Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics

Diploma thesis

Macroeconomic Influence of Immigrants on the Czech Republic

Yulia SYCHEVA

Supervisor: Assoc. prof. Ing. Mansoor Maitah, Ph.D. et Ph.D.

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Souhrn

Tato diplomová práce je založená na analýze míry ovlivnění přímých zahraničních investice (FDI) a přílivem imigrantů v letech 1999 až 2013 České republice

Cílem této práce je shromáždit poznatky o negativních a pozitivních faktorech imigrace z hlediska ekonomiky. Zároveň i nalezení dalších oblastí, které jsou tímto ovlivněny jako obchod a závislost imigrace.

Analytická část je založený na ekonomických a ekonometrických teoriích o sestavení odhadů modelů.

Díky ekonometrické analýze byla nalezena korelace mezi závislou proměnou FDI a některými nezávislými proměnnými jako imigrace, jakožto hlavní vysvětlující proměnná. Výsledkem je prokázání kauzality u imigračních efektů na přímé zahraniční investice.

Tato práce tedy prokazuje, že imigace stimuluje výměnu informací mezi zemí původu a novou zemí, tedy nepřímo vede k vzrůstu investic. Imigranti tedy mají v České republice pozitivní vliv na FDI.

Klíčová slova: Imigrace, FDI, investice, Česká republika, mezinárodní obchod

Abstract

This diploma thesis analyses the influence of immigrants on the Czech foreign direct investment (FDI) between 1999 and 2013 among 18 countries with an account for the biggest immigration stock in the Czech Republic.

The general aim is to organise the gathered knowledge about positive and negative sides of immigration for the economy, as well as, to research new areas which were not covered for the Czech Republic: trade and immigration dependency.
The research is based on the economic and econometric theory building the estimated model. The econometric analysis found a correlation between dependent variable FDI and some of the independent variables including immigration as the main explanatory variable.
The estimated effect proved to have the explained causality of immigration effect on investments.
Therefore study concludes that the immigrant network stimulates the information flow from their country of origin to the host country, indirectly increasing the volume of the investment in the Czech Republic and therefore immigrants have a positive effect on FDI stock in this country.

Keywords: Immigration, FDI, investments, Czech Republic, international trade.

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Abbreviation List

FDI	Foreign Direct Investment
CNB	Czech National Bank
UN	United Nations (intergovernmental organization to promote international co-operation).
EU	European Union
CZSO	Czech Statistical Office (official Czech Database and statistics)
BLUE	Best Linear Unbiased Estimation (estimation with the lowest variance of error term)
OECD	The Organisation for Economic Co-operation and Development
UNESCO	The United Nations Educational, Scientific and Cultural Organization
GDP	Gross Domestic Product (economics)
USD	United States Dollar (currency)
CZK	Czech Koruna (currency)
OLS	Ordinary Least Squares (Method for estimating of unknown parameters in econometrics)
CR	The Czech Republic (country)
USA	The United States of America (country)
CEO	Chief Executive Officer (occupation)
LSDV	Least Squares Dummy Variable Method (Method for estimating of unknown parameters in econometrics)

1. Introduction

Immigration is a key political issue in most of the developed European countries. Czechs argue whenever immigration is more harmful or beneficial for the country. Net migration into the Czech Republic has been rising over the last two decades. In what follows this thesis is focused on a particular aspect of this issue, namely the economic consequences of immigration, concentrating on impacts on the macroeconomics from both: positive and negative sides.

With the issues of asylum seekers in Europe, many countries including the Czech Republic start associate refugees with regular immigrants inbringing the negative aspect of migration to the whole phenomenon, claiming immigrants to have a negative influence on the Czech Republic without distinguishing between working immigrants and asylum seekers.

Czech Member of European Parliament Tomáš Zdechovský positions immigration being a negative phenomenon. "Immigration is a global problem. If we are a part of the EU, which has the immigration among its major priorities for another three years, we must start to do something. It is not only about the quotas," he stated (Bednárová, 2015). These statements not only show immigration in harmful light only but damage other incoming settlers which bring a positive effect to the society and economy. After the immigration crisis in Europe people started seeing immigration as a global problem rather than a benefit. According to (Economist, 2016) the number one problem in Britain according to the questioners is the immigration problem. About 26% of British people called this phenomenon as the biggest threat to the Great Britain. In the United States of America immigration takes 4th ranking counting for 7% of population worrying about immigration problematic.

This was the incentive to start questioning the fact if, indeed, immigrants bring only harm and are the burden for the economy, or there is also a positive side of immigrants in the economy. The outlined problem was barely investigated on a global level as well as the local Czech economy. Without a solid objective research no one can make a rational conclusion if this phenomenon is positive or negative.

Research had started to evaluate objectively the influence of immigration on the Czech Economy from a trade point of view. It is very difficult to cover all the factors which

immigration affects in the positive or negative way. This is why this thesis is concentrated only on a small part of it: The Czech Republic and the trade development with immigration flow correlation. Organising the knowledge about migration hopefully will raise the awareness of this underestimated topic which must have a bigger attention and much better economic analysis coverage.

This research provides a better understanding of the immigration phenomenon competence with the implementation of quantitative empirical investigation on the effects of immigration and the Czech foreign direct investment (FDI) stock and analyses its implications for the Czech economy.

The findings can encourage further studies in this field and can result in better understanding of the macroeconomic influence of immigrants on trade flow in generally and in this particular case, on the Czech economy.

1.1. Structure and Outline

This diploma thesis contains four main parts.

The first part is methodology which shows a number of economic and econometric tools which were selected for this research. It explains the chosen data and period time selected for the assumptions.

The second part is a literature review, which covers a deeper understanding of the stated aim and information gap which this thesis aims to fulfil. The literature review contains overview about migration phenomenon as well as the information about the current situation in the Czech Republic and its connection to the foreign direct investment as well as the factors which affect the trade in the selected country.

Also, second part helps as a preparation for the third part of this thesis which is an analysis which shows the information based on the selected data.

The fourth but not the last part, is the analysis and result discussion can be viewed as a final main part. It investigates practical aspects of the results and set the outcomes into context and perspective on how the results can be applied in the Czech Republic.

This research, also, includes other parts which were important for this thesis preparation and analysis. The conclusion was withdrawn as a part of the research which summarises the whole paper and highlights the main parts of the discovery.

2. Research Aims and Objectives

The specific aim of the thesis is to investigate the theoretical links between immigration and FDI stock from the origin-countries in the case of the Czech Republic. The research aims to enlighten the problematic of underestimated coverage of immigration issues topic, which potentially can bring the attention to further investigations of immigration phenomenon and its direct and indirect positive correlation with trade in a particular country.

Lately immigrants were mentioned by a number of politicians in a content of being an affliction to the economy (Economist, 2016), which raised the purpose of this study to prove or disprove it.

The general aim is to organise the gathered knowledge about positive and negative sides of immigration for the economy, as well as, to research new areas which were not covered for the Czech Republic: trade and immigration dependency. Increasing the awareness of this topic can help in better and more objective judgment about migration phenomenon in future. Hopefully this study can be a trigger for detailed attention to this topic which is barely covered as on a local level, as on the international global level.

Immigration is becoming a more negative term in the light of the last Syrian asylum seekers issues (The Economist, 2015), but it is not necessarily true. This paper aims to objectively justify the influence of immigrants on trade and analyse this topic in-deep.

To study this issue, a number of objectives were created.

First of all, the data regarding FDI stock in the Czech Republic was analysed with regards to the migration movements in this country connected to the country where investments come from.

Secondary, other independent variables were included to maximize the feasibility of the model.

Furthermore, the model testing was accomplished to check the causality of immigration factor and prove that the model consistency is not random but has a significant effect with a proven foundation.

After all, the verification of findings is performed to prove the model robustness and lack of screwness.

Meeting these objectives helped to build the hypothesis and the methodology which can be found in the following chapters.

3. Hypothesis and Research Questions

A number of research questions and the hypothesis was selected to prove or disprove the research aim and conclude this research.

The first hypothesis is analysing the relationship between number of immigrants and Czech FDI:

> *H_1: There is a positive relationship between the number of immigrants from a given country and Czech FDI stock.*

The second hypothesis is not less important and is analysed in this thesis:

> *H_2: immigration is a significant explanatory coefficient for the analysing of FDI stock in the Czech Republic*

Literature Review (Chapter 4) presents an overall description of immigration situation in the Czech Republic and its correlation with bilateral trade.

The econometric model was chosen to analyse the chosen hypothesis.

A number of research questions are selected for a deeper understanding if the selected issue:

1. *Is there any relationship between number of immigrants and bilateral trade (FDI in this case)?*
2. *What other factors affect FDI?*

Both of the chosen hypothesis as well as the research questions will serve as a foundation for practical part of this empirical research. Upon the examinations applicable recommendations are derived on how the outcomes can be integrated into practice.

4. Methodology

Using scientific methodology the economic and econometric approach was chosen.Though there are many aspects which are influenced my immigration in Czech Economy, the aspect of FDI (Foreign Direct Investment) is analysed. In order to fully understand the specifics of Czech immigration and trade situation and, literature base was gathered. Analysed books helped to build a fundament for analytical evaluation of the current problems associated with the immigration and trade volume between the case study country and other related countries. After the analysis the data was gathered from a number of macro-economic statistics web pages, such as: OECD, Czech Statistical Office, World Bank, UNESCO, UN etc.

The best methodology was chosen for the analysis of the impact if immigrants on Czech export, import and FDI. The selected methodology is econometric models which helped in deeper understanding of dependency between dependent variables: FDI and a number of independent variables among which the one of the most considered was immigrant stock in the Czech Republic. Analysis was done using Gretl and Microsoft Office Excel programmes. After the analysis results where withdriven, recommendations were proposed which can help in future model development, future researches and can be useful for the Ministry of Interior of the Czech Republic, which regulates the migration volumes throughout a certain number of policies, laws and enforcements.

4.1. Methodology Discussion

There were a few possible methodologies which could have been used in this diploma thesis, but due to a number of reasons the regression model was chosen. In this chapter some of other possible methods are described and presented for possible future development and researches as well as for analytical conclusion in choosing the best methods for estimation of trade dependency in the Czech Republic and immigration.

4.1.1. Gravity Model

One of the most common methods to use is a gravity model for empirical researches to predict the volume of trade between two given countries. Gravity theory model predicts that the

volume of trade (T_{ij}) is given by a distance between the countries i and j (D_{ij}), their economic masses (Y_iY_j) and A is a constant of proportionality (Anderson, 2010):

$$T_{ij} = A\frac{Y_iY_j}{D_{ij}}$$

Theoretical derivations from the model are based on several assumptions, e.g. complete country specialization in production, identical and homothetic of constant elasticity of substitution type etc. However the model has also been clarified in a wider sense of traditional proportion factors. The Gravity model has not only shown to be one of the most successful economic models providing strong empirical results when investigating international trade flows, the theoretical foundation has also been approved since the introduction and is now well founded in modern economic theories regarding trade in imperfect substitutes (Olsen & Weinberger, 2012).

When investigating the role of immigration in international trade flows the majority of previous studies have applied the augmented Gravity model with the inclusion of the immigrant stock as an additional explanatory variable. However, an exact regression specification and standard variable inclusion are however not defined and established. Additionally, empirical econometric estimation strategies vary across studies due to its dependency on the outlook and type of data used (Olsen & Weinberger, 2012).

All in all, this method is useful and can be applied in next research for comparison with this thesis results but it would need much deeper research for the inclusion of this variable so the model works exactly and represents the real life model for the Czech Republic.

4.1.2. Econometric Estimation Model

Another possible analysis method is economic estimation modelling. It was using many researchers including (Olsen & Weinberger, 2012) in their research of Aarhus University. In the case of the USA the same method was used twice from Oxford University and San Diego University independent case studies (Javorcik, Özden, & Spatar, 2013)and (Foad, 2011) respectively.

All these analyses proved a positive correlation between immigration flow and bilateral trade.

Another research implemented an econometric model based on a logarithmic database which

allowed linearizing the function and therefore easing the model correlation patterns for the program estimations (Kugler, Levintal, & Rapoport, 2013).

As stated in the work of (Olsen & Weinberger, 2012): "When investigating the role of immigration in international trade flows the majority of previous studies have applied the augmented Gravity model with the inclusion of the immigrant stock as an additional explanatory variable. However, an exact regression specification and standard variable inclusion are however not defined and established.

Additionally, empirical econometric estimation strategies vary across studies due to its outlook and type of data used".

This method can provide a full overview of FDI and discuss the problematic from different angles to understand and cover the trade from all available information.

4.1.3. Cost-Benefit Analysis

Another possible method is to count how much government spends per 1 immigrant per year and estimate the approximate benefit from the immigrant. Quantitate cost-benefit analysis would cover and compare if immigrants in the Czech Republic are harmful to the economy.

This method would be a demanding challenge. As it is difficult to count all the benefits and harms immigrant brings in, it depends on his or her occupation, age, sex, health condition and income and duration of stay.

Moreover, there is a lack of data about migrant turnover period or amount of money each immigrant sends home to support the family which stood in the home country.

