BACHELOR THESIS

LABOUR MOBILITY IN THE EU AND THE EFFECT ON EMPLOYMENT

HOW IMMIGRANTS FROM EASTERN EUROPE INFLUENCE EMPLOYMENT IN WESTERN EUROPE

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ABSTRACT

In this research a general labour market equilibrium model is used to investigate the effect of migration on employment. With the use of the eastern- to western-Europe migration flow data an empirical study is set up. According to the theory it is expected that in the short-run the employment rate of natives declines while the total employment rate is expected to rise. In the long-run it is expected that both native- and total employment rate rise. The findings in this research however contradict each other and did not find any consistent evidence on the effect of migration on employment.

CONTENTS LIST

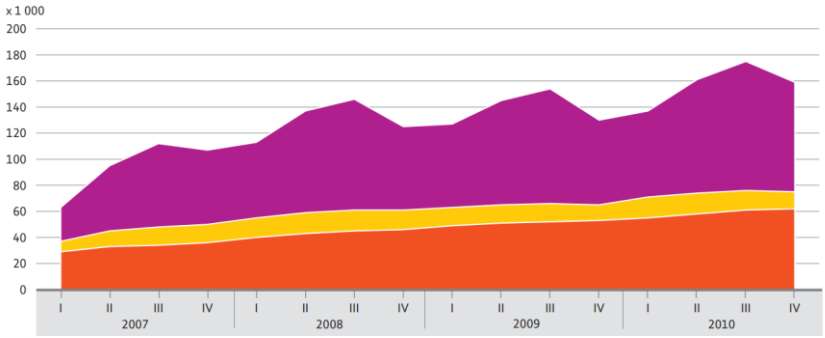
INTRODUCTION

Europe has a rich history of migration. For a long time all kinds of Europeans crossed Europe and the world to trade. Colonization also contributed to huge migration flows, both into Europe as well as to the colonized countries. Also large-scale emigration and forced migration have been a huge part of European history. Immigration into western-Europe itself is a more recent development. From 1945 on all countries in western-Europe started to attract significant numbers of foreign workers (Massey et al., 1993). From 1960 through 1973 the number of foreign-born workers doubled (from 3 to 6 percent). In the late 1980's and the 1990's the number of immigrants has risen sharply again from 104,000 applications for asylum in 1984 to 692,000 applications in 1992 (Hall, 2000).

Since the European Union (EU) opened their borders and established labour mobility the latest surge of migration hit western-Europe. This is especially the case for eastern-European countries. Since 2004 and 2007 Estonia, Hungary, Latvia, Lithuania, Poland, Slovenia, Slovakia and Czech Republic joined the EU; people from those countries are allowed to work in other EU countries without a work permit. Besides those countries Bulgaria and Romania joined the EU, however people from those countries needed a valid work permit until 2014. Still there is a clear rise of immigrants from Bulgaria and Romania as well from 2007 on. For instance the Netherlands recorded a rise of eastern-European immigrants of 143% in 2007 (Ooijevaar et al., 2013). An illustration of the rise in immigrants from new eastern-European EU members into the Netherlands is given in Figure 1. The figure is included though to sketch an image of the total migration flow.

For some time now, immigration policy has been high on the European agenda. In addition to the legal, humanitarian and social aspects, the economic impact of immigration is receiving increasing attention. The economic effects of immigration are at the core of the debate, particularly since the ageing of the population raises the question whether immigrants can help countries to cope with the economic consequences of ageing (Roodenburg et al., 2003). In this research the emphasis is on economic immigrants from eastern Europe. So this research is not aimed at political refugees entering Europe, which is a highly debated issue at the moment in Europe.

Figure 1: Amount of immigrants from new eastern-European EU-members; Orange = immigrants who are registered in the municipal people administration (GBA), Yellow = immigrants once have registered in the GBA, Purple = immigrants have not registered in the GBA.



Source: CBS (2013)

Western-European politicians however are not so optimistic. For instance, David Cameron argued that the UK is not tough enough about immigrants using their health service and not contributing in taxes. In other countries political parties use the issue to mobilize voters and argue that an increase in immigration will increase the unemployment rate in their country, examples are PVV in the Netherlands and Front National in France (Simons & Volkery, 2013). Also a substantial part of the western-European population fears that immigration will cause an increase in unemployment. They argue that a large portion of the immigrants will compete with the native population for the same jobs and therefore cause a downward pressure on employment (Eurobarometer, 2009).

However there are multiple studies that find a positive impact of immigration on the native employment. They argue that immigrants and native workers complement each other, which creates a rise in employment due to a higher productivity of the native workers (Borjas, 2013). To examine the effect of the latest migration surge from eastern-Europe into western-Europe on native employment the following research question is formulated:

Does the increasing amount of immigrants from eastern-Europe causes a decrease in the employment rate of natives of western-Europe?

The purpose of this thesis is to gain a better understanding of the impact of immigration on the employment of natives in western-Europe. This study will distinguish itself from previous literature on this issue, by examining the effect of the latest migration surge to western-Europe

due to eastern-European countries entering the EU. Different western-European countries will be involved in this thesis, so a broader view on the issue will be collected, which will give clearer outcomes. Currently most research has been done on the effect of immigration on wages and/or unemployment, by looking into the effect on employment this thesis will approach the issue in a slightly different way.

The following outline will be followed in this research: First a theoretical framework will discuss various theories for the effect of migration on the employment rate of native-born people. In the literature review studies concerning migration and the effect on the labour market will be discussed. After which the data and methodology will be set up and the used statistical data and methods will be described. Next the results will be discussed from the tests explained in the data & methodology section. In the end the conclusions from the research will be drawn and recommendations formulated.

THEORETICAL FRAMEWORK

This research is based on the theoretical model of the basic labour market equilibrium model[1]. First this basic framework of labour demand and labour supply will be outlined. Afterwards different applications of the model will be discussed to determine the effect of immigration on the employment rate of natives within this labour market framework in the short and long run.

LABOUR SUPPLY

Every individual within a country's labour force has to decide whether to work or not, and if choosing to work, how many hours to work. A market's labour supply is given by adding the work choices of all individuals in the labour force. A description on how a labour supply curve is set up will be given first, since migration is expected to influence the labour supply curve. This way the impact, through the labour supply curve, can be better interpreted.

The framework that is used widely to analyze labour supply is the neoclassical model of labour-leisure choice. This model assumes that an individual gets satisfaction from both consuming goods and consuming leisure. This assumption is captured in the utility function:

$$U = f(C, Leisure) \quad [1]$$

The utility function transforms an agent's consumption of goods (*C*) and leisure (*Leisure*) into a measurement of utility (*U*). The higher this measurement, the more utility the agent has. It is assumed that both the consumption of goods and leisure have a positive impact on utility. With this utility function an indifference curve can be set up. An indifference curve is a set of combinations of the consumption of goods and leisure whereby the agent is indifferent between certain combinations of the consumption of goods and leisure.

