	1.090 (0.222)	0.643*** (0.107)	1.503 (0.384)	1.049 (0.167)	
	Other	0.914 (0.064)	-0.086 (0.065)	0.687 (0.159)	0.684 (0.191)	0.746 (0.169)	0.739 (0.267)	1.081 (0.230)	
	Migration decision influenced by others	0.908** (0.041)	-0.091** (0.041)	0.634*** (0.090)	0.875 (0.138)	0.680*** (0.094)	1.088 (0.203)	1.054 (0.139)	
	Information about destination country via: (news=base outcome)	Institution	1.147 (0.147)	0.232 (0.172)	1.803 (0.971)	1.047 (0.401)	1.160 (0.558)	1.727 (0.728)	0.881 (0.350)
		Family at home	0.788** (0.078)	-0.236** (0.095)	0.864 (0.270)	0.468** (0.161)	0.861 (0.259)	0.431* (0.203)	1.160 (0.321)
Friends abroad		0.913 (0.070)	-0.090 (0.077)	1.459* (0.329)	0.447*** (0.108)	1.320 (0.283)	0.790 (0.237)	1.345 (0.274)	
Been abroad		1.134 (0.098)	0.167* (0.098)	4.780*** (1.927)	0.767 (0.218)	5.308*** (2.014)	0.614 (0.224)	3.265*** (0.996)	
Other		0.773*** (0.055)	-0.240*** (0.070)	0.874 (0.181)	0.327*** (0.078)	0.832 (0.165)	0.388*** (0.116)	0.547*** (0.107)	
Family abroad		0.912 (0.095)	-0.086 (0.105)	1.246 (0.399)	0.506** (0.174)	1.344 (0.419)	0.755 (0.306)	1.089 (0.309)	
Migration assisting programs		Would participate	1.169*** (0.060)	0.164*** (0.057)	1.380 (0.282)	1.568** (0.279)	1.378* (0.268)	1.319 (0.274)	1.441** (0.230)
	Is aware but no participation intend	1.017 (0.062)	0.013 (0.055)	1.643** (0.387)	0.821 (0.230)	2.001*** (0.465)	0.355** (0.157)	1.663** (0.369)	
Country dummies (Albania=base outcome)	Egypt	0.710*** (0.061)	0.266*** (0.073)	0.381*** (0.089)	0.594** (0.155)	0.268*** (0.063)	0.101*** (0.046)	1.931*** (0.420)	
	Moldova		0.163**	2.777***	1.037	1.947***	1.059	0.834	

Dependent: Immigration Requirements	# of doc IRR	# of doc Coef.	Doc_1+ Odds Ratio	Doc_2+ Odds Ratio	Passport Odds Ratio	Health record Odds Ratio	Finance Odds Ratio
	1.167**						
	(0.088)	(0.073)	(0.669)	(0.273)	(0.455)	(0.321)	(0.180)
Tunisia	0.972	-0.040	1.359	0.602*	1.002	0.741	1.365
	(0.071)	(0.072)	(0.318)	(0.157)	(0.227)	(0.221)	(0.296)
Constant	1.019	0.970***	0.649	0.806	0.421	1.369	1.614
	(0.209)	(0.204)	(0.441)	(0.600)	(0.283)	(1.228)	(0.993)
Number of observations	1762	1762	1762	1762	1745	1730	1760
Log-likelihood	-1964.78	-1940.86	-860.68	-697.7	-890.99	-514.78	-989.6
Chi-square/F-Stat	374.873	8.23	268.641	165.468	267.255	144.661	305.644
(Pseudo) R-Square	0.049	0.1680	0.181	0.107	0.185	0.14	0.184

Note: * p<0.10, ** p<0.05, *** p<0.01, standard errors in parentheses

Appendix-Table 4 Dependent: How likely is it that you migrate within the next 6 months?

Dependent: How likely is it that you migrate within the next 6 months?

Ordered logit model (1) Generalized ordered logit model (2) - (5)		(1) Odds Ratio	(2) very unlikely Odds Ratio	(3) quite unlikely Odds Ratio	(4) neither likely nor unlikely Odds Ratio	(5) quite likely Odds Ratio
Demographics	Age	0.984 (0.012)	1.026 (0.016)	0.966** (0.014)	0.966** (0.014)	0.971 (0.019)
	Female	0.624*** (0.080)	0.617*** (0.080)	0.617*** (0.080)	0.617*** (0.080)	0.617*** (0.080)
	Married	1.261 (0.222)	1.175 (0.215)	1.175 (0.215)	1.175 (0.215)	1.175 (0.215)
	Number of children	0.877 (0.071)	0.870 (0.100)	1.041 (0.099)	0.767*** (0.075)	0.786* (0.113)
Relation to household head (HHH)	Child, grandchild or other of HHH	0.822 (0.131)	1.299 (0.284)	0.989 (0.174)	0.509*** (0.091)	0.593** (0.153)
	HH Size	1.018 (0.032)	1.014 (0.034)	1.014 (0.034)	1.014 (0.034)	1.014 (0.034)
Ability to speak language of potential destination country	Very well	1.016 (0.110)	1.047 (0.119)	1.047 (0.119)	1.047 (0.119)	1.047 (0.119)
	Hardly	0.652*** (0.084)	0.665*** (0.089)	0.665*** (0.089)	0.665*** (0.089)	0.665*** (0.089)
Education	Secondary	0.969 (0.110)	0.937 (0.113)	0.937 (0.113)	0.937 (0.113)	0.937 (0.113)
	Tertiary/Post-					

Dependent: How likely is it that you migrate within the next 6 months?

Ordered logit model (1) Generalized ordered logit model (2) - (5)		(1)	(2) very unlikely	(3) quite unlikely	(4) neither likely nor unlikely	(5) quite likely
		Odds Ratio	Odds Ratio	Odds Ratio	Odds Ratio	Odds Ratio
	secondary	1.006	0.869	0.869	0.869	0.869
		(0.150)	(0.140)	(0.140)	(0.140)	(0.140)
Labor market status	Employer	0.785	0.854	0.565***	0.735	1.011
(employed=base outcome)		(0.127)	(0.182)	(0.102)	(0.147)	(0.261)
	Casual worker	1.413**	1.328*	1.328*	1.328*	1.328*
		(0.205)	(0.208)	(0.208)	(0.208)	(0.208)
	Student	0.277***	0.298***	0.298***	0.298***	0.298***
		(0.053)	(0.057)	(0.057)	(0.057)	(0.057)
	Unemployed	1.002	1.298	1.230	0.723*	0.544***
		(0.140)	(0.247)	(0.212)	(0.132)	(0.129)
	Never worked/Unknown	1.947**	0.884	2.086***	2.378***	2.033**
		(0.517)	(0.270)	(0.553)	(0.613)	(0.726)
Industry of work (public admin. And utilities=base outcome)	Petty Trade, Commerce, hotel, restaurant and domestic services	0.860	0.579**	0.900	1.152	0.886
		(0.161)	(0.138)	(0.189)	(0.246)	(0.243)
	Manufacturing, mining and agriculture	1.466*	1.412	1.412	1.412	1.412
		(0.287)	(0.303)	(0.303)	(0.303)	(0.303)
	Construction, transport and repair	1.069	0.873	1.324	1.111	0.763
		(0.208)	(0.225)	(0.293)	(0.249)	(0.211)
	Other or never worked/Unknown	0.887	0.688	0.693	1.294	0.785
		(0.181)	(0.173)	(0.159)	(0.297)	(0.228)
	Salary	1.000	0.999	1.001	1.000	0.999
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Income satisfaction	Not sufficient	0.818	0.860	0.860	0.860	0.860
("ok"=base outcome)		(0.111)	(0.121)	(0.121)	(0.121)	(0.121)
	Sufficient	1.414***	1.466***	1.466***	1.466***	1.466***
		(0.165)	(0.180)	(0.180)	(0.180)	(0.180)
Income compared to others in the community	Worse	1.332*	1.338*	1.338*	1.338*	1.338*
("same"=base outcome)		(0.198)	(0.214)	(0.214)	(0.214)	(0.214)
	Better	1.011	1.060	1.060	1.060	1.060
		(0.127)	(0.135)	(0.135)	(0.135)	(0.135)
Income from	Remittances					

Dependent: How likely is it that you migrate within the next 6 months?

Ordered logit model (1) Generalized ordered logit model (2) - (5)		(1)	(2) very unlikely Odds Ratio	(3) quite unlikely Odds Ratio	(4) neither likely nor unlikely Odds Ratio	(5) quite likely Odds Ratio
		1.044	0.950	1.506***	0.949	0.911
		(0.145)	(0.164)	(0.232)	(0.156)	(0.205)
	Other family member	0.603***	0.743**	0.730***	0.487***	0.457***
		(0.060)	(0.109)	(0.088)	(0.060)	(0.084)
	Agriculture	1.187	1.196	1.196	1.196	1.196
		(0.193)	(0.193)	(0.193)	(0.193)	(0.193)
	Savings	0.769	0.539***	0.524***	1.776***	1.398
		(0.139)	(0.101)	(0.097)	(0.354)	(0.329)
	Rent	1.249	1.062	1.537**	1.068	1.288
		(0.213)	(0.244)	(0.302)	(0.210)	(0.343)
	Social assistance and pension	0.945	0.943	0.943	0.943	0.943
		(0.110)	(0.110)	(0.110)	(0.110)	(0.110)
	Land owner	1.085	0.868	0.957	1.670***	1.306
		(0.176)	(0.162)	(0.166)	(0.301)	(0.291)
	Improve living conditions	0.862	0.772*	0.944	0.800	0.550***
	(personal=base outcome)	(0.106)	(0.122)	(0.134)	(0.118)	(0.109)
	Better work	0.820	0.788*	0.788*	0.788*	0.788*
		(0.107)	(0.108)	(0.108)	(0.108)	(0.108)
	Other	1.220	1.217	1.217	1.217	1.217
		(0.220)	(0.223)	(0.223)	(0.223)	(0.223)
	Migration decision influenced by others	0.694***	0.777*	0.981	0.477***	0.481***
		(0.074)	(0.112)	(0.127)	(0.069)	(0.091)
	Information about destination country via:	1.233	0.739	1.485	1.788	3.316**
	(news=base outcome)	(0.505)	(0.293)	(0.503)	(0.650)	(1.604)
	Family at home	0.776	0.957	1.315	0.539**	0.283***
		(0.175)	(0.290)	(0.333)	(0.140)	(0.123)
	Friends abroad	0.960	1.466*	1.647***	0.584***	0.478***
		(0.169)	(0.311)	(0.316)	(0.118)	(0.121)
	Been abroad	2.018***	1.820***	1.820***	1.820***	1.820***
		(0.469)	(0.378)	(0.378)	(0.378)	(0.378)
	Other	0.688**	1.047	1.047	0.377***	0.286***

Dependent: How likely is it that you migrate within the next 6 months?