Another important factor is that immigrants bring indirect benefit for the country, creating business and giving jobs to locals, as well as, increasing the population and as the result the aggregate consumption.

All these figures would be hard to find and estimate, as some data is completely missing, other can be misleading, for example, the number of illegal immigrants. Also, it would be difficult to compare the expenditures of a government per foreign student versus foreign entrepreneur starting a business in the Czech Republic.

All in all, it would be a great tool to measure the macroeconomic effect of immigrants on the economy, but it is too complete and vast to accomplish it as there is data missing, misleading

data could be found and indirect costs and benefits would be very difficult to quantify and bring to the realistic numbers.

4.2. Chosen Methodology

This research was based on the choice of econometric model with gravity model background. This paper would get the best out of two methodologies. First of all, it would take the essentials from gravity model theory and the parameters of GDP and distance between countries were unplugged into the econometric model with the main explanatory variable being the immigration phenomenon.

One-equation model for FDI and simultaneous model for export and import as these two are interconnected and affect each other. This method is the most accurate; as it covers many factors which could affect bilateral trade and assume that it is not only immigrant stock which affects the volumes of trade. Also, it can be easily modified for future researches.

Data contains 1 unit vector, 7 independent and 1 dependent variables within 18 cross-sectional units (18 countries) and each unit containing 15 time-series observations (data is analysed from the year 1999 until 2013).

This data range is chosen due to a number of related factors. First of all, it is very difficult to find the data before the year 1999. Secondary due to the communist regime in the Czech Republic, the immigration and trade was heavily affected by the government and therefore cannot a good representative of this research of the free market, after the year 1992 the free market started evolving and became significant for the analysis only by the end of the 90s.

Data after 2013 is not included due to conflicts on the territory of Ukraine and trade sanctions with EU and Russia which affected the natural flow of trade. The chosen regression is not adapted to these extreme conditions and therefore cannot present a reliable research after the year 2014, since Ukraine and Russia account for 1st and 3rd the biggest migration stock in the Czech Republic. This atypical political situation could be in plugged into the model using the dummy variable (0 – there is no armed force in the country, 1 - there is a conflict where the examined country is included), but it is still difficult to find FDI data from open based sources as the Czech National Bank did not publish the detailed per country data after the year 2013 yet (CNB, 2016).

4.2.1. Assumptions and Limitations of the Research

Due to this the following description of the explanatory variables and their influence on the dependent variables applies to set of models and tests which were applied. As mentioned before, this model analysis the impact of immigrants on the FDI coming to the Czech Republic from 18 different countries within 15 years range. The dependent variable FDI is explained by 7 independent variables and 1 unit vector.

Assumptions

The main assumption is that the chosen model is the Best Linear Unbiased Estimate (BLUE), meaning that the chosen equation the best describes the variables of dependent y using the series of independent x.

The BLUE model also means that the model does not contain heteroscedasticity, which is inconstant error term variance. The model is normally distributed (the Gauss curve) and there is no serial correlation (covariance is equal to zero).

Another assumption is that than stronger economically dissimilarity of the Czech Republic to its trade partners, than stronger is the immigration-trade connection.

Immigration versus trade link depends on the regional location and country of origin of the immigrant.

Limitations

Limitations of the model include a shallow pool of open databases as well as the difference in statistic gathering methods. Also, time constrain is a big limitation as the model cannot be proven older than in the year 1999 and earlier than 2013.

Another factor which limits the Czech Republic is the relatively small volume of immigrants coming to the country as well as the immigrant versus native people shares. The effect, probably, could be better seen in a bigger economy country with a bigger immigrant share living on the territory of the chosen country.

Nevertheless, it is believed that the outcome of this research is sufficient to prove or disprove the stated hypothesises using the built regression model.

4.2.2. Econometric and Economic Models

In order to prove the hypothesis and answer the research questions, an econometric model was built. All the variables were logarithmized to stabilise the variance of each parameter.

Natural logarithm $x = ln(x)$ was used for numbers bigger than 0. Numbers smaller than 0 were estimated using the following equation:

$$-x = Sign(x) * ln(|x|)$$

The analysis was done in GRETL programme for statistics. Selected panel database was organised in Ms Excel file and plugged into the mentioned statistics programme.

In order to prove the influence of immigration on trade, the immigrant variable must be an independent one, explaining some correlation with dependent variables. A number of researches find a moderate or strong correlation between immigration flow and volume of trade (export, import, and foreign direct investments). As immigrants improve the information stream to their home country and back to the host country. The immigrant is better aware of market advantages and potentially possible new opportunities of each of the country, so immigrant is able to indirectly attract immigrants and establish an information flow, as well as, to start the business and use his or her capital from the home country.

The tested hypothesis is that Foreign Direct investment stock in country i, coming from a county j depends on number of immigrants coming from county j to country i stacked in 1000 people, GDP at market prices (constant 2005) in country j, Population in country j, belongings of country j to EU membership (in form of dummy variables, where 1 stands when country belongs to the EU in particular year), first difference in the percentage change of the exchange rate between the country j and i comparing with previous year and linguistic difference between country i and j. The general economic model is following:

$y_1=(x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8)$

When $y_t= f(x_1, x_2, x_3,…., x_n)$*, therefore:*

$FDI_{ij}=f\,(Unit\ Vector,\ Number\ of\ Immigrants_{ij},\ GDP_j,\ Distance_{ij},Population_j,\ EU_j,\%\Delta Exchange\ Rate_{ij},\ Linguistic\ Distance_{ij})$

With the following hypothesis:

H_0 *– there is no significant correlation between endogenous and exogenous variables.*

H_1 *– there is a significant correlation between endogenous and exogenous variables.*

The hypothesis can be proved or disproved using p-value of each coefficient. P-value evaluates how well the sample data supports the argument that the null hypothesis is true.
If p-value is lower than α level we have to reject the H_0 in favour of H_1.
Parameters are significant for our model if the p-value is lower than alpha value level.
The general econometric model is:

A more detailed data description with a logical background in choosing them is explained in the following chapter (Data Description and Specification).

The analysis was performed using OLS Pooled method first to see if there is a dependency among all the variables without the distinguishing between separate countries.
After, panel data test was used in order to estimate which method of the analysis is the best: pooled, fix-effect or random-effect model.
From the test the output showed that the fixed effect method is the best and it was applied to the equation. This type of the model estimates and distinguishes between separate cross-sectional units (18 countries in this case).
In order to test the significance of immigration which is the main aim for this thesis, the parameter x2 (Number of immigrants) was excluded from the model to check the new quality of estimation with and without the mentioned parameters. Models were compared to conclude and confirm or reject the hypothesis that immigrants have a significant effect on the model with a proven causality.
After all, the economic and econometric verification of the model was performed in order to analyse if the model is, indeed, BLUE (Best Linear Unbiased Estimate) and fits with economic theory.
In case it is true and the model is BLUE, the best equation had been found; data isn't biased and represent the real picture of the reality.
In case it is not true and the model fails to pass the BLUE parameter. There must be significant changes done to improve the model quality, the parameters selection could be revised as well as there is a possibility in future database improvement for the selected model. For this estimation there is a big chance of the model to fail the BLUE criteria as FDI depends

on number of factors which some of them could be omitted and these factors vary depending on economic and political situation and stability.

The conclusions were withdriven out according to with the evaluation of the model which helped in better understanding of the phenomenon of immigration in the Czech Republic.

5. Data Description and Specifications

It is a preliminary econometric research, which uses panel data type. This chapter is describing the data selection and logic behind the selection of each variable.

The 18 countries were chosen according to their volume of immigration stock in the case study country. Ukraine, the Slovak Republic, Vietnam, the Russian Federation, the Republic of Poland, the Federal Republic of Germany, the Republic of Bulgaria, the United States of America, Romania, the Republic of Moldova, the People`s Republic of China, the United Kingdom, the Republic of Kazakhstan, the Republic of Belarus, the Italian Republic, the Republic of Austria, the French Republic and the Netherlands (totally 18 countries) are the biggest migration stock in the case study country selected for the analysis.

The lifespan of the investigation is limited to 15 time periods for each of the observed countries from 1999 until 2013. The main reason for the limitation of the dataset is that there is no or very limited open source information about Czech FDI before the year 1999, moreover a different analysis method was used so the datasets for years 1992-1999 cannot be fully compared with data after 1999. Another main factor which affected the choice of this group was that before the year 1999 there was relatively insignificant FDI stock, which could negatively affect the data quality.

All data was logarithmized (put in natural logarithm$x = ln(x)$) where for negative numbers – x the following equation was used:

$$-x = Sign(x) * ln(|x|)$$

The fact that the model was chosen based on the biggest volumes of one of the independent variables but not a foreign direct investment, the model expects to have small biases.

All data is gathered from official data resources and counted in United States Dollars (USD). The official databases used include: CZSO (Czech Statistical Office), OECD, The World Bank, United Nations Database, Czech National Bank etc.

5.1. Dependent Variable Description

Foreign direct investment (FDI) is a dependent variable which expects to be affected by 7 independent variables and 1 unit vector. FDI is counted in million USD of investment stock in

the current year by country of origin where the investment came from. In the period of time 1993-1998 there was no or very limited data about FDI stocks in the Czech Republic, the volumes were relatively small compared to open market neighbour economies, but the case study country started experiencing a fast interest in foreign investors. The most interesting correlation which is tested is a dependency of FDI and volume of immigrants and correlation within them. Theoretically, Immigrants have a greater awareness of market in their home country and in the host country they stay in currently, so there is a bigger possibility for an immigrant to start a trade or bring on an investor from their home country, as it was discussed in the Literature Review chapter.

5.2. Independent Variables Description

The flowing provides a detailed description of exogenous variables and the logic behind their selection. The first explanatory variable is X_2, as X_1 is a unit vector.

X_2 - Number of immigrants in the host country

The bigger number of immigrants than higher awareness of immigrants is regarding the possible trade between the hosting country (the Czech Republic), and the country of immigrant origin. It is expected to see a *positive correlation* between this exogenous variable and endogenous one. Data is collected from the Czech Statistical Office. For this research, immigrants with the long-term or permanent type of visa are the groups in the research counted in thousands of people separated according to the nationality. Refugees and asylum seekers aren't included in the analysis, as they stay in the country for a short period of time and expected to have no or minor direct effect on trade.

X_3 - GDP at market prices (constant 2005 US$)

GDP at market prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2005 U.S. dollars. Dollar figures for GDP are converted from domestic currencies using 2005 official exchange rates from (The

World Bank, 2016) and expressed in millions.

The gross domestic product represents economic masses. In accordance with the Gravity model the factor is expected to have a positive influence – the level of trade between two nations is proportional to the product of their economic size, therefore GDP should have a *positive effect* on the trade volume. For this research the real yearly GDP in USD per country is chosen to prove the correlation. The data is collected from World Development Indicators database.

X4 - Distance between the Czech Republic and country of immigrant origin

The distance between the Czech Republic and the different trading partners is calculated as the distance between the biggest cities of the two countries weighted with the share of the population of the city in the overall country population. In accordance with the Gravity model the factor is expected to have *a negative effect*. Geographical distance represents transportation costs associated with good transportation, as well as international transaction costs. Also, the distance between countries increases the information gap and therefore a higher cost associated in extracting it. Data is withdriven from DistanceFromTo.net web page based on areal distance in kilometres between current capital cities of two countries (in this case the Czech Republic and country of immigrant origin).

X_5 – Population

Population is expected to have *a positive effect* on trade. Big country potentially has bigger trade interest and therefore is included in this thesis, counted in million people. Data is taken from (UNESCO Institute for Statistics, 2013).

X_6 – EU membership

EU membership is included in a form of dummy variable, where 0 are the countries which are not in EU zone and value 1 states for countries which belong to European Union throughout the analysed time (from 1992 until 2014). Meaning that if, for example, Slovakia joined European Union in 2004, from the year 1992 until 2003 the dummy variable would represent 0, and after 2004 the value 1 would be attached to it. The expectations are that EU countries

have a bigger potential and therefore there is *a positive correlation* for trade with the Czech Republic, as there are fewer trade barriers and easier transportation regulations than for other countries. Data is taken from (Countries-ofthe-World, 2016).

X_7 – Exchange rate

Fluctuation of Czech Koruna directly affects the increase or decrease the value of the currency, which respectively increases or decreases the price of Czech goods and services. A relative positive change is expected to have a negative impact on FDI stock in. A percentage difference between two time periods, in this case, years was used as the explanatory variable for a unit of foreign currency per Czech Koruna.

X_8 - Language genetic proximity

Language distance between two countries has a vital role for trade purposes as well as immigration, as language similarity makes it easier for two countries to communicate and as the result there is a bigger chance for a trade to be established between people from different nationalities. Language similarity also implicates culture similarity, so language distance is expected to have a *negative effect* on the dependent variable. Language genetic proximity potentially can significantly affect trade volume and this is why this variable is chosen for the research. The distance between two given languages was quantified by (Beaufils, 2012) where:

- Between 1 and 30: Highly related languages. Protolanguage (common "ancestor") between several centuries and 2000 years.
- Between 30 and 50: Related languages. Protolanguage approx. between 2000 and 4000 years.
- Between 50 and 70: Remotely related languages. Protolanguage approx. between 4000 and 8000 years.
- Between 70 and 80: Very remotely related languages. Protolanguage older than 8000 years - but at this level, there is a high interference with chance resemblance.
- Between 80 and 100: No recognizable relationship: the few resemblances measured are more likely to be due to chance than to common origin!

