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**Economic and Ethical Impacts
of Immigration**

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Abstract

This thesis analyses the relationship between immigration and native employment rate based on the similarity of the educational attainment and age of immigrants and native-born population. The results of this thesis are in line with recent studies suggesting an increase in native employment by 0.44 % in event of an increase in the share of immigrants by 1 %.

Keywords

Migration, European labour market, employment, immigration impacts

Bibliografický záznam

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Abstrakt

Tato práce zkoumá vztah imigrace a zaměstnanosti tuzemských pracovníků na základě podobnosti vzdělání a věku mezi imigranty a domorodou populací. Výsledky této práce jsou v souladu s moderním výzkumem a předpokládají nárůst domorodé zaměstnanosti o 0.44 % v případě zvýšení cizorodého podílu pracovní síly o 1 %.

Klíčová slova

Migrace, Evropský trh práce, zaměstnanost, vlivy imigrace

Declaration of Authorship

1. The author hereby declares that he compiled this thesis independently, using only the listed resources and literature.
2. The author hereby declares that all the sources and literature used have been properly cited.
3. The author hereby declares that the thesis has not been used to obtain a different or the same degree.

Prague, July 31, 2018

Signature

Bachelor's Thesis Proposal

Institute of Economic Studies
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Author's name and surname: Ondřej Charvát

Supervisor's name: doc. Ing. Tomáš Cahlík, CSc.

Proposed topic: Economic and Ethical Impacts of Immigration

Research question and motivation

This thesis examines the impacts of immigration on labour market outcomes of native population. Specifically, it tries to find a relationship between variation of foreign-born share in labour force and the employment rate of natives in 17 European countries in the period 2004 – 2017.

Contribution

During the studied period Europe faced the economic and the migration crises. As both surely affect migration and labour market conditions, the relationship of interest is likely to change. The main contribution of this thesis is providing results that are up to date and could serve as an inspiration for further research.

Methodology

I collect yearly data for our countries and divide their respective labour force on six groups by different levels of skills (measured by education and age). Then, I use several favored techniques to estimate the potential impact of immigration on the native employment.

Outline

In the first part, I introduce the topic and review existing literature. Next, I describe the immigration context in Europe and compare the immigrants and natives. Then, I explain the methodology and introduce several models to be estimated. Lastly, I present the results followed by a short discussion.

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1 Introduction

The world is on the move. In today's increasingly interconnected world, international migration has become a reality that touches nearly every corner of the globe. Modern transportation has made it easier, cheaper and faster for people to move in search of jobs, opportunities, education and a better quality of life. In general, migration is influenced by several factors, mainly economic, political, environmental or social. These can be either in the migrant's country of origin (referred as push factors) or in the country of destination (referred as pull factors). Historically, although emigration rates are also high, the relative economic prosperity and political stability of Europe creates significant pull effects and attracts migrants.

When supported by appropriate policies, migration can contribute to a sustainable economic growth in both origin and host economies. Origin countries gain from remittances sent by emigrants, whereas the receiving country benefits from increase in population – mainly in its labour force. European population would have declined during the period 2000-2015 in the absence of net positive migration instead of its actual increase (United Nations, 2016). Since leaving the country of origin and starting a new life is a difficult decision to make and requires mature judgement, youngsters below 15 years of age constitute a very small portion of migrants. Similarly, older people are in minority among migrants, thus most of the foreign-born population is of the working age¹. Therefore, migrants often improve the dependency ratio of those actively participating in the labour market to

¹ Working age refers to the age of 15–64 years

the rest of the population. The age structure, skill distribution and other characteristics of immigrants in Europe are presented in Section 3.

As all other inhabitants of the receiving countries, immigrants must pay taxes and social security contributions. A frequent concern among natives is whether immigrants contribute more than they receive from social benefits. The fiscal consequences for the governments and possible adverse effects on natives' labour market outcomes have been studied intensively but the conclusions do not always coincide among researchers. Until recently, most of the attention to migration issue was given by members of the academic and the political sphere. However, the unprecedented increase in worldwide stock of migrants in the 21st century, hand in hand with the recent migration crisis, has brought the topic into the spotlight of a broader audience.

This year, the Eurobarometer, one of the most profound surveys on public opinion in Europe, asked European citizens what topics should be discussed as a priority during the campaign for the next European Parliament elections. Immigration was mentioned by 66 % and 50 % of Italian and German citizens, respectively. The stock of foreign-born population in these countries is among the highest in Europe and the significant concerns of citizens of these major destination countries are surely appropriate. While there are many different aspects of migration, central to public discourse is the impact of immigration on the labour market, such as bidding down wages and lowering employment opportunities of natives (Longhi, Nijkamp and Poot, 2006).

The impacts of immigration are supposed to be analysed jointly to fully explore the consequences of immigration (Dustmann, Schönberg and Stuhler, 2016). However, such analysis would be very extensive, and the quality of the thesis might suffer. Therefore, I focus in detail on the potential influence of immigration on the native employment prospects. The area of interest comprises 17 European countries (Norway, Switzerland and all members of the EU 15²) during the period 2004–2017. These countries are further divided on 6 labour submarkets based on the skills of native and foreign-born labour force. By estimating 5 different models targeting different parts of native population I found that the average impact of immigration on native-born employment rate is positive. On the other hand, the situation is not so clear for low-skilled natives who may suffer from immigration induced competition for jobs with low socioeconomic status. Although a big portion of migrant population is highly educated, the education and experience gained in a foreign country poorly transfers into receiving countries and many high-skilled immigrants end up in jobs below their qualifications. Thus, low-skilled natives are the ones most likely suffering from immigration.

In line with previous research, the term *immigrant* is defined as a person born in a different country. I will substitute between the terms *immigrant* and *foreign-born* throughout the thesis and the counterpart is referred as a *native* or *native-born*. The rest of this thesis is organized as follows. Section 2 reviews a broad spectrum of the existing literature and highlights the roots of the variability of results. Section 3 presents some background on immigration and the dynamics of European population by describing the magnitude of immigration in our sample countries and

² EU15 consists of the following countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and United Kingdom

the skill composition of coming immigrants relatively to skills of natives. In Section 4, I describe the methodology, data and models as well as their limitations. In Section 5, I present the obtained results. Finally, Section 6 highlights the main contribution, provides suggestion for further research and terminates the thesis.

2 Literature review

Immigration has been a heatedly debated topic for a long time and it gained reasonable attention among labour economists and other researchers. Firstly, I briefly review the literature comparing labour market outcomes of immigrants and natives. Secondly, an organised section on the effects of immigration on the outcomes of natives follows. This review includes some major contributors as well as different approaches for describing if and how immigration affects the receiving countries and the unemployment rate or wages of the native population. The amount of existing literature is exhausting and it is not hard to get lost in the multiplicity of the empirical results varying over time periods, regions and different techniques used. Therefore, in the second part of this section, we lay a greater stress on the different methodologies used.

2.1 Labour market outcomes of immigrants and natives

First, we look at literature comparing labour market outcomes of native workers and immigrants, which mainly suggests weaker performance of the latter. The foreign-born population meets several hurdles in achieving the same employment rate as natives and generally earn less, especially shortly after arrival (Reyneri and Fullin, 2010). When a worker migrates into a foreign country, the first difficulty is the limited knowledge of the new labour market and when it comes to employment opportunities the most severe obstacle is often inadequate level of language proficiency (Chiswick, 1978; Friedberg, 2000;

Bleakley and Chin, 2008). Mexican immigrants in the United States, for instance, are not earning any extra compensation for performing tasks with higher risks of fatality (Hersch and Viscusi, 2010). The authors argue that one of the main reasons is again poor level of language, since the bargaining power of immigrants and the jobs available to them become scarce without a sufficient level of English.

Another challenge for immigrants is frequently a poor acknowledgment of their education achievements and work experience gained in a foreign country (Friedberg, 2000). On the other hand, some authors suggest that higher proportions of immigrants in jobs below their skill levels could be also explained by the quick entry into unskilled employment due to their plans of only temporary residence in the foreign country (Dustmann, 2000; Kogan, 2011). Immigrants in south of Europe, for example, do not suffer from overqualification in terms of higher unemployment rate but rather find difficulties in obtaining jobs with higher socio-professional status and often end up in manual or elementary occupations (Bernardi, Garrido and Miyar, 2011 for Spain; Fullin and Reyneri, 2011 for Italy). The returns to education of foreign-born workers are found to be significantly smaller than for natives. Once immigrants start working in the secondary labour market, it can be difficult to improve their situation from that point, because mobility between primary and secondary labour market in most European countries is quite limited (Reyneri and Fullin, 2010).