Ordered logit model (1) Generalized ordered logit model (2) - (5)		(1)	(2)	(3)	(4)	(5)
		Odds Ratio	very unlikely Odds Ratio	quite unlikely Odds Ratio	neither likely nor unlikely Odds Ratio	quite likely Odds Ratio
		(0.115)	(0.211)	(0.186)	(0.071)	(0.071)
Migration assisting programs	Family abroad	1.682** (0.438)	1.885** (0.609)	2.234*** (0.636)	1.550 (0.426)	0.789 (0.286)
	Would participate	1.014 (0.140)	0.949 (0.133)	0.949 (0.133)	0.949 (0.133)	0.949 (0.133)
	Is aware but no participation intend	1.067 (0.150)	1.189 (0.181)	1.189 (0.181)	1.189 (0.181)	1.189 (0.181)
Country dummies (Albania=base outcome)	Egypt	0.893 (0.170)	0.952 (0.223)	0.583** (0.123)	2.139*** (0.493)	0.330*** (0.110)
	Moldova	1.119 (0.202)	1.978*** (0.447)	1.084 (0.222)	1.223 (0.269)	0.303*** (0.100)
	Tunisia	1.217 (0.212)	1.547* (0.356)	3.494*** (0.719)	0.685* (0.144)	0.446*** (0.122)
	Cut1	0.087*** (0.043)	1762 -2281.66			
	Cut2	0.282** (0.139)	803.537 0.182			
	Cut3	0.708 (0.347)				
	Cut4	2.941** (1.442)				
Number of observations		1762	1762	Parallel Line Assumption:		
Log-likelihood		-2607.60	-2281.66	Chi2(63)	79.07	
Chi-square		350.247	803.537	Prob>chi2	0.0832	
Pseudo R-Square		0.065	0.182			

Note: * p<0.10, ** p<0.05, *** p<0.01, standard errors in parentheses

Chapter 4

THE DYNAMICS OF MIGRATION WITH DIASPORA AND COUNTER-DIASPORA EXTERNALITIES

Abstract

This paper studies a neglected aspect of the literature on network externalities that is the multiplier effect of migration networks on counter-migration flows. According to this concept, the multiplier effect is not only associated with the diaspora but also the counter-diaspora. The study presents a theoretical model and empirically tests the existence of counter-flows based on new bilateral data, it finds evidence of significant counter-migration effects at the international level. Long-run implications of a migration shock on migration stocks and flows are examined, which depend on the relative size of diaspora and counter-diaspora. The long-run effect is about 9.9 times larger than the short-run effect but the speed of convergence to the steady state is extremely low. Focusing on a practical horizon of 40 or 60 years (two or three generations) gives reasonable multipliers. Other things equal, the shock increases emigration by 1.9 percent after 20 years and 3.3 percent after 40 years. At the same time, it also increases the counter-migration by 0.1 percent after 20 years and 0.4 percent after 40 years. Reversals from net emigration to net immigration are possible and obtained by attractive countries, receiving many migrants from abroad (United States, Canada, Australia, New Zealand, Luxembourg or Switzerland).

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1 INTRODUCTION

Network or diaspora externalities constitute a key channel through which international migration affects sending and receiving countries. They have long been recognized in the sociological literature and, more recently, by economists. A growing literature has identified that migrants' networks promote international trade (e.g. Gould, 1994, Rauch and Casella, 1998, Lopez and Schiff, 1998, Rauch, 2003), stimulate foreign direct investments (e.g. Javorckiv et al, 2006, Kugler and Rapoport, 2007, Docquier and Lodigiani, 2008), accelerate technology transfers (Lodigiani, 2008, Spilimbergo, 2008) and induce other transfers of norms and values.

Most of all, as repeatedly shown in the literature, established migrants' networks play an important role on the migration decisions of individuals. By reducing psychic and legal migration costs, existing diasporas facilitate further migration of people (e.g. Massey et al. 1993, Carrington et al. 1995, Pedersen et al. 2008, Mc Kenzie and Rapoport 2007, Beine et al. 2009). By relying on network information, newcomers can reach relatively better and safer decisions in the case of uncertainty and imperfect information. As discussed in Massey et al. (1993), the 'network externalities' theory distinguishes between so-called community effects, which increase the utility of a community (i.e. the inflow of people from the same nation helps creating subcultures), and family effects, which only increase the utility of friends and relatives (see Carrington et al, 1996). Besides these cost-based self-selection mechanisms, diasporas attract new migrants via family reunification programs (relaxing the constraint induced by restrictive immigration policies). Hence, migration tends to follow geographical, cultural or political channels and thus low-moving-cost individuals migrate first. Their presence lowers the migration costs of the next group and the process continues as long as benefits exceed costs of migration.

By inspiring friends to migrate and sponsoring relatives, each migrant is likely to attract further migrants, giving rise to a migration multiplier. For example Bruecker et al. (2001) point out that family reunification became a major channel of migration in Europe after the guest worker agreements ceased in the 1970s. Immigration flows increased despite increased restriction of migration as prior immigrants brought in their family members. A few studies have attempted to estimate a migration multiplier by focusing on family reunification entitlements only. Using data on the 1986 cohort of US immigrants, Arnold et al. (1989) obtained a projected number of newly eligible migrants per visa issued of 1.0 for Filipinos

and 0.5 for Koreans (i.e. multipliers equal to 2 and 1.5). Jasso and Rosenzweig (1989) computed the multiplier for three generations for different immigrant groups to the United States (characterized by different sponsorship rates). The three-generation multiplier for males and female labor-certified immigrants equal 1.2 and 1.3, respectively. Although family reunion is the main route for many potential migrants, these values can be seen as lower-bound estimates of the migration multipliers. Network externalities may lead people to use different routes and come under refugee, employment, points-based programs or lotteries. For most OECD countries family based immigration constitutes the largest category of entry and often more than half of the immigrants enter the countries this way (SOPEMI 2008). It is likely that this category is the one where network externalities can unfold best.

This paper studies one neglected aspect of this literature on “network externalities”, i.e. the effect of migration networks on counter-migration flows. The idea is the following: by transferring information and reducing communication barriers, the existing diaspora originating from country *i* and living in country *j* positively impacts further migration flows not only from *i* to *j*, but also migration counter-flows from *j* to *i*. Indeed, immigrants from *i* know the language, culture, values, laws and practices of their home country. By propagating the information at destination, the diaspora reduces information costs and communication barriers for potential counter-migrants from *j*. Compared to the standard network effect, counter-diaspora externalities are likely to involve a stronger economic substance. In line with the diaspora effect on investments and trade, counter-migration flows can be associated with the relocation of firms, setting up of affiliates, and economic partnership abroad. It should be noted that this effect is defined as independent from any return migration; however, it may include the return of second generation migrants.

This concept is not new. In the ninetieth century, the geographer Ravenstein (1885) used the 1871 and 1881 English population censuses and derived seven migration laws governing human migration patterns between “kingdoms”¹. The fourth law states that “each main current of migration produces a compensating counter-current”. The term “produces”

¹ Ravenstein’s laws of migration (pp. 198-199) can be summarized as follows: (1) A great body of migrants move only a short distance. (2) There is a process of absorption, whereby people immediately surrounding a rapidly growing town move into it and the gaps they leave are filled by migrants from more distant areas, and so on until the attractive force is spent. (3) There is a process of dispersion, which is the inverse of absorption. (4) Each main current of migration produces a compensating counter-current. (5) Long-distance migrants go to one of the great centers of commerce and industry. (6) Natives of towns are less migratory than those from rural areas. (7) Females are more migratory than males.

suggests a causal link from migration to counter-migration, which is in line with the network externality discussed above. The link between internal migration flows and counter-flows is confirmed by a rather dated body of literature. Reviewing European or American studies on internal migration, Sorokin and Zimmerman's (1929) and Macisco and Pryor (1963) concluded that all Ravenstein's laws are globally verified (except the sixth in some studies). Quoting Thomas (1938), "it is known that the total migration stream between any origin and destination is composed of a main current to the gaining destination and a counter-current back to the losing origin". Until recently, due to the lack of bilateral data it was impossible to investigate the validity of Ravenstein's fourth law at the international level.

Basically, it would not be surprising to observe a correlation between migration and counter-migration. If, as suggested by the neo-classical theory, migration is driven by expected income differentials, a negative correlation between flows and counter-flows should be observed: strong incentives to migrate from i to j go hand in hand with low incentives to migrate from j to i . On the contrary, if, as suggested by many gravity models, migration is driven by geographical, cultural and linguistic distances, a positive correlation between flows and counter-flows should be observed: low costs from i to j imply low costs from j to i . However, such a positive correlation based on the "cost" argument cannot be interpreted as a causality linkage. Hence, studying counter-diaspora externalities requires controlling for costs and incentives in a bilateral context. In Section 2, develops a simple model of international migration introducing diaspora and counter-diaspora externalities. From that model, a testable specification is derived, which allows to quantify the size of those externalities.

Section 3 tests the existence of counter-flows and finds evidence of significant counter-migration effects at the international level. The analysis is based on an extension of the recent bilateral data set developed by Docquier and Marfouk (2006) and Docquier et al (2009), which provide migration stocks and rates by educational level from all the world's countries to the 30 OECD member states in 1990 and 2000. This data set was extended for this study by adding 10 receiving countries.²

Subsequently, Section 4 examines the long-run implications on migration stocks and flows. The interplay between such "diaspora" and "counter-diaspora" externalities is likely to be crucial. Assume a change in migration flows from i to j due to an economic shock or a

² The extension was undertaken together with Docquier and Marfouk.

change in migration policies. In the short-run, this shock obviously increases net emigration from i . In the long-run, the shock will be expanded through the standard multiplier. However, if counter-migration effects operate, the shock will be lessened or even offset by counter-flows from j to i . The net effect clearly depends on the relative size of diaspora and counter-diaspora externalities, which are likely to vary by pair of countries.

These results are important to understand the remarkable rise in immigration experienced by high-income countries between 1960 and 2005. Indeed, the UN estimates show that the proportion of international immigrants residing in the more developed countries has been multiplied by three in that period, an evolution which is very similar to the change in the world trade/GDP ratio. They are also important if one aims to predict the effect of policy reforms leading to increased migration flows. For example, in the late 1970s the EU facilitated intra-EU migration (including the members at that time) while restricting immigration from third countries. This policy did not have the desired effect. In fact, it led to third country-nationals making extensive use of the family reunification option and while the share of migrants within the EU stagnated at 1.5 percent, the share of third country immigrants increased from 1.5 percent to 3.3 percent of the EU population (Bruecker et al. 2001). Clearly, network effects affected these flows and such flows are predictable using the model and estimates of this study.

2 FROM THEORY TO EMPIRICS

The following section develops the model that the empirical equation to estimate diaspora and counter-diaspora externalities is based on and presents the econometric issues to be addressed in the estimation.

2.1 *The Model*

A simple model is used to describe diaspora and counter-diaspora externalities. A worker endowed with h units of human capital earns a wage w_i in country i where w_i is the skill price in that country. As in Rosenzweig (2008), this structure reflects the assumptions that (i) the main source of variation in wages within a country is the differences in the human capital levels (h) of the residents and (ii) the source of variation in wages across countries is the differences in average skill levels and skill prices (w_i). The individual utility is linear in income but also depends on moving costs and characteristics of the country of residence. For a particular individual with human capital h born in country i , the utility of staying in i is denoted by

$$(1) \quad U_{ii} = w_i h + \eta_i,$$

whereas the utility of the same individual of migrating to a country j is given by

$$(2) \quad U_{ij} = w_{ij}(\cdot)h - C_{ij}(\cdot) + \eta_j$$

where C_{ij} denotes migration costs including moving and assimilation costs (such as transportation costs, expenditures to learn a new language, find a job and obtain license to practice a profession) and costs borne to overcome the legal hurdles set by the destination country's government (such as visa fees or bureaucratic barriers for citizenship, etc.); w_{ij} is the expected skill price in country j ; η_i and η_j are random terms.

Expected wages and migration costs are affected by the presence of diasporas and counter-diasporas. The expected skill price abroad depends on the capacity of migrants to be matched with employers or to create a profitable business, i.e. on informational and transaction costs. These costs are reduced if previous generations of migrants from i to j , or from j to i , are connected to potential candidates for emigration. Hence, w_{ij} is a function of established diasporas M_{ij} and counter-diasporas M_{ji} . As explained in the previous section this latter effect is particularly important in this work. It could also depend on the educational structure of Diasporas and counter-Diasporas, H_{ij} and H_{ji} , if one thinks that skilled migrants are more effective in transferring information and reducing barriers:

$$(3) \quad w_{ij} = w_{ij}(M_{ij}, H_{ij}, M_{ji}, H_{ji})$$

with $w_{ii}=w_i$, the maximal wage that a native can obtain on the labor market of her origin country and $w_{ij} \leq w_j \forall j \neq i$.