The average genetic proximity of all languages of this study is 71.8. The average statistical expected value is 83.36 with an average standard deviation of 5.03. The expected values and expected standard deviations stated in the pairwise comparisons are specific to these comparisons and reflect their own exposure to chance.

There are repetitive languages in the selected group of analysed languages as US and UK citizens speak English, the same can be said about Austria and Germany. For the countries with multiple main languages the official and most used was selected: For the Netherlands it is Dutch language and Mandarin for China.

As the result, data shows that the closest language is Slovak, which scored 5.4 (highly related languages) and the most distant one is Mandarin language, scored 90 (no recognizable relationship). Quantified data is taken from Elinguistics.net research.

6. Literature Review

For a deeper understanding the global topic of immigration, as well as the case study Czech Republic, it is important to understand a theoretical background which gives the fundamental understanding of this topic. In this chapter several important issues are discussed: reasons for migration, history and current migration situation in the Czech Republic, policies and possible future development of migration phenomenon.

(National Geographic, 2005) Migration (human) is the movement of people from one place in the world to another. People can either choose to move ("voluntary migration") or be forced to move ("involuntary migration").

Emigrant: A person who is leaving a home country to live in another.

Immigrant: A person who is entering a country from another to make a new home.

Refugee: A person who has moved to a new country because of a situation in their former home (e.g., war).

6.1. Incentives for Migration

Temporal and active migration was not popular until last century, people moved in general on short distances in the short run or if moving to longer distance for a great period of their lives. Due to these factors as well as high costs and travel risks as well as unpredictability and lack of food kept people in their home countries. After a latest 20s century immigration "boom" around 3% of nowadays world population lives outside of the country of its origin. It is a natural effect of globalisation (Bodvarsson & Van den Berg, 2009).

It is remarkable that even though economical reason is counted as the main reason for immigration, the citizens of the poorest countries of the world do not move in big volumes. The main reason is a purchasing power. Immigration is a costly and risky process. Not only one has to buy a flight ticket but save money in case he or she is not able to find job for some certain time. People with small or almost no income are not able to afford themselves to move to developed countries, where monthly costs for basic goods and services sometimes exceed yearly income of average citizen of developing country (Bodvarsson & Van den Berg, 2009). Moreover there are still 774 million illiterate adults, meaning that these people are not able to read and write (UNESCO Institute for Statistics, 2013). This layer is not able to find a job in

developed countries as they have no skills to offer in the industrialized world. These reasons keep people from the least developed countries to move abroad. By the year 2014 the world biggest emigration outflow was from Spain (United Nations, 2013). The main incentive for it is high unemployment rate. Spain deals with

The book of (Portes, 1995) explains the sociological reasons for immigration, staying in a different country and working abroad from economic point of view. Detailed information about duration economic reasons and physiological explanation help predict and learn what to expect from foreigners in future. Furthermore, it helps to forecast the logic, push factors and duration of migration.

"Sociologists of immigration have noted a number of empirical anomalies that systematically contradict these predictions. International labour migration largely originates in countries at an intermediate level of development rather than in countries where wages are lowest. Furthermore, in these intermediate countries, the very poor and the unemployed are not the first to migrate and are generally underrepresented in the outbound flow. Instead, it is people with some resources—small rural proprietors, urban artisans, and skilled workers—who most commonly initiate and sustain the movement. But of course, not all of them leave. Migration is a highly selective process in which certain urban areas and rural communities become prime sources of the movement, while other areas of comparable socioeconomic makeup are not touched by it (Portes, 1995)."

While (Borjas, 1990) tries to look at immigrants as factors that influence US economy. He writes about immigrants and their influence on American economy describing and giving types of different foreigners.

"The USA became an International Labour Market giving opportunities to immigrants and offering workplaces. The US attracts relatively unskilled workers comparing to Australia and Canada, so immigrants neither compare with natives when it comes to the labour market, nor pose a threat to them (Borjas, 1990)".

Alejandro Portes also mentions the division of immigrants in the group they belong to:

There are 3 types of Social Expected Duration of immigration (SED): "socially prescribed, collectively expected and patterned temporal expectations (Portes, 1995)."

Socially prescribed - term of staying in a foreign country is regulated by certain law so a

foreigner cannot exceed the dates of visa.

Collectively expected - in case of war, riots or revolutions some people prefer to move to another safer country but in most cases only for the period of unstable situation at home . "What distinguishes these durations from socially prescribed duration is that they tend to be imprecise, are rarely formalised and we can infer, depend on frequent, no routine, group interaction. Immigrants can create enclaves in which they speak their native language, who in stores owned by co-ethnics, and even be employed by co-ethnics (Portes, 1995)."

Patterned temporal- is a group which settles a family in a new country, finds a good job and plans to raise children in a new hosting country. "Seeing immigration as temporary is likely to increase these ambivalences. For example, temporary immigration is often associated with the separation of family members, as when the husband migrates and leaves the wife and children behind. Even when husband and wife move together, there are still likely to be ambivalences about responsibilities toward parents left behind and the extent to which the immigrant should, or needs to, keep in touch (Portes, 1995)."

From another hand (Bodvarsson & Van den Berg, 2009) have their own point of view on the types of immigrants which exist:

Settlers – a group of people who immigrates to another country with a purpose to stay there permanently. For example, a big group of Slovaks settle in the Czech Republic raising their children there.

Contract workers – Usually seasonal workers, who come to a host-country for a temporal period of time, agriculture labour, domestics sector or tourism. Greece is dependent on seasonal workers, tourism maintain country earnings and emerges a need for seasonal labour.

Professionals – High educated managers CEOs or directors, often work for corporations or international companies. A good example can be military workers from the USA in Germany. Germany hires educated, high-skilled American soldiers to maintain its military strength.

Asylum seekers – "These are people who left their home countries to escape political, religious, or social persecution, or other threats to their safety and well-being." After June 30, 2013, when the president of Russian Federation banned "Propaganda of non-traditional sexual relations to minors" (Grekov, 2013)and signed an anti-homosexual law, stream of Russian homosexual asylum seekers appeared in the USA and Europe.

Involuntary immigrants – group of people who were forced to immigrate. Africans until 19 century were involuntary immigrants; they had been taken as slaves to the New World.

Students - it is a very different type of immigrants: people who travel to another country in order to obtain higher or additional education.

Illegal immigrants – people who were not permitted to enter one country but they crossed the border breaking the law (Bodvarsson & Van den Berg, 2009)

The economist (Portes, 1995) is sure that usually people move as a community, not by individuals. Families or close relatives move for a long term time abroad to find a better job, better social level of life or satisfying amenities. Once someone moves, the destination becomes attractive for their relatives and close people too; reunification of the family bonds is one of the top factors of emigration. These family chains is what makes other people follow one and fills in a destination with co-ethnics from the same country of origin, bursting into a big number of immigrants and making trends of migrations. Sometimes, the same chains and feeling of the responsibility for the family at home make immigrants return to their home countries.

"The fact of individual immigration arises a new generation of co-ethnic immigration and can give a start for new community migration: "Family reunification provisions brought in over 80% of the 643000 immigrants admitted in the fiscal year 1988 (Portes, 1995)."

Individuals usually emigrate due to a weak relationship with family members. Usually, it is a young or not married person who wants to try a new experience and his or her own skills in a new environment in order to receive some higher standards of living. Often, they do not have anything to lose at a home country that is why they are willing to take a risk in a new hosting place.

Later, (Bodvarsson & Van den Berg, 2009) also researched the reasons to migrate.

They analysed immigration from different angles, not only considering immigrants as a labour factor but as consumers and tax payers.

Looking for the factors which influence people to move they found out that there are very different facts which affect people in their decision. It could be a better salary or a better satisfying job, climate conditions, social securities, level of social life or public goods, school, political and economic stability.

These economists describe Borjas` findings of labour demand and its influence on the labour market. In case of labour shortage a person who does not have a chance to find a well-paid job in a home country has a chance to earn more abroad or vice versa. For example, the Czech chef who specialises in the Czech cuisine and very known between his co-ethnics, might not find the same popularity in another country, simply because the Czech food is not that famous abroad (Bodvarsson & Van den Berg, 2009).

"Canadian doctors who obtained their schooling in Canada should easily be able to transfer their skills to the U.S. and continue to earn relatively high incomes after migration. In contrast, a ρ that is positive but very small implies that skills do not transfer well across borders. It is also possible that $\rho < 0$, which is the case if a person's skills generate relatively low (high) earnings at home, but relatively high (low) earnings in the destination country (Bodvarsson & Van den Berg, 2009)."

Also, they introduce the summary of push and pull factors for immigration and against it. Factors which make people move abroad or keep people on the place they are already. Picture 1 is based on (Bodvarsson & Van den Berg, 2009) and (Gamesby, 2013) researches. "Push" factors are the factors which motivate to migrate. "Pull" factors make one country be more attractive to immigrate. "Stay" factors are the reasons which keep one person in a home country and "Stay away" factors make a hosting country less attractive for migration.

This factors where adapted to the case study the Czech Republic:

Table 1: Push and Pull migration factors.

Home Country	**Destination Country**
Push Factors	**Pull Factors**
Low income	Higher wages
Poverty	Higher social status
Undesirable weather	Better climate
Wars, revolutions	Peace
Unemployment	Employment
Discrimination	Personal & economic freedom
High level of crime	Low level of crime

Forced military service	Family reunion
Religious persecutions	Religious freedom
Low public goods and services	Better public goods and services
Lack of amenities	Demanded amenities
Social immobility	Social mobility
Low social securities	Educational opportunity
"Stay" factors	**"Stay Away" factors**
Family	Language barrier
Friendship	Cultural barrier
Social status	Low social status
Employment	Unemployment
Property	Lack of political or social rights
Cultural familiarity	Uncertainty
Certainty	
Political and religious privileges	

Source: Bodvarsson, Ö. B., & Van den Berg, H. (2009). Economics of Immigration Theory and Policy. New York: Springer.

The push and pull factors were adapted to the case study: Czech Republic. There is a list of factors which make people stay away from this destinations or move, it could be internal factors which motivate or demotivate potential foreigners and these factors are listed in "Push" and "Pull" part of the sector. Some of the reasons affecting immigrant can be external, as shown in "Stay" and "Stay away" factors. The most common incentive is financial; people look for a better opportunity abroad (Bodvarsson & Van den Berg, 2009). For example, in case of the Czech Republic, the second largest migratory group is Slovak; they do not have cultural or language barrier as strong as other nationalities. Slovak language is generally accepted in media, universities and schools and is used without translation to the Czech language. It is much easier to migrate for Slovaks to the Czech Republic comparing other migratory nations as there are less negative factors they have to deal with.

6.1.1. E.G. Ravenstein Laws

E.G. Ravenstein invented a group of laws in 1970`s which explain the general rules of migration based on his research and data evaluation. E.G. Ravenstein found out that there are certain patterns which migrants follow. Though these laws were invented almost 50 years ago, they still work in present world:

(Grigg, 1977). Grigg extracted the summary of E.G. Ravenstein work and put them in organized collection.

Ravenstein Laws:

a. The majority of migrants go only a short distance.

Though there is a big development of global transportation system and flight tickets are cheaper than they have ever been relative to the average salary, people still tend to travel short distances. For example the biggest immigration group to USA is Mexican. Mexican group accounts for 25% of all immigrants living in US. (Baker & Rytina, 2013)

The Czech Republic records a similar tendency: in 2013 the biggest immigration groups were formed by Ukraine (23.9% of all immigrants living in the Czech Republic with long-term or permanent visas) and Slovakia (20.7%). (Czech Statistical Office, 2013).

Slovakia and Ukraine are very close to the Czech Republic this is one of the trigger factors which make these ethnic group to immigrate to the Czech Republic. Of course, Ukrainian`s and Slovak`s migration is not explained only by the distance to country to move but also by common history, culture and belongings to the same language group.

b. Migration proceeds step by step

As internal migration occurs (moving from villages to bigger cities inside one country), some job places become unoccupied which leads to a wave of foreign migration which fills in the shortage, after some time they are likely to move to cities too.

c. Migrants going long distances generally go by preference to one of the great centres of commerce or industry

The cost and risks of migration are reasonable only if there is a great opportunity, which can be usually found in big cities or agglomerations.

d. Each current of migration produces a compensating counter-current.

As people leave their jobs, it increases local labour undersupply, which makes other mass

compensate it moving for available jobs.

e. The natives of towns are less migratory than those of rural areas
f. Females are more internal-migratory than males, but males more frequently venture beyond the home country border.

In case of the Czech Republic this tendency is proven. Female immigrants from Ukraine, Slovakia, Vietnam and Russia account for 46.1%, 45.7%, 43.7% and 55.9% respectively. All the countries except for Russian Federation have the same tendency: majority of international migrants are male. (Czech Statistical Office, 2013).