However an agent's consumption of goods and leisure is constrained by her time and by her income. To take this constraint into account the budget constraint is introduced. This constraint can be written as:

[1] Borjas, G (2013). *Labor Economics.*

$$C = w * (T - Leisure) + V \quad [2]$$

This means that the currency value on the consumption of goods (*C*) has to be equal to the wage (*w*) times hours worked, which is equal to total hours (*T*) minus hours of leisure (*Leisure*), plus non-labour income (*V*).

At this point every agent has to decide how many hours to work. One last important assumption has to be made to reach this point and that is that every agent maximizes his/her utility. This utility maximization point is reached at the point where the utility function is tangent to the budget constrain; the highest utility point where the budget constraint is still satisfied. This point thus depends heavily on the wages, because the wage influences the budget constraint. Thus there are many different maximization points depending on the wage.

The labour supply curve is the predicted relation between hours of work and the wage rate. Labour supply is generally written down as[2]:

$$L^s = f(w^+, b^-, t^-, POP) \quad [3]$$

Where labour supply (L^s) is positively influenced by the wage (*w*). Next to that the labour supply is negatively influenced by the real unemployment benefit (*b*), which is part of the non-labour income (*V*) in the budget constraint, and the tax rate paid by the employee (*t*), which lowers the wage received by the employee (*w*). The labour supply is also influenced by the population size (*POP*) (Minford, 2015). Wages are expected to drop due to immigration and thus it is expected that labour supply will decrease, since employees get a lower wage for their work.

[2] Minford (2015).

LABOUR DEMAND

Labour market outcomes do not depend only on the supply of labour, but also on the willingness of firms to hire those workers. Since the interest of this paper is more on the labour supply side, labour demand will only be discussed briefly.

A competitive firm will hire labour up to the point where the wage is equal to the value of marginal product of labour. Thus, as long as a worker contributes more in value than he/she costs (wage) a firm should hire this worker. This implies that, the labour demand curve is a negative function between employment and the wage. Labour allocation is not flexible in the short-run, so these changes through the wage should only occur in the long-run (Marsden, 1988). As earlier stated wages are expected to drop due to immigration and thus labour demand should increase, which will not cause a decrease in employment.

LABOUR EQUILIBRIUM

The labour market equilibrium is the point where the labour supply curve and the labour demand curve intersect eachother (Figure 2). In the original situation (without immigration) the equilibrium wage will be W_0 and the equilibrium employment will be E_0. Now the model has been set up, the effect of immigration in this model will be discussed.

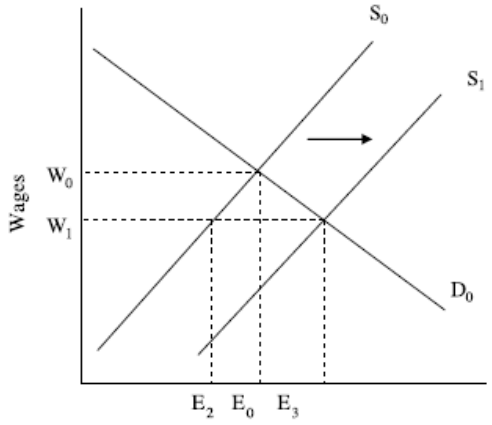
The first distinction to be made is whether the immigrants are (mostly) substitutes or complements of the native workers. When immigrants are substitutes of natives, then both have the same skill level and thus compete in the labour market. When immigrants are complements of natives, then they have different skill levels and thus are not competing in the labour market. Comparisons show that there is an increasing skill mismatch of labour demand and supply in the EU. Also three out of four immigrants from eastern-Europe fill low-skilled jobs (Slack, 2015). For this reason there is a focus on immigrants being substitutes in this paper. This means that immigration shifts out the labor supply curve, because the immigrants and natives compete with each other in the labour market. As a result, in this framework, the wage drops to W_1 and native employment decreases to E_2(Borjas, 2013). Therefore hypothesis 1a is stated as follows:

Hypothesis 1a: In the short run the employment rate of the natives in western Europe has decreased after the migration wave.

However, the shift of the labour supply curve to the right causes total employment (E_3) to rise. So, in this new equilibrium there is a lower wage (W_1) and less natives are willing to work at this new equilibrium wage (E_2). The immigrants however are willing to work at a lower wage, so total employment rises (Borjas, 2013). A possible explanation that immigrants from eastern-Europe are willing to work at a lower wage is that the wages in eastern-Europe are substantially lower (Magda et al., 2008). Since the new equilibrium wage is lower there is also more demand for labour (Borjas, 2013). Thus hypothesis 1b is as follows:

Hypothesis 1b: In the short run the total employment rate has increased after the migration wave.

Figure 2 Impact of Immigrants on the labour equilibrium;



Source: (Borjas, 2013)

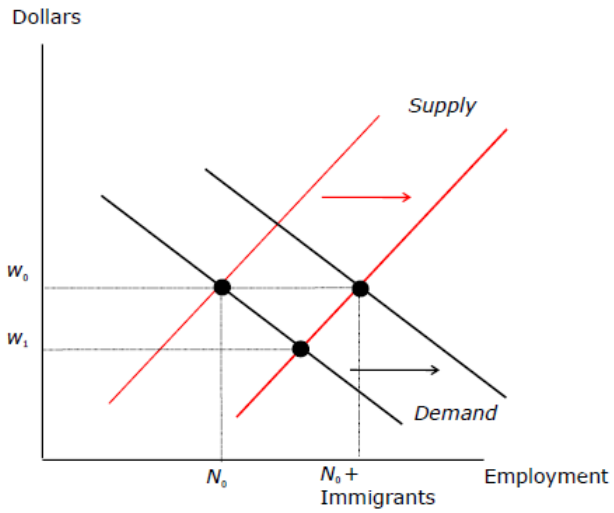
Thus in the short run it is assumed, according to the general labour equilibrium model, that immigrants lower employment of natives. However immigration also leads to an expected increase in the return on capital. After all, the wages are expected to decrease as well, so the cost on labour for employers declines. Over time, this increased profitability of firms will inevitably attract capital flows. This increase in capital will shift the demand for labour outwards (Figure 3). This is supposed to increase the total employment (N_0 + immigrants) and is assumed that the employment of native-born increases from the short-run position back to the original equilibrium (N_0) (Borjas, 2013). These changes are expected to take place in the longer run, since labour allocation is not flexible in the short run (Marsden, 2007). Thus hypothesis 2a is as follows:

Hypothesis 2a: In the longer run the native employment rate will increase (with the short run equilibrium as starting point).

