The impact of CEFTA Agreement on its members' export flows

Evidence From a Country-Pair Panel

Master Thesis

Name: Bujar Maxhuni
Student Number: 428818
Faculty: Erasmus School of Economics
Supervisor: Laura Hering

Erasmus University Rotterdam

Abstract

By using a panel dataset of 71 countries over the years 1990-2014, this thesis investigates the impact of Central European Free Trade Agreement (CEFTA) on its members' export flows. CEFTA Agreement is a multilateral free trade agreement facilitated by the European Union with the objective of helping Central and Eastern European countries integrate further towards the EU. Having been signed firstly by Poland, Hungary, Czech Republic and Slovak Republic in 1992, it is the first free trade agreement after the collapse of the Soviet Union. Later on these countries were joined by Slovenia, Romania, Bulgaria and Croatia. Because most of these countries joined the EU in the mid 2000s, another seven countries signed CEFTA in 2006 and 2007. These countries are Albania, Bosnia-Herzegovina, Kosovo, Macedonia, Montenegro, Moldova and Serbia. Multiple fixed effects estimators are employed to control for unobserved heterogeneity in country-pairs, countries and country-year combinations. We find that CEFTA has had a positive impact on its members' export flows. For instance, a robustness check is made by using TRADHIST dataset which was acquired from CEPII Institute. According to the estimates obtained by carrying out the same tests with two different datasets, the results that CEFTA has had a positive impact are very robust. Finally, we test a second hypothesis; has CEFTA1992 been more beneficial for its members than CEFTA2006-7? The results are quite ambiguous, but after using country-pair fixed effects on top of country-year fixed effects, we suggest that CEFTA1992 has indeed been more positively impactful.

Table of Contents

1. Introduction

Free trade has been one of the most debatable topics in economics since the beginning of the 19th century. It refers to the policies taken by governments which do not impose restrictions in exports nor imports in the international markets. Since foreign trade is one of the main components of the Gross Domestic Product (GDP), economists have been arguing whether free trade impacts positively economic growth. One of the earliest arguments over free trade is given by Adam Smith in his book, "The Wealth of Nations". He argues that if citizens of country A can buy a good from country B for a cheaper price than they would themselves produce, they should always go for it because it will be advantageous (Smith, 1776).

However, in Great Britain, which has been one of the main industrialized countries in the beginning of the 19th century, the arguments of Friedrich List in favor of protectionism had been dominating and also influencing policy making in the United States. The argument of Friedrich List had been that if a country imposes tariffs on imports, it will protect the domestic industries and therefore enhance industrial development. Other arguments from Friedrich List also point out that opening to free trade will increase the inequality gap because only the wealthy agents will take advantage from free trade. This comes as a result of economies of scale through which concept benefits the largest multinationals because they are able to produce at the lowest cost, while the less productive firms will be worse off due to the increases in the cost when opening to free trade (Gomes, 2003). Furthermore, Karl Marx in "The Communist Manifesto", opposes free trade because it creates space for exploitation of labor by capital (Marx, 1848).

On the other hand, David Ricardo, in his book, "On the Principles of Political Economy and Taxation", introduced the theory of comparative advantage. This theory explains the gains from trade that come as a result of differences in factor endowments and production technology. It states that a country has comparative advantage if it can produce a particular good at a lower cost than another country (Ricardo, 1821). The theory of comparative advantage has been a base for many economic models on international free trade such as the Heckscher-Ohlin model of trade. On a survey of American economists in 2006, 87.5% of economists had voted that U.S. should eliminate all tariffs and barriers to trade (Whaples, 2006). That is a good indicator of what economists think of free trade nowadays.

Today, there is a high number of regional trade agreements (RTAs) that are notified at the World Trade Organization (WTO). These FTAs exist in different forms depending on how

much these markets are integrated. Besides the United States which is a complete integrated market, we have the European Union (EU) which is becoming more and more integrated. One of the biggest achievements of the EU was the launch of the common currency Euro, which has been adopted by 19 out of 28 members. Besides the programs which aim to further integrate the EU countries, the EU closely supervises countries which aim to become part of the EU in the future.

One of the preparatory programs for Western Balkan countries that also serves as a requirement for EU membership countries is the Central European Free Trade Agreement (CEFTA). Thus, this paper will investigate the effect of CEFTA on the exports of member countries. After the Soviet Union was dissolved in 1991, the satellite countries started to take actions independently and in 1992, Hungary, Poland, Slovak Republic and Czech Republic established CEFTA. Later on joined Slovenia, Romania, Bulgaria, and in 2003 Croatia. This set of countries will be referred to as the "CEFTA1992", while the countries that joined CEFTA in 2006-2007 will be termed as "CEFTA2006-7". Additionally, Croatia will be counted as CEFTA 2006-7 because it has entered CEFTA in 2004 and left in 2013 which means that it has spent more years with the second group of countries rather than with the first. Once CEFTA countries are granted EU membership, they have to leave CEFTA. After these former CEFTA countries joined the EU, a decision was taken to extend this agreement to southeastern European countries. Thus, in 2006 and 2007, seven more countries joined CEFTA. These countries are Macedonia, Albania, Serbia, Montenegro, Moldova, Bosnia and Herzegovina, and United Nations Interim Administration Mission in Kosovo (UNMIK) on behalf of Kosovo. CEFTA 2006-7 replaced 32 bilateral FTAs which existed among the countries that joined CEFTA (CEFTA, 2006).