Internal migration though has a totally different picture: Among foreigners, the greater number of internal migration is represented by females: 51.8% of migration among foreigners within the Czech Republic is done by females on average form the year 2003 until 2007. A very similar picture can be seen among Czech natives, where males are minority in internal migration accounting for 46.7% of all migration on average for the year 2013. (Czech Statistical Office, 2013).

g. Most migrants are adults: families rarely migrate out of their county of birth.

The reason for this phenomenon is that it is more complicated to move as a group, it is more difficult to adapt to new place for children, there are greater risk which parents do not want to expose their children to.

i. Large towns grow more by migration than by natural increase

The Czech demographic health is sustained by immigrants mainly. The whole country is dependent on immigrants in case of the Czech Republic.

j. Migration increases in volume as industries and commerce develop and transport improve
k. The major direction of migration is from the agricultural areas to the centres of industry and commerce
l. The major causes of migration are economic.

The main factor which pushes people to migrate from relatively political stable country is economic reasons. It could be a greater financial opportunity in migratory country, unemployment in the home country etc.

These thirteen Ravenstein Laws represent typical behaviour and conditions which push or pull

the immigrants towards moving or staying in the home country.

6.2. The Czech Republic as a Migration Location

The Czech Republic is becoming more and more attractive immigration destination. It is a landlocked country in Central Europe, which became a separate state in 1993 after Czechoslovakia split. Its GDP composition in the year 2014 was: 2.7% in agriculture, 37.8% industry and remaining 59.5% were services (The World Factbook, 2016).

The Czech Republic's main export partners are Germany, Slovakia and Poland while its main import partners are Germany, Poland and Slovakia, respectively according to the volume of trade (Europa.eu, 2015).

The most numerous group of migrants residing in the Czech Republic recently comes from Ukraine (119 thousands persons), followed by Slovakia (81 thousands), Vietnam (58 thousands) and Russian Federation (32 thousands). Among the top 10 countries of origin belong also Poland, Germany, Moldova, Bulgaria, United States and China. The traditional high numbers of migrants from Ukraine and other former Eastern bloc countries might be explained by the geographical and cultural proximity of these countries (CZSO 2012a).

As (Blahoutová, 2013) states in her summary: during the communist regime more than 550 thousands Czechoslovak citizens left the country because of political and economic reasons (Drbohlav 2005). On the other hand, only a limited number of temporary workers, students and trainees came to Czechoslovakia from other socialist countries. The picture of in- and out-migration flows has rapidly changed after 1989 with the democratization process of the country. The number of foreigners residing in the country has been steadily increasing. From 78 thousands persons in 1993, it rose to its peak of 439 thousands in 2008. Recently, foreigners with long-term and permanent residence represent approximately 4 percent of the total population (434 thousands) (CZSO 2012a).

From the year 2008 the tendency reversed again and was marked by a sharp decrease of migration inflows into the Czech Republic. Due to the world economic crisis, the number of newly coming foreigners reduced by 46% internally (2008/2009) what was the biggest drop among all OECD countries (OECD 2011).

Geographically the migrants reside mainly in greater cities with relatively low unemployment rates. One third of all migrants lives in the capital city of Prague (160,783 persons). Except from Prague, a higher proportion of migrants can be found living in greater cities such as Pilsner, Brno, Ostrava, Karlovy Vary, and Mladá Boleslav. Foreign residents are also to be found in the industrial areas in the central part of Bohemia as well as in the border regions in the North-Western and North-Eastern parts of the country (CZSO 2012b).

6.2.1. Immigration History to the Czech Republic

Human migration history started earlier than it could be expected. First tribes with total population no more than 10,000 people started fighting for their lives trying to survive in the wild world full of danger and treats, as Gugliotta G. (2008) writes.

Today's scientists believe that from human`s beginnings in Africa, the modern humans went first to Asia between 80,000 and 60,000 years ago. By 45,000 years ago, or possibly earlier, they had settled Indonesia, Papua New Guinea and Australia. The moderns entered Europe around 40,000 years ago, probably via two routes: from Turkey along the Danube corridor into Eastern Europe, and along the Mediterranean coast. By 35,000 years ago, they were firmly established in most of the Old World. The Neanderthals forced into mountain strongholds in Croatia, the Iberian Peninsula. The Crimea and elsewhere, would become extinct 25,000 years ago. Finally, around 15,000 years ago, humans crossed from Asia to North America and from there to South America.

In middle eve temporal immigration still was not a common thing, the biggest migration flow was in 1650 when Europeans started to migrate to North and South America. The ocean passage from England to one of the North American colonies cost the equivalent of half a year’s wages for a farm labourer that time (Bodvarsson & Van den Berg, 2009). According to (Bodvarsson & Van den Berg, 2009) there were the obvious dangers of crossing oceans and passing through hostile territory like bad weather conditions, wild north, unpredictability of ocean flows, low technology development and lack of food and water.

In the 1800s, European immigrants seeking to settle in Oregon, in the North-western United States, had to survive an ocean voyage on a sailing ship followed by a gruelling 2,000-mile wagon train journey that took months and claimed many lives. For some immigrants the

journey to the United States is still dangerous today: In 2000, 369 illegal immigrants died crossing the desert to reach the United States from Mexico (Bodvarsson & Van den Berg, 2009).

The current unstable situation in Syria claims many lives, who try to escape to Europe in hope for a better life. So far more than 2,600 migrants are known to have died crossing the Mediterranean Sea to reach Europe in 2015 (The Economist, 2015).

Speaking about immigration history in a particular case: The Czech Republic, some of the related events must be highlighted: at the close of World War I, the Czechs and Slovaks of the former Austro-Hungarian Empire merged to form Czechoslovakia. During the interwar years, having rejected a federal system, the new country's predominantly Czech leaders were frequently preoccupied with meeting the increasingly strident demands of other ethnic minorities within the republic, most notably the Slovaks, the Sudeten Germans, and the Ruthenians (Ukrainians) (The World Factbook, 2016).

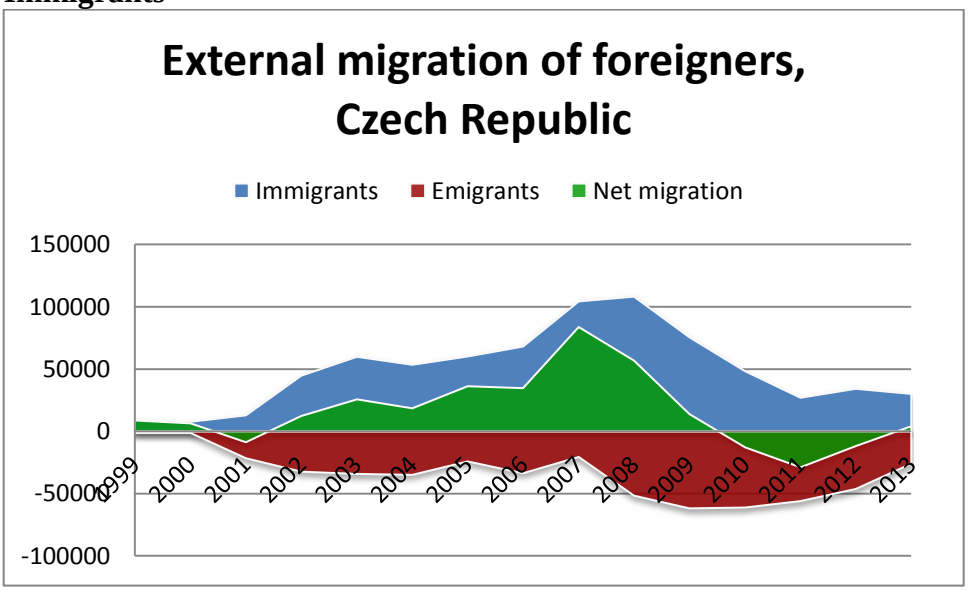
On the eve of World War II, Nazi Germany occupied the territory that today comprises the Czech Republic, and Slovakia became an independent state allied with Germany. After the war, a reunited but truncated Czechoslovakia (less Ruthenia) fell within the Soviet sphere of influence. In 1968, an invasion by Warsaw Pact troops ended the efforts of the country's leaders to liberalize Communist rule and create "socialism with a human face," ushering in a period of repression known as "normalization." The peaceful "Velvet Revolution" swept the Communist Party from power at the end of 1989 and inaugurated a return to democratic rule and a market economy. On 1 January 1993, the country underwent a nonviolent "velvet divorce" into its two national components, the Czech Republic and Slovakia. The Czech Republic joined NATO in 1999 and the European Union in 2004 (The World Factbook, 2016).

6.2.2. Current Immigration Situation in the Czech Republic

Net migration tendency had changed for the Czech Republic over last 15 years showing a drastic increase and then decrease in migration flows. Starting from the year 2002 immigrants prevailed total emigrants and the trend was steady at its peak in 2007, when due to the global crisis and some other related and fears from instability drew migrants away or made them stay in their home country. After the year 2011 net migration started to recover and in 2013

became positive (United Nations, 2013). See the Figure 1.

Figure 1: Migration History, Czech Republic 1999-2013 Period and Number of Immigrants



Source: Own computation, input data: United Nations. (2013). UN. Retrieved from United Nations: http://www.un.org/

There are 4% of immigrants compared to native population lives in the Czech Republic (The World Factbook, 2016), migrant share of total population is low, comparing it to other countries such as Germany where migrants account for 11.9% of total population or united Kingdom 12.4% for the year 2013 (The World Factbook, 2016).

There is a positive net migration in the Czech Republic, after a big drop in net migration in 2011, the inflow of immigrants is increasing again. Statistically, foreigners move to cities or urbanized zones, in the Czech Republic urban population accounts for 73% of total population (2015), which is a high level, majority of native people avoid living in rural areas, this fact is led by bigger life opportunities, higher salaries and purchasing power. Current rate of urbanization is 0.35% annual rate of change (2010-2015 est.) meaning that in general people tend to move away from villages and other rural areas.

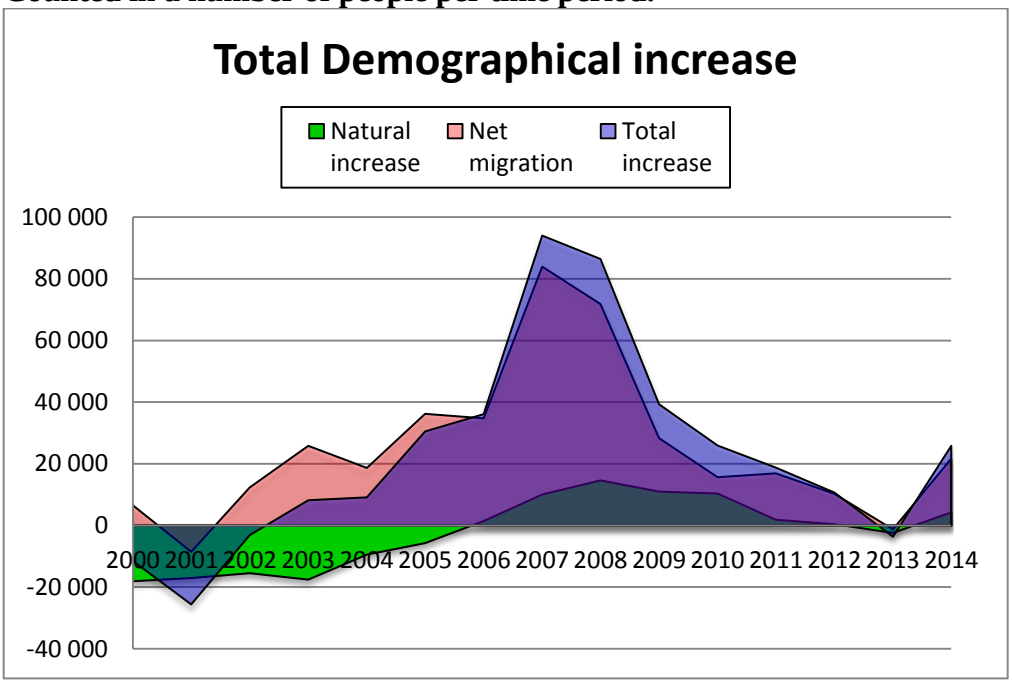
On the contrary, fertility rate is very small: 1.44 children born/woman (2015 est.) meaning that country has to deal with negative natural increase (The World Factbook, 2016).

The reasons for immigration to the Czech Republic include several of factors such as family reunion, job opportunities better level of life or safety.

6.2.3. Demographic Perspectives of the Czech Republic

As it is seen on the Figure 2, the natural increase in the Czech Republic had been insignificant for the past 15 years. Though death rate is not high, fertility in this country is 1.44 children, which is not productive in terms of demographic development. Czechs are not able to sustain even the same number of citizens not even speaking about increasing it. Total demographic growth is driven by immigrants. In the year 2013 a demographical collapse had happened, the demographical increase was below zero, due to the world crisis and other related factors. In 2014 population growth rate was 0.16% (The World Factbook, 2016), which is in long-term is very insignificant growth and could develop in a serious issue in the case of abnormal events like wars, natural disasters, economic crisis etc. .