Migration costs also depend on the size of established bilateral diasporas and counter-diasporas (size and education structure), on individual human capital and distances:

$$(4) \quad C_{ij} = C(M_{ij}, H_{ij}, M_{ji}, H_{ji}, h, D_{ij})$$

The total number of type- h individuals in age of migration in country i can be denoted by $N_i(h)$. Since McFadden (1984), it is known that when the random term η follows an extreme-value distribution, the proportion of individuals who decide to emigrate to country j is given by

$$(5) \quad \Pr \left[U_{ij} = \max_k U_{ik} \right] = \frac{N_{ij}(h)}{N_i(h)} = \frac{\exp[w_{ij}(\cdot)h - C_{ij}(\cdot)]}{\sum_k \exp[w_{ik}(\cdot)h - C_{ik}(\cdot)]}$$

Similarly, the proportion of stayers amounts to

$$(5') \quad \Pr[U_{ii} = \max_k U_{ik}] = \frac{N_{ii}(h)}{N_i(h)} = \frac{\exp[w_i h]}{\sum_k \exp[w_{ik}(\cdot)h - C_{ik}(\cdot)]}$$

Dividing the number of emigrants N_{ij} by the number of residents N_{ii} and taking logs results in

$$(6) \quad \ln N_{ij}(h) = [w_{ij}(M_{ij}, H_{ij}, M_{ji}, H_{ji}) - w_i]h - C_{ij}(M_{ij}, H_{ij}, M_{ji}, H_{ji}, h, D_{ij}) + \ln N_{ii}(h)$$

The standard diaspora externality is characterized by the following equations:

$$(7) \quad \frac{\partial \ln N_{ij}(h)}{\partial M_{ij}} = \frac{\partial w_{ij}}{\partial M_{ij}} h - \frac{\partial C_{ij}}{\partial M_{ij}} \geq 0$$

$$(7') \quad \frac{\partial^2 \ln N_{ij}(h)}{\partial M_{ij} \partial H_{ij}} = \frac{\partial^2 w_{ij}}{\partial M_{ij} \partial H_{ij}} h - \frac{\partial^2 C_{ij}}{\partial M_{ij} \partial H_{ij}} > 0$$

$$(7'') \quad \frac{\partial^2 \ln N_{ij}(h)}{\partial M_{ij} \partial h} = \frac{\partial w_{ij}}{\partial M_{ij}} + \frac{\partial^2 w_{ij}}{\partial M_{ij} \partial h} h - \frac{\partial^2 C_{ij}}{\partial M_{ij} \partial h} > 0$$

From equation (7), it is obvious that the existing diaspora from i to j (M_{ij}) has a positive impact on the propensity to migrate and number of migrants from i to j . In Equation (7'), the network externality is allowed to vary with the educational structure of the Diaspora. From equation (7''), it can be seen that the positive effect of networks on wages induces more skilled people to move (first term of the right hand side sum). However, networks can induce more unskilled workers to move if the diaspora effect on wages and migration costs provides more benefits to low-skill individuals (second and third right hand side terms). In fact, the empirical study of Beine et al (2009) reveals that diaspora externalities benefit more unskilled people. The reason is that migration tends to follow geographical, cultural or political channels; people who are relatively well off in terms of resources and skills and who can afford migration cost, tend to move first. Their presence lowers the migration costs of the next group and the process continues as long as benefits exceed costs of migration. The cost decrease hence allows less well off individuals to migrate. Interestingly, the above mentioned study shows that diasporas explain a large portion of the variability of migrants' flows (71 percent) and selection (47 percent). These percentages capture both network externalities that lower migration costs and the effect of family reunification programs.

Similarly, the model accounting for counter-diaspora externalities generates the following implications:

$$(8) \quad \frac{\partial \ln N_{ij}(h)}{\partial M_{ji}} = \frac{\partial w_{ij}}{\partial M_{ji}} h - \frac{\partial C_{ij}}{\partial M_{ji}} \geq 0$$

$$(8') \quad \frac{\partial^2 \ln N_{ij}(h)}{\partial M_{ji} \partial H_{ji}} = \frac{\partial^2 w_{ij}}{\partial M_{ji} \partial H_{ji}} h - \frac{\partial^2 C_{ij}}{\partial M_{ji} \partial H_{ji}} > 0$$

$$(8'') \quad \frac{\partial^2 \ln N_{ij}(h)}{\partial M_{ji} \partial h} = \frac{\partial w_{ij}}{\partial M_{ji}} + \frac{\partial^2 w_{ij}}{\partial M_{ji} \partial h} h - \frac{\partial^2 C_{ij}}{\partial M_{ji} \partial h} > 0$$

From equation (8), the existing diaspora from j to i has a positive impact on the propensity to migrate and number of migrants from i to j . There is no study comparing the magnitude of this counter-diaspora effect to the standard diaspora externality. In equation (8'), the counter-Diaspora externality is allowed to vary with the educational structure of the Diaspora. From equation (8''), the counter-diaspora effect ambiguously varies by human capital endowment. Contrary to the standard diaspora externality, there is no study analyzing whether counter-diaspora externalities are significant and how they vary by educational level.

2.2 Empirical Model

To address this issue, a migration model which matches equation (6) is estimated. Thus, this study will analyze the effect of migration networks on counter-migration flows considering the total diaspora and counter-diaspora, hence including both skilled and unskilled migrants.³ Due to the data underlying this analysis, which captures immigrant stocks and not flows, the flow of migration from i to j is proxied by the log-change in the bilateral migration stock, $\ln(N_{ij,t}) = \ln(M_{ij,t+1}) - \ln(M_{ij,t})$. This dependent variable is regressed on origin and destination-country fixed effects capturing amenities, proportion of skilled, development level and other characteristics at destination and origin (α_i and α_j). Further, it is regressed on a set of bilateral variables A_{ij} capturing migration costs between countries (geographical distance, cultural links, linguistic links, bilateral agreements of free mobility) and finally, on the existing diaspora size ($\ln M_{ij,t}$), and on the existing counter-diaspora size ($\ln M_{ji,t}$). Additionally, diaspora and counter-diaspora externalities can vary by educational

³ Theoretically, it would be possible to extend the model to skilled and unskilled migrant flows, however, this is not done by this study for simplicity reasons. Instead, the model will control for variation of diaspora externalities across different education levels, as explained further below.

level. For this purpose the log-ratios of highly skilled to low skilled migrants, $\ln(M_{ij,t}^H / M_{ij,t}^L)$ and $\ln(M_{ji,t}^H / M_{ji,t}^L)$ are introduced. The empirical model can be written as follows:

$$(9) \quad \ln\left(\frac{M_{ij,t+1}}{M_{ij,t}}\right) = \alpha_i + \alpha_j + \delta A_{ji} - \beta \ln(M_{ij,t}) + \lambda \ln(M_{ji,t}) + \rho \ln\left(\frac{M_{ij,t}^H}{M_{ij,t}^L}\right) + \theta \ln\left(\frac{M_{ji,t}^H}{M_{ji,t}^L}\right) + \varepsilon_{ij}$$

where ε_{ij} is a iid error term and $(\alpha_i, \alpha_j, \delta, \beta, \lambda, \rho, \theta)$ is the set of parameters to be estimated.

Equation (9) can first be estimated using standard OLS regressions. However, the analysis will further address an important econometric problem that occurs within the estimations, i.e. a potential bias that could result from the endogeneity of the lagged dependent variable.

2.3 *Econometric Issues*

The sources of endogeneity are multiple. First, endogeneity is suspected due to the construction of the dependent because the lagged migration stock is used to compute the diaspora's growth rate. This problem is referred to as the "Nickel bias" (see Nickel, 1981). Second, one may expect some correlation between the size of the diaspora or counter-diaspora and the error term. Such a correlation arises if bilateral variables (such as a common culture) that cannot be observed directly, simultaneously affect the diaspora, the counter-diaspora size and migration flows. Third, even in the absence of correlated effects, some kind of endogeneity can arise as a consequence of the so called "reflection problem" (Manski, 1993). It arises when the propensity of an individual to behave in some way varies with the prevalence of that behavior in some reference group containing the individual. Inference is no more possible unless one has some prior information specifying the composition of the reference group. In all cases, the endogeneity problem has to be addressed by instrumenting the lagged diaspora and counter-diaspora, as in Evans (1992), Munshi (2003) or Beine et al (2009); in such a case the OLS results would lead to some kind of omitted variable bias.

In order to make use of instrumental variable techniques, it is necessary to find suitable instruments, which will affect the size of diasporas in 1990 but not the subsequent migration flows. Consequently, these instruments need to consist of factors that had led to an increase (or decrease) in the stock of migrants measured in 1990. Following Beine et al (2009), this can be achieved by using information from the 1960s, 1970s and 1980s that had an impact on migration flows during that time (but not later on). The instruments used in this analysis are of bilateral nature and based on a policy background—guest worker agreements

and social security agreements—and on push and pull factors of migration—population size, immigration statistics and distance. It is very unlikely that the factors included in the instruments simultaneously have an impact on migration flows between 1990 and 2000. They will be described in more detail further below.

Further, the issue of zero migration flows occurring in the data needs to be discussed because a high number of zeros might induce a potential selection bias. There are two main reasons why the sample contains zeros. The first is that no migrant wanted to leave her country for example because of prohibitive high migration costs. The second is simply that data was not available from the particular country and the country pair is missing. Due to the log nature of the migration-flow variable the zeros result in 19 percent of missing observation in the dependent variable.

Beine et al (2009) address this problem in their analysis of network effects by introducing a Heckman two-step procedure using diplomatic representation as an exclusion restriction. They base their selection on the argument that costs are prohibitive for some migrants and that this causes that migration stocks cannot be observed where migrants would actually move. Despite the strength of this argument this analysis does not follow this approach. The reason is that this analysis uses a very different composition of origin and destination countries.⁴ It is unlikely that among the 40 countries included in the current analysis the argument of prohibitive cost holds to the extent that they cause zero migration flows. Rather, the zeros may stem from imprecision in the data released by the statistical offices. For example, some offices did not report countries of origin where only a few migrants were sent from and classified them as unknown instead.⁵ While a lot of zeros occur in data from Eastern Europe (1990) the zeros are also distributed across the other countries. It is thus assumed in this analysis that they do not create a substantial selection bias.

3 DATA AND EMPIRICAL RESULTS

This section describes the data used to estimate equation (9) and provides the regression results obtained in OLS and IV.

⁴ Beine et al (2009) include the OECD as destination only and 195 origin countries (they do not address the role of the counter-Diaspora).

⁵ Also for confidentiality reasons.

3.1 *Bilateral migration data*

The estimations rely on an extension of the bilateral database developed in Docquier, Lowell and Marfouk (2009), henceforth labeled DLM. This data set characterizes the gender and education compositions of international migrants from all the world's countries to the OECD in 1990 and 2000. It is based on harmonized immigration data collected in 30 OECD host countries, where information about the birth country, gender, age and educational attainment of immigrants is available. This information is found in national population censuses and registers (or samples of them). The DLM only includes the adult population aged 25 and over. This excludes students who temporarily emigrate to complete their education. Migration is generally defined on the basis of the country of birth rather than citizenship.⁶ Using the foreign-born definition of what a migrant is, counter-flows pertain to real counter-migrants and not to returnees. This is also the case when citizenship is used since most returnees have dual citizenships and are not considered as immigrants by their initial origin country. It is worth noticing that the counter-flows include returns of migrants' children (i.e. migrants from the second generation). This is in line with Ravenstein's story.⁷

The DLM includes gender-disaggregated data with the highest level of detail on birth countries and three levels of educational attainment: immigrants with upper-secondary education, those with post-secondary education and those with less than upper-secondary education (including lower-secondary, primary and no schooling). Although the analysis focuses on total migration flows and stocks, the disaggregation by education level allows us to build the indicators of educational structure of diasporas and counter-diasporas $\ln(M_{ij,t}^H / M_{ij,t}^L)$ and $\ln(M_{ji,t}^H / M_{ji,t}^L)$ used in (9).

As mentioned, the DLM was extended for this paper by adding data collected in 10 non OECD host countries that are part of the EU or at least candidate countries, Bulgaria, Croatia, Cyprus, Estonia, Latvia, Lithuania, Macedonia, Malta, Romania and Slovenia. Data by country of birth and educational level were obtained for eight countries from the national statistics offices. In two cases (Macedonia and Cyprus), migrants are defined by citizenship.

⁶ Foreign born are individuals born abroad with foreign citizenship at birth. In a couple of countries (Australia, New Zealand, Belgium), "foreign born" means "overseas-born", i.e. an individual simply born abroad. In five cases, due to the absence of adequate data (Germany, Hungary, Italy, Japan and Korea), migrants are defined on the basis of their citizenship.