A recent study on labour market performance of new immigrants in Germany, based on data from the German Socio-Economic Panel (GSOEP)

survey of 2013, reveals that earnings of new immigrants are on average 20 % lower compared to those of native workers with otherwise identical characteristics (Beyer, 2016). A half of this gap is explained by the lower presence of immigrants in high autonomy occupancies. The wage differential was smaller for foreign-born workers with greater knowledge of the German language but the gap increased up to 30 % for individuals without German writing skills or a German degree. While the rate of participation on labour market converges over time, the unemployment rate of immigrants stays a few percent above the rate of natives.

2.2 The impacts on native labour force

Next, we proceed with a review of literature concerning influence of immigration on labour market outcomes of native workers, e.g. wages and employment rate. The impacts depend critically on the assumptions, for example about the elasticity of substitution between immigrants and natives. A simple model with elastic labour supply suggests that immigrant influx would first drive down wages and some natives might opt to leave the labour force rather than accept lower earnings (Blau and Mackie, 2017). This framework would suggest that immigration would decrease the natives' participation rate rather than employment rate. However, the impact of immigrants on natives is more complex and needs to build on more reliable assumptions (Gang, Rivera-Batiz and Yun, 1999). A fair amount of studies have tried to shed a new light on the possible adverse immigration effects on natives, although a variety of results have caused difficulties in producing a final conclusion.

Some authors found a negative effect on natives outcomes (Altonji and Card, 1991; Angrist and Kugler, 2001; Borjas, 2003; Bratsberg *et al.*, 2014), while majority of studies found no significant or very small effects (Gang and Rivera-Batiz, 1994; Pischke and Velling, 1997; Gang, Rivera-Batiz and Yun, 1999; Addison and Worswick, 2002; Dustmann, Fabbri and Preston, 2005) and some of the authors found even positive effects (Venturini and Villosio, 2002; Chassamboulli and Palivos, 2013; Moreno-Galbis and Tritah, 2016). A meta-analysis performed on estimates of the impact on natives' employment from 9 different studies produced the 'consensus estimate' to be negative and significant, but very small. An increase of 1 percent in the number of immigrants is followed by a decline of native-born employment by 0.024 percent (Longhi, Nijkamp and Poot, 2006). However, the negative effects were found to be slightly larger on employment of females and on native European workers in general. The measured impacts of immigration on natives differ widely across studies and sometime even within one study. Therefore, we highlight some of the most used techniques and discuss their main differences.

First, we review the research based on aggregate nationwide data, including *the skill-cell approach*. Most of these studies divide labour force into several groups by their skill levels, which is mostly measured by education and experience. George Borjas, a frequent contributor to the immigration literature, pioneered the skill-cell approach and many authors followed this method (for example Ottaviano and Peri, 2008, 2012; Stillman and Maré, 2009; Bratsberg *et al.*, 2014). In a widely cited study, Borjas (2003) used this technique by defining labour submarkets of differently skilled workers (through education and experience). Using data from decennial censuses of 1960-1990 and the Current

Population Survey for 1998-2001, Borjas examined the effect of immigration on wages of natives in the United States. If we consider the context of increased male labour supply by 11 % through immigration during this period, his results suggest that the wage of an average worker decreased by 3.2 %. The observed effect was dramatically larger for poorly educated workers; the reported decline in wages of high school dropouts was almost 9 % (Borjas, 2003).

Building on the previous research by also using skill-based division of labour market in the US, a negative effect on natives' wages was found to be smaller and eventually turned positive. Ottaviano and Peri (2008) claimed that the effect on native wage was -0.4 % in the short-run and +0.6 % in the long-run. The same authors also found a substantially larger and negative effect of -6.7 % on wages of the previous immigrants (Ottaviano and Peri, 2012). Although the study shares the same approach and the area of interest (the United States) as in Borjas (2003), their results do not match. The root of this disagreement is different assumption about the elasticity of substitution between native and foreign-born workers. Borjas treats immigrants and natives with the same skills as perfect substitutes whereas Ottaviano and Peri support the imperfect substitution rate. They conducted further research to bring more evidence for their claims (Borjas, Grogger and Hanson, 2008, 2011; Ottaviano and Peri, 2012) but no common resolution was reached. This case of varying results among studies sharing the same approach suggests that not only the methods but also the additional assumptions may influence the conclusion. To give one example for a European country, Bratsberg et al. (2014) conducted a study on immigration effects on natives' wages. They found overall negative effects but of different size for immigrants of different origin. The immigrants coming from

other Nordic countries affected the wages of natives much more than immigrants from developing countries. Considering the fact, that Nordic immigrants are close substitutes due to natives in Norway, their greater influence on Norwegians is not surprising.

The second method is *the spatial approach*, or *the area approach*. The research based on this approach involves division of the studied regions on sub-regions (usually cities or metropolitan areas within one country) and compare the variations of the labour market outcomes with high and low densities of the foreign-born population in those areas. In other words, this approach relates the differences in regional wages or the employment rates with different shares of immigrants across regions. To give one example, Altonji and Card (1991) studied how immigration affects labour market outcomes of less-skilled natives. Their results imply that an extra inflow of immigrants with the size of 1 % the total population in a standard metropolitan statistical area (SMSA) reduces wages of less-skilled natives by 0.3 % or 1.2 %, depending on the estimation method (Altonji and Card, 1991). Speaking of Altonji and Card (1991), this study has served as a great inspiration for many following authors in the way of constructing a plausible instrument to cure potential endogeneity of the independent variables. Specifically, the immigrants can choose a region to migrate to and the choice of their destination may depend on the local labour market conditions. Therefore, the instrumental variable (IV) procedure is used to account for possible reverse causality.³ The area approach, however, was criticised by several authors (including George Borjas) by reasoning that immigration affects all regions of the country and not just the areas receiving the

³ Further discussion on this issue in Section 4

immigrants (Friedberg and Hunt, 1995; Borjas, 2003). This might happen, for example, if the immigration induced increase in the labour supply convinced some present workers to reallocate and move to regions with lower competition on the labour market (Borjas, 2003).

Some authors use a combination of the spatial approach with the skill-cell division of national labour markets; suggestively called *the mixture approach*. As our relationship of interest is the employment rate of natives and the shares of immigrants within skill-cells in numerous European countries, it is needed to review some studies implementing the mixture approach in the European setting. Angrist and Kugler (2001) analysed the effect of immigration on native employment in Western Europe between 1983 and 1999. They find a negative, although modest, effect of 0.2-0.7 % decrease in employment rate of natives following a 10 % increase in the foreign share. In a more recent study, Moreno-Galbis and Tritah (2016) apply the mixture approach to analyse the employment effects in 13 European countries. The authors choose a different way to determine the skill groups than the usual education-experience groups. The workers were instead separated into groups based on the occupation they performed (either present or the last occupation in case of unemployed individuals). The authors argue that immigrants and natives in the same occupation cell are more likely to be competing on the labour market than those in the same group based on their education and experience. This statement is supported by the fact that many foreign-born workers experience down-grading of their education and/or experience gained in a different country (as reviewed in the previous subsection). The results of this study suggest that employment rate of natives increased in occupations and sectors with higher shares of immigrants.

The authors used data from the European Labour Force surveys of 1998 – 2004 and found that a 10 % increase of the foreign-born share in the country-occupation cell improves the employment rate of natives within the same group by around 0.5 % (Moreno-Galbis and Tritah, 2016). Although the effect seems small, in the context of the immigration boom in Europe the potential gains might be substantial. Another study of native employment and immigration influence in Europe was conducted by D’Amuri and Peri (2011), who use the traditional definition of skill groups by education and age (where age acts as a proxy for experience). Their estimates suggest that a 1 % increase in the share of immigrants in the cell increases the employment to population ratio of natives by around 0.3 % (D’Amuri and Peri, 2011). The results suggest slightly larger effect when the IV method is used, indicating a 0.37 % improvement of the native employment to population ratio.