By using a gravity model of 71 countries over a time span from 1990 to 2014, two hypotheses will be tested. The data is mostly obtained by international organizations databases such as the Direction of Statistics from IMF, World Development Indicators from World Bank, and the gravity dataset of CEPII. The first hypothesis is constructed as follows: *"CEFTA has had a positive impact on enhancing trade between its members"*. The investigation of the general impact of CEFTA over the last 25 years is the main aim of this paper whilst there will be one more hypothesis to be tested throughout the paper. This hypothesis is specified as following: *"The impact of CEFTA2006-7 on export flows has been weaker than the impact of CEFTA1992"*. The reason why CEFTA 1992 countries are expected to have had more benefits than CEFTA 2006-7 is the bilateral political conflicts that continue to be present in the Balkans

today, e.g. Serbia and Bosnia-Herzegovina don't recognize the independence of Kosovo while Croatia keeps demanding to block Serbia's integration towards EU because of the war crimes (Milekic and Dragojlo, 2016). This hypothesis is tested by adding two additional dummies which control for the CEFTA 1992 and CEFTA 2006-7 respectively.

The findings from this thesis contribute to the abundant literature on FTAs by confirming that these agreements can indeed boost bilateral and multilateral trade. More specifically, it contributes to the literature that explores the economic integration of Eastern European countries and finally to the scarce literature on the economic integration of Balkan countries. We find that CEFTA has had a positive impact on enhancing the trade between its members which has been a great path to follow towards the EU integration. Through this conclusion, this thesis supports the findings from Adam et al. (2003) and Bussiere et al. (2005) that CEFTA and Baltic Free Trade Agreement (BFTA) have been effective in enhancing economic integration towards EU for Eastern European countries. Moreover, as expected, because of political and social conflicts between some countries in the Western Balkans, the impact of CEFTA2006-7 has been weaker than of CEFTA1992.

The thesis structure will be as follows: Section 2 contains relevant literature review whilst Section 3 will explain the theoretical model and how economists have used it in the past. Section 4 consists of data description and the methods of testing the hypotheses while results of these tests will be discussed in Section 5. Finally, limitations of the study will be discussed in Section 6.

2. Literature Review

2.1 Tariff: A Theoretical Explanation

Tariffs refer to the taxes that are imposed on exports or imports which lead to higher prices of the imported goods. As such, domestic companies gain advantages in the national markets. Most of modern economists see tariffs as distortionary policies in the international market and as such they keep advocating for free trade. Besides tariffs, these distortionary policies can also be imposed in forms of import quotas. While tariffs come in forms of taxes which affect goods' prices directly, import quotas are restrictions on quantities.

To see the effect of a tariff on an imaginary good on consumers, producers and the social welfare of the country, a brief discussion through an illustration with a simple graph will be provided. Before analyzing the effect of the tariff, notice that the initial quantity demanded

6

is represented by point Q_{C1} and quantity supplied by point Q_{S1}. The difference between these two points is filled by the imports from the international market. Now assume that the government decides to impose a tariff on imported milk because last year they decided to subsidize milk production to enhance economic growth. The price of milk in the national markets now moves from P_{world} to P_{tariff}. Before we discuss its effects on welfare, notice that because of the higher price, quantity demanded has decreased from Q_{C1} to Q_{C2}, while quantity supplied has decreased from Q_{S1} to Q_{S2}. Compared to the situation without a tariff, the quantity of imports now has decreased substantially because of the reduction in quantity demanded and the increase in quantity supplied. The imposition of the tariff will have an impact on the consumer surplus, producer surplus and finally on the social welfare of the citizens. First, the difference between the price that consumers are willing to pay and the
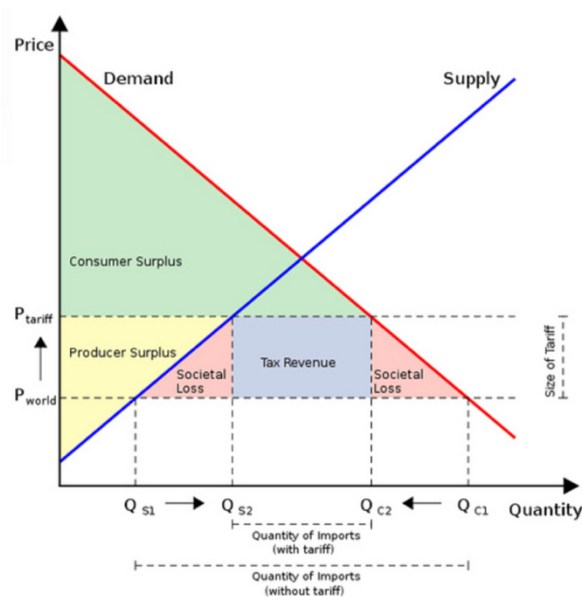

Figure 1: The effect of tariff on an imaginary good   Source: Mankiw

actual price, which in economics is known as the consumer surplus, decreases. Second, the difference between the price that producers are willing to sell their products and the actual selling price, producer surplus, increases. Although there is an increase in the tax revenue which is a gain for the government, the consumer surplus decrease outweighs the producers' and government's gains, leading to a reduction in the social welfare of the country. The only way to bring the equilibrium to its initial level is by removing the imposed tariff (Mankiw, 2003). Therefore, the loss in social welfare is the main reason why neoclassical economists argue in favor of free trade. The tariff analysis had led to many political decisions taken by governments at different times.