⁷ Ravenstein (1885, p.187) pointed out that p.187, "this counter-current is not composed of migrants who return [...], which are included in the native population". "It includes many children of migrants".

From this data a 40x40 matrix of migration stocks in 1990 and 2000 was extracted. Excluding the cases where origin and destination are the same, the sample includes 1,560 observations of bilateral stocks M_{ij} of migrants and counter-migrants in 1990 and 2000. As stated before, the flow of migration from i to j is proxied by the log-change in (or growth rate of) the migration stock between 1990 and 2000.⁸

The total numbers of adult migrants captured by the 40x40 matrix amounts to 30.9 million in 2000, including 9.4 million skilled workers. Table 1 gives detailed information on the size of the top 30 bilateral diasporas and the magnitude of the corresponding counter-diasporas in 2000. For example Germany attracted around 1,3 million emigrants from Turkey, while approximately 84 thousand immigrants from Germany lived in Turkey. The United States attracted 6,4 million emigrants from Mexico, 716 thousands from Canada, 647 thousands from Germany and 637 from the United Kingdom while (only) around 68 thousand immigrants from the US reside in Mexico, 199 thousand in Canada, 75 thousand in Germany and 99 thousand in the UK. The same table shows that 422 thousand emigrants from Ireland live in the United Kingdom and 183 thousand immigrants in Ireland are originating from UK. Thus, the sizes of the counter-diasporas relative to the diasporas can vary substantially and the counter-diaspora ranges from 1 percent to 44 percent of the diaspora—the outlier is the US and Canada, the number of Canadians in the US is 360 percent of the number of US born people in Canada.

Further, Table 1 shows that the fraction of one bilateral diaspora (counter-diaspora) of the total diaspora (counter-diaspora) of the origin (destination) country is also very different across all countries. The two last column of Table 1 show these percentages: The percentage of the bilateral diaspora of the total diaspora from this origin country ranges from 6.6 (for the United Kingdom-New Zealand) to over 99 percent (for Mexico-US). The percentage of the bilateral counter-diaspora of the total emigration from the destination country, thus of the total diaspora of the destination country, varies between 0.2 (for Germany-Croatia and United States-Portugal) and 83.5 percent (for Canada-United States). The numbers show that there are large migration corridors where one country primarily sends migrants to one other country like between the US and Mexico or between Ireland and the UK. But this does not necessarily mean that the counter-part (US or UK in the example) sends back many migrants. Conversely, there are countries sending a substantial number of its emigrants to one country and receive a

⁸ Return migration and mortality among past migrants is not observed.

substantial number back from that same country. This is the case between the UK and Australia or Germany and the Netherlands.

Table 1 Diaspora and counter-diaspora, Top 25 emigration countries, 2000

Country of origin	Country of destination	Bilateral emigration (diaspora of origin)	Bilateral counter-emigration (Counter-diaspora of origin)	Bilateral diaspora as % of total diaspora from origin	Bilateral counter-diaspora as % of total emigration from destination
Mexico	United States	6,374,825	67,737	99.1%	9.5%
Turkey	Germany	1,272,000	84,518	63.9%	3.6%
United Kingdom	Australia	969,004	77,314	32.1%	36.5%
Canada	United States	715,825	199,115	83.5%	27.8%
Korea	United States	676,640	9,545	56.0%	1.3%
Germany	United States	646,815	75,428	27.4%	10.5%
United Kingdom	United States	637,584	98,783	21.2%	13.8%
United Kingdom	Canada	580,250	49,954	19.3%	5.8%
Portugal	France	536,236	7,575	44.3%	0.9%
Italy	United States	461,085	39,595	19.4%	5.5%
Italy	Germany	456,000	31,200	19.2%	1.3%
Ireland	United Kingdom	422,393	183,334	62.0%	6.1%
Korea	Japan	400,747	10,711	33.2%	2.6%
Poland	United States	399,165	5,625	35.0%	0.8%
Italy	France	373,863	25,874	15.7%	3.0%
Bulgaria	Turkey	346,176	6,839	70.2%	0.3%
Germany	Netherlands	343,221	93,794	14.5%	15.7%
Italy	Canada	312,190	3,515	13.2%	0.4%
Spain	France	309,010	135,680	43.1%	15.8%
Japan	United States	283,295	27,487	68.5%	3.8%
New Zealand	Australia	273,981	33,051	76.8%	15.6%
Slovakia	Czech Republic	262,840	9,130	70.5%	4.5%
Greece	Germany	248,000	7,315	33.4%	0.3%
Italy	Switzerland	222,712	12,718	9.4%	5.6%
Italy	Australia	216,318	3,066	9.1%	1.4%

To further illustrate the relation between migrant flows and counter-flows and between the sizes of the diasporas, Figure 1 plots flows against counter-flows and Figure 2 presents the link between diasporas and counter-diasporas sizes in 2000. The correlation between counter-flows and flows is not significant. Indeed, there is no clear pattern emerging from Figure 1. Such a stylized fact is compatible with model (9). If b is between 0 and 1, each bilateral stock of migrants converges to a unique steady state: in the long-run, the growth rate of the bilateral diaspora should be equal to zero. On the contrary, Figure 2 shows a clear positive relationship between the two stocks. The correlation rate between counter-diasporas and diasporas amounts to 60 percent. Of course, the existence of a strong correlation does not imply causation. It can be driven by many factors such as country sizes (large countries receive and send more migrants than small countries), bilateral agreements of free mobility, cultural or

geographical proximity, etc. However, the correlation gives a first indication of counter-diaspora externalities. An empirical model such as the one presented above is required to ascertain an externality.

Figure 1 Migration flows (X-axis) and counter-flows (Y-axis) in log (1990-2000)

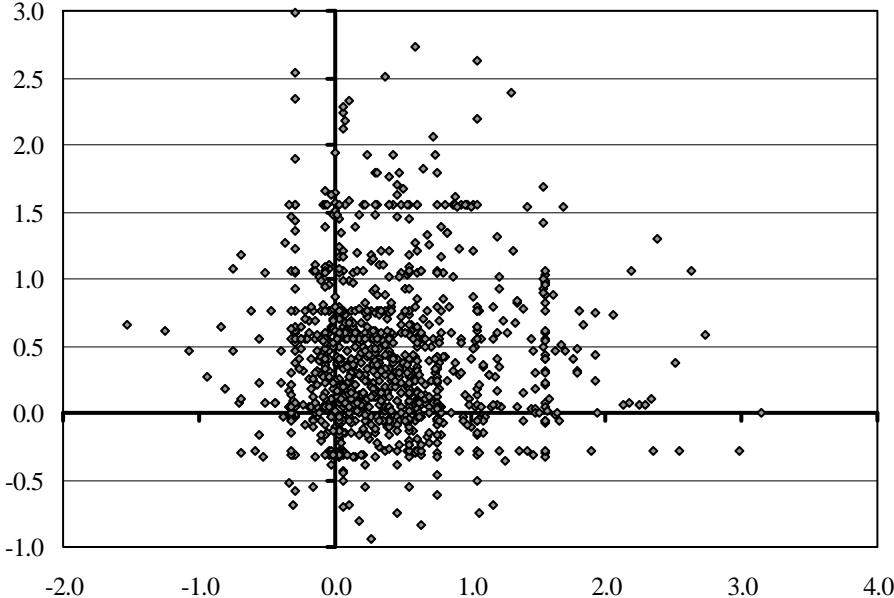
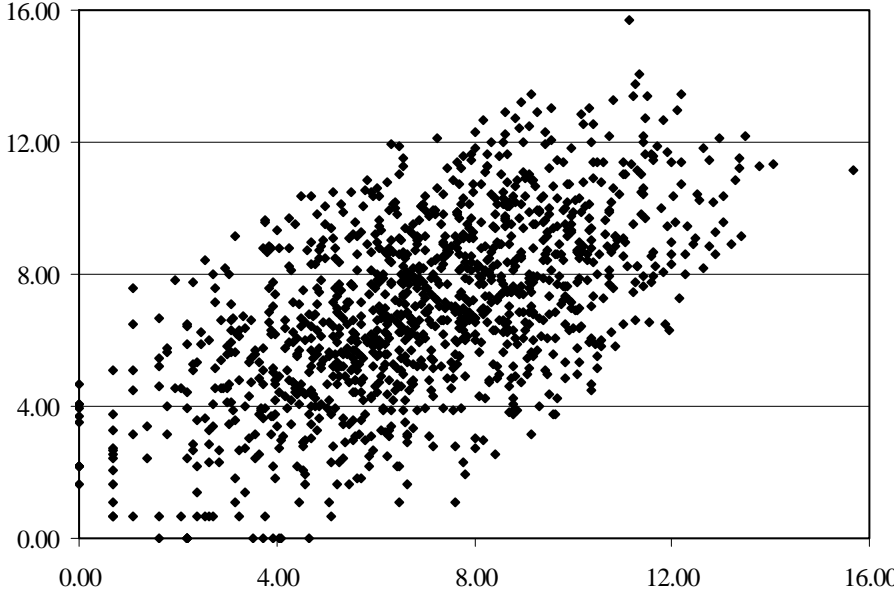


Figure 2 Migration diasporas versus counter-diasporas in logs, 2000



3.2 *Other Data Sources*

Other data sources are required to estimate the model presented above. This regards primarily the variables contained in the vector A_{ij} of bilateral variables affecting migration flows, thus bilateral agreements concluded between 1990 and 2000, the geographical distance (in logs) and an indicator of linguistic proximity. Geographical and linguistic distances are taken from the CEPII database described in Clair et al. (2004). Colonial links are not included since the set of 40 countries excludes many former colonies. Bilateral agreements are taken from the OECD (2004). The OECD distinguished over 175 bilateral agreements and other form of foreign workers recruitment signed by the OECD countries. Among the bilateral agreements only those signed between 1990 and 2000 are considered. This variable is symmetric for diaspora and counter-diaspora.

Further, it should be noted that the country fixed effects capture all time-invariant characteristics of sending and destination countries and minimizes the need for explanatory variables. As these characteristics are not of primary interest in this study and to avoid potential bias from misspecification, the analysis does not aim at disentangling them and has no data requirements in this respect.

Still, the instrumentation method requires additional variables and thus data sources. The information on population at origin and destination in 1960 and Immigration at origin and destination in 1960 is taken from the database provided by the UN Population Division (UN 2005, 2008). Further, the IV estimation makes use of guest workers agreements, which correspond to foreign workers recruitment in the 1950s and 1960s, the data was collected from various studies.⁹ It should be noted that while these guest worker agreements could in principal be reciprocal the effect of recruitment only went in one direction in practice, meaning guest workers went for example from Turkey to Germany but not vice versa. Consequently, the variable is kept asymmetrical. Additionally, the variable of bilateral social security agreements is used and taken from a study on social protection of migrants (Avato et al. 2009).

⁹ Miles (1989), McDowell (2003), Martin (2003), Castles (1986), Bohning (1974), Basok (2000).

3.3 Empirical Results

The OLS and IV results are presented in Table 2. The first column shows the estimation results for each determinant as presented in equation (9). The coefficients of diaspora and counter-diaspora sizes are indeed significant at the 1 percent level. The coefficient β (for the diaspora D1)) is stable across specification and amounts to 0.17. The coefficient λ (for the counter-diaspora D2) is equal to 0.039.

Further, the results show that the skill ratios of both diasporas are insignificant and small. This means that in this model diaspora and counter-diaspora externalities do not vary by educational level and the results concern equally skilled and unskilled migrants. Further, bilateral agreements are positive and significant, confirming their migration enhancing effect. Distance is negative and significant as expected. The longer the distance to overcome, the lower migration flows. Finally, linguistic proximity is positive and significant, also as expected.