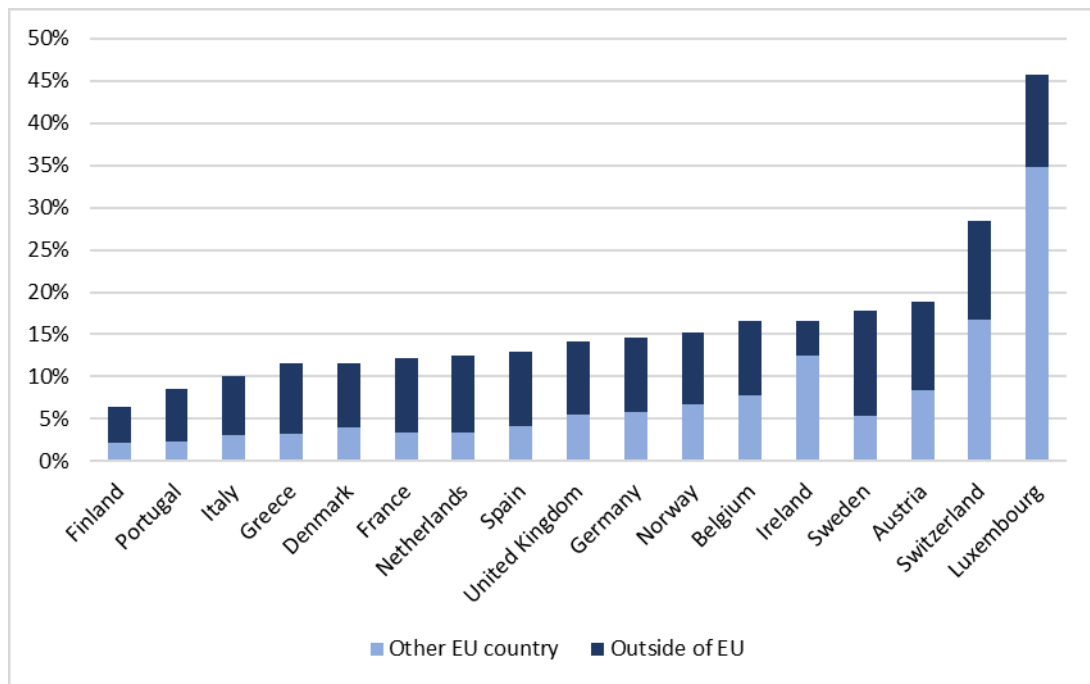
To conclude this section, a different study yields different results and sometimes even within the same methodology a disagreement may occur (as in the case Borjas – Ottaviano and Peri). The results are impossible to compare, since they usually answer slightly different questions and have different interpretation (Dustmann, Schönberg and Stuhler, 2016). As was pointed out a long time ago by Borjas, the economic impacts of immigration can be either beneficial or harmful, but it will change over time and places (Borjas, 1994).

3 European population and immigrants

Before I review the main qualities of immigrants in Europe, some global statistics need to be mentioned to put the European case in perspective. According to the International Migration Report 2017, the international migrant stock rose since 2000 by almost 50 %, from 173 million to 258 million migrants (United Nations, 2017a). In Europe, the migrant stock in 2017 reached 78 million; approximately 30 % of the worldwide total. A majority of the foreign-born population in Europe resides in Germany (12 million) or in United Kingdom (9 million). Most of the foreign-born population (61 %), however, come from intra-European migration

Immigrants constitute 10–20 % of the total populations in majority of the countries of interest (Switzerland, Norway and the EU 15 countries). As shown in Figure 1 below, only four of those countries had either lower or higher shares of foreign-born individuals in 2017. Finland and Portugal had 6.3 % and 8.5 % respectively, whereas share in Switzerland was 28.4 % and for Luxembourg the number reached slightly above 45 %. In contrast to the previous statistics for Europe, the immigrants from the European Union (the current composition) hardly reach 50 %. The only exceptions are Ireland, Switzerland and Luxembourg where the immigrants from the EU are dominant in the foreign-born population.

Figure 1: Share of foreign-born population by origin, 2017



Source: Eurostat (migr_pop3ctb)

As Blau and Mackie illustrate in their comprehensive description of immigration impacts, the skillset composition of immigrants and its complementarity to the skillsets of natives can determine if the effects on the receiving labour market will be positive or negative (Blau and Mackie, 2017). Furthermore, this comparison between immigrants and natives could potentially explain the results achieved in the empirical section. Therefore, the attributes of both (foreign-born and native-born population) are further discussed in the following subsection.

3.1 *European immigrants and natives*

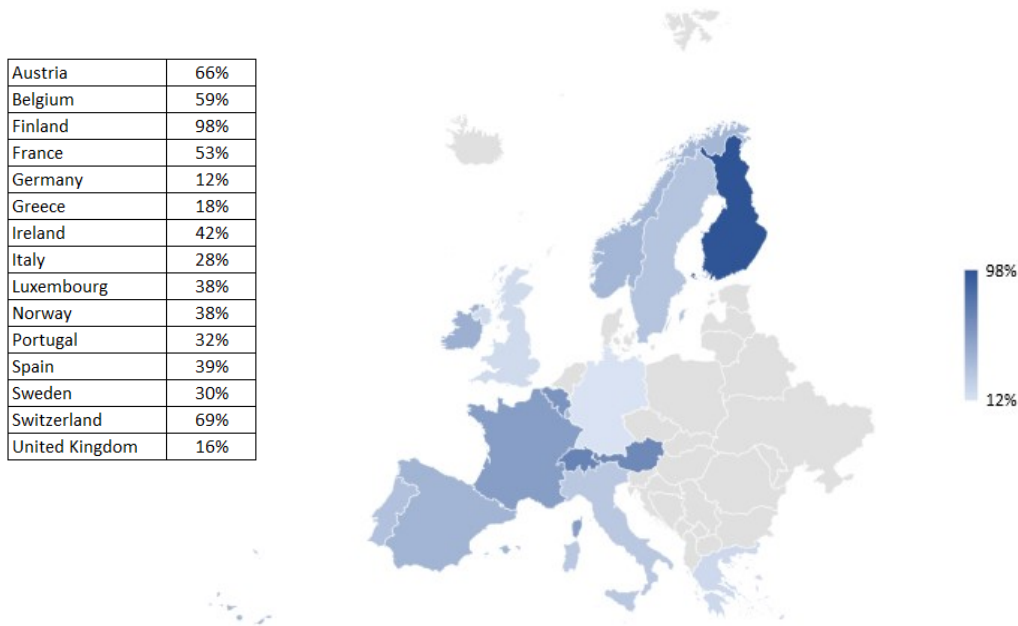
The skills of arriving immigrants play a key role in determination of their impacts on the receiving country. It is reasonable to argue that more skilled immigrants can orientate in the new environment easier and assimilate faster. Therefore, more skilled immigrants produce more positive fiscal contribution, for example through consumption or taxation since they are more productive and receive higher wages (Borjas, 1994). Low skilled immigration, on the other hand, can be more costly because of greater use of unemployment benefits and other assistance offered by the government. Nevertheless, their immigrant status can make it harder for them to achieve the same benefits as natives.

As shown later in this subsection, the performance of the intra-EU immigrants is overall superior to the non-EU immigrants, and in some cases even to natives. Thus, according to the previous forethought, the non-EU migrants could cause grater concerns about their fiscal contribution. The following Figure 2 suggests that in time of unemployment a large portion of third country nationals⁴ (TCNs) hardly reach the same benefits as natives. According to Migration Integration Policy Index (MIPEX), in our sample countries (except Switzerland, Austria and Finland) only about 50 % or less TCNs collected the unemployment benefits. This may be caused by the fact that non-European migrants are less likely to have sufficient levels of language spoken in the country and their knowledge of the benefit system might be limited. Other explanation is that recent immigrants need to have some working

⁴ Third Country National in the EU context reffers to a person residing in the EU but originating from a country outside of the Euroepan Union

experience in the hosting country to become eligible for the unemployment benefits.