Since the labour demand curve shifts to the right, starting in the short run equilibrium, wages will rise and thus more people are willing to work (a walk on the supply curve). So, in the longer run it is expected that because of the rising demand (which increases the wage) total employment will rise too, so the increase in native employment is not at the expense of the foreign employment and the long-run employment equilibrium will consist of the original employment equilibrium plus the number of immigrants (N_0 + immigrants). Hypothesis 2b states:

Hypothesis 2b: In the longer run the total employment rate will increase further (with the short run equilibrium as starting point).

Figure 2 Longer run equilibrium



Source: (Borjas, 2013)

LITERATURE REVIEW

The outcomes of the previous research on the relationship between immigration and employment differ widely. The estimated effect of immigration on labour markets even differs within studies (Borjas, 2003). The negative impact of immigration on the labour market are highlighted in most previous research. However other studies show the positive impact immigration can have on the labour market. First we will take a look at the negative impact on the labour market of immigration.

Longhi et al (2004) discussed the effect of immigration on the wages of natives. The effect they found was very small; however they found that the negative effect on wages is larger in the EU than in the US (Longhi et al., 2004). They explain this by the fact that employees in the US have a higher willingness to move for another job than in the EU. This explains the fact that the effect on wages is more negative in the EU than in the US. The outcomes found in the research are significantly too weak however.

Okkerse (2008) extends the research of Longhi et al (2004) by including the effects on employment and labour market participation. She focuses on different approaches in a literature study. With respect to employment she concludes that the probability that immigration decreases employment is the short run is low and in the long run zero (Okkerse, 2008). She finds that most area analysis and time series analysis do not find a significant effect of migration on employment. Also Gang et al (1999) fails to find a significant influence of immigration on employment probabilities.

Shan et al. (1999) investigate a possible causal link between immigration and unemployment in Australia and New Zealand. They use Granger no-causality testing procedure. They however find no Granger causality between immigration and unemployment. The results in their study thus do not support the political arguments that immigrants displace native workers and decrease native employment.

However some studies do find evidence that immigration has a significant effect on employment, Winegarden and Boon Khor (1991) do find that for teenagers and young women the decrease in employment is significant due to immigration.

Van der Waal (2009) argues that competition between natives and immigrants occur on sector level, wages and employment will decrease in a specific sector when an inflow of immigrants occurs in the specific sector (van der Waal, 2009). Van der Waal compares the effect of immigration between Amsterdam and Rotterdam. Amsterdam is mostly a city of the service sector and Rotterdam is mostly an industrialized city. He uses the cross-regional approach to compare both cities. He looks at the sector level to find more significant results compared to a national approach. The results show a negative effect on the employment of natives due to immigration; mostly for the industrial sector (van der Waal, 2009).

Lokshin et al. (2009) did research on the impact of male migration into Nepal on labour market behaviour of women. They used the 2004 for household survey of Nepal and applied a maximum likelihood test to find factors that simultaneously affects the decision to migrate for men and the decision to work for women. They found a negative impact of male migration on labour market participation of women in Nepal. Although it is very different research and they make a difference between the sexes, this study does show how migration can influence employment in some way, which is relevant for this research.

However immigration can also be viewed as a positive development. For example immigrants can complement native workers, which will create more employment and economic development (Friedberg & Hunt, 1995) They discuss however the difference between skill levels on this issue. Friedberg and Hunt (1995) also argue that immigrants affect the domestic per capita growth in income, for example due to the inflow of immigrants, the number of consumers rises and thus increases domestic consumption (Friedberg & Hunt, 1995).

Besides that Gross (2002) argues that in the long run immigrants create more jobs than they occupy and total employment rises permanently. In the short run he finds a slight increase in unemployment (Gross, 2010) Gross investigated the effect of a migration inflow on the labour market in France during the 1970's to the 1990's using time-series techniques. Another benefit is that the inflow of immigrants can offer a solution to the ageing problem in many western European countries. Although the inflow of immigrants has to be very large to offer a solution, according to Bermingham (2001).

In this study the focus is on the effect of migration on employment. Massey et al. (1993) looked at this situation the other way around. They examined the effect of employment on migration. In

their literature research they try to set out different theories on why migration exists using various models such as the neoclassical model, the new "economics of migration" model and dual labour market theory. They found that different models have different implications for policy formulation. Some theories say that the employment conditions in destination countries influence the immigration flow; others however say that such conditions do not. If migration follows from employment conditions, people will move to countries where there are more employment options. In this case immigrants fill employment spots in places where needed and in this way immigrants do not influence employment negatively.

Antolin and Bover (1997) did similar research on the effect of regional migration on unemployment using pooled cross section data. The goal of their study is to identify which economic factors contribute to the decision to migrate of males in Spain. They find that the own unemployment or high unemployment in the region is not a reason to migrate. From this point of view employment thus does not influence migration.

Overall it is not possible to draw a clear conclusion from previous research. The variation in different studies is big and both positive and negative effects of immigration on employment are found, if there already is a significant effect. Therefore, the aim of this study is to get clearer results on the issue. In the following chapters empirical research will be performed to get these results.

DATA AND METHODOLOGY

DATA

In this study the international migration database and the employment and unemployment rates database from the OECD (Organisation for Economic Co-operation and Development) iLibrary are used (OECD, 2015). All migration and employment data from the OECD countries is allocated in here. From this database a number of variables will be collected, which will be outlined in this section.

For this research the data will be collected from several western European OECD countries. The countries have to satisfy several criteria to be included in this research. The aim of the research is to investigate the impact of migration from eastern Europe to western Europe on the natives in western Europe, therefore the first criteria is that the countries are in the geographical region that is specified as western Europe according to EES UCLA (Center for European and Eurasian studies) (UCLA, 2015). Further the countries have to be a member of the EU, as the migration wave from eastern- to western Europe is mostly due to the labour mobility within the EU. The countries that satisfy both criteria are: Austria, Belgium, Denmark, Finland, France, Germany, Italy, Ireland, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

The time frame for which the data is collected is 2001-2013. This time frame is chosen, because in 2004 and 2007 many eastern European countries entered the EU. The years before 2004 are to sketch the situation before the migration waves from eastern Europe into western Europe. The years after 2007 are to determine the longer-run effect of the migration waves. So the longer-run in this research paper will be around 4 or 5 years, since data for a longer run are not available and the purpose of this research is to determine a trend in the years after a migration wave. For the migration wave in 2004 it is possible to extend the longer-run with several years, this may help to gain better results regarding the longer-run effects.

VARIABLES

The dependent variables will be the native employment rate (*native_employment*) for the hypotheses 1a and 2a and the variable total employment rate (*total_employment*) for the hypotheses 1b and 2b. These variables are chosen as dependent variables since the goal of this research is to examine the effect on employment. The native employment rate is given as the share of employed native-born persons aged 15-64 to the total of the native born population aged 15-64. People are regarded as employed if they worked at least one hour or if they had a job but were absent from work during the reference week. The total employment rate is defined as the ratio of the employed population to the working age population. The working age population is defined as all people aged 15-64. The total employment rate is seasonally adjusted.