2.2 Empirical Evidence

After more than 20 years of empirical research conducted to investigate the effect of FTAs on international trade, results mainly suggest that FTAs do have significant positive effects on creating trade. However, some economists continue to believe that the gains from FTAs are highly reduced for developing countries. Francois et al. (2005) argued that the FTAs between the EU and developing countries lead to uneven gains one another. They claim that

the EU sets various restrictions on labor-intensive goods, mainly being agricultural goods, imported from developing countries, leading to substantially reduced gains to developing countries from FTAs. This comes as a result of misspecifications on the agreement of GATT 1994 on how much trade FTAs should cover. Furthermore, Hamanaka (2013) argues that usage or utilization rate of FTAs is very low in some regions in Asia. This is an outcome of the zero Most-Favored Nations (MFN) tariffs between countries in Asia. This means that partial effect of FTAs is substantially low and therefore suggests that the estimates from gravity models tend to suffer from upward biases.

Nowadays, most international economists tend to agree that FTAs boost economic interaction. The new aim of their research is to improve the use of gravity model in overcoming different econometrical issues. One big issue which hasn't been addressed much in the past is the endogeneity of trade policies. Thus, Baier and Bergstrand (2007) conducted a panel study which seems to be the best method to control for endogeneity in the gravity models which tests for the effectiveness of FTAs. They choose to use fixed effects to control for the unobserved heterogeneity because they believe that reason why the models suffer from endogeneity bias is the presence of unobserved time-invariant heterogeneity in the gravity equation. Their final result from this paper is that when two countries sign an FTA, their trade will double in 10 years.

Until then, all of the studies on the effect of FTAs have been done through the parametric empirical estimations. Two years after they provided significant evidence of the positive effect of FTAs, Baier and Bergstrand (2009) introduced the first study which used nonparametric estimations through matching econometrics to study the effects of FTAs in the long run. Furthermore, they focus on two well known agreements which are the European Economic Community and the Central American Common Market. They test the effectiveness of these agreements by using cross-sectional estimations and comparing the country pairs where an FTA is present with the country pairs which lack an FTA. They found that the trade increases significantly in the former group. The main result from their study is that FTAs increase bilateral trade every year. Similar to the previous paper, they do provide evidence that panel studies either with parametric or non-parametric estimates provide more plausible results than the cross-sectional studies.

Furthermore, Bergstrand et al. (2015) extend the use of gravity models by employing exporter-year and importer-year fixed effects to control for endogenous prices and time-varying country multilateral heterogeneity. On top of that, they add country-pair fixed effects

followed by a time trend to control for time-varying bilateral effects. Finally, they conduct these estimations by using a PQML estimator. They conclude that the partial effect of FTAs has been overestimated by around 30%.

Besides the studies which focus on FTAs as a whole and control for them in a single dummy variable, there have been several studies which focus on the trade liberalization of the Eastern European countries. Bussiere et al. (2005) use a gravity model to estimate the trade flows across 61 countries for a period from 1980 to 2003. By using panel data and estimating the model with several different specifications including both fixed and random effects, they find significant and robust results on the integration of the Eastern European countries. They find that Central Eastern European countries are becoming very integrated in the world economy. On the other hand, Baltic countries although being part of the EU are still trading a lot more with the Eastern European countries such as Russia, Ukraine and Belarus. Additionally, they find that Southeastern European countries Albania, Bosnia and Macedonia are still isolated in the world market.

In a study for policy making within the International Monetary Fund (IMF), Adam et al. (2003) investigate the effect of the two largest FTAs in Europe during the 1990s; CEFTA 1992 and Baltic Free Trade Agreement (BFTA). They use a gravity model with panel data consisting of 37 countries for a period of five years between 1996-2000. In this study, they use real GDPs per capita for country i and j, distance in km between the capital cities, and a similarity index which is constructed as follows:

$$SIM_{ijt} = [1 - (\frac{GDP_{it}}{GDP_{it} + GDP_{jt}})^2 - (\frac{GDP_{jt}}{GDP_{it} + GDP_{jt}})^2]$$

The larger this index, which is bounded between 0 and 0.5, the higher will be similarity between countries in terms of output and intra-industry trade. The effects of FTAs are captured by dummy variables same as the effects of common border and language, and also for EU membership which is expected to have a positive impact on trade. Finally, they use another dummy variable to control for the Council for Mutual Economic Assistance (CMEA) which was an organization for economic cooperation under the Soviet Union. They use different specifications with both fixed and random effects. They do find positive and statistically significant coefficients on all but one preferential FTAs. One key finding is that BFTA has been more efficient in creating more trade between the member countries compared to CEFTA.

3. Theoretical Model

This paper adopts the gravity model of trade which has, so far, been the most successful model when investigating the effects of various economic flows from one country to another. Besides being very successful in explaining trade flows, the gravity model has been very successful in explaining migration flows from one country to another too. The gravity model was created by the physicist Issac Newton in the 17th century to explain the interaction between space objects.

The model looks as following:

$$F = G\frac{M_1 M_2}{D^2}$$

Here F represents the force, G is a gravitational constant, M_1 and M_2 are the masses of objects 1 and 2, and D^2 is the distance between the objects. This model explained that the greater the distance between two objects, the lower would be the force of interaction. The opposite is with masses which have a positive relationship with the interaction force. Although this model was created to explain a theory on physics, Tinbergen (1962) used this model to explain the trade flows between two countries. The gravity model of trade uses masses of country 1 and country 2 and the distance between them to calculate the trade flows from country 1 to country 2. Masses of the two countries are represented by national incomes, GDPs or more recently GDPs per capita. It is expected that the higher the national incomes or GDPs of the two countries, the higher will be the trade between them. On the other hand, the distance represents transport costs and therefore it will negatively affect trade flows between these two countries. However, this remains only the baseline model because many other economists continued to work with it and therefore they experimented with other explanatory variables. A few years after Tinbergen introduced the idea of using the gravity model on explaining trade flows, Linnemann (1966) extended the model by including population. His model looks as following:

$$X_{ij} = \beta_0 Y_i^{\beta_1} N_i^{-\beta_2} Y_j^{\beta_3} N_j^{-\beta_4} D_{ij}^{-\beta_5} P_{ij}^{\beta_6}$$