Given the importance of inequality between sending and receiving countries as a migration driver, column two presents results that test whether diaspora externalities affect migration flows differently in a poor-rich country dimension. Accordingly, counter-diasporas that came from a poor and went to a rich country are distinguished, thus migrant flows from rich to poor countries compared to others are considered. Column (2) shows the results including an interaction between the counter-diaspora and a bilateral dummy depicting those country pairs in migrant flows that move from rich-to-poor countries.¹⁰ The estimates show that the main effect of the counter-diaspora remains positive and significant but is slightly smaller (0.031). Also the main effect of the bilateral region dummy is positive and significant. Most importantly, the interaction effect is positive and significant at the 1 percent level. Consequently, the effect of the counter-diaspora consisting of individuals who moved from poor to rich countries seems to be stronger.¹¹

¹⁰ Poor countries (GDP per capita below US\$20,000): Bulgaria, Croatia, Czech Rep., Estonia, Hungary, Latvia, Lithuania, Macedonia, Malta, Mexico, Poland, Portugal, Romania, Slovak Rep. and Turkey.

Rich Countries (GDP per capita above US\$30,000): Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom and United States. Countries between the two groups (Cyprus, Korea, New Zealand, and Slovenia) are not classified in terms of income.

¹¹ Similar estimations including the opposite interaction for poor to rich migrant flows showed the reverse effects.

The poor-rich dimension is even stronger accounting for a counter-diaspora that moves from a poor country to one of the EU15 countries and migration flows consequently going from the EU15 towards poor countries. Figure 3 visualizes the effect of the counter-diaspora on migration flows. It thereby distinguishes the counter-diaspora that moved from poor countries to the EU15 versus others. The effect is significant below the 1 percent level and the line for the mentioned group clearly has the steeper slope. This effect is particularly interesting because most of the poor countries in the sample are EU members (or at least candidates for membership). Consequently, migration that has happened from newer members to the “old” members apparently produces increased counter-migration, and issue that has been discussed during the recent accessions from Eastern Europe.

Figure 3 Predicted values of migration-flows: Effect of the counter-diaspora by region

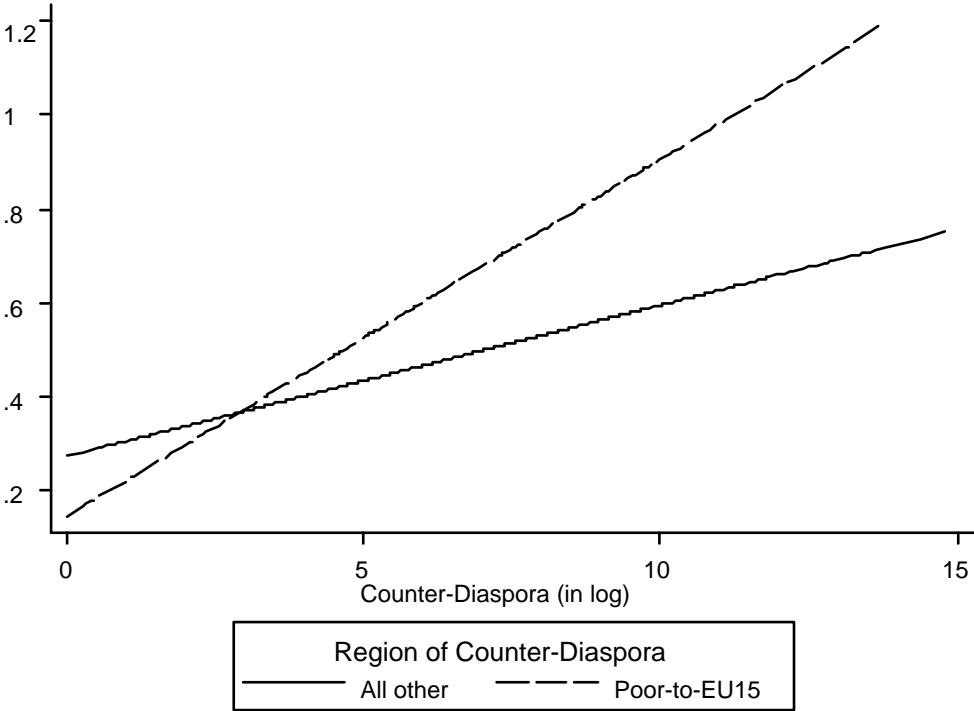


Table 2 OLS and IV estimates, Dependent = Log-change in the migration stock 1990-2000

	Total flow	Rich-to-Poor	IV1	IV2	Rich-to-Poor ^a
Counter-diaspora D2 (l)	0.039*** (4.983)	0.031*** (3.881)	0.084* (1.874)	0.081** (2.066)	0.093* (1.905)
Diaspora D1 (-b)	-0.174*** (-11.850)	-0.168*** (-11.636)	-0.154*** (-3.209)	-0.149*** (-3.033)	-0.132*** (-2.597)
D2-skill-ratio (q)	-0.004 (-0.513)	-0.004 (-0.657)	0.001 (0.185)	0.001 (0.176)	0.003 (0.385)
D1-skill-ratio (r)	-0.005 (-0.498)	-0.001 (-0.145)	-0.001 (-0.044)	0.000 (0.004)	0.006 (0.448)
Bilat. Agreements (d)	0.140** (2.234)	0.118* (1.889)	0.095 (1.291)	0.094 (1.309)	0.057 (0.765)
Distance in log (d)	-0.084*** (-2.984)	-0.102*** (-3.741)	-0.009 (-0.146)	-0.007 (-0.123)	0.009 (0.144)
Same language (g)	0.148*** (2.931)	0.184*** (3.799)	0.077 (1.071)	0.076 (1.143)	0.072 (0.970)
Rich-to-Poor (C')		0.100 (1.164)			0.265* (1.929)
D2xR-t-P (l')		0.032*** (2.963)			0.009 (0.518)
Constant (C)	0.767** (2.164)	0.720** (2.053)	0.832 (0.643)	0.780 (0.652)	0.166 (0.129)
Number of observations	1263	1263	1263	1263	1263
F-stat	87.06	149.27			
R-Square	0.583	0.596	0.566	0.566	0.562
Hansen J-stat p value			0.91	0.94	0.62
Kleinbergen-Paap Wald rk F-Stat			12.6	10.6	7.0

Note: * p<0.10, ** p<0.05, *** p<0.01. ^a Also IV-estimates.

To sum up the effects estimated by the OLS models, networks seem to not only induce chain migration via the diaspora (traditional network effects) but also through the counter-diaspora. Thus, the estimations confirm another positive multiplier effect.

Although the model controls for country of origin and destination fixed effects, the size of the diasporas and the magnitude of migration flows can be affected by some unobserved bilateral shocks contained in the error term. This may result in biased estimates in OLS as explained above. The problem will be addressed by using IV methods. To instrument both the diaspora and the counter-diaspora several instruments are included; two specifications are presented here. The inclusion of more than two instruments allows for the use of the Hansen over-identification test (along with several other tests) to test for the validity of instruments. As mentioned before all instruments are based on statistics collected well before 1990 and are expected to affect the size of the existing diaspora, but not of the

current migration flows.¹² In the first specification, which is presented in column (3) in Table 2, three instruments are used:

$$\begin{aligned}
 & IV1_{ij} = (SSA_{ij} + GWA_j) * \ln(\text{immig}_j / \text{dist}_{ij}) \\
 (10) \quad & IV2_{ji} = (SSA_{ji} + GWA_i) * \ln(\text{pop}_j) * \ln(\text{immig}_i) - \ln(\text{dist}_{ji}) \\
 & IV3_{ji} = \ln(\text{pop}_j) * \ln(\text{immig}_i / \text{dist}_{ji})
 \end{aligned}$$

where SSA stands for bilateral social security agreement between country j and i prior to the 1980s and GWA represents a guest worker agreement that respectively country i or j have concluded prior to 1980s. Further, pop_j is the population size in the 1960s in country j, immst_i is the immigrant stock in country i in the 1960s and dist_{ij} is the geographical distance between i and j.

From the notation of the IVs it is made explicit that IV1 is geared towards instrumenting the diaspora and IV2 and IV3 towards instrumenting the counter-diaspora. Note that particularly guest worker agreements cause that the instruments are not symmetrical. This is important given that each diaspora is also a Counter-diaspora¹³ and the guest worker agreements are used for instrumenting the diaspora and counter-diaspora simultaneously. These instruments address policies affecting migration flows through the concluded agreements and take into account that larger sending countries, immigration in the destination as well as distance impact on the size of migrant stocks. The IVs are expected to having increased prior (to 1990) migration stocks but it is unlikely that they have had an impact on migrant flows after 1990 that goes beyond the diaspora network effect. For example, social security agreements are usually negotiated after larger migrant flows occurred between the relevant countries, or the many guest worker agreements that were concluded after World War II were ceased in the 1970s or prior.

The second specification shown in the table (column 4) includes four instruments, where IV2 remains the same and the other three are calculated as follows:

¹² Also see Beine et al. (2009).

¹³ E.g. Canadians in the US are a 'diaspora' for migrant flow from Canada to the US and a 'counter-diaspora' for migrant flows from the US to Canada.

$$\begin{aligned}
& IV4_{ij} = (SSA_{ij} + GWA_j) * \ln(pop_i / dist_{ij}) \\
(11) \quad & IV5_{ij} = \ln(pop_i) * \ln(immig_j / dist_{ji}) \\
& IV6_{ji} = \ln(pop_j) * \ln(immig_i) - \ln(dist_{ji})
\end{aligned}$$

Notation and names, as well as the idea on how these instruments affect the diasporas are similar to the previous specification.

The results in Table 2 show that both, the effect of the diaspora and the counter-diaspora, are underestimated in OLS. The coefficient of the counter-diaspora is still significant at the 5 and 10 percent level and increases to 0.08. The diaspora effect β is around 0.15. The skill ratios are again insignificant indicating that there is no variation with the educational composition of migrants. The bilateral variables of agreements, distance and linguistic proximities have the expected sign, however, are insignificant. The latter result is surprising and needs further investigation. It may stem from the use of distance in all instruments and the simultaneous instrumentation of diaspora and counter-diaspora.

Similar to the OLS results, the IV model is also estimated for the interaction to account for a potential rich-to-poor migration as indicated to exist in the OLS model. The results of this estimation are presented in column (5) for the first IV specification. Methodologically this is done by also interacting the instruments with the specific dummy, thus the number of endogenous variables increases to three and the number of instruments increases to six. It turns out that the instrumental variable estimation does not confirm such a rich-to-poor dimension, the interaction effect is insignificant.

Very important in the IV estimation is further to ensure the validity of the method and instruments. With respect to the most important test results, the Hansen J-statistic is very small (and the p-value very high) and strongly rejects any correlation of the instruments with the error term; it therefore confirms the validity of the instruments. Further, the F-statistics in the first stages testing for the strength of the instruments are sufficiently high and in particular the Kleibergen-Paap Wald rk F-statistic, which is relevant in the presence of more than one endogenous variable, is sufficiently above the critical values to rule out a weak instrument problem. Even if one considered the value of 12.6 and 10.6 as too low the model can be estimated using the limited maximum likelihood method as suggested by Stock and Yogo (2005) in the presence of weak instruments. The results show that the mentioned F-statistics are well above the critical values while coefficients do not change. The IV tests from the

estimation in column (5) are less satisfying, however, the argument for the use of the limited maximum likelihood method also holds for this estimation.

Summing up the results, the estimations consistently show a positive impact of the counter-diaspora on migration flows across all models, thus confirming the existence of another diaspora externality that has mostly been disregarded in the literature to date. In the next section, the dynamic implications of this result will be investigated.

4 CHARACTERIZING THE DYNAMICS OF MIGRATION

Specification (9) is that of a traditional beta-convergence dynamic model. Given q and r are not significant, the dynamics of diaspora and counter-diaspora sizes for a given pair of countries is determined by the following first-order planar system:

$$(12) \quad \begin{pmatrix} \ln M_{ij,t+1} \\ \ln M_{ji,t+1} \end{pmatrix} = \begin{pmatrix} 1-\beta & \lambda \\ \lambda & 1-\beta \end{pmatrix} \begin{pmatrix} \ln M_{ij,t} \\ \ln M_{ji,t} \end{pmatrix} + \begin{pmatrix} \ln V_{ij} \\ \ln V_{ji} \end{pmatrix}$$

where $\begin{pmatrix} 1-\beta & \lambda \\ \lambda & 1-\beta \end{pmatrix} \equiv Z$ is a 2x2 matrix of time-invariant parameters common to all pairs of countries and $\ln(V_{ij}) = \alpha_i + \gamma_j + \delta A_{i,j}$ is a set of country-pair-specific terms.