Figure 2: All TCNs receiving unemployment benefits



Note: Data are available only for year 2012 and do not include Netherlands and Denmark

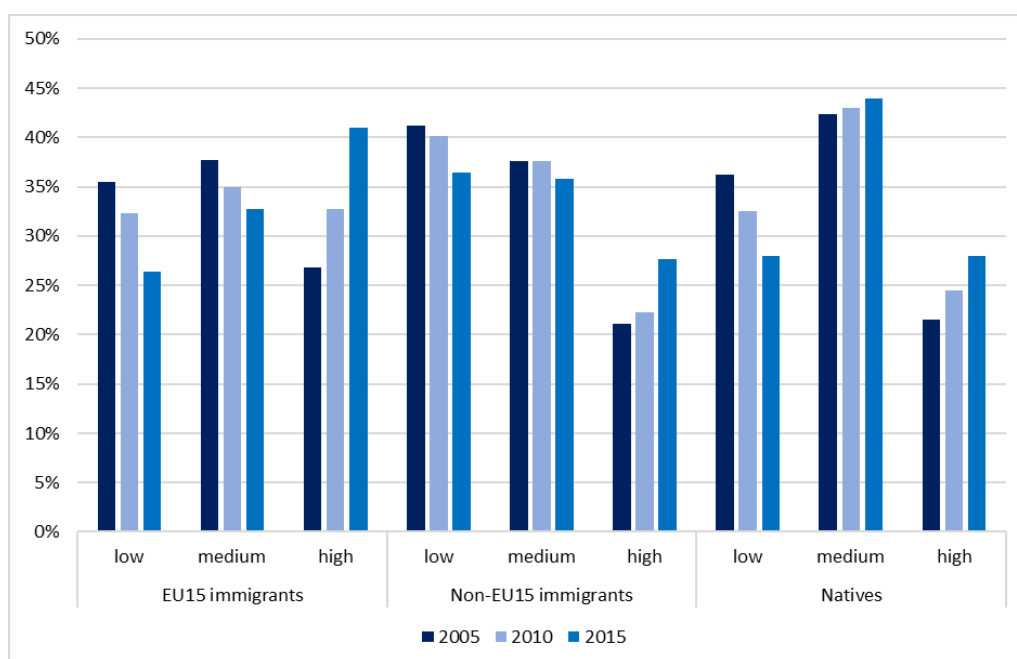
Source: Migration Integration Policy Index (MIPEX)

As was already mentioned, when trying to predict the consequences of immigration influx on the outcomes of natives, the skill complementarity is a key factor. If a large portion of newcomers is low-skilled, the native low-skilled labour force is more likely to suffer as they compete for similar jobs (Blau and Mackie, 2017). Likewise, if the immigrant inflow consists mainly of high-skilled workers, the high-skilled workforce in the receiving country will face a greater competition and their labour market prospects might become worse. On the other hand, there are both winners and losers among the native labour force. While immigration can harm those with similar skills, the complementary workers are

likely to benefit (Blau and Mackie, 2017). Since education and experience of migrants is frequently downgraded in the receiving countries (as was discussed in Section 2), the low-skilled labour force might compete even with more educated or more experienced immigrants. Hence, they can be the most vulnerable group among natives independently of the skill-type of the immigration influx.

Comparing education attainment of foreign-born and native workers is the simplest way to measure their skill differences. I define three groups of education attainment based on the International Standard Classification of Education (ISCED) scale as follows. Low education level comprising pre-primary, primary and lower secondary education attainment (ISCED levels 0–2); medium education level comprising upper secondary and non-tertiary post-secondary education (ISCED levels 3–4); and high level of education representing and tertiary education (ISCED levels 5–8). Figure 3 depicts changes in the EU 15 population in terms of the educational attainment shares of natives and immigrants, where the latter is further divided by origin (EU 15 immigrants and non-EU 15 immigrants). It is easy to see some differences among these groups in terms of the initial composition and in development paths throughout the period 2005–2015.

Figure 3: Educational distribution of the EU 15 population by origin, 2005–2015



Source: Eurostat (edat_lfs_9912)

All three groups (natives, EU 15 and non-EU 15 immigrants) improved their share of high education and the share of low educated workers decreased. Surprisingly, the EU 15 immigrants exhibit even better results than natives in terms of the initial distribution and further development. Native labour force surpasses the immigrants from outside of the EU 15 only in higher share of medium education and lower share of low education attainment, while their shares of highly educated individuals in working age are almost identical throughout the period.

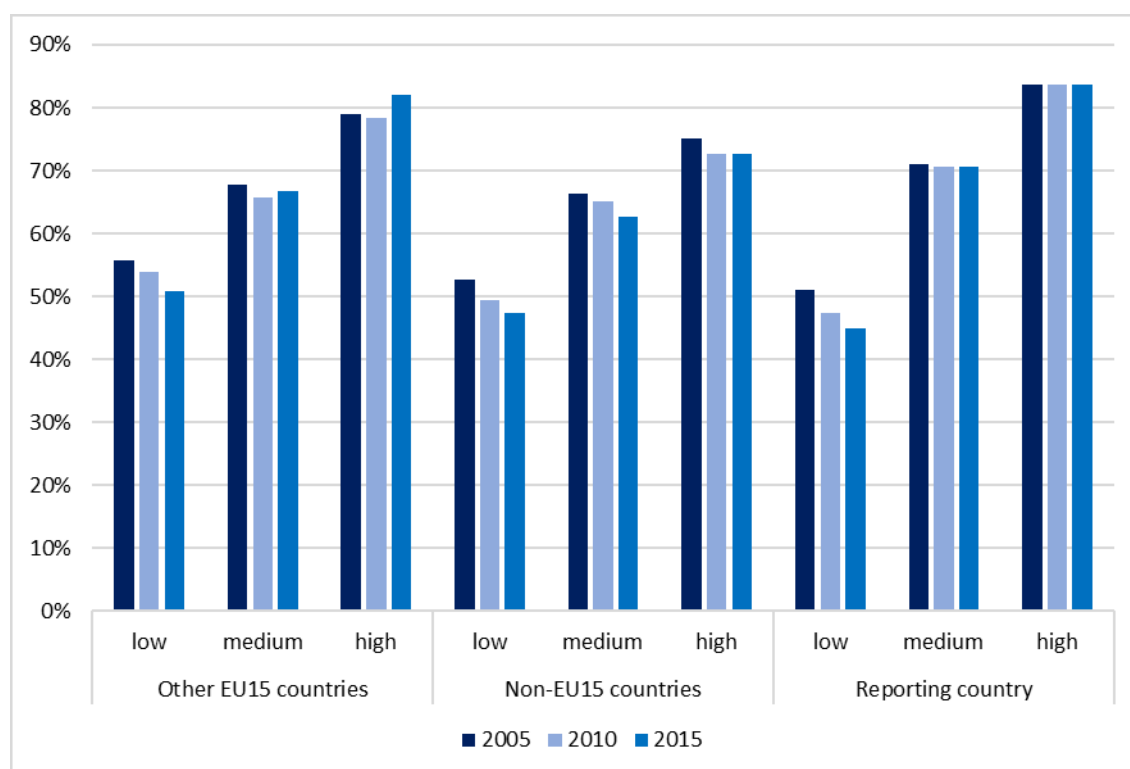
The share of low educated workers among the EU 15 immigrants decreased from 35.5 % to 26.4 % and the native workforce lowered its share of least educated from 36.2 % to 28 %, which seems as a comparable improvement. The shares of highly educated, however, indicate clearly a superior progress of the EU 15 immigrants. This group improved by almost 15 percentage points,

reaching 41 % share in 2015 from initial 26.8 %. The natives improved their share of high education from 21.5 % by only 7 percentage points, which is still a significant progression considering the larger size of the native population compared to immigrants⁵. The worst performance in terms of educational distribution and its improvement is shown by the non-EU 15 immigrants. Their share of least educated was 41.2 % in 2005 and dropped only by 4.8 % during the following ten years, which still results in a higher proportion of low educated workers than the initial shares of the two remaining groups (35.5 % for the EU 15 immigrants and 36.2 % for natives).

The magnitude of improvements in educational distributions were clearly different but all groups demonstrated some. Development of the employment rates, however, seems less optimistic. In Figure 4, it is obvious that employment rate generally increases with higher education levels for all three groups. On the other hand, most of the subgroups (based on both origin and education) experienced a decrease of their employment rates over time. The only exceptions were highly educated immigrants from the EU 15 who slightly improved and natives with at least medium education who remained around the same rate of employment.

⁵ The share of immigrants in our sample countries is around 10–20 % (see Figure 1 in Section 3)

Figure 4: Employment rate by education and origin, 2005–2015



Note: Employment rate is defined as the ratio of the employed population and the active population.

Source: Eurostat (lfsa_ergaedcob)

Surprisingly, native workers indicate the worst performance, although just slightly, among the least educated while dominating the other two categories. This observation supports the previous assessment that native workers might face greater competition on the labour market since immigrants are often overqualified. Since immigrants are often more profitable alternative for companies as they are more benevolent to lower wages, the low-skilled natives are probably the easiest to substitute with foreign-born workforce. Obviously, many other factors can potentially explain the employment backwardness of natives among the least educated, but it is definitely an interesting finding to keep in mind during further analysis.