He used the populations of trading partners, N_i and N_j, with the purpose of more accurately explaining the country sizes. Y_i and Y_j control for GDP of the respective countries whilst P_{ij} represents the preferential trade agreements (PTAs) as he was trying to find the effect of PTAs on the trade flows .Anderson (1979) on his paper, "A Theoretical Foundation for the Gravity Model", states that the gravity model had been the best instrument to calculate for bilateral

trade in the last 25 years. Further, he adds that one of the reasons why the gravity model is being so successful is because it allows the interpretation of distance which is a crucial factor in explaining bilateral trade flows. Many other economists used the gravity model to explain the effects of different regional integration agreements, trading blocs, migration flows, etc.

Furthermore, Deardorff was one of the first economists to prove that the gravity model also has a theoretical foundation. He did this by using the Heckscher-Ohlin model to derive the gravity model. He turned down the arguments that the evidence on the gravity model was against weakening the Heckscher-Ohlin model (Deardorff, 1997). Besides the two main explanatory variables, national income and distance, many other economists have used some additional variables to control for other factors that might affect the bilateral trade between countries. Some of the most used variables have been border contiguity, currency union, common language, geography position, colonization, etc.

One of the firsts to test the gravity model empirically including an additional variable from the above mentioned was McCallum. He used the gravity model with border effects to see the difference in trade within provinces in Canada compared to the trade in trade between provinces in Canada and the United States (McCallum, 1995). He used the following model:

$$x_{ij} = a + by_i + cy_j + ddist_{ij} + eDUMMY_{ij} + u_{ij}$$

DUMMY$_{ij}$ is a dummy variable which equals 1 for trade within provinces and 0 for trade between the Canadian provinces and the US. This has been called the McCallum puzzle and in the meantime everyone has pointed it out as the home bias because of the significantly increased trade within the Canadian provinces compared to the trade with the US.

However, Anderson and Wincoop find out that the model used by McCallum is a combination of omitted variables bias and small size of the Canadian economy. They find out the national borders reduced trade by about 44% between the US and the Canada (Anderson and Wincoop, 2001). Another reason why the gravity model has become so famous empirically is the high goodness of fit that we see in most of the studies. As such, Baier and Bergstrand call the gravity model "a workhouse for cross-country empirical analyses of international trade and in particular the effects of FTAs on trade flows" (Baier and Bergstrand, 2003). This comes as a result of the high goodness-of-fit in most of the studies that use the gravity model to test for bilateral trade flows. However, more recently, economists have started to suspect the high goodness-of-fit in gravity papers. Cheng and Howard claim that the high goodness-of-fit comes as a result of unobserved heterogeneity between the trading partners. (Cheng and Howard,

2005). Therefore, many other studies have used fixed effects to control for unobserved heterogeneity and to prevent omitted variable biases.

4. Data and Methodology

4.1 Data Description

My data mainly comes from World Bank, IMF and CEPII Institute. More specifically, the data on export flows for the years 1990 until 2014 has been obtained from the IMF Direction of Trade Statistics (DoTS) whilst the data on GDP per capita and population for the same years has been acquired from the World Bank: WDI (World Development Indicators). The remaining binary variables such as contiguity, language, currency, landlocked and RTA have been acquired from the CEPII database. The binary variable CEFTA has been constructed based on the years that countries leave and join CEFTA. A short explanation of how this binary variable has been constructed can be found in the Appendix C. As already discussed, the baseline gravity model uses trade flows, masses of the trading countries and the distance between them. As in many other papers, this paper uses GDP per capita to control for mass size of the two countries. Besides GDP per capita, population will be added because it has a big contribution in controlling for country size. The data on GDP per capita and export flows are measured in current US dollars while distance is measured in km. It is important to note that the RTA variable was available only up to year 2006. Using Stata, the values of year 2006 have been extended to all the remaining years up to 2014. This is because almost all of the agreements that are currently in force have been signed before that year or at least agreements where the countries included in the study are part of.

4.2 Descriptive Statistics

This section will provide a discussion of the evolution of exports for CEFTA countries and a brief summary of the descriptive statistics from the data used in this thesis. Figure 2 shows the evolution of exports for CEFTA1992 countries through years 1992 to 2004. A better visualization would be to include a few years before 1992 to see if there is any visible change in the trend after CEFTA was signed, but due to missing data for many of the included countries 1992 is the first year.
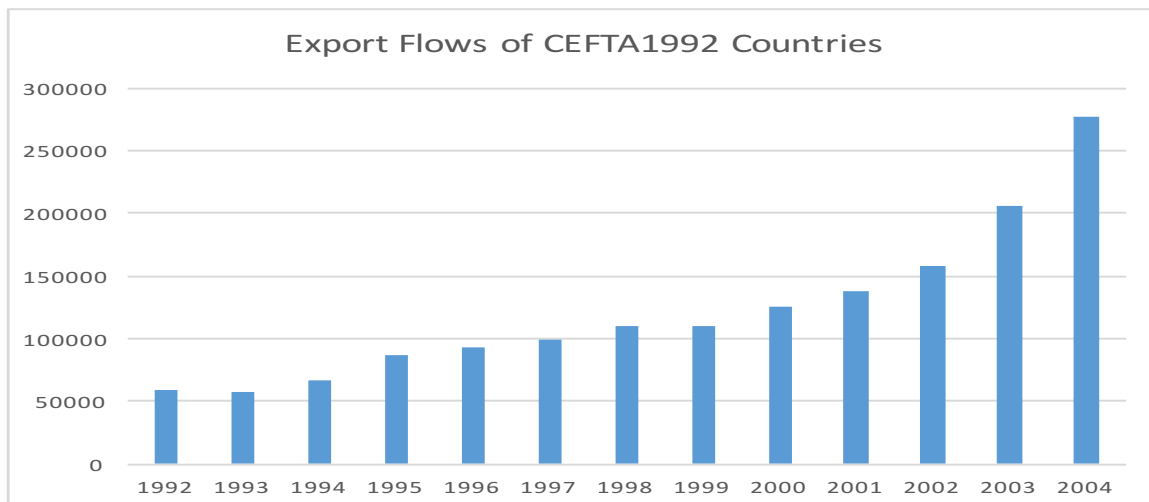
Figure 2: Export flows of CEFTA1992 countries. Data is in millions of dollars.