As explanatory variables different migration and labour market variables will be used. The first explanatory variable is the native-born participation rate (*native_participation*). This variable is calculated as a percentage of the native-born labour force. The labour force is defined as the employed and unemployed population aged 15-64. Unemployed people are those who report that they do not have any work during a reference week; however they are available for work and have taken active steps to find work.

Next to the native-born participation rate, the participation rate for foreign-born (*foreign_participation*) is included as an explanatory variable. The foreign-born participation rate is defined in the same way as the native-born participation rate; the only difference is that it is defined as a percentage of the foreign-born labour force. Also the foreign-born employment (*foreign_employment*) is included as an explanatory variable, as the foreign-born may be employed instead of the native-born. The foreign-born employment rate is calculated as a percentage of the total foreign-born population. For hypothesis 1b and 2b the total participation rate (*total_participation*) will be included too.

Lastly the explanatory variables about migration are included. The migration inflow (*migration)* is the central variable of interest as this research tries to explain the effect of an immigration wave into a country. Data on the immigration inflow is thus crucial. Migration inflow is defined as the inflow of foreign population into the country. The data collected is in thousands. Data on migration inflow is collected by nationality. First the total migration inflow for each investigated

country will be collected. Afterwards also migration inflow per new eastern European EU-member will be collected for the countries for which it is available.

To get results for hypothesis 2a and 2b a lag of several explanatory variables will be included in the regression. The lag will be taken from the migration inflow and the control variables, since the aim is to investigate the longer-run effect of migration on employment.

Next to the explanatory variables control variables will be included so the impact of the explanatory can be controlled for to test the relative impact on the dependent variable. As control variables the average wage (*wage*) and the Gross Domestic Product (*GDP*) of the specific countries will be included. The average wage is calculated by the total wage, which is based on the national accounts, divided by the average number of employees in the economy, this in turn is multiplied by the ratio of the average usual weekly hours per full-time employee to the average usually weekly hours for all employees. The average wage is denoted in US dollars. Of the average wage the natural logarithm is taken to preserve a linear-model (*ln_wage*). The GDP is the expenditure on final goods and services minus imports. This variable is measured in US dollars per capita at current prices and PPPs. All variables are collected as yearly data.

METHODOLOGY

To get results from the above mentioned data, panel data analysis will be used. Panel data is a dataset in which behavior of multiple entities is observed over time. The reason why panel data is used for this research is that this research is focused on the effect over time on employment for multiple western-European countries. Besides panel data allows you to control for variables that cannot be observed and/or measured, that are constant over time, for example cultural factors. Also it controls for variables that change over time but not between entities, for example international agreements (Torres-Reyna, 2007).

With the collected panel data, regression models will be set up for the selected countries with the employment rate of natives as dependent variable. The participation rate of natives, the participation rate of foreign-born, the employment rate of foreign-born and the foreign-born population will be the explanatory variables for hypothesis 1a. For hypothesis 1b the total

employment rate will be the dependent variable and the total participation rate and the migration inflow will be the explanatory variables. The year will be indicated with *t*.

The regression equation to test hypothesis 1a is as follows:

$$Native\_employment_t = \beta_0 + \beta_1 * native\_participation_t + \beta_2 * foreign\_participation_t + \beta_3 * foreign\_employment_t + \beta_4 * foreign\_population_t + \beta_5 * migration_t + \beta_6 * ln\_wage_t + \beta_7 * GDP_t + \varepsilon$$

The regression equation to test hypothesis 1b is as follows:

$$Total\_employment_t = \beta_0 + \beta_1 * total\_participation_t + \beta_2 * foreign\_population_t + \beta_3 * migration_t + \beta_4 * ln\_wage_t + \beta_5 * GDP_t + \varepsilon$$

The regression on hypothesis 1a will also be estimated without the variables *native_participation* and *foreign_participation*. It can be possible that the participation rate explains a large part of the employment rate. Since you have to participate to be employed and thus a higher participation can lead to higher employment. This statement is supported by the correlation between the variables. Correlation between *native_employment* and *native_participation* is 0,917, this means that the variables cohere for 91,7% with each other. The correlation coefficient of *foreign_employment* and *foreign_participation* is also high with a value of 0,719 (Appendix A).

Next there has to be determined if fixed effects have to be included in the regression. This is done by first estimating a model without fixed effects. Such a model assumes that intercepts are the same for each country and for each year. Afterwards also a model with country-fixed and time-fixed effects will be estimated. Next it has to be determined which model has to be used to get the best outcomes.

Before the regressions can be estimated a panel unit root test on stationarity will be performed. If this shows that some data is non-stationary (a random walk) the regression can be spurious. The data will be transformed to the first difference of the relevant variable. This will be continued until the data is stationary.

After the variables are tested on stationarity, a cointegration test has to be performed. With a test on cointegration it will be tested if the residuals of the variables are stationary. If there is cointegration, than the variables that are non-stationary do not have to be transformed after all and thus the first difference does not have to be taken for any of the variables. However if there is no cointegration, than the first differences of the non-stationary variables do have to be taken.

These first regressions will give a general idea about the effect of migration and the foreign-born population on employment (of the native population). This research however investigates the effect of the migration wave due to the labour mobility in the EU and then specific of migrants from eastern-Europe. To gain more insight in this effect two follow up regressions will be estimated. The dependent variables stay the same, but the explanatory variables will now consist of the migration inflow per new eastern European EU-member. The variables of migration inflows from specific countries will be denoted as that country. The control variables will be the same as the other regressions, being *ln_wage* and *GDP*. The regressions will be as follows:

$$Native\_employment = \beta_0 + \beta_1 * Estonia + \beta_2 * Hungary + \beta_3 * Latvia + \beta_4 * Lithuania + \beta_5 * Poland + \beta_6 * Slovenia + \beta_7 * Slovakia + \beta_8 * Czech + \beta_9 * Romania + \beta_{10} * Bulgaria + \beta_{11} * ln\_wage + \beta_{12} * GDP + \varepsilon$$

And the same regression will be set up with total employment rate as dependent variable instead of the employment rate of natives. The regression however will only be set up for the shorter run, since the data is already limited and if lags have to be taken of the explanatory variables the dataset will be too small to draw conclusions. Since the explanatory variables have relatively low values, they consist of migration from one country to another country, another regression model will be set up taking the total migration inflow from eastern-European EU

members. This variable will be called *eastern_Europe* and will replace the explanatory variables in the above regression (except the control variables).

This way the effect of the specific migration inflows from eastern-Europe on employment can be estimated. This can expand the outcomes found on the regressions of the effects of total migration on employment.