3.2 *The population ageing in Europe*

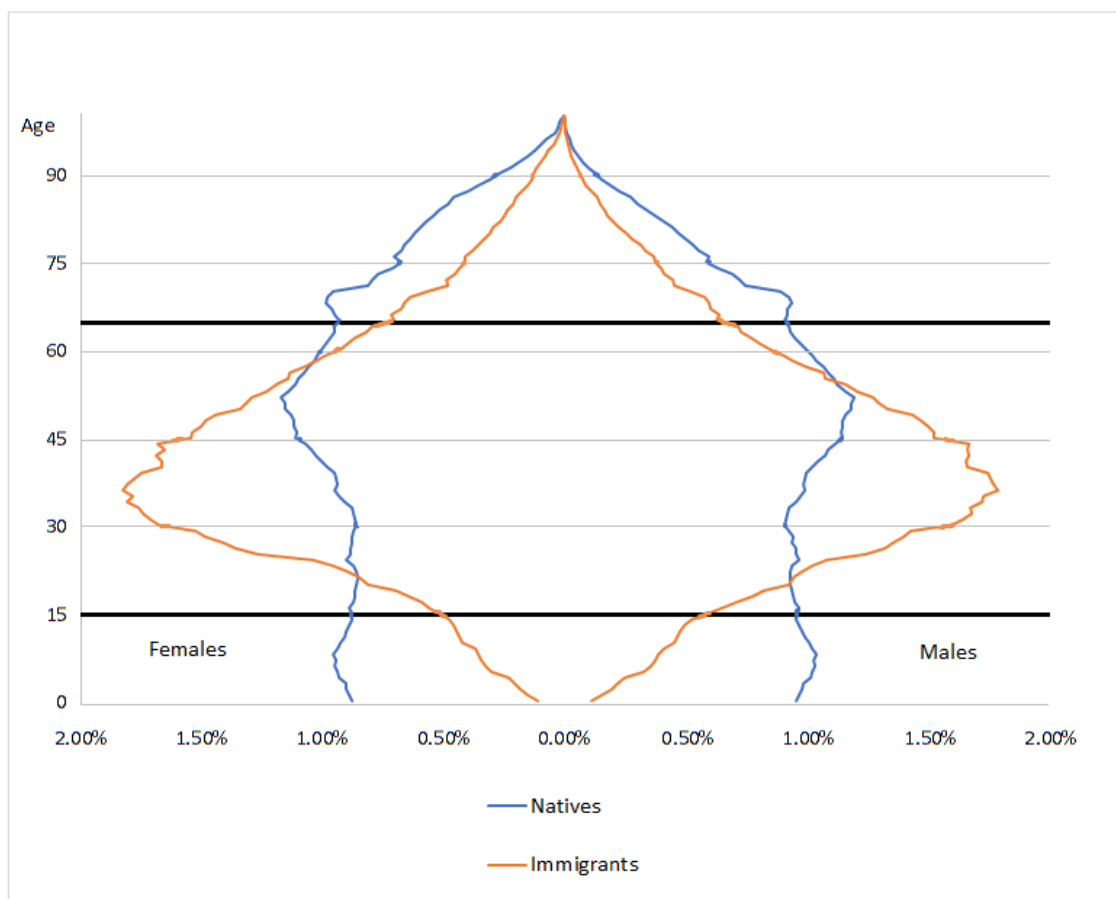
The natural growth of the population gradually declines in most advanced countries (United Nations, 2017b). This is not a new phenomenon as economic, religious and social factors, such as higher labour force participation of women, later marriages and a trend of smaller families have been slowing down the population growth since the end of the 20th century (Samuelson and Nordhaus, 1992). Population ageing is one of the key policy issues because of two reasons. One being the decreasing labour force growth compared to the rest of the population, which comes with a declining ratio of workers to dependents. And the other (relatively underestimated) reason is that seniors do not purchase as many durable goods (Blau and Mackie, 2017). Consequently, as the share of older generation increases, the economic demand falls accordingly.

As we can see in Figure 5, the foreign-born population of countries in our sample (Switzerland, Norway and the EU 15) is much more concentrated in the working age than the native population. The share of immigrants in the working age is 64 % whereas the share among natives is only 50 %.

Next to the proportions, even the structures of working age populations appear differently. The immigrants are heavily clustered in the 24–55 age interval and natives seem evenly distributed across all working ages with a slight increase around the age of 50. It is reasonable to argue that the age interval 24–55 is more productive as more individuals in the age of 15–24 have limited or no experience and those of age 55 and more are closer to retirement than workers in between. The potential benefits of the age structure of the foreign-born

population are unquestionable. On the other hand, another question is what happens when these productive workers in their prime years grow old.

Figure 5: Age distribution of natives and immigrants, 2017



Note: The black horizontal lines represent the borderlines of the working age (15-64)

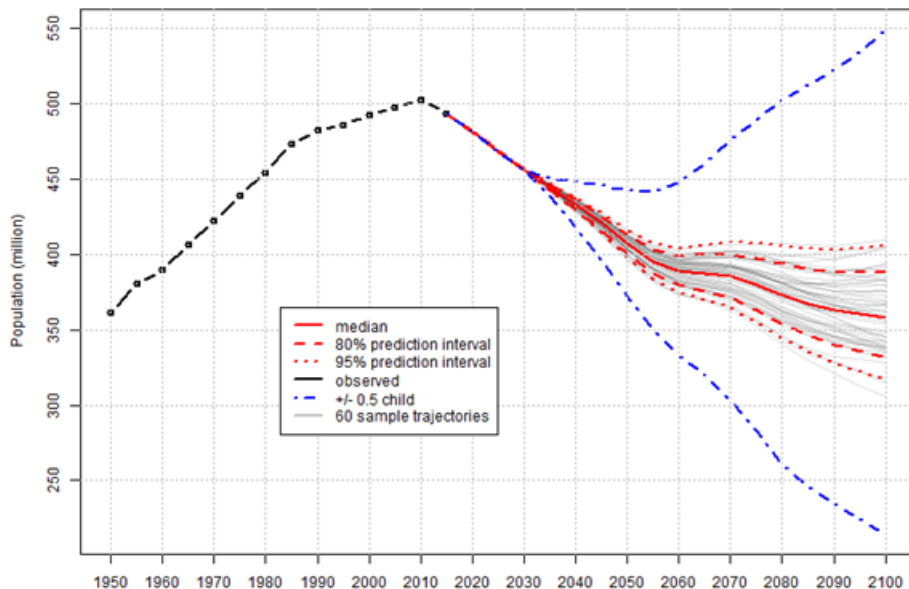
Source: Eurostat (migr_pop4ctb)

As stated in the Madrid International Plan of Action on Ageing, the global population of 60+ years expands faster than children and young adults in most countries. This can have serious implications for the labour policy making. A report of United Nations from 2017 claims that net migration is projected to slow down the population ageing in 27 countries. The remaining 14 countries of the study, however, are expected to experience acceleration of ageing caused by net migration between 2017 and 2030 (United Nations, 2017b). After Japan

three European countries indicate the highest shares of population aged 60 year and over in the world, with 33 % for Japan, 29 % for Italy and 28 % for Germany and Portugal (United Nations, 2017b).

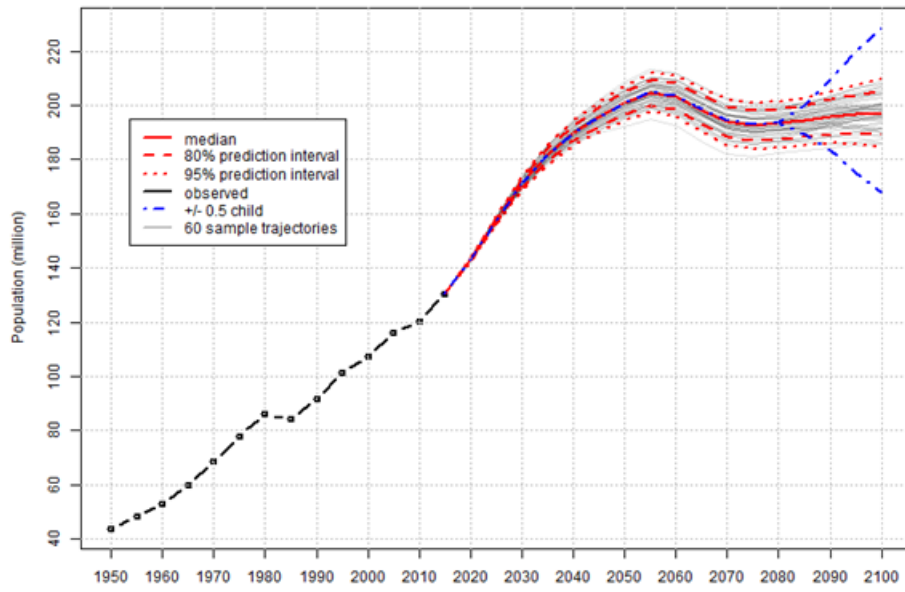
Following Figure 6 and Figure 7 present two projections of the European population (age 15-64 and 65+, respectively). Immigration alone is not sufficient to revert the ongoing ageing trend, which is intensified by decreasing fertility and mortality rates. However, the positive net migration at least slows down the ageing process, that would start earlier and progress at a faster pace in a situation with zero net migration (United Nations, 2017a). The median estimate of the size of population in working age indicates same level in 2100 as in 1950. The size of the population aged 65 years and over, on the other hand, is predicted to be almost five times higher in 2100 than in 1950.