In the 1990s, exports seem to have a slowly increasing trend which doesn't say much about CEFTA impact whilst in the early 2000s this trend is more persistent. The high increase of exports in 2004 can be an outcome of the 2004 EU Expansion where five (Hungary, Poland, Czech Republic, Slovak Republic and Slovenia) out of eight CEFTA countries joined the EU. Unlike the Figure 2 which shows this slowly increasing trend in exports, the Figure 3 shows continuous ups and downs in the exports of the CEFTA 2006-7 countries. While there seems to be an increasing trend in the years before CEFTA 2006-7 was signed, the change in years 2007 and 2008 is quite substantial. Having data from years before the agreement was signed helps to visually analyze the effect of CEFTA in the first years. However, in years 2009, 2012 and 2015 there seem to be decreasing rates in exports from CEFTA 2006-7 countries. The effect of the Great Recession (2007-2009) only had an impact in 2009 and this shock did not persist for too long. In general, it is ambiguous to say that CEFTA 2006-7 has had an impact on the export flows of its members. Moreover, Western Balkan countries continue to have political crisis which is expected to have negative impacts on the trade flows between them. Furthermore, Croatia is a large destination for exports from Western Balkan countries and in 2013 they joined EU which resulted in a decrease of exports coming in Croatia from Western Balkan countries (Jukic, 2012). However, Croatian EU membership didn't have a long impact as Figure 3 shows an increase in exports on years 2013 and 2014 and then followed by a decrease in 2015. Again, figure below doesn't seem to have any explanation on the impact of CEFTA for the countries that signed it in 2006-7.
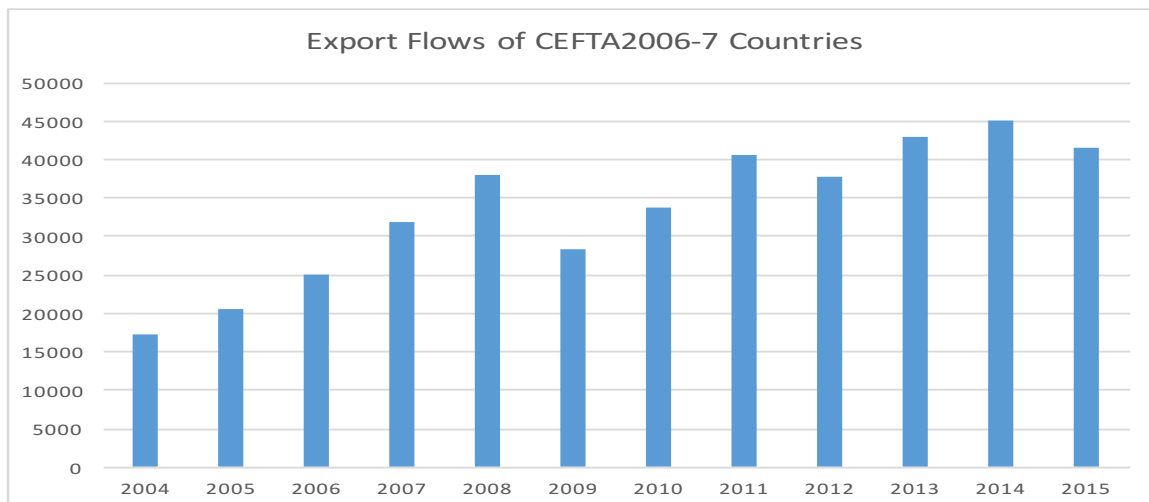
Figure 3: Export flows of CEFTA2006-7 countries. Data is in millions of dollars.

The dependent variable, exports, is quite spread out as it can be seen from the minimum and maximum values in Table 2. The lowest value represents the exports of Albania to Egypt in 2004 while the highest is the exports of China to the United States in 2014. The lowest value of GDP per capita was measured in Iraq in 1995 while the highest in Luxembourg in 2014. Furthermore, the lowest value of population is 254,826 in Iceland in 1990, while the highest is around 1.37 billion in China in 2014. The shortest distance between the capitals of trading partners is 59 km, from Bratislava (Slovak Republic) to Vienna (Austria), while the longest is 19772 km, from Bogota (Colombia) to Jakarta (Indonesia).