To test the second hypothesis the same data as for hypothesis 1 will be used. The goal of hypothesis 2 is to estimate the longer run effect of migration on the labour market. The variables used to investigate the second hypothesis are the same as the variables used for hypothesis 1. The data that will be used for the second hypothesis are thus the foreign-born population, the employment rates for both natives and foreign-born and the participation rates of both natives and foreign-born. Again the control variables average wage and GDP are added.

The second hypothesis will be tested, just like hypothesis 1, by using panel data analysis. The difference with the analysis in hypothesis 1 is that in the regressions to test hypothesis 2 lags of several independent variables will be used. So for hypothesis 2a again the employment rate of natives will be used as the dependent variable and the foreign-born population, the migration inflow, employment rate of the foreign-born, the participation rate of both natives and foreign-born, the average wage and the GDP will be independent variables. However the foreign-born population, the migration inflow and the control variables will be lagged, to estimate the longer run effect of those variables. For hypothesis 2b the total employment rate will be the dependent variable and the total participation rate, foreign-born population, the migration inflow, the average wage and the GDP will be the explanatory variables. Again the lag of the same explanatory variables will be used.

The regression equation to test hypothesis 2a is as follows:

$$Native\_employment_t = \beta_0 + \beta_1 * native\_participation_t + \beta_2 * foreign\_participation_t + \beta_3 * foreign\_employment_t + \beta_4 * foreign\_population_{t-2} + \beta_5 * migration_{t-2} + \beta_6 * ln\_wage_{t-2} + \beta_7 * GDP_{t-2} + \varepsilon$$

The regression equation to test hypothesis 2b is as follows:

$$Total\_employment_{\ t} = \beta_0 + \beta_1 * total\_participation_t + \beta_2 * foreign\_population_{t-2} + \beta_3 * migration_{t-2} + \beta_4 * ln\_wage_{t-2} + \beta_5 * GDP_{t-2} + \varepsilon$$

For all tests a significance level of 10, 5 and 1 percent will be used in this research. This will help to get a broader view on the significance level of the variables. This means that, with a significance level of 5 percent, with a certainty of 95 percent there can be concluded that the null hypothesis holds, so there can be concluded that the statement is true.

RESULTS

In this section the outcomes of the research, which is outlined in the data & methodology section, will be discussed. The outcomes will be discussed by (sub)-hypothesis. After which the outcomes of the migration inflow regression will be discussed.

Before the outcomes can be discussed we have to test whether the variables are stationary. The Levin, Lu & Chu unit root test is used as panel data test on stationarity. The null hypothesis for this test is that the variable is non-stationary, thus can be spurious.

In Table 3 in Appendix B it can be seen that *native_employment* had a test outcome with p-value 0,0922 (>5%), so for *native_employment* it means that a random walk is found. After taken the first difference of *native_employment* the p-value of the unit root test is 0,0000 (<5%) and thus is stationary again and can be used in the regressions. All other variables were stationary.

To find if it is really needed to take the first difference of *native_employment* in the regressions the regressions have to be tested on cointegration. The Kao residual cointegration test is used for that. The null hypothesis states that there is no cointegration. The p-value of the cointegration test for the regression model of 1a (where *native_employment* is the dependent variable) is 0,000(<5%) (Table 4 in Appendix B). The null hypothesis thus has to be rejected and there can be concluded that there is cointegration. Thus the first difference of *native_employment* does not have to be taken.

Eviews corrects for the heteroskedasticity by applying the White robust standard errors.

EFFECT OF MIGRATION ON THE NATIVE EMPLOYMENT IN THE SHORT-RUN

To find the most realistic outcomes for hypothesis 1a two different regression models have been set up and tested. The outcomes can be seen in Table 1. The goal of these regressions is get results of migration on native employment in the short-run.

Table 1: *Regression outcomes hypothesis 1a*

Dependent variable: Native_employment				
Model	1.1	1.2	1.1^a	1.2^a
Constant	0,115	-1,736***	0,341	2,047***
	(0,095)	(0,379)	(0,325)	(0,405)
Native_participation	1,050***		0,846***	
	(0,015)		(0,105)	
Foreign_participation	-0,649***		-0,478***	
	(0,030)		(0,062)	
Foreign_employment	0,535***	0,496***	0,527***	0,339***
	(0,021)	(0,092)	(0,035)	(0,039)
migration	-0,000011**	-0,000069***	0,000027**	0,000041
	(0,000)	(0,000)	(0,000)	(0,000)
ln_wage	-0,007	0,212***	-0,027	-0,154***
	(0,008)	(0,034)	(0,028)	(0,038)
GDP	9,09E-08	-0,0000036***	0,00000042	0,000001**
	(0,000)	(0,000)	(0,000)	(0,000)
Observations	180	180	180	180
R-Squared	0,974	0,233	0,985	0,962
Countries included	14	14	14	14
Periods included	13	13	13	13

*, ** and *** indicate that a variable is significant at a 10, 5 and 1% significance level respectively.

^{a} indicates the same model, but with time fixed and country fixed effects

(..) indicate the standard errors

Model 1.1 is the full model (without fixed effects) with native- and foreign participation taken into account. In the table can be seen that the constant and the control variables (*ln_wage* and *GDP*) are not significant. All other explanatory variables are significant at (at least) a 5% significance level.

In this model *native_participation* and *foreign_employment* have a (significant) positive effect on *native_employment* of respectively 1,050 and 0,535. This can be interpreted as a percentage point change, so a positive 1 percentage point change of *native_participation* will lead to an increase of 1,050 percentage point of *native_employment*. *Foreign_participation* and migration however have a negative effect on *native_employment* of respectively -0,065 and -0,000011. Participation rate can also be interpreted as a percentage point change. *Migration* however has to be interpreted a little differently since migration is not measured as a percentage. A rise of *migration* by 1(which is a thousand migrants) leads to a decrease in *native_employment* of 0,000011percentage point . So an inflow of 1 million migrants leads to a negative effect on *native_employment* of 0,011 percentage point.

If the native- and foreign participation rate is not taken into the regression model the constant and the control variables become significant. Model 1.2 shows the outcomes of this regression. The constant and *GDP* are both negative and *ln_wage* positive. This means that a rise in *GDP* will lower *native_employment*, which is a contradictionary result. The outcome however is very small and positive in all other models. If the wage rises this has a positive effect on *native_employment*, which is expected because with a higher wage more people are willing to work.

Model 1.1^a and 1.2^a consist of the same variables of respectively model 1.1 and 1.2 but within these models country fixed and time fixed effects are included. In model 1.1^a an important difference is that the effect of migration is now positive instead of negative (as it was in model 1.1). This is in contradiction of the main theory on which this research is based. It follows that an inflow of 1 million migrants will lead to an increase of *native_employment* of about 0,027 percentage point. This suggest that migrants are complements instead of substitutes. In model 1.2^a the results differ a lot from the results found in model 1.2. Again *migration* has a positive impact on *native_employment*. Next to that wage has a negative effect on *native_employment* now, which may suggests that if wages rise, employers demand less labour. GDP and the constant now have a positive effect on *native_employment*.