Figure 2: Total Demographical Increase, the Czech Republic in the years 2000-2014. Counted in a number of people per time period.



Source: Own Graph, Data from: Czech Statistical Office. (2013). *Czech Statistical Office*. Retrieved October 2015, from CZSO: https://www.czso.cz

According to (Rabusic, 2001) for the modernizing Czech society the decrease in the number of births must be attributed to individual social mobility aspirations since these can only be fulfilled with zero or a very low number of children. Low fertility results from individual social aspirations, that is, their pursuit of social advancement (and desire for comfort and

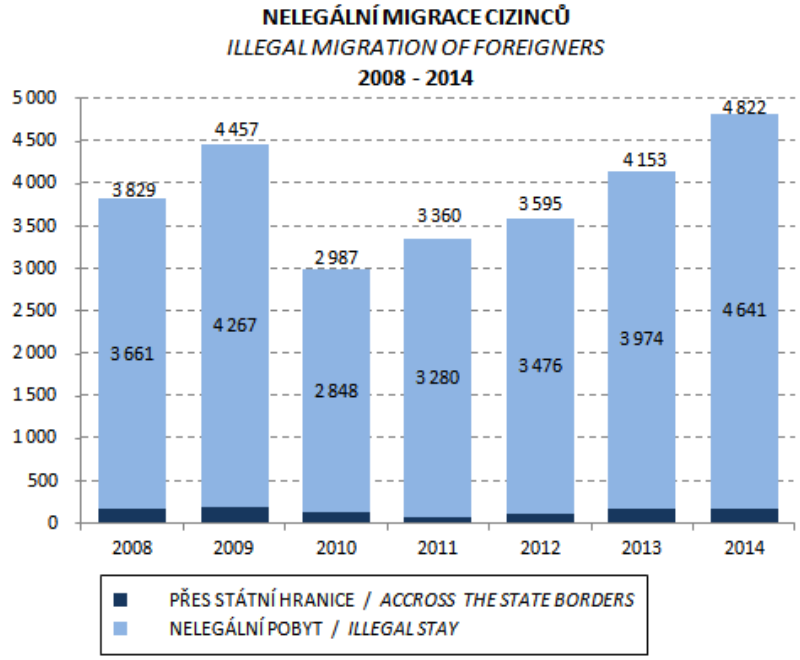
luxury), holds equally true. Desire for success, which naturally includes advancement within the social hierarchy, belongs among the strongest motivations of human activity. Real socialism blocked natural paths towards success and social mobility based on knowledge, skills, performance and luck. These paths have reopened for the current young generation and it is absolutely understandable that they have been exploring them to the fullest with vehemence peculiar to young age. Postponing conception and lowering the number of children is only a logical consequence of such exploration.

6.2.4. Illegal Immigration

Unsurprisingly, there is a much smaller number of researched on illegal immigration in the Czech Republic, compared to legal aspects of this phenomenon. While sociologists try to find out the reasons why individuals decide to immigrate breaking a law, who they survive without governmental help and medical assistance and where they take jobs as a form of money resource, this phenomenon continues to happen.

Data on illegal migration is not very precise and varies from one data resource to another. The Table 2 bellow shows the number of estimated illegal immigrants in the Czech Republic. According to (Czech Statistical office, 2014), data which was gathered before year 2008 cannot be compared with data after 2008 regarding illegal migration due to the changes in methodology of statistical data gathering due to the fact that the Czech Republic had joined Schengen area in the end of 2007 (Schengen Visa, 2015).

Table 2: Trend in the Number of Foreigners in the CR by type of Residence 2008-2014 and in Number if People



Source: Czech Statistical Office. (2013). *Czech Statistical Office*. Retrieved October 2015, from CZSO: https://www.czso.cz

The amount of foreigners apprehended for illegal migration has decreased by 82% since 1993 until 2007, mainly due to a large decrease of the pool of illegal immigrants apprehended for illegal border crossings. However, one cannot make a conclusion that the volume of illegal migration has diminished, since there is no evidence as to whether the drop has been caused by a real overall decrease in illegal movements, or by improved methods and strategies of illegal migrants, which make apprehension of illegal migrants less probable (Jand, Hollomey , & Stepien, 2007). Moreover, the fact that the Czech Republic joined the Schengen area at the end of 2007 and hence does not have any external EU border might further diminish the number of apprehended foreigners for illegal border crossing (Drbohlav, Lachmanová-Medová, Čermák, Janská, Čermáková, & Dzúrová , 2009).

The Czech state has applied various measures as to how to combat irregular/illegal migration. First of all, such combating belongs to one of the explicitly declared policy goals of the official state migration policy (see the Basic Policy Principles on International Immigration from 2003 - e.g., in Drbohlav, Horáková, Janská 2005). In 2000 a new "Interdepartmental

body for repressing the illegal employment of foreigners" was established in the Czech Republic under the umbrella of the Ministry of Labour and Social Affairs. Recently, this commission has gone through a sort of restructuring process and has activated its work. Already in 2001, it was forbidden for asylum seekers to start working unless one year elapsed after they submitted their asylum application. Recently, a new stricter regime established for asylum seekers who stay in Czech detention centres. Also, foreigners who participate as co-partners in public trading companies and limited liability companies have to have work.

However, local labour offices have no specifically set or unified method of how to perform the controls, thus, a generalization of their results is highly problematic, if not impossible.
Another repressive measure that has been applied is that the state increased fines for those who violate rules regarding legal employment of foreigners (especially employers). On the other hand, there have been long-lasting problems with legislative definition, and hence control, of another form of irregular employment when a person holds a trade licence but in fact works as an employee (in the Czech context known as the "Švarc system"), which is used by foreigners and even more by Czech citizens.

6.2.5. Influence of Illegal Immigrants on the Czech Economy

As it is written in the work of (Kabeleová, 2004) , it is very problematic to fully understand the influence of immigrants on any economy in general, as it is never known how much immigrants send home to their relatives and how many people work on the black market. The model which could be checked is only hypothetical which assumes a perfect market in the specific country, which cannot be realistic enough.
The most immigrant influenced spheres are **economic growth, labour market, unemployment rate and income rate.** In hypothetical aspect, immigrants support local economy by increasing aggregate consumption, as they simply need additional units of food and basic goods to consume, more transport to ride and more potential customers on the market, which result in higher economic growth. Economists argue whenever immigration has a positive value to the market. Immigrants are willing to work for a smaller salary which negatively influences the development of wages. Though, from another hand, it is a big plus

for employers as there are smaller costs for the firm associated with hiring foreigners. Moreover, immigrants occupy positions which are undesirable for local people. Citizens of the country do not want to work at some certain positions which are taken by immigrants. Though if the labour market is taken as the market with fixed number of available positions, generally immigrants take away the job opportunity from citizens (Kabeleová, 2004).

Luckily, illegal immigrants account for 1.07% comparing to the volume of the legal immigrants who lived in the Czech Republic in the year 2014 (Czech Statistical office, 2014). Their influence on the economy is not as drastic as in other countries, for example, in the USA where the approximation of

6.3. Immigration Policies in the Czech Republic and Other EU Countries

There a number of visa types which allow foreigners to stay inside the borders of the Czech Republic for some period of time:

- EU citizens and their family members:
- registered without a temporary or permanent residence permit,
- temporary residence permit (more or less in a form of registration),
- permanent residence permit;
- Third country nationals:
- short-term visas (up to 90 days),
- visas for the period exceeding 90 days (valid for 1 year, cannot be extended)
- Long-term residence permits (following the visas for the period exceeding 90 days valid for 1 year, can be extended),
- Permanent residence permits (usually issued after 5 years of residence)
- Foreigners who gained asylum/international protection;

The crucial legal norm regulating the entry and stay of migrants in the Czech Republic is Aliens Act (Act No. 326/1999 Coll., on the Residence of Foreign Nationals in the Territory of the Czech Republic).

The latest changes caome into force after 1st January, 2011 and it brought a number of significat changes. New requirments were imposed on lin term and permanent visa types.

More strict requirments were introduced to proof the travel health insurance, acoomodation and occupation in order to decrease the faulsification of the documents.

As (Drbohlav, Lachmanová-Medová, Čermák, Janská, Čermáková, & Dzúrová , 2009)states, in May 2004, the Czech Republic joined the EU. That was a significant mark within general political and social development of the state. One of the most visible proofs of a stronger conceptualization of migration and of a more EU independent approach, however, a rather more symbolic than effective one, was a formulation of 6 basic policy principles in the field of international migration, which were agreed upon by the Government in 2003. They were thought of as a base for a complex migration strategy; however, no such strategy has been planned yet. Moreover, a modest sign of the state "taking the responsibility for migration decision-making in its hands" can be detected in a pilot project called "The Selection of Qualified Foreign Workers" that was launched in 2003. Its main goal was to encourage foreign experts, specialists and highly-skilled workers to settle along with their families in the country by offering them the possibility to apply for a permanent residence permit after 2.5 years instead of 5 years as usual. Applicants to the pilot project had to have at least secondary education and a valid residence and work permit in the Czech Republic. Therefore applicants were not provided with a job, housing or help with the immigration administrative procedure. Selection of applicants was based on a point system with several criteria (e.g., age, education, language skills, and working experience, but no specific occupation/profession requirements were set) that was further limited by a yearly-set quota for successful applicants.

At first, only immigrants from three source countries (Bulgaria, Kazakhstan, and Croatia) could apply. The project, however, was designed as a pilot project and hence each year it has been slightly modified. The list of eligible countries of origin has been widened (mostly to Eastern European countries – e.g. Belarus, Moldova, or Ukraine).

Moreover, if the applicant graduated from a Czech secondary school (after 2000) or university (after 1995) he/she is eligible to enter the program regardless of his/her citizenship (no country of origin limitation).

Furthermore, in case a project participant loses his/her job, a protection period of 45 days can be applied within which he/she can find a new job without losing his/her work permit. In the course of time, the waiting period for a permanent residence permit has even been shortened to

1.5 years for highly qualified participants (university educated individuals who worked in the Czech Republic in a position relevant to their education) and their families.
It is a small-scale project in comparison with total foreign employment in the Czech. The given countries were selected in order to test the mechanisms of the project. Hence, they were seen as an appropriate sample (variable in terms of cultural proximity and overall setting) to test the criteria of selection and also Czech embassies in these countries agreed to cooperate in the project (Drbohlav, Lachmanová-Medová, Čermák, Janská, Čermáková, & Dzúrová , 2009).

More countries were involved because of a small number of interested persons in the originally selected countries. Also, countries with a significant number of immigrants already present in the Czech Republic were included, which should have guaranteed a sufficient pool of applicants and fulfilled requests of certain Czech employers. Selection of countries further incorporated in the project also came into play if the country in question had signed specific treaties with the Czech state (e.g., on legal cooperation).
Czech foreign policy principles were also taken into account (Vládní 2004, Vládní 2005). The inclusion of foreign graduates of Czech schools was incorporated in the project due to a similar change of the EU policy towards foreign graduates (i.e. more preferential approach) as argumented in the Government resolution. The reasons might be strict prerequisites (e.g., already having a work permit which is seen as a difficult and time-consuming process), low public awareness, low involvement of employers or low attractiveness of offered advantages.

At the end of 2007, a restrictive amendment of the Alien Act was passed as a reaction to presumably growing numbers of fake mixed marriages and paternity declarations that were thought to be motivated only by getting a permanent residence permit.

Hence, according to the amendment a family member of Czech or EU citizen might get a permanent residence permit after 2 years of legal residence in the Czech Republic, out of which he/she must be at least for one year in the position of a family member (e.g. a husband/wife of Czech or EU citizen).

The major change occurred with a re-assessment of the Concept of Immigrant Integration. The Concept was found to be a minimally effective tool, especially because of its concentrating only on granting rights to foreigners (via the mainstreaming method) and leaving aside their social integration, not mentioning its overly general and vague character.

Hence, in 2005 an updated Concept was prepared with the following changes (see Updated Concept 2006): - key prerequisites for immigrant integration (priority areas of the updated Concept) were defined and specific measures for fulfilling the given goals were planned, - emphasis is put on an individual (as a member of society, not of a particular ethnic community), his/her personal efforts and responsibility – this is a clear acceptance of a so-called civic integration approach, - immigrant integration is defined as a two-way process30 of unifying local population and immigrants into a single society, where mutual accommodation by immigrants on one hand and the creation of conditions for immigrant integration in the host (receiving) society on the other are required, - creation of a long-term framework of integration policies and measures (the first period being 2006 – 2008), - target group of the Concept was set to be immigrants legally staying in the Czech Republic for at least one year.

In the original Concept integration was seen as gradual insertion of immigrants into host society´s structures, hence more as a one-way process.

Four key prerequisites/priority areas of the Concept were defined and for each of them detailed goals and measures with a time schedule for their fulfilment were set.

The most visible impact of the updated Concept is that standardised Czech language tests (on the A2 level of the Common European Framework of Reference for Languages) are applied as a necessary prerequisite for being granted a permanent residence permit since January 1, 2009.