Table 1: Descriptive Statistics					
Variable	Observations	Mean	Std. Deviation	Min	Max
exports	100550	1700000000	9350000000	1.26	397000000000
gdppercapita_origin	100550	17712.23	18948.49	171.96	116559.7
gdppercapita_destination	100550	17395.43	18826.83	171.96	116559.7
population_origin	100550	73900000	210000000	254826	1360000000
population_destination	100550	74200000	209000000	254826	1360000000
distance	100550	5616594	4684032	59.61	19772.34
contiguity	100550	.0429538	.2027539	0	1
curency	100550	.0269617	.1619723	0	1
language	100550	.0513178	.2206462	0	1
landlocked	100550	.0208553	.1429005	0	1
CEFTA	100550	.0106216	.1025128	0	1
rta	100550	.2706315	.4442883	0	1

The rest of the variables are binary and will not be discussed in this section. However, it is helpful to discuss that the mean of CEFTA is 0.0106 which means that only 1.06% of the country pairs at one point on time are part of CEFTA. This study includes 71 countries over a time-span of 25 years (1990-2014) which results in 126,025 observations, but because there is

a lot of data missing from developing countries the number of the observations included equals 100,550. Table 2 presents more details about means, standard deviations, minimum and maximum values of all variables included in the model.

4.3 Fixed vs Random Effects

Before discussing the use of differently specified fixed effects, one issue needs to be addressed; why fixed effects over random effects? To begin with, the use of fixed or random effects depends on two assumptions that have to be made over the unobserved heterogeneity that one is trying to control for. For fixed effects; the unobserved factors have to be time-invariant and correlated with the independent variables. On the other hand, to use random effects, these unobserved factors have to be time-variant and also uncorrelated with independent variables. Intuitively, it's hard to think of many time-variant bilateral factors that would affect trade between two countries. As an example from the few, the armed conflict in 2014 in Ukraine resulted in airplane crash where around 300 people died where most of the passengers were Dutch. Because the Netherlands accused Russia for downing this airplane, this could affect the trade flows between the Netherlands and Russia from 2014 and onwards. Cases like this one are quite few and thus the use of random effects for investigating trade flows through gravity models is not supported. Egger (2000) uses a Hausman test to check for differences between fixed and random effects and strongly rejects the null hypothesis for using random effects. Based on previous literature and some intuition behind, this paper will employ fixed effects to control unobserved factors that affect trade flows.

4.4 Fixed Effects Discussion

The first empirical gravity models have been estimated by OLS were criticized on their incapability for controlling for unobserved characteristics that explain trade volumes between two countries. In the late 1990s, economists such as Matyas (1997), Bayoumi and Eichengreen (1997), Cheng (1999), were the first ones that started employing fixed effects to control for these unobserved characteristics both in exporters and importers and also country-pairs. However, the use of fixed effects has differed amongst them; Matyas (197) uses two sets of country fixed effects, one for exporter one for importer while Cheng (1999) and Wall (1999) use country-pair fixed effects. Some of the factors which are hard to observed and are controlled through the use of country fixed effects are multilateral trade resistance and firm heterogeneity (Cheng and Wall, 2005). On the other hand, by employing country-pair fixed effects one would aim to control for unobserved bilateral heterogeneity such as country-pair

historical, cultural and ethnic factors. More recently, Baier et al. (2014) use exporter-year and importer-year fixed effects on top of country-pair fixed effects to control for endogenous price differences in countries throughout years. In this paper, multiple fixed effects will be used to control for these unobserved differences in countries and country-pairs. With the use of of fixed effects, this paper aims to avoid any bias caused by omitted or endogenous variables.

4.5 Model Specification

Four different models will be used to investigate the effect of CEFTA. We begin with the benchmark model which uses country fixed effects:

$$
\begin{aligned}
lnExp_{ijt} = a_i + b_j + \gamma_t &+ B_0 + B_1 lnGDPC_{it} + B_2 lnGDPC_{jt} + B_3 lnPop_{it} + B_4 lnPop_{jt} \\
&+ B_5 lnDst_{ij} + B_6 Ctg_{ij} + B_7 Cur_{ijt} + B_8 Lan_{ij} + B_9 Lnl_{ij} + B_{10} CEFTA_{ijt} \\
&+ B_{11} RTA_{ijt} + \varepsilon_{ijt}
\end{aligned}
\tag{1}
$$

The variables above represent the following:

lnX_{ijt}- the natural logarithm of exports from country i to country j for period t,

$lnGDPC_{it}$- the natural logarithm of GDP per capita of country i for period t,

$lnGDPC_{jt}$-the natural logarithm of GDP per capita of country j for period t,

$lnPop_{it}$- the natural logarithm of Population of country i for period t,

$lnPop_{jt}$- the natural logarithm of Population of country j for period t,

$lnDst_{ij}$- the natural logarithm of the distance between countries i and j,

Ctg_{ij}- dummy that takes value 1 if countries i and j share the same border, 0 otherwise

Cur_{ijt}- dummy that takes value 1 if countries i and j use the same currency, 0 otherwise

Lan_{ij}- dummy that takes value 1 if countries i and j speak the same language, 0 otherwise

Lnl_{ij}- dummy that takes value 1 if both countries i and j are landlocked, 0 otherwise

$CEFTA_{ijt}$- dummy that takes value 1 if both countries i and j are in CEFTA, 0 otherwise

RTA_{ijt}- dummy that takes value 1 if a regional free trade agreement is in force between countries i and j, 0 otherwise

ε_{ijt}- disturbance error term

The two terms, a_i and b_j represent exporter and importer fixed effects whilst the year fixed effects are denoted by γ_t. The benchmark model uses country fixed effects to check whether accounting for unobserved heterogeneity between exporters and importers helps in uncovering the real effect of CEFTA.