To get an idea of the explanatory value of the regressions the R-squared statistic is used. All models seem to have a really high R-squared statistic. Only model 1.2 has a low explanatory

value of 23,31%. Model 1.1^{a} has the highest explanatory value with 98,53% of the variation in *native_employment* explained by the regression.

EFFECT OF MIGRATION ON THE TOTAL EMPLOYMENT IN THE SHORT-RUN

The outcomes of the regression set up to test hypothesis 1b are outlined in Table 2. The aim of the regressions is to get results of the effect of migration on the total employment in the short run.

Model 1.3 is the regression used to test hypothesis 1b without any fixed effects. The constant and the control variables do not have a significant effect. Only *total_participation* and *migration* are significant in this model. *Total_participation* has a positive effect on *total_employment* of 1,279. This means that if more people participate in the labour market the employment rate will increase. *Migration* has a negative effect however of 0,00013, this contradicts the theory and the main literature findings. It suggests that *total_employment* will decrease when there is a migration inflow.

In model 1.3^{a} the same regression model is used, but now country fixed and period fixed effects are included. The main changes are that the constant and the control variables are now significant; however *migration* is not significant anymore. Since the main interest for this hypothesis is the effect of migration the conclusions drawn from this regression are that *migration* has no significant influence on employment. Which means that an migration inflow does not contribute to a change in the total employment rate.

The explanatory power of both regressions are 26,20% and 52,64%, which is lower than the explanatory power found in the regressions on the native employment rate.

Table 2: *Regression outcomes hypothesis 1b*

Dependent variable: Total_employment		
Model	1.3	1.3^a
Constant	-0,371	7,443***
	(0,685)	(2,568)
total_participation	1,279***	1,993**
	(0,180)	(1,000)
migration	-0,00013***	-0,000092
	(0,000)	(0,000)
ln_wage	0,0053	-0,825***
	(0,065)	(0,251)
GDP	0,0000009	0,000013**
	(0,000)	(0,000)
Observation	180	180
R-Squared	0,262	0,526
Countries included	14	14
Periods included	13	13
*, ** and *** indicate that a variable is significant at a 10, 5 and 1% significance level respectively.		
^{a} indicates the same model, but with time fixed and country fixed effects		
(..) indicate the standard errors		

EFFECT OF MIGRATION ON THE NATIVE EMPLOYMENT IN THE LONGER RUN

To find results on the longer-run effect of *migration* on *native_employment*, lags will be introduced on some explanatory variables of model 1.1 and 1.2. In Table 3 the outcomes of this estimated model are shown.

Firstly model 2.1 is estimated. This is the full model, with all explanatory- and control variables included. In the table it can be seen that in the model the constant and the control variables

(*ln_wage* and *GDP)* are not significant. All the explanatory variables however are significant at a 1% significance level.

Table 3: Regression outcomes hypothesis 2a

Dependent variable: Native_employment				
Model	2.1	2.2	2.1^a	2.2^a
Constant	0,082	-1,785***	1,128***	2,807***
	(0,112)	(0,397)	(0,403)	(0,401)
Native_participation	1,045***		0,722***	
	(0,017)		(0,120)	
Foreign_participation	-0,650***		-0,431***	
	(0,037)		(0,073)	
Foreign_employment	0,534***	0,490***	0,5449***	0,373***
	(0,024)	(0,098)	(0,034)	(0,036)
migration (-2)	-0,000013***	-0,000076***	0,0000164	-0,00000021
	(0,000)	(0,000)	(0,000)	(0,000)
ln_wage (-2)	-0,003	0,218*	-0,097***	-0,226***
	(0,010)	(0,036)	(0,033)	(0,037)
GDP (-2)	1,09E-08	-0,0000039***	0,00000017	0,00000081
	(0,000)	(0,000)	(0,000)	(0,000)
Observations	154	154	154	154
R-Squared	0,972	0,269	0,987	0,973
Countries included	14	14	14	14
Periods included	11	11	11	11

*, ** and *** indicate that a variable is significant at a 10, 5 and 1% significance level respectively.

^{a} indicates the same model, but with time fixed and country fixed effects

(..) indicate the standard errors

The model does not differ a lot from model 1.1. Again *foreign_participation* and the lag of migration have a negative effect on *native_employment*. It now shows an effect of migration two years ago has a negative effect of 0,0000128. This means that a migration inflow of 1 million two years ago will lead to a decrease of *native_employment* of 0,0128 percentage point. In the longer-

run it was expected that migration has a mitigating effect on *native_employment*, in these outcomes however a (slightly) larger negative effect is found on the effect of immigration in two years than the short-run effect. Also, just as in model 1.1, *foreign_employment* and *native_participation* have a positive effect on *native_employment*. The effects are merely the same, as would be expected since the variables have not changed.

In model 2.2 both participation rates are not taken into account. In this case the constant and all other variables are significant. Just as model 2.1, the differences with model 1.2 are very small. The effects are all the same and differ only in a minimal change of the value of the effect. Again we see that the negative effect of migration is somewhat larger (0,1% per 1 million immigrants), this contradicts the main findings in theory.

Model 2.1^{a} and 2.2^{a} show the same models when country fixed and period fixed effects are included. The first important thing to mention is that the effects of migration are not significant in both models. Thus the conclusion has to be made that the effect of a migration inflow on *native_employment* is not significant. Apart from the significance of migration the other variables show similar effects and thus do these models not add any real value to the research.

Looking at the explanatory value of the models and the significance of migration the best model on the effect of migration on *native_employment* is not easy to be point out. Model 2.1^{a} has the highest explanatory power with 98,68%, however model 2.1 and 2.2^{a} also have high explanatory power.

EFFECT OF MIGRATION ON THE NATIVE EMPLOYMENT IN THE LONGER RUN

Lastly the outcomes of the regressions on hypothesis 2b are discussed. Here the effect of migration, with a lag of two years, on *total_employment* will be shown. The outcomes of the regression are in Table 4.

Table 4: *Regression outcomes hypothesis 2b*

Dependent variable: Total_employment		
Model	2.3	2.3^{a}
Constant	-0,503	5,039**
	(0,431)	(2,024)
total_participation	0,939***	2,638**
	(0,115)	(1,143)
Migration (-2)	-0,00014***	-0,00032**
	(0,000)	(0,000)
ln_wage (-2)	0,045	-0,586***
	(0,041)	(0,218)
GDP (-2)	0,00000033	-0,0000018
	(0,000)	(0,000)
Observations	154	154
R-Squared	0,392	0,577
Countries included	14	14
Periods included	11	11
*, ** and *** indicate that a variable is significant at a 10, 5 and 1% significance level respectively.		
^{a} indicates the same model, but with time fixed and country fixed effects		
(..) indicate the standard errors		

Model 2.3 is the equivalent of model 1.3, but now with a lag of two years on *migration* and the control variables *ln_wage* and *GDP*. The effects are very similar, *total_participation* and the lag of *migration* are the only two significant variables. The effect of *total_participation* is smaller in this regression, a 1 percentage point change of *total_participation* leads to an increase of 0,939 percentage point of *total_employment*. The effect of *migration* is basically the same.