Figure 6: Projection of European population (15–64 years)



Source: United Nations, Department of Economic and Social Affairs, Population Division (2017)

Figure 7: Projection of European population (65+ years)



Source: United Nations, Department of Economic and Social Affairs, Population Division (2017)

4 Empirical section

The first consequence of immigration to a foreign country is expanding its population, including its labour force. How immigrants affect native individuals, however, is difficult to predict. While an inflow of extra workers can have adverse effects on part of the existing labour force, it can also yield benefits. Since immigrants are minority in all countries and they are highly concentrated only in some industries, a majority of the working population in hosting countries should remain unaffected. Therefore, the immigration impacts on labour market outcomes of natives is most observable in skill groups or industry sectors with high immigrant shares.

The magnitude and direction of those effects are influenced by many other factors, such as the ability of capital to adjust to changes in labour supply and the upward shift in consumer demand induced by growing population. The relationship of interest in this study, however, is how different shares of immigrants are associated to the native employment rate. The rest of this section is organised as follows. First, I introduce the used methodology and sources of inspiration for further analysis. Then, I describe the data needed for estimation. In the third part, I explain the baseline model and its additional forms. In the fourth part I discuss some limitations of the presented analysis.

4.1 Methodology

In fashion of Borjas (2003), I divide the labour force by educational attainment and experience (measured by age) but in a multi-country setting. I divide the working population by age into groups of 15–24 or 25–64 years of age and into three groups of educational attainment are defined based on the International Standard Classification of Education (ISCED). Low education level comprises pre-primary, primary and lower secondary education attainment (ISCED levels 0–2); medium education level comprises upper secondary and non-tertiary post-secondary education (ISCED levels 3–4); and high level of education represents any tertiary education (ISCED levels 5–8). This division yields 6 skill groups, which results in 106 separate labour markets at the country-age-education level. Considering the studied period 2004–2017 of 14 years our sample amounts for 1428 observations in total.

The skill-based research of employment effects of immigration in more European countries simultaneously is very scarce and mostly, earlier periods are in focus. The few studies that I took main inspiration from are those of Angrist and Kugler (2001), D’Amuri and Peri (2011), and Moreno-Galbis and Tritah (2016). While they all implement the skill-cell division of labour market in a multi-country context, the methods and the results slightly differ ⁶. I intend to follow mostly the research of D’Amuri and Peri (2011) while I use other studies as an additional source of inspiration and comparison. I choose the approach of D’Amuri and Peri because the constructed models in their research have clear

⁶ See Section 2.2 for more details

interpretation, they use the same measure of skill (education and age) and their study is more up to date than the research of Angrist and Kugler (2001). Although Moreno-Galbis and Tritah (2016) conducted the most recent study of those mentioned, their use of occupation as a proxy of skill makes it difficult to implement for the education-age case. Nevertheless, they provide a detailed theoretical foundation with convincing methodology and I include some features of their approach in the framework of D'Amuri and Peri (2011).

Apart from the essential dependent variable (share of immigrants) and the independent variable (natives employment to population ratio), D'Amuri and Peri (2011) include sets of country-education and education-time fixed effects capturing the heterogeneity across countries and education groups in time. The authors estimate the model by OLS and 2SLS method. I implement the same model of D'Amuri and Peri (2011), but as in Moreno-Galbis and Tritah (2016), I use native employment rate (the ratio of employed and active population) instead of the employment to total population ratio as the dependent variable. Another feature taken from the study of Moreno-Galbis and Tritah is that the denominator of the key regressor (the immigrant share in a cell) is set to its initial value from 2004. The reason behind this is simply the fact that the active population of natives is present in denominators of both sides of the equation and therefore might cause a positive spurious correlation between the share of immigrants and the employment rate of natives. This way it is accounted for possible changes in the size of the native population and the variation of the independent variable stem only from changes in the size of the foreign-born active population. I use robust standard errors clustered at the country-age-

education level since serial correlation within a labour market is very likely to occur.

Despite the effort to control for the unobserved factors of native employment by including the mentioned fixed effects, the endogeneity caused by omitting some determinants correlated with both natives' employment rate and share of immigrants still poses a threat. Therefore, I address this issue as in majority of studies with the Two Stage Least Squares (2SLS) estimation method with an instrumental variable (IV), although finding an appropriate instrument was challenging. In a study of Angrist and Kugler (2001), the authors used the IV strategy based on variation in the size of immigration from former Yugoslavia since during their studied period many of the immigrants came from the Balkan area. A broadly preferred instrument is the one used by Altonji and Card (1991) based on the previous settlement patterns of immigrants by their country of origin. This theory builds on the fact that immigrants tend to move to areas with higher share of their peers and the proportions of immigrants by origin in the initial period can serve as strong predictors for further inflows.

I follow D'Amuri and Peri (2011) and implement the 2SLS estimation by constructing the predicted stocks of immigrants by region of origin. The authors extracted the distribution of immigrants in skill-cells by nine large regions⁷ of origin at the start of their studied period from censuses of 1990 and 1991. Due to data availability, they needed to limit their sample on 7 out of 14 countries. Then they combined these distributions with the yearly data from (Ortega and Peri, 2014) on inflows of immigrants by countries of origin into the OECD area

⁷ North Africa, Other Africa, North America, Central and South America, Middle East and Central Asia, South and Eastern Asia, Eastern Europe, Western Europe and Oceania

constructed rates of further immigration to their country-skill-cells. Finally, assuming the national population remained at its 1991 levels, they inferred shares of immigrants by origin in all cells for all consecutive years. This method secures that the variation of shares across cells is driven only by the composition of immigrants by origin in the initial year and by the variation of consecutive inflows from those regions. My sample of countries and the studied period are different. Therefore, I cannot simply extract the data from D'Amuri and Peri (2011) nor from Ortega and Peri (2011). However, I managed to gather the needed data for five countries for period 2010–2016. Although this subsample seems very small, it allows for 2SLS estimation which solves the potential endogeneity bias.

4.2 Data

The focus of this thesis lies on the labour markets of 17 European countries in the period 2004–2017. Those countries are either members of the original composition of the EU 15, or one of the two added states; Switzerland and Norway. The choice of the studied area was driven partly by data availability. As all our sample countries are either members of the European Union (EU) or members of the Organisation for Economic Cooperation and Development (OECD) or even both, most of the data were extracted from Eurostat and the statistical OECD database. Majority of the existing research examined the period around the break of centuries, my research continues in their steps but tries to explore the impacts of immigration in more recent times.

The data on employment of natives in each education-age cell were collected already in the desired format. I calculated the data on shares of immigrants in those cells as follows. First, I extracted the annual educational distributions of foreign-born population for both age categories and for each country. Then I combined these distributions with the annual foreign-born stocks of active population (either employed or unemployed immigrants) and obtained yearly stocks of active foreign-born population by education and age for all sample countries. Finally, I divide the size of the active immigrant population in each cell by the total active population in that cell. As mentioned in the previous subsection, the total active population in the denominator of the foreign-born share in each skill-cell is set to its initial value (2004 or 2010 based on what sample of countries is studied).

The essential data for construction of the instrumental variable were obtained from the database of the Organisation for Economic Cooperation and Development. Unfortunately, the data on annual inflows of immigrants by their country of origin is very limited. The OECD database provides complete data for only 5 countries from the sample and only for years 2010–2016. From these data, I calculate the immigration rates of immigrants by 6 different regions⁸ of origin. Next, the initial shares of immigrants by origin in all skill-cells were extracted from the Database on Immigrants in OECD and non-OECD Countries (DIOC). This detailed database from 2010 contains information about the stock of foreign-born population and their sociodemographic properties which allows me to compute the origin-specific sizes of foreign-born active population in each

⁸ Europe, North America, Africa, Asia, South-Central America and the Caribbean, and Oceania

skill-cell for the initial year 2010 for the 2SLS analysis. Multiplying the origin-specific growth rates by this initial distribution of immigrants among skill-cells allow to infer the stocks of foreign-born population by origin in each country-age-education labour market for the following years in the period 2010–2016. To obtain the total amount of foreign-born population in each cell, the origin-specific stocks are combined. As in the original model for the whole sample, the foreign-born share is calculated as the ratio of the active population of immigrants and the total active population of the initial year; which is 2010 for the 2SLS analysis. This instrumental variable turned out to be very strong predictor of the actual share of immigrants (first stage statistics are presented in Table A 1 in the appendix).