In a second model, we control for unobserved heterogeneity between the country-pairs, we employ country-pair fixed effects together with year fixed effects. The model will be as follows:

$$lnExp_{ijt} = \delta_{ij} + \gamma_t + B_1 lnGDPC_{it} + B_2 lnGDPC_{jt} + B_3 lnPop_{it} + B_4 lnPop_{jt} + B_5 Cur_{ijt}$$
$$+ B_6 CEFTA_{ijt} + B_7 RTA_{ijt} + \varepsilon_{ijt} \tag{2}$$

Because a fixed-effect estimator is being used, time-invariant variables such as distance, contiguity, language, and landlocked are dropped. δ_{ij} and γ_t are two new terms that represent country-pair fixed effects while the latter time fixed effects.

Finally, to control for unobserved heterogeneity in countries at certain points on time, country-year fixed effects are added. The corresponding equation will be as the following:

$$lnExp_{ijt} = \eta_{it} + \theta_{jt} + B_1 lnDst_{ij} + B_2 Ctg_{ij} + B_3 Cur_{ijt} + B_4 Lan_{ij} + B_5 Lnl_{ij}$$
$$+ B_6 CEFTA_{ijt} + B_7 RTA_{ijt} + \varepsilon_{ijt} \tag{3}$$

Again, the two new terms represent exporter-year and importer-year fixed effects. The time fixed effects are dropped because now they are added individually first for exporters and then for importers too. For instance, country specific controls such as GDP per capita and population are absorbed by the country-year fixed effects.

Finally, following the work from Baier and Bergstrand (2015), country-pair fixed effects will be used on top of the country-year fixed effects. The specification now is different:

$$lnExp_{ijt} = \eta_{it} + \theta_{jt} + \delta_{ij} + B_1 Cur_{ijt} + B_2 CEFTA_{ijt} + B_3 RTA_{ijt} + \varepsilon_{ijt} \tag{4}$$

Now we have a combination of exporter-year, importer-year and country-pair fixed effects which has been the most recent way of estimating gravity models to avoid any omitted variable bias. In this equation, only time-variant bilateral variables are kept because all other variables are absorbed by using fixed effects. First, similarly to the equation (4), country specifics such as GDP per capita and population are dropped because we use country-year fixed effects. Second, time-invariant dummies are dropped because we add a third fixed-effect which controls for unobserved heterogeneity in country pairs.

Equations above will all serve for uncovering the general impact of CEFTA agreement over the last 25 years, which is the main objective of the thesis. The second objective is to check whether CEFTA 1992 has been more beneficial to its members than CEFTA 2006-7. The same equations from above will be used to test the second hypothesis but an additional dummy CEFTA2006_7 will be added to investigate whether a difference between these two agreements exists. This additional dummy CEFTA2006_7 is expected to have a negative sign

for the reasons discussed in the introduction. One issue that raises in cases when testing for the effects of a specific FTA like CEFTA in this case, is the bilateral dummy RTA which captures the trade policies between those two countries. One would expect a high correlation between CEFTA and RTA and thus suspect the estimates to be biased. For instance, the dummy RTA will be dropped and all the regressions will be executed again to check whether the sign, magnitude or significance changes from the initial estimates.

Furthermore, a robustness check will be performed to see whether the results acquired by the regressions above are robust. The dataset "Historical Bilateral Trade and Gravity Dataset (TRADHIST)" which is a widely known dataset from CEPII French Institute will be employed to do the robustness check. This dataset contains around 1.9 million observations from year 1827 to 2014 with 225 exporters and 225 importers. Compared to the dataset used to test the hypotheses presented above, TRADHIST uses GDP instead of GDP per capita, doesn't have population variables, no common currency nor RTA. However, to capture bilateral similarities, the variables "colonial_relationship" and GATT from this dataset will be used. "Colonial_Relationshipl" is a dummy that equals 1 if the two trading countries have had a colonial relationship whilst GATT tells whether the two countries are part of GATT (now WTO). Because Serbia and Montenegro have been a single state until 2006, this dataset doesn't include data on them as separate state. Furthermore, Kosovo as having declared independence on 2008, is also excluded. Therefore, only the first hypothesis will be tested using this dataset due to the missing of three out seven countries that signed CEFTA2006-7. For instance, CEFTA dummy has been constructed the same way as discussed above.

4.6 Motivation Behind the Use of Variables

As in the theoretical gravity model of physics, object sizes, in this case countries' GDP's per capita, are expected to have positive impact on the trade flow between the two countries. Exports is one of the GDP components and as such is expected to be very well explained by the variation in GDP per capita. Basically, the higher the GDP's of the trading partners the higher the trade flows will be. GDP per capita will be used instead of GDP because it is expected to tell more about the country size at an individual level. Furthermore, this thesis also adopts the use of population controls from Linnemann's augmented gravity model. China is a perfect example to explain why population has a positive impact on economic growth. Therefore, population is a very useful proxy to control for country sizes. Distance, similarly to the theoretical physics model, is expected to have a negative impact on the trade flows. Although today technology is very advanced, transportation continues to be costly. Holding

other things constant, a longer distance between two trading partners would contribute in a reduction of trading volumes because of the transportation costs.

Besides the variables that control for country size and distance, a few more binary variables will be used; contiguity, currency, language, landlocked and RTA. All of these variables are used to control for similarity between the exporter and importer. Contiguity, apart from explaining similarity also means reduced costs of transportation which is why it is expected to affect trade flows positively. Currency is also expected to have a positive impact on trade flows because if the trading partners use the same currency, issues with exchange rates and inflation are avoided. The same language is another dummy that captures similarity and is expected to have a positive impact on the trade flows. Holding other things constant, a German company is expected to trade more with a Swiss company rather than with a Czech one. The next variable, landlocked, it's more complicated to have a specific expectation. Generally, this variable is expected to have a negative impact on trade flows because being landlocked means that a country can't use water transportation which is one of the most intensive types of transport. However, if everything else is equal, two landlocked countries such as Hungary and Slovak Republic are expected to trade with one another more than Albania trade with Estonia although both of them are coastal. Finally, the last control dummy variable is RTA which captures the effect of any regional free trade agreement in force between the trading partners at a certain point on time. Generally, this variable is expected to have a positive sign because countries that trade intensively with each other always try to negotiate on reducing barriers between themselves.