With fixed effects (model 2.3^{a}) the model does change with respect to the model on the short-run effect of migration. The main difference is that the lag of *migration* is significant, as it was not significant in the short-run model. The effect of the lag of *migration* is a negative effect on *total_employment* of 0,00032, which says that *total_employment* will decrease after a migration inflow two years ago. Next to *migration*, the lag of the wage has a negative effect on *total_employment* as well. This means that a rise in the average wage will decrease *total_employment* in the longer-run. *Total_participation* rate has a significant positive effect on *total_employment* in this model.

EFFECT OF MIGRATION FROM SPECIFIC EASTERN-EUROPEAN COUNTRIES

To gain a more detailed insight of the effects of the actual migration inflows from new eastern-European EU members a regression with the inflows of these countries as explanatory variables is set up. The dependent variables are *native_employment* in the first model and *total_employment* in the second model. The outcomes of these regressions can be seen in Table 5.

Before the regressions could be conducted all the variables had to be tested for a unit-root. The results of these tests can be seen in Table 5 in Appendix B. The outcomes were that all variables, except Poland, were non-stationary. This means the first differences of these variables have to be taken to get rid of the spurious effects. After taken the first differences of the variables most variables were stationary, thus they can be used in the regression. Only Slovenia still was non-stationary, so the second difference for Slovenia was taken.

However it followed from the Kao residual cointegration test that there is cointegration between the variables (Table 6 in Appendix B). The p-value of the test was 0,000(<5%), thus the null hypothesis of no cointegration had to be rejected. So the first differences of the variables do not have to be taken after all.

Table 5: *Regression outcomes on migration inflows per eastern-European country*

Dependent variable:	Native_employment		Total_employment	
Model	3.1	3.1^a	3.2	3.2^a
Constant	-2,221***	0,851	0,108	7,246*
	(0,730)	(0,919)	(1,584)	(3,940)
Bulgaria	-0,005**	0,004***	-0,003	-0,005
	(0,002)	(0,001)	(0,005)	(0,005)
Czech	-0,002	-0,018***	-0,127***	-0,051
	(0,011)	(0,006)	(0,024)	(0,032)
Estonia	0.005	0.0004	0,005	0,015
	(0,006)	(0,002)	(0,013)	(0,010)
Hungary	0.013**	0.0002	0,009	0,004
	(0,005)	(0,002)	(0,011)	(0,011)
Latvia	-0,001	-0.009*	-0,016	0,025
	(0,013)	(0,004)	(0,028)	(0,018)
Lithuania	0.025*	-0.001	0,033	-0.042**
	(0,013)	(0,005)	(0,029)	(0,020)
Poland	-0.002	-0.0004	0,003	0.009***
	(0,000)	(0,000)	(0,002)	(0,002)
Romania	-0.0002	-0.0002*	-0,0004	-0.0004
	(0,000)	(0,000)	(0,001)	(0,000)
Slovenia	0.086*	0.022*	-0,060	0,077
	(0,045)	(0,011)	(0,098)	(0,109)
Slovakia	-0.006	-0.020***	0,040*	-0.053*
	(0,010)	(0,005)	(0,022)	(0,027)
GDP	-0,000003***	0,000	-0,000001	0,00002**
	(0,000)	(0,000)	(0,000)	(0,000)
Ln_wage	0,288***	-0,018	0,061	-0,694*
	(0,070)	(0,086)	(0,153)	(0,380)
Observations	117	117	117	117
R-Squared	0,544	0,978	0,580	0,853
Countries included	9	9	9	9
Periods included	13	13	13	13

*, ** and *** indicate that a variable is significant at a 10, 5 and 1% significance level respectively.

^{a} indicates the same model, but with time fixed and country fixed effects

(..) indicate the standard errors

In model 3.1 *native_employment* is taken as dependent variable. It shows that about half of the variables have a significant effect. The outcomes however differ a lot, some have a positive effect and some have a negative effect. It was expected that the effects would have the same effect, since the nationality of immigrants does not seem relevant for the effect on employment. When country fixed and period fixed effects are included (model 3.1^a) the main difference lies in the explanatory power of the model, which is 97,82%. The effects of the migration inflows however still differ per country and are very small.

Model 3.2 describes the relation between the migration inflow per country and *total_employment*. Just as model 3.1 the effects differ per country. However just a few variables are significant in this model. The explanatory power of the model with fixed countries and fixed periods effects is larger, thus any conclusions drawn from this model will be of model 3.2^a. In this model can be seen that only a few variables are significant. Poland is the only explanatory power that is significant at a 1% significance level. Poland has a positive impact on *total_employment* of 0,009. So an inflow of a thousand Polish migrants will lead to an increase of 0,009 percentage point of the total employment rate.

In Table 6 the results are shown when the migration inflows from the eastern-European countries are taken as a whole. The first thing to notice is that within the regressions without country fixed and period fixed effect the variable *eastern_Europe* is not (very) significant and the models have (relatively) low explanatory power. For this reason we look at the regressions with country fixed and period fixed effects. In model 3.3^a only the control variable *GDP* is not significant. In this model the migration inflow from eastern-Europe has a small negative effect on the native employment rate of 0,0005 percentage point per thousand migrants.

In model 3.4^a all variables are significant. In this model a positive effect of migration inflow from eastern-Europe on the total employment rate is found. The size of this effect is with 0,004 percentage point per thousand migrants of recognizable size. For instance this model predicts that an inflow of migrants from eastern-Europe of 1 million will increase the total employment rate in a specific western-European country with 4 percentages points.

Both effects found in model 3.3^a and 3.4^a are in accordance with the theory, as (in the short-run) the native employment rate decreases and the total employment rate increases due to migration.

Table6: *Regression outcomes on migration inflows from eastern-Europe (total)*

Dependent variable:	Native_employment		Total_employment	
Model	3.3	3.3^a	3.4	3.4^a
Constant	-3,838***	2,475***	-0,573	11,887***
	(0,591)	(0,715)	(1,569)	(4,155)
Eastern_Europe	-1,6E-05	-0.0005***	-0,0005**	0,004***
	(0,000)	(0,000)	(0,000)	(0,001)
GDP	-4,29E-06***	3,74E-07	-8,18E-07	1,67E-05**
	(0,000)	(0,000)	(0,000)	(0,000)
Ln_wage	0,442***	-0,171**	0,119	-1,132***
	(0,057)	(0,066)	(0,152)	(0,388)
Observations	117	117	117	117
R-Squared	0,370	0,965	0,038	0,727
Countries included	9	9	9	9
Periods included	13	13	13	13

*, ** and *** indicate that a variable is significant at a 10, 5 and 1% significance level respectively.