In a model without counter-diaspora externalities ($\lambda = 0$), the dynamics of each stock could be studied separately. A standard diaspora externality arises if $1-\beta$ is positive or equivalently, if $\ln(M_{ij,t+1})$ is an increasing function of $\ln(M_{ij,t})$. If $\beta \in [0,1]$, which is the case in both OLS and IV regressions, the model is stable. In the short-run (i.e. for a given diaspora size in t) $d\ln(M_{ij,t+1})/d\ln(V_{ij})=1$ is assumed. Any shock leading to a 1-percent increase in exogenous factors V_{ij} (such as migration caused by the relocation of a plant abroad) would lead to a 1-percent increase in the emigration stock $M_{ij,t+1}^T$. Then, the long-run stock would be given by $\ln(M_{ij,ss}) = \ln(V_{ij})/\beta$. The dynamic multiplier would be equal to $1/\beta$, i.e. about 7 using the IV estimate (and 5.5 using OLS).

When counter-diaspora externalities are factored in ($\lambda > 0$), the dynamics of bilateral stocks is the result of the system (12). The stability of the system depends on the eigenvalues of Z , which are given by $z_1 = 1-\beta-\lambda$ and $z_2 = 1-\beta+\lambda$. The system is globally stable if $|z_1| < 1$ and $|z_2| < 1$. The OLS and IV estimates verify these conditions. In particular, the IV

estimates in Table 2 gives $z_1 = 0.770$ and $z_2 = 0.932$. As l is positive and significant, the emigration from one country to another is expected to be lessened or offset by counter-migration flows. Given interdependencies between countries, the multiplier is stronger. In the short-run, i.e. for given diaspora sizes in t , $d \ln(M_{ij,t+1})/d \ln(V_{ij}) = 1$ and $d \ln(M_{ji,t+1})/d \ln(V_{ji}) = 1$ are assumed. Any shock leading to a 1-percent increase in exogenous factors V_{ij} will lead to a 1-percent increase in the emigration stock $M_{ij,t+1}^T$. This increase in emigration induces counter-flows of migration from j to i which, in turn, stimulate further migration from i to j . Given these considerations, the next sub-section characterizes the long-run and transitory equilibria of the model.

4.1 The long-run response to migration shocks

The long-run equilibrium diaspora size (subscript ss for steady state) is obtained by replacing the time subscripts by ss in the system (12). This yields:

$$(13) \quad \begin{cases} \beta \ln(M_{ij,ss}) = \ln(V_{ij}) + \lambda \ln(M_{ji,ss}) \\ \beta \ln(M_{ji,ss}) = \ln(V_{ji}) + \lambda \ln(M_{ij,ss}) \end{cases}$$

Solving this system gives

$$(14) \quad \begin{cases} \ln(M_{ij,ss}) = \frac{\beta \ln(V_{ij}) + \lambda \ln(V_{ji})}{\beta^2 - \lambda^2} \\ \ln(M_{ji,ss}) = \frac{\beta \ln(V_{ji}) + \lambda \ln(V_{ij})}{\beta^2 - \lambda^2} \end{cases}$$

A 1-percent increase in exogenous factors V_{ij} will lead to an increase in the emigration stock from i to j by $\beta/(\beta^2 - \lambda^2)$ percent. This elasticity is larger than one and measures the migration multiplier. This is due to two reasons. First, given the dynamic structure of the model, a shock induces a progressive change in the emigration stock and the elasticity is equal to one in the short-run. But then, the classical network externality operates and migration flows increase further. Second and more importantly, counter-flows generate a dynamics of “counter-network” effects that stimulates global migration. Indeed, a 1-percent increase in exogenous factors V_{ij} will lead to an increase in the counter-emigration stock from j to i by $\lambda/(\beta^2 - \lambda^2)$ percent.

The number of residents in country i (R_i) is the number of natives P_i minus the number of net emigrants NM_{ij} to all destinations j :

$$R_i = P_i - \sum_{j \neq i} (M_{ij} - M_{ji}) = P_i - \sum_{j \neq i} NM_{ij}$$

From the results above, the semi-elasticity of net bilateral emigration to exogenous factors V_{ij} is given by

$$(15) \quad \frac{dNM_{ij,ss}}{d \ln(V_{ij})} = \frac{\beta M_{ij,ss} - \lambda M_{ji,ss}}{\beta^2 - \lambda^2}$$

Counter-flows mitigate the emigration costs in the long-run. In particular, a short-run increase in the emigration can give rise to a long-run net immigration (i.e. a decrease in NM_{ji}) if the following condition on initial emigration stocks holds:

$$(16) \quad \beta M_{ij,ss} < \lambda M_{ji,ss}.$$

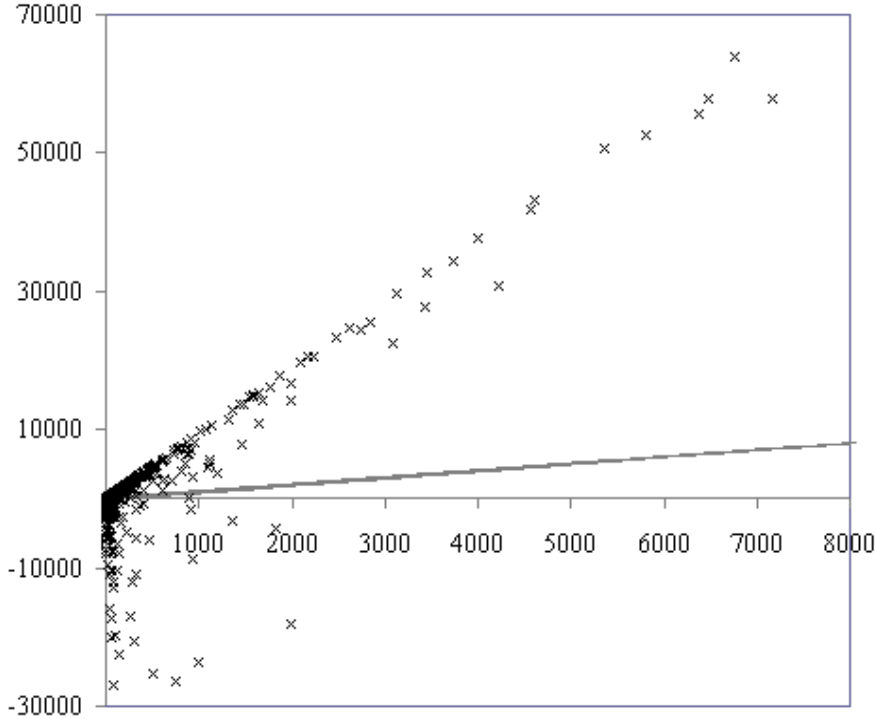
In such a case, the country i , which experiences an emigration shock in the short-run, can experience a long-run net immigration shock. This reversal from emigration to immigration is likely to be obtained when migrants go to a destination initially sending many counter-migrants. Concrete examples will be given in the subsequent section.

Using estimated parameters, the long-run effect of a one-percent change in exogenous factors V_{ij} on the long-run volume of bilateral net emigration for all pairs of countries can be computed. Figure 4 compares the short-run and long-run impacts of such a shock. On the X-axis, the short-run impact amounts to 1 percent of the emigration stock from i to j . On the Y-axis, the long-run effect on net emigration is obtained from Eq (15). For this the coefficients estimated from the IV model, i.e. $\beta=0.149$ and $\lambda=0.081$, were taken. Out of the 1,560 (i,j) pairs of countries such that i differs from j , the model predicts 643 reversals (40 percent of the sample), i.e. cases where counter-flows dominate emigration flows in the long-run.¹⁴ On the contrary, for a majority of country pairs (60 percent), the net effect is positive and far above the 45 degree line in grey. In many cases of unilateral migration ($M_{ij} > 0$ whereas M_{ji} is low or

¹⁴ Note that with OLS estimates ($\beta=0.174$ and $\lambda=0.039$), 496 negative values (31 percent of the sample) would be obtained. However, with this kind of dynamic regression model, instrumenting Diasporas is recommended.

zero), the standard diaspora externality “multiplies” the short-run effect. For these pairs, the long-run effect is about 9.9 times larger than the short-run effect.

Figure 4 Short-run (X axis) and long-run (Y-axis) impacts of total migration shocks



4.2 Migration multipliers on the transition path

Although the model predicts a strong migration multiplier in the long-run, it is characterized by large eigenvalues ($z_1 = 0.770$ and $z_2 = 0.932$). When eigenvalues are not too far from one, the speed of convergence towards the steady state is low. Since a period represents 10 years, it is crucial to understand the dynamics of the model in the first periods after the shock. To characterize the transition path of diaspora and counter-diaspora size, (12) can be expressed in differences:

$$(17) \quad \begin{pmatrix} d \ln M_{ij,t+1} \\ d \ln M_{ji,t+1} \end{pmatrix} = \begin{pmatrix} 1 - \beta & \lambda \\ \lambda & 1 - \beta \end{pmatrix} \begin{pmatrix} d \ln M_{ij,t} \\ d \ln M_{ji,t} \end{pmatrix} + \begin{pmatrix} d \ln V_{ij} \\ d \ln V_{ji} \end{pmatrix}$$

Starting from a hypothetical steady state at time 0 (initial conditions), consider a shock affecting emigration flows from i to j , i.e. $d \ln V_{ij} > 0$ whereas $d \ln V_{ji} = 0$. Thus, after one period of 10 years:

$$\begin{cases} d \ln M_{ij,1} = d \ln V_{ij} \\ d \ln M_{ji,1} = 0 \end{cases}$$

Applying (17) sequentially, the change predicted for $t=2$ (after 20 years) is given by

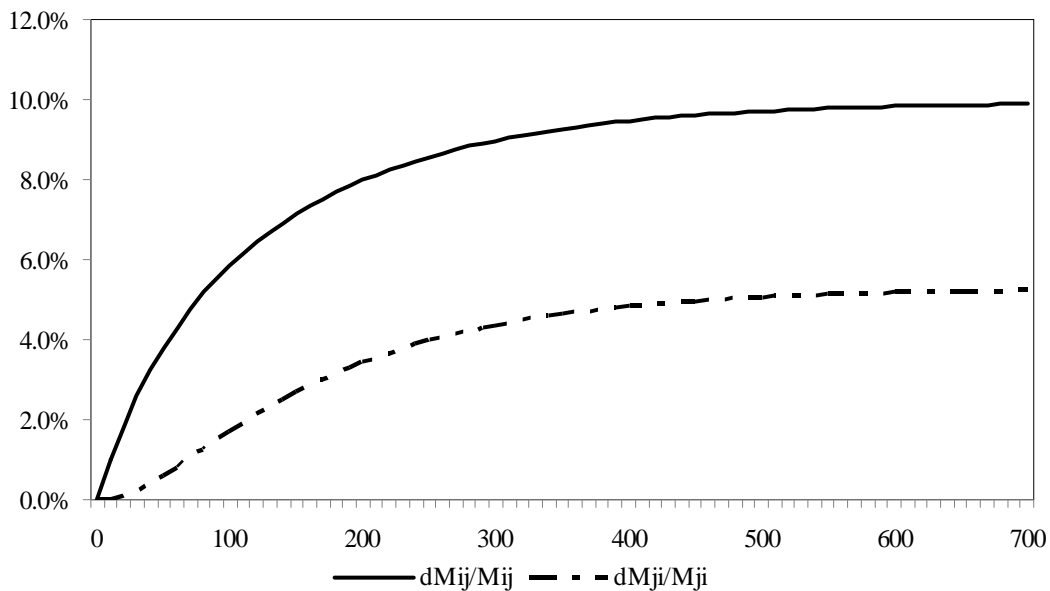
$$\begin{cases} d \ln M_{ij,2} = [(1-\beta) + 1]d \ln V_{ij} \\ d \ln M_{ji,2} = \lambda d \ln V_{ij} \end{cases}$$

At time 3 (after 30 years),

$$\begin{cases} d \ln M_{ij,3} = [(1-\beta)[(1-\beta) + 1] + \lambda^2 + 1]d \ln V_{ij} \\ d \ln M_{ji,3} = [(1-\beta)\lambda + \lambda[(1-\beta) + 1]]d \ln V_{ij} \end{cases}, \text{ etc.}$$

Obviously, log-changes in diaspora (or equivalently, the relative changes) are proportional to the shock and do not depend on the initial size of bilateral diasporas. The proportions are time-varying combinations of the two estimated parameters, (β and λ). Figure 5 represents and evolution of the relative change in diaspora and counter-diaspora sizes following a 1-percent increase in exogenous factors V_{ij} .