The models are in the log-log form and the results are therefore interpreted as elasticities. To give them a further interpretation value, descriptive statistics of the main independent variable *imsh* (share of immigrants) and the dependent variable *empl* (employment rate of natives) are presented in Table 1. Both variables have subscripts of the initial year of their respective analysis. The data suggest that employment remains unaffected when a different sample is considered. On the other hand, the shares of immigrants with respect to the initial years show significant differences. The greater mean and maximum values of the share of immigrants with respect to the total active population in 2004 can be explained by the fact that since the variable of the foreign-born share is constructed by setting the denominator to its initial value. The variation of those shares is driven only by the changes in the size of active population of immigrants. Since the foreign-born population in Europe increased with time, longer period allowed the ratios to the population of 2004 increase by a

substantially greater amount than the share to the 2010 population during only 6 years. The same statistics for each skill-group are available in the appendix in Table A 2.

Table 1: Descriptive statistics of data

Variable	Unit	Mean	SD	Min	Max
empl ₂₀₀₄	%	61.11	22.7704	3.80	93.40
imsh ₂₀₀₄	%	16.57	16.4222	1.42	173.947
empl ₂₀₁₀	%	63.32	21.15	5.80	91.60
imsh ₂₀₁₀	%	10.17	4.99	2.72	33.16

Note: The shares of immigrants are calculated as the ratio of foreign-born active population and the total active population of the initial year (denoted by the subscripts)

4.3 Models

Following the methodology discussed in Section 4.1 and building on the research of D'Amuri and Peri (2011) with a few adjustments taken from other mentioned studies, the baseline model (1) of the main analysis is:

$$\ln(empl_{cst}) = \beta_1 \ln(imsh_{cst}) + \delta_{ce} + \delta_{et} + u_{cst}$$

where subscript s denotes the skill group (a combination of age and education), $empl_{cst}$ denotes the employment rate of natives in a country c , skill-group s , and year t . The explanatory variable $imsh_{cst}$ denotes the share of immigrants in the active population⁹ in the country-skill cell cs and year t . Both dependent variable and the main independent variable are in the logarithm form and their relationship is interpreted in elasticity. The coefficient β_1 is to be estimated and measures the proposed relationship. The sets of country-education and education-year fixed effects are represented by δ_{ce} and δ_{et} , respectively. Finally, u_{cst} is the idiosyncratic error with zero mean and no correlation with explanatory variables. This model analyses the average impact of immigration on natives' employment rate.

Since immigrants from the EU 15 area and those from the rest of the world possess different human capital (as reviewed in Section 3.1) their skill complementarity to natives differs and might potentially affect the employment rate of native labour force distinctively. Hence, we allow immigrants from the

EU 15 and non-EU 15 immigrants to have different impacts on native employment rate by constructing the following model (2):

$$\ln(\text{empl}_{cst}) = \beta_1 \ln(\text{eush}_{cst}) + \beta_2 \ln(\text{neush}_{cst}) + \delta_{ce} + \delta_{et} + u_{cst}$$

Furthermore, we let the main regressor in the baseline model (1) to interact with numerous sets of dummy variables in order to see how immigration affects different demographic groups of natives. First, we interact the logarithm of foreign-born share with age dummies, trying to capture the impacts on young and old natives by the model (3):

$$\ln(\text{empl}_{cst}) = \beta_1 \ln(\text{imsh}_{cst}) * d_{young} + \beta_2 \ln(\text{imsh}_{cst}) * d_{old} + \delta_{ce} + \delta_{et} + u_{cst}$$

Then, we allow for different effects of immigration on natives with low, medium and high levels of education by interacting the main independent variable with educational dummies. This model could potentially discover whether low-skilled natives are the most vulnerable group as proposed earlier in Section 3.1. The model 4 is constructed as:

$$\begin{aligned} \ln(\text{empl}_{cst}) &= \beta_1 \ln(\text{imsh}_{cst}) * d_{low} + \beta_2 \ln(\text{imsh}_{cst}) * d_{medium} \\ &+ \beta_3 \ln(\text{imsh}_{cst}) * d_{high} + \delta_{ce} + \delta_{et} + u_{cst} \end{aligned}$$

⁹ The active population in the denominator of the explanatory variable is set to its initial value (either 2004 or 2010 depending on the sample and analysis), for details see Section 4.1

In the last part, I experiment and take the interactive estimation a step further by including the full set of skill dummy variables. Since it might discover some differences between the impacts of immigration on employment of natives with different skills, the following model 5 is analysed:

$$\begin{aligned}
\ln(empl_{cst}) &= \beta_1 \ln(imsh_{cst}) * d_{young} * d_{low} + \beta_2 \ln(imsh_{cst}) * d_{young} * d_{medium} \\
&+ \beta_3 \ln(imsh_{cst}) * d_{young} * d_{high} + \beta_4 \ln(imsh_{cst}) * d_{old} * d_{low} \\
&+ \beta_5 \ln(imsh_{cst}) * d_{old} * d_{medium} + \beta_6 \ln(imsh_{cst}) * d_{old} * d_{high} \\
&+ \delta_{ce} + \delta_{et} + u_{cst}
\end{aligned}$$

All proposed models (1) – (5) are estimated in three ways. Firstly, the models are estimated for the whole sample of 17 countries and 14 years by the Ordinary Least Squares (OLS) method with the added fixed effects. Secondly, the OLS estimation is used on the subsample of 5 countries and the period of 2010–2016. And finally, the restricted subsample is estimated in all models with the Two Stage Least Squares (2SLS) method using the instrumental variable.

4.4 Limitations

First issues of the proposed models come with their underlying assumptions. Once the fixed effects are introduced, it is assumed that the variation of the immigrant share is exogenous for the OLS estimation be valid. However, the serial correlation remains a threat even if the explanatory variables are exogenous and ignoring it would bias the standard errors and make our estimates inefficient (Baltagi, 2005). Therefore, the robust standard errors are adjusted for

clustering at the age-education-country level, as in D'Amuri and Peri (2011) or Moreno-Galbis and Tritah (2016). The immigrants are the most mobile workers and can choose their destination based on the labour market conditions which also affect the employment rate of natives. Despite the effort to account for the unobservable conditions by including education-year and country-education fixed effects, the endogeneity of the main independent variable is still in question. I try to implement the 2SLS method, but since the sample of countries got very thin, the reliability of the achieved estimates is not convincing.

One potential problem outside the speculation about the assumptions' validity is associated with the division of national labour markets by specific skill-levels. Due to data availability, I was forced to create only 6 different skill groups while majority of researchers divide the labour force into more cells (usually by only two education levels but then by numerous age intervals of 5–10 years each). Another problem of the approaches implementing skill-cells (either the pure skill-cell approach or the mixture approach) assume that the immigrants and natives with the same education and experience (or age) are substitutes and compete on the labour market. Since the education qualifications of immigrants are frequently downgraded even high-skilled immigrants might end up in the secondary labour markets and compete with low-skilled natives, as was mentioned in the Section 2.1 and Section 3.1.

5 Results

This section is divided into three parts. The first subsection presents the results from the baseline model (1) and model (2). The baseline model estimates the average effect of immigration on the employment rate of natives. The second model allows for separate effects of immigrants from the EU 15 and from the non-EU 15 countries. The second subsection reviews the results of models (3) and (4). These models try to capture any differences between effects on young and old natives or by different levels of education. The last part describes the estimates of model (5) which tries to measure the individual effects in each skill group.

5.1 Average effect and effects by origin

The resulting estimates of the first two models in Table 2 are consistently positive and significant. The average effect of 1 % increase of the immigrant share within the cell is associated with an increase of the native-born employment rate by around 0.44 % when considering the OLS results and by 1.06 % when considering the 2SLS estimate. To put these elasticities in perspective lets recall the averages of foreign-born share and native employment from Table 1 and use the obtained elasticity to these mean values. The OLS estimates imply that an increase in the share of immigrants by 10 % (from average 16.57 % to 18.23 %) yields return of positive 4.4 % in native employment rate which means an increase from average 61.11 % to 63.8 %. The OLS estimates are in line with the results of D'Amuri and Peri (2011) who find

an effect of about 0.37 %. The results achieved from 2SLS estimation are significantly larger and suggest that the OLS estimates might be underestimated due to the endogeneity bias. However, the 2SLS estimates have also larger standard errors and it is important to bear in mind relatively small size of the restricted sample. To conclude, both estimation methods suggest a positive effect on native-born employment rate.