The insufficient anti-discrimination legislation is also one of the reasons (together with a lack of legislation on foreigners' political participation) why the Czech Republic has ranked 17th among 28 (mostly) European countries evaluated within the Migrant Integration Policy Index. However, within Central and Eastern European countries, the Czech Republic has ranked at the top of them, together with Slovenia and Hungary (see Niessen, Huddleston, Citron 2007).

6.4. Foreign Direct Investments and Immigration in the Czech Republic

The definition of foreign direct investment (FDI) by (The World Bank, 2016) is following: "Foreign direct investment refers to direct investment equity flows in the reporting economy. It is the sum of equity capital, reinvestment of earnings, and other capital. Direct investment is a category of cross-border investment associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise that is resident in another economy. Ownership of 10 percent or more of the ordinary shares of voting stock is the criterion for determining the existence of a direct investment relationship."

According to (Kugler, Levintal, & Rapoport, 2013) his main assumption in his paper was that financial investments are informational sensitive. In other words, investors tend to invest more in places they know better. The well-known implication of this assumption is the home bias in financial flows, which has been found repeatedly in the literature. (Kugler, Levintal, & Rapoport, 2013) states: "Given these information frictions, the presence of migrants is expected to stimulate bilateral financial flows. Specifically, migrants facilitate the flow of information from their home countries to their host countries. Hence, financial flows from country i to country j should be positively affected by the presence of migrants that were born in country j and reside in country i" arguing for positive influence of immigrants on the economy.

As (Tomohara, 2015) finds in his research: "the results of our analysis do not necessarily oppose unskilled immigration, as we also observe diaspora effects: larger immigrant stocks induce FDI inflows. Although unskilled immigration flows discourage FDI inflows contemporaneously (i.e., via tradeoff effects), immigration promotes inward FDI in the longer term, regardless of whether immigration is of skilled or unskilled workers. Long-run diaspora effects are shown to be more dominant than short-run tradeoff effects. This is a novel implication of this analysis, which distinguishes between two possible effects:

- whether larger foreign communities in a host country attract more FDI (i.e., diaspora effects) and
- FDI inflows could be deterred when a country simultaneously 35 welcomes immigrants

(i.e., tradeoff effects)

Since immigrants proved the information web and therefore increase the flow of the information, the research can prove the theoretical background with the practical analysis which can be found in the following chapter.

7. Analysis

The analysis of the panel data was made in Gretl Programme with a help of Microsoft Office Excel. In order to start with the analysis part it is important to build the economic and econometric models first

The general economic model is following:

$y_1=(x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8)$

When $y_t= f(x_1, x_2, x_3, \ldots, x_n)$*, therefore:*

$FDI_{ij}=f$ (*Unit Vector, Number of Immigrants*$_{ij}$, *GDP*$_j$, *Distance*$_{ij}$, *Population*$_j$, *EU*$_j$, *%ΔExchange Rate*$_{ij}$, *Linguistic Distance*$_{ij}$)

With the following hypothesis:

H_0 – *there is no significant correlation between endogenous and exogenous variables.*

H_1 – *there is a significant correlation between endogenous and exogenous variables.*

The hypothesis can be proved or disproved using a p-value of each coefficient. P-value evaluates how well the sample data supports the argument that the null hypothesis is true.

If the p-value is lower than α level we have to reject the H_0 in favour of H_1.

Parameters are significant for our model if the p-value is lower than alpha value level.

The general econometric model is:

$$y_t=\gamma_{11}x_{1t}+ \gamma_{12}x_{2t}+ \gamma_{13}x_{3t}+\ldots.+ \gamma_{nk}x_{nkt}+u_{1t}$$

Therefore the model for this research is:

$$y_{1t}=\gamma_{11}+\gamma_{12}\mathbf{NumberImmigrants_{ij}}+\gamma_{13}\mathbf{GDP_j}+\gamma_{14}\mathbf{Distance_{ij}}+\gamma_{15}\mathbf{Population_j}+\gamma_{16}\mathbf{EU_j}+\gamma_{17}\mathbf{\%\Delta ExchangeRate_{ij}}+\gamma_{18}\mathbf{Linguistic\ Distance_{ij}}+u_{1t}$$

Declaration of the variables:

y_1 – FDI stock in the Czech Republic coming from a particular country counted in millions USD.

x_1 – unit vector.

x_2 – Number of Immigrants currently living in the Czech Republic from the same country, as where FDI comes from, measured in thousands of people.

x_3 – GDP of the country where investment comes from, counted in millions of USD.

x_4 – Distance between the Czech Republic and country of investor between capital cities of each county, measured in km.

X_5 – Population of the investment source country counted in million people.

X_6 – Belongings of the investor country to European Union in form of dummy variables

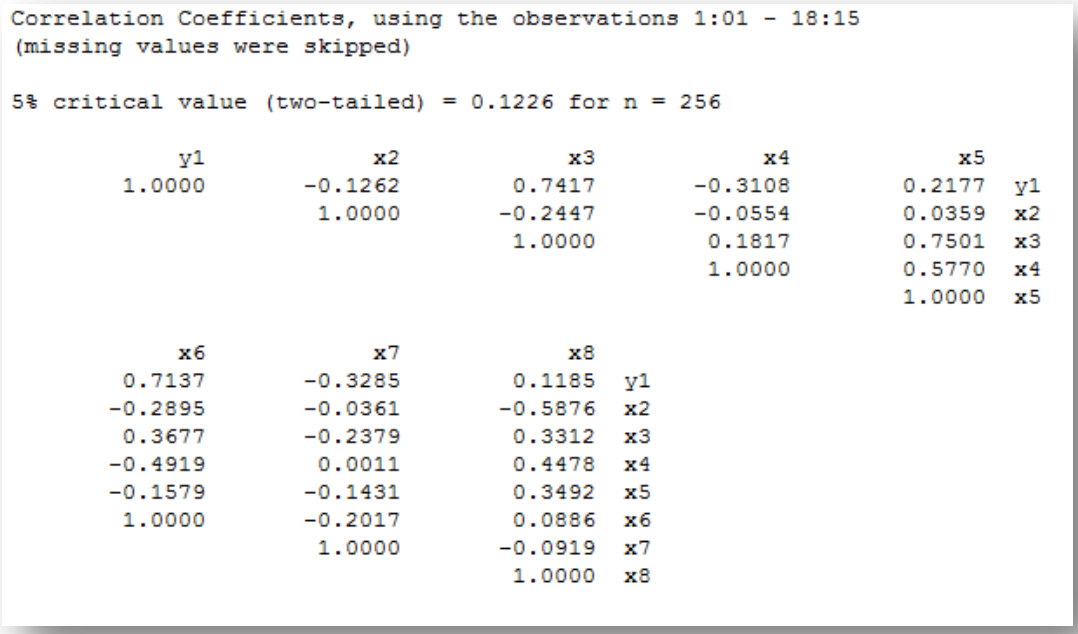
X_7 – percentage difference between CZK and investment local currency.

A more detailed data description with a logical background in choosing them is explained in the following chapter (Data description and Specification).

7.1.Multicollinearity Test

Before the start of model estimation the multicollinearity test was carried out to check if there is a significant dependency between exogenous variables which could significantly decrease the model quality. As it is seen from the Figure 3 the most significant multicollinearity occurs between variables x5 and x3 which is population and GDP respectively, which is a logical consequence.

Figure 3: Multicollinearity Matrix



```
Correlation Coefficients, using the observations 1:01 - 18:15
(missing values were skipped)

5% critical value (two-tailed) = 0.1226 for n = 256

           y1            x2            x3            x4            x5
       1.0000       -0.1262        0.7417       -0.3108        0.2177  y1
                     1.0000       -0.2447       -0.0554        0.0359  x2
                                   1.0000        0.1817        0.7501  x3
                                                 1.0000        0.5770  x4
                                                               1.0000  x5

           x6            x7            x8
       0.7137       -0.3285        0.1185  y1
      -0.2895       -0.0361       -0.5876  x2
       0.3677       -0.2379        0.3312  x3
      -0.4919        0.0011        0.4478  x4
      -0.1579       -0.1431        0.3492  x5
       1.0000       -0.2017        0.0886  x6
                     1.0000       -0.0919  x7
                                   1.0000  x8
```

Source: Own computation, Data is withdriven from the official databases[1]

The significant collinearity level is accounted for 80% (SOURCE) none of the observed regressors have this high level of interdependency therefore the model passes this test. The model is ready to be tested.

7.2. Pooled Estimation

First of all, Pooled Method was carried out for Ordinary Least Squares estimation (OLS).

This approach can be used when the groups to be pooled are relatively similar or homogenous. Level differences can be removed by 'mean-centring' (similar to Within-Effects Model) the data across the groups. The model can be directly run using Ordinary Least Squares on the concatenated groups (Joseph, 2010).

[1] Data about immigrants is from Czech Statistical Office. (2013). *Czech Statistical Office*.
Data about FDI: CNB. (2016, February 1). *CNB*. https://www.cnb.cz/en/
GDP Data: The World Bank. (2016). *The World Bank*.: http://data.worldbank.org/
Distance between countries: The World Factbook. (2016, January 5). *Central Intelligence Agency*. CIA: https://www.cia.gov
Population Data: UNESCO Institute for Statistics. (2013, August 30). *UNESCO Institute for Statistics*. UIS: http://www.uis.unesco.org/
Percentage difference of exchange rate: United Nations. (2013). *UN*. http://www.un.org/,
Linguistic Distance: Beaufils, V. (2012). *Elinguistics.net*. Elinguistics.net: http://www.elinguistics.net/

As it is seen in the output from Gretl programme below */**/*** represent the significance level with 10%, 5% and 1% respectively.

Model 1: Pooled OLS Estimation

```
Model 1: Pooled OLS, using 256 observations
Included 18 cross-sectional units
Time-series length: minimum 9, maximum 15
Dependent variable: y1

            coefficient   std. error   t-ratio     p-value
  ---------------------------------------------------------
  const      -23.0253      1.38029     -16.68     2.10e-042 ***
  x2           1.24292     0.0990182    12.55     2.63e-028 ***
  x3           2.47259     0.102448     24.14     4.95e-067 ***
  x4          -0.390288    0.122604     -3.183    0.0016    ***
  x5          -2.07770     0.155113    -13.39     3.77e-031 ***
  x6           1.75632     0.412881      4.254    2.98e-05  ***
  x7          -0.0458990   0.0507922    -0.9037   0.3671
  x8           1.05459     0.156488      6.739    1.11e-010 ***

Mean dependent var   4.590454   S.D. dependent var   4.144192
Sum squared resid    453.3588   S.E. of regression   1.352058
R-squared            0.896481   Adjusted R-squared   0.893559
F(7, 248)            306.8120   P-value(F)           3.0e-118
Log-likelihood      -436.4011   Akaike criterion     888.8022
Schwarz criterion    917.1636   Hannan-Quinn         900.2090
rho                  0.708664   Durbin-Watson        0.375281

Excluding the constant, p-value was highest for variable 8 (x7)
```

Source: Own computation, Data from official databases.[2]

As it is seen from the results of OLS estimation in the Model 1, adjusted R^2 is equal to 0.893% which means that explanatory power of exogenous variables are proved in 89.3% which is an outstanding result proving the equation to be significant.

Independent variables Number of Immigrants, GDP of immigrant country, Distance between the Czech Republic and immigrant country, Population, EU membership and Language genetic proximity proved to be significant with the strongest alpha equals to 0.01. With confidence level of 99% all listed above explanatory variables are significant and affect the explained variable.

[2] Data about immigrants is from Czech Statistical Office. (2013). *Czech Statistical Office*.
Data about FDI: CNB. (2016, February 1). *CNB*. https://www.cnb.cz/en/
GDP Data: The World Bank. (2016). *The World Bank*.: http://data.worldbank.org/
Distance between countries: The World Factbook. (2016, January 5). *Central Intelligence Agency*. CIA: https://www.cia.gov
Population Data: UNESCO Institute for Statistics. (2013, August 30). *UNESCO Institute for Statistics*. UIS: http://www.uis.unesco.org/
Percentage difference of exchange rate: United Nations. (2013). *UN*. http://www.un.org/,
Linguistic Distance: Beaufils, V. (2012). *Elinguistics.net*. Elinguistics.net: http://www.elinguistics.net/

Explanatory variable x7 (percentage difference of exchange rate between two countries) failed to be significant even with alpha 0.1 (p-value is bigger than 0.1). Meaning that the level of the probability of rejecting the null hypothesis when the null hypothesis is true is high and therefore we have to accept the null hypothesis with variable x7. Null

The reasons why x7 failed to be significant could be that it is difficult to withdraw existing investments even with the unsuitable exchange rate, second investors are aiming in long term period, meaning that even if there are a couple of unsatisfying years they still tend to keep their investments in the country.

Though the results of pooled estimation were very satisfactory there could be improvement done in the model.

Pooled method treats all the data as one without distinguishing the separate data among the 18 countries chosen, fixed effects estimation and random effects estimation take into consideration the individuality of each data set in the panel type of data.

Using the *Joint significance of differing group means test, Breusch-Pagan test statistic and Hausman test statistic* to identify the most suitable estimation method among three following: pooled method, fixed-effects method or random effects method, fixed-effects method was chosen for the estimation of the data set which is used for this diploma thesis.