Figure 5 Relative change in diasporas and counter-diaspora



As expected from the eigenvalues, the convergence process is very slow. Other things equal, such a shock increases the migration stock M_{ij} by 1 percent after 10 years (1 period), by 1.9 percent after 20 years (2 periods), 3.3 percent after 40 years, 5.2 percent after 80 years, 5.9 percent after one century and 9.9 percent in the very long-run. It also increases the

counter-migration stock M_{ji} by 0.1 percent after 20 years, 0.4 percent after 40 years, 1.3 percent after 80 years, 1.7 percent after one century and 5.3 percent in the very long-run.

Such percentage changes are homogenous across country pairs. However, they must be applied to heterogeneous values of diaspora and counter-diaspora sizes $(M_{ij,0}, M_{ji,0})$. Hence, the impact on net emigration depends on these initial stocks of migrants. In Figure 6 an economy i initially sending 0.1 million migrants to country j ($M_{ij,0}=0.1$) is considered and the effect of 1-percent increase in exogenous factors V_{ij} computed that affects the net emigration from i to j under three pre-shock scenarios. The first symmetric scenario assumes that j initially sends 0.1 million migrants to i ($M_{ji,0}=0.1$). The second considers that j sends 0.01 million migrants ($M_{ji,0}=0.01$ thus smaller) and the third considers that j sends 0.5 million migrants to i ($M_{ji,0}=0.5$ thus larger). The initial exogenous factors $(V_{ij,0}, V_{ji,0})$ are calibrated in such a way that initial migration stocks are stationary at time 0.

In the symmetric case, the shock induces a net loss of 1,000 individuals after 10 years, 1,778 after 20 years, 2,856 after 40 years, 4,161 after one century. In the second scenario, where country j initially sends fewer migrants to i and counter-diaspora externalities are lower: the net loss is larger and amounts to 1,851 individuals after 20 years, 3,211 after 40 years and 5,698 after one century. On the contrary, in scenario 3, country j sends a lot of migrants to i and counter-diaspora externalities are huge: the net loss amounts to 1,456 after 20 years, 1,280 after 40 years. A reversal is observed after 70 years and a net gain of 2,673 individuals is obtained after one century. Obviously, increasing the initial number of counter-migrants from j to i shortens the period of net loss; with 1 million migrants from j ($M_{ji,0}=1$), a net gain would be obtained after 40 years.

Figure 6 Evolution of net emigration stocks following a 1-percent increase in emigration

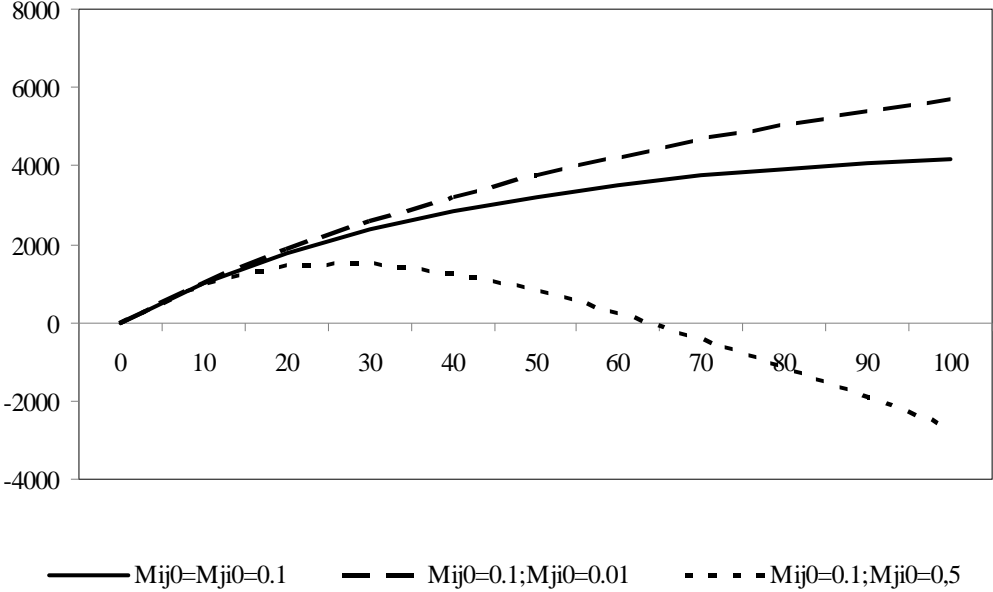


Table 3 applies this result to the sample of countries. For each origin country, a 1-percent increase in exogenous factors V_{ij} to all destination j is simulated. The first 5 columns give the number of reversal cases (that is net immigration in the long-run) experienced by each origin country after 20, 30, 40, 50 and 100 years. Since the sample includes 40 countries, this number is comprised between 0 and 39. After one century, Australia (35), Canada (30) and the United States (35) Luxembourg (27), New Zealand (27) and, to a lower extent, Switzerland and the Netherlands (21) exhibit high numbers of reversals. These immigration countries attract many migrants and have geographically concentrated diasporas. More than half of these reversals are observed after 20 years. On the other hand, less attractive countries such as Romania (0), Poland (3), Slovenia (4), Bulgaria (4) Hungary (4) or the Slovak Republic (4) exhibit only a small number of reversals. Moreover, countries that are attractive and have large numbers of immigrants but also send many migrants, like some of the larger EU countries do, have rather few reversals. Examples after 20 years are Germany (5), France (4) and the UK (4).

However, despite the high number of beneficial cases of some countries mentioned above, they could still suffer from a general increase in emigration. Assuming a simultaneous shock in V_{ij} to all destination j , the last four columns give the total effect on net emigration. All countries would suffer in the short-run (i.e. within 20 years). A long-run net gain is only observed in four cases: the United States, Australia, Switzerland and Luxembourg.

Table 3 Long-run effect of a 1-percent emigration shock to 40 destinations

Origin	Number of reversal after...					Long-run response after...			
	20 Y	30 Y	40 Y	50 Y	100 Y	10 Y	20 Y	50 Y	100 Y
Australia	18	25	27	29	35	2116	2080	-5612	-26859
Austria	8	9	11	13	16	3702	6469	11089	12967
Belgium	5	11	13	13	19	3161	5545	9630	11537
Bulgaria	4	4	4	4	4	4925	9128	18621	28351
Canada	18	23	27	28	30	8562	14083	19171	11421
Croatia	5	5	5	6	7	5583	10344	21075	32036
Cyprus	9	10	11	12	14	1123	2072	4172	6250
Czech Rep	6	6	6	6	8	2010	3465	5669	6030
Denmark	7	10	11	13	16	1651	2972	5585	7618
Estonia	9	9	9	9	9	601	1111	2247	3383
Finland	9	9	11	12	14	2693	4960	9942	14810
France	4	7	8	11	16	8015	13357	19233	14385
Germany	5	9	9	11	17	23248	40298	67265	74641
Greece	6	6	8	9	11	7391	13658	27631	41642
Hungary	0	0	3	3	4	3020	5576	11261	16935
Iceland	11	13	15	16	18	183	329	610	818
Ireland	14	15	16	16	16	6811	12467	24594	35884
Italy	4	5	8	9	13	23534	43519	88225	133296
Japan	2	2	2	2	2	4133	7314	13067	16451
Korea	0	0	0	0	0	12053	22385	45895	70305
Latvia	6	6	6	7	8	673	1198	2180	2828
Lithuania	6	6	6	6	7	1888	3496	7111	10788
Luxembourg	17	22	22	23	27	196	298	258	-258
Macedonia	7	7	7	7	7	2675	4955	10086	15315
Malta	15	15	16	16	16	952	1758	3547	5329
Mexico	8	9	9	9	10	64345	119515	245122	375646
Netherlands	9	12	13	15	21	5728	9940	16647	18601
New Zealand	14	19	19	20	27	3566	6375	11749	15553
Norway	8	9	11	13	16	1136	2012	3605	4558
Poland	1	2	3	3	3	11305	20824	41774	62290
Portugal	9	10	11	12	13	12094	22451	45978	70334
Romania	0	0	0	0	0	4692	8692	17704	26901
Slovak Rep	3	3	3	3	4	3721	6906	14135	21609
Slovenia	1	1	2	2	4	1259	2289	4427	6290
Spain	8	9	10	12	13	7121	12748	23589	31424
Sweden	9	12	15	16	18	1723	2845	3938	2528
Switzerland	11	13	17	17	21	2253	3449	3150	-2426
Turkey	4	4	4	4	5	19602	35997	71627	105698
Un. Kingdom	4	7	9	12	18	30084	54765	106380	152043
Un. States	18	20	26	27	35	6879	3231	-44319	-162097

4.3 Globalization and the Dynamics of Migration

Finally, a global, homogenous and permanent shock is assumed that affects both V_{ij} and V_{ji} , i.e. $d\ln V_{ij}=d\ln V_{ji}=d\ln V$ at time 0; again starting from (17) and a hypothetical steady state at time 0. Such scenario is the case for example under a global decrease of transportation cost. The dynamics of the migration multiplier are straightforward. After one period the multiplier is defined by

$$m_1 \equiv \frac{d \ln M_{ij,1}}{d \ln V} = \frac{d \ln M_{ji,1}}{d \ln V} = 1$$

In subsequent periods, it increases to

$$m_t \equiv \frac{d \ln M_{ij,t}}{d \ln V} = \frac{d \ln M_{ji,t}}{d \ln V} = (1 - \beta + \lambda)m_{t-1} + 1$$

The long-run multiplier is given by

$$m_{ss} \equiv \frac{d \ln M_{ij,ss}}{d \ln V} = \frac{d \ln M_{ji,ss}}{d \ln V} = \frac{1}{\beta - \lambda}$$

Suppose $d\ln V_{ij}=d\ln V_{ji}=0.01$ for all (i,j) , i.e. a short-run 1-percent increase in all migration stocks at time 1. Using the estimates for β and λ , and all things equal, the total number of migrants increases by 1.9 percent after 20 years, 2.8 after 30 years, 3.6 after 40 years, 4.4 after 50 years and 7.4 after one century. Since the sample records 30.6 million migrants in 2000, such a shock would generate an increase by 300,000 migrants in the short-run and 1.1 million migrants after 40 years or two generations. Such a scenario is roughly confirmed by the estimates of the UN migration statistics. The UN estimates that the average growth rate of the number of international migrants was 1.4 percent after 20 years (1960 and 1980), 2.4 percent after 30 years (1960-1990), 2.1 percent after 40 years (1960-2000) and finally 2.1 after 45 years (1960-2005).

5 Conclusion

This paper studied one neglected aspect of the literature on “network externalities”, i.e. the effect of migration networks on counter-migration flows. According to this concept, the multiplier effect is not only associated with the diaspora but also the counter-diaspora. Consequently, migrants from a country i in country j may induce migrant flows from j to i . Indeed, immigrants from i know the language, culture, values, laws and practices of their home country. By propagating this information at destination, the diaspora reduces information costs and communication barriers for potential counter-migrants from j . Such counter-migration flows are likely to have a strong economic driver as they can be associated with the relocation of firms, setting up of affiliates, and economic partnership abroad.

The analysis used a new data set that extends the data set developed by Docquier, Lowell and Marfouk (2009), which comprised bilateral migration stocks in 30 OECD countries from 195 origin countries by education level and gender. The extension added 10 new countries: non-OECD but EU countries and EU candidate countries. For the analysis a 40x40 matrix was extracted from that database. The data shows that the size of the counter-diaspora ranges from 1 percent up to 44 percent of the diaspora and the stocks of diaspora and counter-diaspora are positively correlated.