Table 2: The effects on native employment (average effects and effects by origin)

		OLS		2SLS
Sample		(1) unrestr.	(2) restr.	(3) restr.
Model	Independent variable			
1	ln (imsh)	0.477*** (0.074)	0.410*** (0.131)	1.057** (0.383)
2	ln (eush)	0.328*** (0.043)	0.325*** (0.092)	0.517** (0.176)
	ln (neush)	0.153*** (0.045)	0.265** (0.080)	0.453*** (0.123)
Number of observations		1428	210	210

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 '' 1

Note: IMSH denotes the share of immigrants, EUSH denotes the share of immigrant from EU15 and NEUSH denotes the share of non-EU15 immigrants. The standard errors in parenthesis are clustered at the country-education-age level.

The effect remains positive and significant even if we differentiate between the immigrants from the EU 15 and from the outside of the EU 15 area and the estimates imply a slightly greater influence of the EU 15 immigrants.

5.2 *Effects by age and effects by education*

Proceeding to the interaction models (3) and (4), the results start to lose consistency and significance, as can be seen in Table 3. The first indications of possible adverse effects on native employment emerge for young natives, although these effects are statistically indifferent from zero. The interactions with education dummies do not support the theory that low-educated natives suffer from immigration as their estimates are one of the highest and most significant. With the significance level of 5 %, the meaningful estimates range between positive 0.15 % and 0.82 % which is similar to the interval obtained in the previous subsection. The interactive models bring no fundamental findings but the presence of a few negative results (yet insignificant) asks for a further examination.

Table 3: The effects on native employment (effects by age and effects by education)

		OLS		2SLS
Sample		(1) unrestr.	(2) restr.	(3) restr.
Model	Independent variable			
3	ln (imsh)*d_young	-0.062 (0.084)	-0.242 (0.268)	0.062 (0.367)
	ln (imsh)*d_old	0.152* (0.069)	0.001 (0.199)	0.260 (0.315)
4	ln (imsh)*d_low	0.665*** (0.138)	0.350 (0.180)	1.255 (0.819)
	ln (imsh)*d_medium	0.153 (0.045)	0.501* (0.220)	0.819* (0.384)
	ln (imsh)*d_high	0.203* (0.093)	0.411 (0.268)	1.039 (0.600)
	Number of observations	1428	210	210

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Note: IMSH denotes the share of immigrants, d_age and d_education represent respective dummies. The standard errors in parenthesis are clustered at the country-education-age level.

5.3 Individual skill-group effects

The results from estimation of the model (5) yield surprising results and are presented in Table 4. More effects turned to be negative and this time even significant. These are found for young natives with low education levels for restricted and unrestricted samples. Unfortunately, no 2SLS estimates are significant to give more information for discussion. The negative effects for young and low-educated natives can be explained by the increased competition from immigration since even highly-skilled immigrants end up in low-status and

manual jobs. While the results from Section 5.1 suggest the overall effect to be positive, these results support the proposition of Blau and Mackie (2017) that there are winners and losers among natives when assessing the impacts of immigration.

Table 4: The effects on native employment (effects by skill groups)

		OLS		2SLS
Sample		(1) unrestr.	(2) restr.	(3) restr.
Model	Independent variable			
5	ln (imsh)*d_young*d_low	-0.371* (0.177)	-1.243*** (0.201)	-0.785 (0.527)
	ln (imsh)*d_young*d_medium	0.295** (0.114)	-0.547 (0.326)	-0.402 (1.377)
	ln (imsh)*d_young*d_high	-0.039 (0.108)	0.201 (0.163)	0.114 (0.294)
	ln (imsh)*d_old*d_low	0.005 (0.104)	-0.722*** (0.145)	-0.335 (0.423)
	ln (imsh)*d_old*d_medium	0.436*** (0.104)	-0.286 (0.219)	0.100 (1.092)
	ln (imsh)*d_old*d_high	0.085 (0.087)	0.344 (0.205)	-0.484 (0.893)
	Number of observations	1428	210	210

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Note: IMSH denotes the share of immigrants, d_age and d_education represent respective dummy variables. The standard errors in parenthesis are clustered at the country-education-age level.

6 Conclusion

Immigration receives worldwide attention as its magnitude increases. The research assessing the impacts of immigration on the receiving countries and the respective native populations yields a wide array of results. Most of the studies agree on a very small or no effects of immigration. However, the stocks of foreign-born population grew rapidly in last two decades, and the traditional views on consequences of migration are most likely to change.

This thesis examines the impacts of immigration on the native-born employment across 17 European countries. Data from years 2004 to 2017 allow for a comprehensive analysis of the most recent times. Since majority of conducted studies focus on earlier periods, this thesis provides results up to date with the recent economic and migration crises. The results imply that immigration stimulates the native employment rather than having negative effects. On average, 1 % increase of the immigrant share in the active population of a specific skill-level increases the employment rate of natives within the same skill-cell by 0.48–1.06 %. On the other hand, there are both winners and losers among natives. Considering the six different labour markets in each country by education and age separately, the results suggest a negative effect for the young natives with low levels of education.

The theoretical frameworks alone cannot explain the potential consequences of immigration, especially of this size. Hence, data driven analyses are essential for setting the right immigration policies to exploit the benefits of immigration and to anticipate its potential threats. This thesis may serve as a starting point in further research of the immigration impacts on native-born population. Since downgrading of immigrants' education and experience often takes place, low-skilled natives may

suffer from greater competition even if the immigration influx is rather high-skilled. Therefore, I would suggest leaving out grouping of natives and immigrants based on their skill levels as the human capital is not fully transferable across different regions. Instead, the aggregate effects or cross-effects between the skill groups might be more revealing.

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Appendix

Table A 1: The first-stage of the instrumental variables

Model	Instrument(s)	Coeff	SE	F-stat
1	ln (ivsh)	0.261***	(0.036)	181.84
2	ln (iveu)	0.372***	(0.038)	175.25
	ln (ivneu)	0.399***	(0.056)	382.5
3	ln (ivsh)*d_young	0.891***	(0.034)	2945.8
	ln (ivsh)*d_old	0.634***	(0.024)	4550
4	ln (ivsh)*d_low	0.255***	(0.051)	262.54
	ln (ivsh)*d_medium	0.252***	(0.030)	513.36
	ln (ivsh)*d_high	0.306***	(0.078)	66.861
5	ln (ivsh)*d_young*d_low	1.039***	(0.034)	5804.8
	ln (ivsh)*d_young*d_medium	0.895***	(0.029)	5989.3
	ln (ivsh)*d_young*d_high	0.806***	(0.059)	2233.7
	ln (ivsh)*d_old*d_low	0.650***	(0.039)	2895.8
	ln (ivsh)*d_old*d_medium	0.061***	(0.018)	11243.0
	ln (ivsh)*d_old*d_high	0.647***	(0.032)	5249.2

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table A 2: Descriptive statistics (detailed)

Education	Variable	Unit	Age: 15–24 years				Age: 25–64 years			
			Mean	SD	Min	Max	Mean	SD	Min	Max
Low	Empl ₂₀₀₄	%	28.50	16.48	3.80	62.70	60.48	9.12	45.50	88.20
	Imsh ₂₀₀₄	%	11.97	7.84	3.42	48.80	20.15	13.64	2.73	59.82
	Empl ₂₀₁₀	%	34.78	17.49	5.80	55.00	58.62	6.16	48.00	66.00
	Imsh ₂₀₁₀	%	8.50	4.01	3.92	17.06	13.14	3.65	5.76	21.42
Medium	Empl ₂₀₀₄	%	51.40	18.65	13.20	79.80	77.49	5.92	54.30	88.20
	Imsh ₂₀₀₄	%	10.86	8.02	2.18	54.02	16.19	10.52	2.81	56.62
	Empl ₂₀₁₀	%	58.33	16.54	23.80	72.90	77.74	4.32	70.20	82.60
	Imsh ₂₀₁₀	%	6.86	2.26	2.91	10.99	10.75	3.19	4.26	15.20
High	Empl ₂₀₀₄	%	62.45	17.10	21.40	87.70	86.32	4.18	69.40	93.40
	Imsh ₂₀₀₄	%	15.85	17.03	1.42	109.75	24.38	27.88	1.86	173.95
	Empl ₂₀₁₀	%	64.17	20.86	21.40	82.50	86.25	3.99	78.80	91.60
	Imsh ₂₀₁₀	%	10.24	7.73	2.72	33.16	11.50	4.51	3.06	19.71