As it is seen from the Figure 4, in the first Joint significance of differing group means test p-value is lower than alpha 0.01 therefore we must reject the null hypothesis, using pool method, in favour of fixed effects estimation.

Second Breusch-Pagan test also showed us that among pooled and random effects methods, pooled method must be rejected (p-value is, again, lower than alpha 0.01). The null hypothesis was rejected in favour of alternative one: random effects estimation is better than pooled method.

In order to understand the best method among two remaining: fixed and random effects methods the third and the last test took its place: Hausman test statistic. Null hypothesis:

random effect model is consistent was rejected (p-value is lower than alpha 0.01) in favour to alternative hypothesis: fixed effect model is consistent.

Figure 4: Joint Significance of Differing Group Means Test, Breusch-Pagan Test Statistic and Hausman Test Results.

```
Residual variance: 211.797/(256 - 23) = 0.909
Joint significance of differing group means:
 F(17, 233) = 15.632 with p-value 8.6058e-030
(A low p-value counts against the null hypothesis that the pooled OLS model
is adequate, in favor of the fixed effects alternative.)


Breusch-Pagan test statistic:
 LM = 282.639 with p-value = prob(chi-square(1) > 282.639) = 1.99718e-063
(A low p-value counts against the null hypothesis that the pooled OLS model
is adequate, in favor of the random effects alternative.)

Variance estimators:
 between = 1.62471
 within = 0.909
Panel is unbalanced: theta varies across units

                        Random effects estimator
          allows for a unit-specific component to the error term
          (standard errors in parentheses, p-values in brackets)

         const:        -29.432         (3.3759)        [0.00000]
            x2:         1.2464        (0.15663)        [0.00000]
            x3:          2.969        (0.22799)        [0.00000]
            x4:       0.077875        (0.40455)        [0.84751]
            x5:        -2.7241        (0.39769)        [0.00000]
            x6:         1.8945        (0.43924)        [0.00002]
            x7:      -0.019195       (0.038006)        [0.61397]
            x8:        0.77094        (0.47628)        [0.10679]

Hausman test statistic:
 H = 19.259 with p-value = prob(chi-square(5) > 19.259) = 0.00171987
(A low p-value counts against the null hypothesis that the random effects
model is consistent, in favor of the fixed effects model.)
```

Source: Own computation, Data is taken from official databases [3]

[3] Data about immigrants is from Czech Statistical Office. (2013). *Czech Statistical Office*.
Data about FDI: CNB. (2016, February 1). *CNB*. https://www.cnb.cz/en/
GDP Data: The World Bank. (2016). *The World Bank*.: http://data.worldbank.org/
Distance between countries: The World Factbook. (2016, January 5). *Central Intelligence Agency*. CIA: https://www.cia.gov
Population Data: UNESCO Institute for Statistics. (2013, August 30). *UNESCO Institute for Statistics*. UIS: http://www.uis.unesco.org/
Percentage difference of exchange rate: United Nations. (2013). *UN*. http://www.un.org/
Linguistic Distance: Beaufils, V. (2012). *Elinguistics.net*. Elinguistics.net: http://www.elinguistics.net/

These tests proved the consistency of Fixed-effects model as the best and most useful one for our panel dataset. It was applied to withdraw the conclussion to the model.

7.3. Fixed-Effects Estimation

As you see in the Model 2, there is estimation with fixed-effect model.

Variable x4: Distance between CR and country of the immigrant as well as Language genetic proximity were excluded due to exact collinearity between them.

Model 2: Fixed-Effects Model with Immigration Explanatory parameter

```
Model 2: Fixed-effects, using 256 observations
Included 18 cross-sectional units
Time-series length: minimum 9, maximum 15
Dependent variable: y1
Omitted due to exact collinearity: x4 x8

             coefficient   std. error   t-ratio    p-value
  ---------------------------------------------------------
  const      -34.6134      9.44889      -3.663    0.0003    ***
  x2           0.762024    0.220252      3.460    0.0006    ***
  x3           4.47494     0.425216     10.52     1.92e-021 ***
  x5          -5.36718     2.47237      -2.171    0.0310    **
  x6           1.51920     0.466225      3.258    0.0013    ***
  x7          -0.0176630   0.0372628    -0.4740   0.6359

Mean dependent var   4.590454   S.D. dependent var   4.144192
Sum squared resid    211.7969   S.E. of regression   0.953415
LSDV R-squared       0.951638   Within R-squared     0.612360
LSDV F(22, 233)      208.4037   P-value(F)           6.8e-140
Log-likelihood      -338.9859   Akaike criterion     723.9719
Schwarz criterion    805.5109   Hannan-Quinn         756.7666
rho                  0.508414   Durbin-Watson        0.768958
```

Source: Own computation, Data was withdrawn from official databases [4]

[4] Data about immigrants is from Czech Statistical Office. (2013). *Czech Statistical Office*.
Data about FDI: CNB. (2016, February 1). *CNB*. https://www.cnb.cz/en/
GDP Data: The World Bank. (2016). *The World Bank*.: http://data.worldbank.org/
Distance between countries: The World Factbook. (2016, January 5). *Central Intelligence Agency*. CIA: https://www.cia.gov
Population Data: UNESCO Institute for Statistics. (2013, August 30). *UNESCO Institute for Statistics*. UIS: http://www.uis.unesco.org/
Percentage difference of exchange rate: United Nations. (2013). *UN*. http://www.un.org/
Linguistic Distance: Beaufils, V. (2012). *Elinguistics.net*. Elinguistics.net: http://www.elinguistics.net/

Least squares dummy variable method (LSDV) coefficient of determination or fixed effect R^2 is equal to 0.952 meaning that the total explained variance in the model is 95.2% overall or 61.2% within each individual cross-sectional unit (within R-squared equals to 0.612).

Variables x2, x3, x6 (number of immigrants, GDP and EU membership respectively) have a strong effect on dependent variable with significance level 99% (alpha is 0.01). Regressor x5 (Population) is significant on the level alpha 0.05 (lower explanatory power toward dependent variable, though still proved significance).

X7 the same as in the pool method does not prove the explanatory significance in terms of FDI. In this research FDI stock was used in the particular country and it is difficult to withdraw it immediately. If checked, FDI inflow could be much more sensitive to the exchange rate rather than its stock. Also, there is a chance to have the type error II case in the model: though in reality the percentage difference in exchange rate does affect FDI, this model failed to prove it, rejecting the significance of the given parameter.

It is clear from the fixed-effect model that immigration as well as GDP, population and EU belongingness explains the FDI stock in the Czech Republic in the given year. Undoubtedly, the correlation between the independent and dependent variables is proved.

In order to check whenever the immigration indeed has a significant effect on the model, test on the Model 2 took place.

This time the research was done *omitting* the x2: number of immigrants in the Czech Republic variable. The change in overall coefficient of determination as well as the significance of each of the parameters can help us to estimate the causality of immigration as an explanatory variable. This method will help us to eliminate the chance of random causality of this variable, proving or disproving that the strength of the model is caused partly by immigration as a regressor and that the model was strong not by a chance but due to the correctness of explanatory variables selection.

Below you can see a Model 3 with the fixed-effects method performed on the same dataset as in the Model 2 (fixed-effects) but with omission of x2 regressor.

Model 3: Fixed-Effects Model without Immigration Parameter

```
Test on Model 2:

  Null hypothesis: the regression parameter is zero for x2
  Test statistic: F(1, 233) = 11.9701, p-value 0.000642771
  Omitting variables improved 0 of 3 information criteria.

Model 3: Fixed-effects, using 256 observations
Included 18 cross-sectional units
Time-series length: minimum 9, maximum 15
Dependent variable: y1
Omitted due to exact collinearity: const

            coefficient   std. error   t-ratio    p-value
  ---------------------------------------------------------
  const      -50.7716      8.40432     -6.041    5.97e-09  ***
  x3           5.25844     0.368235    14.28     1.09e-033 ***
  x5          -3.21899     2.44859     -1.315    0.1899
  x6           1.63117     0.475878     3.428    0.0007    ***
  x7          -0.0403547   0.0375310   -1.075    0.2834

Mean dependent var   4.590454   S.D. dependent var   4.144192
Sum squared resid    222.6777   S.E. of regression   0.975507
LSDV R-squared       0.949154   Within R-squared     0.592445
LSDV F(21, 234)      208.0062   P-value(F)           1.6e-138
Log-likelihood      -345.3984   Akaike criterion     734.7969
Schwarz criterion    812.7908   Hannan-Quinn         766.1657
rho                  0.520749   Durbin-Watson        0.750906
```

Source: Own computation, Data from official databases[5]

Comparing the information from the Model 2 and 3 it is obvious that the quality of the equation had decreased: in Model 3 variable 5, which is population, is not significant anymore and the coefficient of determination had decreased by 0.3%, falling from 95.2% to 94.9%.

[5] Data about immigrants is from Czech Statistical Office. (2013). *Czech Statistical Office*.
Data about FDI: CNB. (2016, February 1). *CNB*. https://www.cnb.cz/en/
GDP Data: The World Bank. (2016). *The World Bank*.: http://data.worldbank.org/
Distance between countries: The World Factbook. (2016, January 5). *Central Intelligence Agency*. CIA: https://www.cia.gov
Population Data: UNESCO Institute for Statistics. (2013, August 30). *UNESCO Institute for Statistics*. UIS: http://www.uis.unesco.org/
Percentage difference of exchange rate: United Nations. (2013). *UN*. http://www.un.org/
Linguistic Distance: Beaufils, V. (2012). *Elinguistics.net*. Elinguistics.net: http://www.elinguistics.net/

More important, within R-squared had decreased by 2.0%: from 61.2 to 59.2%.

This change proves immigration being a vital explanatory variable in the equation of foreign direct investment in the Czech Republic. Therefore the immigration cannot be omitted in researching the FDI in this case study country.

7.4. Verification

In order to check the correctness of the chosen model economic and econometric verification had taken place. All the implemented tests failed to find a significant screwness of the model.

7.4.1. Economic Verification

For this purpose the best equation which is seen in the figure 5 had been chosen.

The equation for FDI in the Czech Republic is following:

Table 3: Coefficients of the 2nd Model

Variable	Variable name	Coefficient
X1 (constant)	Unit Vector	-39.88
X2	Number of Immigrants	0.76
X3	GDP	4.47
X4	Distance between 2 countries	-
X5	Population	-5.37
X6	EU membership	1.52
X7	%Δ Exchange rate	-0.02
X8	Language distance	-

Source: Own computation, Data comes from official databases[6]

According with the declaration of the coefficients in the Table 3. The econometric model is:

$y_1=-39.88+0.76x_2+4.47x_3-5.37x_5+1.52x_6-0.02x_7+u_t$

[6] Data about immigrants is from Czech Statistical Office. (2013). *Czech Statistical Office*.
Data about FDI: CNB. (2016, February 1). *CNB*. https://www.cnb.cz/en/
GDP Data: The World Bank. (2016). *The World Bank*.: http://data.worldbank.org/
Distance between countries: The World Factbook. (2016, January 5). *Central Intelligence Agency*. CIA: https://www.cia.gov
Population Data: UNESCO Institute for Statistics. (2013, August 30). *UNESCO Institute for Statistics*. UIS: http://www.uis.unesco.org/
Percentage difference of exchange rate: United Nations. (2013). *UN*. http://www.un.org/
Linguistic Distance: Beaufils, V. (2012). *Elinguistics.net*. Elinguistics.net: http://www.elinguistics.net/

Explanation of the coefficients:

Table 4: Economic Explanation of the Coefficients

Variable	Explanation
X_2	If the number of immigrants for a particular country in the Czech Republic increases by 1000, FDI stock coming from the country of immigrant increases by 0.76 million USD. It confirms the consistency of the model with economic theory. Higher number of immigrants provides better knowledge and awareness of investors from the country of immigrant origin.
X_3	If the GDP at market prices of the country where investments come from increases by 1 million USD, FDI stock in the Czech Republic increases by 4.47 million USD. The theoretical positive relationship is confirmed in the real model. FDI is very sensitive towards changes in GDP of other countries. With increased economic strength, people are willing to invest abroad more.
X_5	If the population in the partner county increases by 1 million people, FDI in the Czech Republic decreases by 5.37 million USD. It is not consistent with the economic theory as the bigger country has a potential in big investments. One of the reasons could be that population is the most significant parameter in estimation a number of potential investors. HDI could be the better parameter for this model.
X_6	If the partner country of the Czech Republic is also an EU member, the volume of FID stock in the Czech Republic increases by 1.52 million USD. This parameter is consistent with economic theory, as the European Union decreases trade and investments barriers.
X_7	If exchange rate between two countries increases by 1%, FDI stock in the Czech

	Republic decreases by 0.02 million US. This parameter is also proves the economic theoretical background, as positive percentage increase signals a stronger Czech currency, therefore goods and services in this country become relatively more expensive for the investor.

Source: Own computation, Data comes from official databases[7]

All in all, economic verification proved a consistency of the current Model 2 to be consistent with economic theory and therefore passed this verification stage.