The paper developed a model that captures the effect of the counter-diaspora in addition to the traditional diaspora effect and is controlling for the relevant factors. Estimation of the empirical model consistently confirmed the existence of a counter-diaspora effect that is smaller than the traditional diaspora effect. With the estimation results, the paper simulated various scenarios assuming an exogenous emigration shock of 1 percent and showed how net emigration and immigration developed in the long term.

The model predicts a strong migration multiplier in the long-run, however, as the long run is very long, the speed of convergence towards the steady state of diaspora and counter-diaspora stocks is slow. According to the estimates, an emigration shock increases the migration stock by 1 percent after 10 years (1 period), by 1.9 percent after 20 years (2 periods), 3.3 percent after 40 years, 5.2 percent after 80 years, 5.9 percent after one century and 9.9 percent in the very long-run. Similarly, it increases the counter-migration stock by 0.1 percent after 20 years, 0.4 percent after 40 years, 1.3 percent after 80 years, 1.7 percent after one century and 5.3 percent in the very long-run. Accordingly, the path of convergence depends on the initial sizes of the diasporas. If they are initially equal, the 1 percent

emigration shock cannot be compensated by counter-migration. If the counter-diaspora is much smaller the net loss is even larger. If the counter-diaspora is larger, however, a net loss can turn into a net gain. These reversals especially happen in attractive countries that receive many migrants from abroad (United States, Canada, Australia, New Zealand, Luxembourg or Switzerland). Still, attractive countries that simultaneously also send many migrants, like the larger EU countries Germany, France and the UK do, the number of reversals is rather low. Overall, 40 percent of the sample show reversals and more than half of these reversals are observed after 20 years. However, if the shock affects migration to all destinations the number of reversals is much lower.

Against the background of constantly rising numbers of migrants a global, homogenous and permanent shock affecting emigration in both countries was simulated. The results show that all things equal, the total number of migrants increases by 1,9 percent after 20 years, 2,8 after 30 years, 3,6 after 40 years, 4,4 after 50 years and 7,4 after one century.

These results are important to understand the remarkable rise in immigration experienced by high-income countries for the last decades and to understand the significant contribution that network effects have had on migration patterns. Indeed, UN estimates show that the proportion of international immigrants residing in the more developed countries has been multiplied by three during that period. Moreover, the results are also important for making prediction with respect to the effect of policy reforms. The multipliers may enhance policies that lead to increased migration flows. On the other hand, policies that aim at restricting migration may become effective at a much slower pace than the initiating country may wish.

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Chapter 5

CONCLUSION

This thesis presented research in the field of highly skilled migration and addressed issues that are of a particular concern to the European Union. One of the central topics of interest in the international migration debate concerns the selection of migrants or, more broadly, the characteristics of migrants versus non-migrants. A better understanding of these characteristics is of central importance to formulating effective immigration policies and assessing the impact of future migration flows. The EU is in a different situation compared to other major immigrant receiving countries because on the one hand it has attracted comparatively low skilled migrants over the past decade, driven primarily by prior migration policies and network effects, while on the other hand it has experienced a substantial brain drain to other countries like the US.

The reasons for this situation have been discussed in the introduction. They refer to the R&D capacity of the EU that is lagging behind that of major competitors. Most importantly, the US labor market in R&D offers a more rewarding and stimulating environment for many, and thus constitutes a sheer magnet for highly skilled people from all over the world. Further, the EU, even though an attractive destination for many migrants, has traditionally had migrants with lower skills enter its countries, which was caused by large guest worker programs and extensive use of family reunification and humanitarian immigration schemes. Migration patterns were reinforced by network effects of diasporas as it becomes easier for migrants to follow their fellow countrymen. Indeed, this thesis has shown that diasporas are a major determinant for migration flows from and to countries. Given the importance of human capital in economic growth and its ambition to become a world class knowledge economy, the EU has developed a vital interest in nurturing local scientists and attracting highly skilled immigrants by focusing on improving the education system, the R&D research environment, and developing effective selective immigration policies.

Against this background, Chapter 2 analyzed the degree by which highly skilled (tertiary educated) EU emigrants fare in the US labor market to investigate how European education transfers into the US labor market and whether there exist differences by European country in which education was obtained. While most studies treat European immigrants as a single successful and homogeneous group that integrated well in the US labor market, Chapter 2 showed that there is reason to assume differences in labor market integration among migrants from European countries. Indeed, idiosyncratic sociopolitical structures and heterogeneous education systems in European countries lead to significantly different regional results. Moreover, economic linkages between European countries as well as the US immigration system seem to affect immigrant earnings. Along the lines of economic assimilation theory, the analysis of 1993 microdata from the National Survey of College Graduates (National Science Foundation) in combination with various data sources on education, trade and the US immigration policy finds that immigrants educated in Eastern or Southern European countries earn less than native-born Americans. In contrast, and controlling for relevant variables, immigrants from Western or Northern Europe earn up to 10 and 19 percent more than comparable native-born Americans attributable to their foreign education.

These findings suggest differences in assimilation of European immigrants due to regionally diverse education systems, economic ties with the US and immigrants' legal status when entering the US. The results highlight new aspects on the transferability of foreign skills. In particular they show how European higher education is valued in international labor markets and how this evaluation differs with the region of education. In fact, they inform European education policy about international competitiveness of their graduates and provide valuable insights to improve the implementation of the policies agreed upon in the Bologna Process. Moreover, the results show that the EU loses productive and well performing people and that the US has a great incentive to facilitate skilled immigration from the EU. Consequently the EU would be well advised to take a more nuanced approach to the Lisbon strategy, focusing primarily on improving tertiary education in those regions which do not yet produce the most highly valued graduates, such as Southern and Eastern Europe. On the other hand, countries that are generating plenty of very highly valued emigrants to the US, policies should potentially

be focused more on improving the transition of its graduates into the job market; strengthening its R&D environment and increasing other incentives for highly skilled people to stay, return—or come. An interesting topic for further research regards the effectiveness of various suggested policy measures in this field.

Immigration and the effectiveness of selective migration policies were analyzed in Chapter 3. The analysis aimed at better understanding the relation between emigration pressures in migrant sending countries and immigration policies that try to select for better educated migrants. To achieve this, the study looked at the determinants of migrant intentions as well as determinants of the realization of these intentions. The analysis was based on new survey data from Albania, Moldova, Egypt and Tunisia that offered unique detail with respect to the migration process. Specifically, the study focused on (i) the self-selection of migrants in terms of skills and (ii) the impact of selective immigration policies on the migration process. The paper finds that migration pressures, or the intent to migrate, are not subject to any self-selection. However, immigration policies exert a positive out-selection that is likely part of the reason why positive selection is found in many studies. Further, the study confirms that the EU attracts comparatively lower skilled migrants than other destinations.

Apart from using new and unique data, a major contribution of this study is to look at both steps of the migration process, the formation of intentions and how immigration requirements affect their realization, which has not been possible with most available data. Moreover, and given that the data was collected in 2006, the study shows that the EU has not yet accomplished to change the composition of its immigrants. Analyzing the destination choice, the study only found positive selection for destinations other than the EU. Consequently, the EU has to be moderate in its expectations to change the composition of immigrants in the near future. Other migration causes such as diaspora externalities may have a stronger impact and reinforce current migration patterns or even favor low skilled migration. While it is obviously important to reform its immigration schemes—and possibly make them more transparent across all member states—it is unlikely that skills migration policies will be able to exert a strong enough selection of migrants to fill existing skill gaps. The case of the failed temporary visa program for specialists in information technologies in Germany is a case in point. Consequently, more

efforts need to be undertaken to fill these skills gaps from within the EU. In this respect it is important to remember that the European Commission has estimated that only for the EU15 it would take 550 000 to 835 000 new researchers to reach the Lisbon goal in 2010; a number that is close to the loss of highly skilled people that the EU has experienced. Consequently, and in line with the conclusions of Chapter 2, it is indispensable for the EU to improve the transition of graduates into the labor market and create a more productive environment in the R&D sector to appropriately respond to the demand of skills.

Given the importance of networks in migration dynamics and particularly the mechanisms how they interact with migration policies, Chapter 4 focused on diaspora externalities. In particular it looked at the previously disregarded network effect of the diaspora inducing counter-migration flows. According to this concept, the multiplier effect of networks is not only associated with the diaspora but also the counter-diaspora. The analysis used a new data set that extends the data set developed by Docquier and Marfouk and empirically tests for a counter-diaspora network effect based on a new theoretical model. In simulations the model predicts a strong migration multiplier in the long-run; however, as the long run is very long, the speed of convergence towards the steady state of diaspora and counter-diaspora stocks is slow. The path of convergence depends on the initial sizes of the diasporas. If they are initially equal, a simulated emigration shock cannot be compensated by counter-migration. If the counter-diaspora is much smaller the net loss is even larger. If the counter-diaspora is larger, however, a net loss can turn into a net gain. These reversals especially happen in attractive countries that receive many migrants from abroad (United States, Canada, Australia, New Zealand, Luxembourg or Switzerland). Still, attractive countries that simultaneously also send many migrants, like the larger EU countries Germany, France and the UK do, the number of reversals is rather low.

These results are important to understand the remarkable rise in immigration experienced by high-income countries for the last decades and to understand the significant contribution that network effects have had on migration patterns. Moreover, the results are important for making prediction with respect to the effect of policy reforms. The multipliers may enhance policies that lead to increased migration flows. On

the other hand, policies that aim at restricting migration may become effective at a much slower pace than the initiating country may wish. This is in line with the findings in Chapter 3 and suggests that network externalities may be a likely reason why the EU immigration policies have not yet been very effective in changing migration patterns. Although not tested in the study, it is likely that diasporas—skilled and unskilled—also induce counter-migration flows of skilled migrants; particularly assuming a strong economic substance in what drives counter-flows (e.g. relocation of firms or setting up of affiliates). This may offer at least some compensation for the loss of skilled personnel to countries outside the EU. With respect to migration within the EU, the effect of diasporas inducing counter-flows is a crucial finding given the inequalities among the member states. It would be interesting in future research to analyze the substance and composition of counter-flows in more detail to further assess their economic impact.

Overall, the chapters presented in this work contributed to better understand selection in the dynamics of highly skilled migration and addressed specific concerns of the EU that stem from its particular situation in international migration. It looked at European emigration and education, at the effectiveness of selective immigration policies and at the forces exerted by diasporas. The results can help EU policy makers in their efforts to implement, improve and evaluate migration, education and R&D policies. There is indeed a need to improve the environment in the field of R&D as to better absorb the highly skilled labor force in order to comply with the Lisbon Agenda and progress competitiveness as a knowledge based economy. The EU has already started this journey. It will be vital to further pursue this path and improve it continuously following advice that is based on sound and comprehensive research. Considering that international migration is a particularly controversial and often emotional topic, it will be paramount for researchers and policy makers to improve their cooperation and to better target policy relevant research and translate its results into concrete and effective policies.

Abbreviations

CEPII	:	French research center in international economics
D1	:	Diaspora
D2	:	Counter-diaspora
DLM	:	Dataset developed by Docquier, Lowell and Marfouk
EB	:	Employment based
EC	:	European Commission
ETF	:	European Training Foundation
EU	:	European Union
EU12	:	12 latest members of the EU
EU15	:	15 oldest members of the EU
EU27	:	All current member states of the EU
FB	:	Family based
FDI	:	Foreign direct investment
HH	:	Household
IID	:	Independently and identically distributed
INS	:	US Department of Immigration and Naturalization Services
IV	:	Instrumental variable
MNC	:	Multinational corporation
NSCG	:	National Survey of College Graduates
NSF	:	National Science Foundation
OECD	:	Organization for Economic Co-operation and Development
OLS	:	Ordinary Least Square
POE	:	Place of Education
R&D	:	Research and development
REF	:	Refugee
S&E	:	Science and engineering
S&T	:	Science and technology
TNC	:	Transnational corporation
UK	:	United Kingdom
UN	:	United Nations
US	:	United States