^{a} indicates the same model, but with time fixed and country fixed effects

(..) indicate the standard errors

CONCLUSIONS AND RECOMMENDATIONS

The main goal of this thesis was to gain a better insight on the effect of eastern-European migrants on the employment in western-Europe due to the increased labour mobility in the EU. To examine the research was split in two sections; the short-run and the longer-run effect. Different models of the effect on the native employment rate and the total employment rate in several western-European countries are used.

The theory of the basic labour market equilibrium model is used (Borjas, 2013). Within the theory it is assumed that natives and immigrants are substitutes. If that is the case it is expected that a migration inflow will lower the native employment rate in the short run. The total employment rate however is expected to rise due to a decrease in wages. In the long-run this theory states that the demand for labour increases as well and the native employment rate will be at its original position and the total employment has increased.

In the literature no consistent effect is found. Most studies do not find a significant effect of migration on employment. In some papers a negative relation between migration and employment is found, as Van der Waal (2009) finds a negative effect of immigration on the sector level in the Netherlands and Lokshin et al. (2009) find a negative effect on the female labour market. Other papers however find a positive relation between migration and employment. As some studies see natives and immigrants as complements and they create more jobs (Friedberg & Hunt, 1995).

Consistent with the literature, no significant evidence is found in the empirical research. The outcomes with regard to hypothesis 1 show different effects of migration on the native employment rate. As it describes a negative effect in the regressions without fixed effects and a positive effect in the regressions with fixed effects. The outcomes on the total employment rate show a slightly significant negative effect, which is contradictory with the theory.

The outcomes with regard to hypothesis 2 show that in the longer-run migration has a (very small) negative effect on both the native- as the total employment rate. No clear conclusions can be drawn from these outcomes however. The time frame is really short to get clear long-term results. For this reason the available data will become too small if the lag increases.

Next to that the migration inflows specific from the originated country is investigated. The outcomes of these regressions show very different effects per country of origin of the immigrants. Also the effects are really small and only significant for a part of the variables. The size of the variables were too small to draw conclusions from the regressions, as most migration inflows only accounted for a few thousand immigrants and even less for others.

If the total migration inflow from all eastern-European countries is taken as explanatory variable, than the results show an outcome which is in accordance with the theory. The conclusions drawn from these regressions are that a migration inflow from eastern- to western-Europe decreases the native employment rate and increases the total employment rate in western-Europe in the short-run.

Further research on this topic would be needed to draw a clearer conclusion. Recommendations for further research include that a longer time frame is used to investigate the long-run effect of immigration. In this thesis the period after the migration wave was very short to draw significant conclusions in the long-run. Also it is recommended to control for other events. As the only control variables in this research are the wage and GDP, clearer conclusions can be drawn if more control variables are included in further research. Next to that further research can distinguish the type of immigrants. For example investigate the different effects of low-skilled and high-skilled immigrants or investigate sector specific migration.

Finally, this thesis does find an overall negative effect of migration on the native employment rate, in the short-run and the long-run. Also a negative effect on the native employment rate and a positive effect on the total employment rate is found for eastern-European immigration specifically. However the results differ within this thesis with negative and positive effects and not in all tests significant results are found. For this reason no clear conclusions can be drawn on the effect of migration on (native) employment.

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APPENDICES

Appendix A: Correlation tables

Table 1: *Correlations models 1.1 & 1.2*

Variables	FOREIGN_EMPL	FOREIGN_PART	GDP	LN_WAGE	MIGRATION	NATIVE_EMPL	NATIVE_PART
FOREIGN_EMPL	1						
FOREIGN_PART	0.718684	1					
GDP	0.272248	0.076112	1				
LN_WAGE	-0.187890	-0.471389	0.668963	1			
MIGRATION	-0.015971	0.101635	-0.217872	-0.102702	1		
NATIVE_EMPL	0.129460	-0.070670	-0.086146	0.129909	-0.148674	1	
NATIVE_PART	0.007655	0.083775	-0.195711	-0.010125	-0.055568	0.917407	1

Table 2: *Correlations model 1.3*

Variables	GDP	LN_WAGE	MIGRATION	TOTAL_EMPL	TOTAL_PART
GDP	1				
LN_WAGE	0.668963	1			
MIGRATION	-0.217872	-0.102702	1		
TOTAL_EMPL	0.055120	0.014426	-0.222772	1	
TOTAL_PART	-0.139783	-0.133217	-0.051376	0.464974	1

Appendix B: Test results

Table 3: *Unit root test*

Variable	Test statistic	P-value
native_employment	-1,3275	0,0922
d(native_employment)	-5,3547	0,0000
native_participation	-4,3781	0,0000
foreign_participation	-4,9773	0,0000
foreign_employment	-4,2126	0,0000
migration	-2,4323	0,0075
ln_wage	-8,7429	0,0000
GDP	-3,3863	0,0004
foreign_population	9,64597	1,0000
total_participation	-2,8802	0,0020
total_employment	-148,4760	0,0000

Table 4: *Cointegration tests*

Model	Test statistic	P-value
1.1	-6,31419	0,0000
1.2	-3,03366	0,0012
1.3	-2,02382	0,0215
2.1	-2,38489	0,0085
2.2	-2,32489	0,0100
2.3	-2,55676	0,0053

Table 5: *Unit root tests*

Variable	Test statistic	P-value
Bulgaria	0,66476	0,7469
D(Bulgaria)	-5,76665	0,0000
Czech	-1,48989	0,0681
D(Czech)	-6,21953	0,0000
Estonia	1,28865	0,9012
D(Estonia)	-7,02401	0,0000
Latvia	0,65582	0,7440
D(Latvia)	-1,85299	0,0319
Lithuania	0,14863	0,5591
D(Lithuania)	-5,10319	0,0000
Hungary	-3,29559	0,0005
D(Hungary)	2,56763	0,9949
Poland	-1,65428	0,0490
Romania	2,53524	0,9944
D(Romania)	-5,66460	0,0000
Slovakia	-1,30680	0,0956
D(Slovakia)	-4,43215	0,0000
Slovenia	0,12619	0,5502
D(Slovenia)	-1,18498	0,1180
D(Slovenia,2)	-6,37866	0,0000
Eastern_Europe	1,35701	0,9126
D(Eastern_Europe)	-2,19097	0,0142

Table 6: *Cointegration tests*

Model	Test statistic	P-value
3.1	-8,737663	0,000000
3.2	-7,503851	0,000000
3.3	-3,309199	0,000500
3.4	-4,139119	0,000000