7.4.2. Econometric Verification

Econometric verification took place in order to check the model for screwness. Gretl program was used for this purpose. Dataset input was represented in Excel format.

The Table 4 below shows four econometric verification tests which were applied to the model and the output. First column represents the test name, second one the null hypothesis and alternative one. Third column helps to understand if null or alternative hypothesis holds.

If p-value is bigger than α, null hypothesis holds.

In case p-value is lower than α, H0 must be rejected in favour of alternative one.

Table 5: Statistical Verification of the Model

Test Name	Hypothesis tested	P-value and α	
Test for different groups intercepts	H0: Groups have a common intercept	p-value	8.61E-30
	H1: Groups do not have a common intercept	α	0.05
Distribution free Wald test for heteroscedasticity	H0: The units have a common error variance (homoscedasticity)	p-value	0
	H1: The units do not have a common error variance (heteroscedasticity)	α	0.05

[7] Data about immigrants is from Czech Statistical Office. (2013). *Czech Statistical Office*.
Data about FDI: CNB. (2016, February 1). *CNB*. https://www.cnb.cz/en/
GDP Data: The World Bank. (2016). *The World Bank*.: http://data.worldbank.org/
Distance between countries: The World Factbook. (2016, January 5). *Central Intelligence Agency*. CIA: https://www.cia.gov
Population Data: UNESCO Institute for Statistics. (2013, August 30). *UNESCO Institute for Statistics*. UIS: http://www.uis.unesco.org/
Percentage difference of exchange rate: United Nations. (2013). *UN*. http://www.un.org/
Linguistic Distance: Beaufils, V. (2012). *Elinguistics.net*. Elinguistics.net: http://www.elinguistics.net/

Normality Test	H0: Error is normally distributed	p-value	5.55E-10
	H1:Error is not normally distributed	α	0,05

Source: Own computation, Data comes from official databases[8]

Test for different groups intercept failed to reject the null hypothesis as p-value is smaller than alpha. Groups do not have common intercepts with $\hat{Y}=a+bX$, where a is the Y intercept and b is the slope. It implies that every independent variables group has its own intercept affecting dependent one, having a particular separate effect distinguishable from other cross-sectional units, which is a positive sign for the tested model.

Distribution free Wald test for heteroscedasticity supports alternative hypothesis that the stated model does not contain a common error variance (p-value is smaller than alpha). Heteroscedasticity means that the variability of error term of a dependent variable is unequal across the range of values of regressors. Since the residual term is inconsistent, the accuracy of the error terms relationship between explanatory and explained variable is not strong, which is a negative outcome for the Model 2.

Normality Test failed to accept null hypothesis because p-value is less than α. The error term is not normally distributed, which is correlated with heteroscedasticity in the previous test. It is an undesirable outcome for the Model 2 due to the unpredictability of the residual term.

All in all, estimated regression must be taken with caution due to the fact of low econometric verification creditability. There should be significant model improvements done in order to pass all of the applied tests listed above. I higher level of data quality and equation modelling would ensure a better creditability of the model.

[8] Data about immigrants is from Czech Statistical Office. (2013). *Czech Statistical Office*.
Data about FDI: CNB. (2016, February 1). *CNB*. https://www.cnb.cz/en/
GDP Data: The World Bank. (2016). *The World Bank*.: http://data.worldbank.org/
Distance between countries: The World Factbook. (2016, January 5). *Central Intelligence Agency*. CIA: https://www.cia.gov
Population Data: UNESCO Institute for Statistics. (2013, August 30). *UNESCO Institute for Statistics*. UIS: http://www.uis.unesco.org/
Percentage difference of exchange rate: United Nations. (2013). *UN*. http://www.un.org/
Linguistic Distance: Beaufils, V. (2012). *Elinguistics.net*. Elinguistics.net: http://www.elinguistics.net/

Economic verification proved to align with the economic theory. Therefore in general model proved to have an acceptable quality, though major changes must be done in this preliminary research to prove the higher quality of the dataset.

8. Analysis Results

Nevertheless this *preliminary research* had a number of limitations, such as a limited access to data, as majority of databases are closed for open public, lack of time-series information before 1999 and after the year 2013 which limited the model to 15 time sequences as well as a chance of omission of some important variable, the research proved to have a significant outcome.

In the analysis part three regressions had been estimated to check the hypothesis stated at the beginning of this thesis.

First, the pooled model (Model 1) estimation was carried out to check the dependency of all the x variables on the dependent Y without the regards towards the separate cross-sectional units which treated the whole model as one single dataset without distinguishing between countries.

Second, after a sequence of the thesis the fixed-effects model test was chosen (Model 2) with all the parameters included. The standard fixed effects model excluded

Third, the same model was chosen with the omission of the explanatory variable x2 which represents immigration according to the country of origin.

Model 3 proved a significant decrease of the regression quality of the model in general as well as within independent parameters relatively to the quality of the Model 2 with the inclusion of the immigration as the explanatory variable.

Indeed, people with a foreign background can reduce the trade barriers by facilitating information flow between two countries.

All this can help us suggest that the first hypothesis of this thesis is confirmed. Indeed, there is a positive relationship between the number of immigrants from a given country and Czech FDI inflow.

The second hypothesis was partially proved too. Model 2 shows immigration to be significant parameters for estimating of the dependent variable. Unfortunately, the econometric verification proved data to have screwness.

The analysis helps us to answer the stated research questions:

1. *Is there any relationship between a number of immigrants and bilateral trade (FDI in*

this case)?

The model proved to have a significant relationship between the number of immigrants and FDI using fixed-effect model. The relationship holds with accordance with economic theoretical background verifying its causality. Moreover, as it was seen in the Model 3, quality of the equations decreases with omission of immigration as explanatory variable, which proves its significance in estimation of FDI stock in the Czech Republic. It is an important factor which cannot be neglected.

If the number of immigrants for a particular country in the Czech Republic increases by 1000, FDI stock coming from the country of immigrant increases by 0.76 million USD.

. This positive correlation is significant in theory, though reality can differ from the estimated model. Even ignoring the fact that this model was a preliminary research and some of the important variables could have been omitted or the dataset quality could have been improved, the real life implication and dependency can differ from the model.

The specified econometric model predicts that when increasing the number of immigrants or descendant by specific number the trade and FDI inflow volume would instantaneously increase by an exact amount. In practice the effect could be significantly delayed as it is a time demanding process and the quality of information transfer from immigrant to the investor could depend on immigrant personal skills, connections at the home country, education as well as interests in the information transactions. Other important factors which would stop the immediate effect of immigrants on the real life foreign direct investment are a duration of immigrant stay in the Czech Republic, as well as the immigrant stock turnover time.

2. *What other factors affect FDI?*

All parameters apart from difference in the exchange rate proved to be significant for the Model 2. Indeed, FDI depends on a number of factors including volume of immigration stock in the Czech Republic, GDP of a country where the investments come from, Distance between Czech Republic and the country of investments (with accordance with the gravity model and population in the home country of immigrant, EU membership and Language genetic proximity are significant in explaining the effect on foreign direct investments stock in the Czech Republic.

All in all a higher level of data quality that is an exact determination of the amount of FDI received from all source nations at given time would increase the credibility. As described in literature review, the effect of immigrants on FDI could be multiple-dimensional. Immigration can also influence FDI inflow and outflow. As previous studies have found, it could also influence export and import in the Czech Republic. Which effect that dominates is a topic for further research.

Nevertheless, the estimation which was done in this thesis to prove that immigrants who are hosted in the Czech Republic have a vital positive role in FDI and have increased the level of FDI stock in this country, at least for the period of examined time: from 1999 until 2013. All in all, the estimation must be repeated in order to prove the outcome of this research, Data quality must be increased and a deeper research in types of immigrants could be done, as education level or occupation could be very relevant factors which are omitted in this research. Also there must be significant improving done in order to pass all the estimations verifications to make the equation BLUE (best linear unbiased estimate).

9. Recommendations

Transforming this strictly theoretical output into the real-life model is just at its beginning. There should be a number of actions done to prove the working model and to apply it to he real world. The most efficient way for it would be a series of other analysis which would look at the problematic, also, from different angles. FDI inflow and outflow as well as export and import could be related parameters which must be taken into account. The model is very specific to each country, as the model failed to be BLUE (best unbiased linear estimate) failing a number of econometric verification tests, there could be dozens of other variables which affect FDI and immigration. This exact model cannot be applied to any other country as the dependency of each parameter would vary depending on location, economic power and a number of other parameters. Also, with each economic and market change the used model must be adapted according to the current political and economic situation.

The initiatives of this study should not be regarded as final answers or a best practice but more as a suggested proposal that is applicable to the situation in the Czech Republic. Moreover, immigration in the content of the trade cannot be viewed as the most efficient utilising of positive effects on the immigration. It is not the final conclusion and summary of the positive effects of immigration, but rather a starting point of discovering the benefits and harms from settlers.

A number of other pluses and minuses of immigrants are to be discovered and analysed in future. It is important to understand under what circumstances the migrant brings profit or loss to the economy, which can help to minimize the risks for the hosting country and maximize the profit.

It should be highlighted that the recommendations and outcomes of this research should not be viewed as a substitute to traditional tools of raising the level of Czech trade, but more as a compliment to existing tools.

As one of the recommendations it is good to mention that immigrants should receive a special

attention in future when developing the policies regarding migration regulations and trade barriers decrease.

Also, the behaviour of FDI inflow and outflow can be relative parameters for the analysis. The dependent variable could be foreign direct investment inflow instead of stock. As the inflow is more and faster affected by external factors and therefore the effect can be seen more quickly. In this condition the difference of foreign exchange, which showed to be the irrelevant factor in this study, can prove to have a significant influence on the dependent variable. Other regressors can be included to make the estimation better and more realistic. The parameters such as war (as a dummy variable), the level of corruption in the country of investment outflow, human development index, financial integration and level of trade openness can affect the model and bring it to the more realistic model.

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Unfortunately, this empirical research showed some weak spots which need to be modified in order to prove a better quality. Much of the focuses should naturally be on immigrant-specific characteristics that are by type of residence permit refugee, asylum seeker, independent and how immigrants spread and take advantage of their knowledge and competences in the Czech society.

Moreover, the factors such as occupation, sex, age, the level of education and visa duration in the Czech Republic could be the major factors which affect FDI stock.

All in all, the research proved a moderate dependency of FDI and exogenous variable

immigration stock. According to the output of the model, Czech Republic should stimulate the flow if immigrants to the country, preferably with a high level of education and capital. Immigrants not only fill in almost zero natural increase of the country but also stimulate the bilateral trade to the country providing the information exchange channel between the host country and their home country.

10. Conclusion

This thesis has analysed the effects of immigration on Czech foreign direct investment stock between 1999 and 2013. The study was aiming to analyse if immigrants bring harm or benefit to the Czech Republic as an investment country, as well as the fact that the most time immigrants are viewed from the point of the financial burden for the economy rather than the benefit for the country. Though the profit for the Czech Republic is not direct, the investment in immigrants come back to the country in the form of greater investment force, greater aggregate consumption, taxes and immigrant own money investing in new life abroad.
The model was partly based on the Gravity model which is known for its effectiveness. Other probable factors were included in the model.

One of the major findings is that immigrants have a significant influence on the FDI in the Czech Republic, proving the main hypothesis that there is a positive relationship between Immigration stock and FDI stock in the Czech Republic. As already mentioned in the methodology discussion part, this finding is also proved to have a positive correlation in Denmark by Aarhus University, in the USA it was proved twice from Oxford University and San Diego University independent case studies (Olsen & Weinberger, 2012), (Javorcik, Özden, & Spatar, 2013)and (Foad, 2011) respectively.

Another finding which attracts attention is insignificance of the foreign exchange parameter. IT was the only independent variable which did not significantly affected the model. A number of the reasons could be associated with it starting from the difficultness of investment withdrawing as well as the long-term investor orientation finishing with low data quality. Also, the population parameter proved to have a negative effect on the FDI, which is not supported by economic theory background as bigger countries should have a bigger investment possibility power. It can be explained by the fact that it's not the population as a fact which drives the investment but the average financial power of each individual (Human Development Index).

To confirm the robustness of the model a number of economic and econometric verifications

took place. All in all, the tests were satisfactory, though major changes must be done to improve the data quality and therefore increase the model goodness of fit. Also, the dipper modification can bring even better results. Immigrants can be divided according to their education, occupation, age, sex and length of living in the host country.

Summarizing this thesis as a whole the model of foreign direct investment and its explanatory variable for the Czech Republic were simplified and does not contain all the factors which can affect the trade from both: positive and negative sides. The study suggests making a repetition of this research in order to prove or disprove the findings. More extended database could be included.

This study helps to understand the effect of the immigrants in the macroeconomic aspect of a country. Hopefully this research will raise the awareness in public debates of this topic and highlight the need in future attention and research of this topic.
Many economic analysis count immigrants as a financial liability, though as proven in this research they also bring indirect benefit to the country. It is important to understand the problematic of this issue from all aspects: positive and negative. This thesis contributes the general understanding of macro economical influence of immigrants on the Czech Republic and can help in future deeper researches.

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