5. Results

This section discusses the results obtained by the regressions presented in the previous section. The main interest of the thesis lies on the relationship between the dependent variable, exports, and the dummy variable CEFTA. The results from the first regressions which are conducted to test the first hypothesis, which is also the main focus of the paper, will be discussed in the first subsection. The second subsection contains a discussion of the results from the second hypothesis tests where the aim lies on finding whether the effect of this agreement has been the same for the two groups of countries.

5.1 The overall impact of CEFTA Agreement

The benchmark model for testing the first hypothesis, as discussed in the methodology section, employs country fixed effects. On top of the country fixed effects, time dummies are

used to control for global factors like the Great Recession (2007, 2008, and 2009). Although we use controls such as gdp per capita and population for country size, there are more characteristics that determine trade volumes between two countries. A very discussed issue is multilateral trade resistance. Although we use RTA to capture the effect of any trade agreement on trade volumes between two partners, that doesn't say anything about how resistant these countries are to trade in the world market. So far, the use of country fixed effects had helped overcome this issue.

Table 2 presents the estimates from running the regressions described. As it can be noticed from Column 1, the variable of interest, CEFTA, has a positive sign which represents economic significance. The magnitude is high too which leads us to accept the main hypothesis. In more econometric terms; if both trading partners are part of CEFTA, this will lead to an increase in trade volumes between them by 1.07% on average. RTA is also positive and significant meaning that regional trade agreements do indeed increase trade volumes between member countries. Regarding the rest of the variables; the ones that show unexpected impact are the population of origin, landlocked and currency. This may come as a result of a measurement error as in most of the research so far conducted, population of origin has a positive sign. Landlocked is more complicated as some people tend to expect a positive sign from it. However, the negative sign of currency is hard to be reasoned. Rose (2000) came to the conclusion that monetary union such as Euro do have a positive impact in enhancing trade between its members. However, in 2000, Euro was very young and its effects were hard to be investigated. Nevertheless, the estimates from the benchmark model lead us to accept the hypothesis that CEFTA has indeed increased trade volumes between its members.

The second model is more traditional when it comes to the use of fixed effects in gravity model. It employs country-pair fixed effects followed by time dummies. This means that all time-invariant bilateral dummies will be dropped as they are absorbed by the use these fixed effects. Compared to the benchmark, the magnitudes of the coefficients change slightly, but all the signs remain the same. However, CEFTA from being highly significant at 1% critical level, it becomes insignificant. Furthermore, RTA is still positive and statistically significant, but the magnitude is substantially lower. Again, population of origin, currency and landlocked have unexpected effects. However, when using country-pair fixed effects, most of the empirical gravity models still suffer from omitted variable bias caused by the omission of variables such as as firm heterogeneity in both exporting and importing country. Therefore, this paper uses two different specifications as they were described in the methodology section.

Although country-pair and country specific fixed effects have been widely used in the early 2000s, more recently economists have started to use more specific fixed effects to account for omitted variables bias. Baier and Bergstrand (2007) employ exporter-year and importer-year fixed effects to control for endogeneous prices and multilateral heterogeneity. Furthermore, Baier et al. (2014) added country-pair fixed effects on top of the country-year fixed effects to capture all time-invariant bilateral factors that affect trade between the two countries. Before the results from these two approaches are discussed, it is helpful to clarify that exporter-year and importer-year fixed effect account for GDP per capita and population controls which will be dropped from the estimation. Obviously, there are more time-varying factors that affect trade between two countries and therefore by using country-year fixed effects helps to capture all these unobserved factors.

This paper follows the same approaches used by Baier and Bergstrand (2007) and Baier et al. (2014). Column 3 shows the results from using the approach from Baier and Bergstrand (2007) and these estimates provide enough evidence in favor of the first hypothesis. All the estimates from this Column are very close to the estimates from the benchmark model, have the same sign and are statistically significant at the same critical levels. This is somewhat expected because the previous estimation used country and time fixed effects separately, while this model is estimated by interacting countries and years. Obtaining such close estimates from these two models explains that GDP per capita and population are the only country time-varying factors that affect nominal trade between each-other. Once again, this estimation provides evidence to accept our main hypothesis.

Table 2: Estimates for the main hypothesis				
Dependent Variable lnexports	(1) Country FE (Benchmark)	(2) Country-Pair FE	(3) Country-Year FE	(4) Country-Pair and Country-Year FE
lngdpc_origin	0.537 (11.89)	0.682*** (15.43)		
lngdpc_destination	0.784*** (22.77)	0.846*** (27.61)		
lnpopulation_origin	-0.937*** (-4.68)	-0.392* (-2.03)		
lnpopulation_destination	0.291 (1.83)	0.437** (3.04)		
lndistance	-1.580*** (-40.62)		-1.581*** (-39.65)	
contiguity	0.411*** (3.42)		0.402*** (3.32)	
language	0.633*** (5.79)		0.632*** (5.73)	
currency	-0.453*** (-6.40)	-0.160*** (-5.11)	-0.491*** (-5.49)	-0.0108 (-0.30)
landlocked	0.443** (3.06)		0.451** (3.10)	
CEFTA	1.074*** (8.82)	0.0784 (0.94)	1.155*** (9.12)	0.157* (2.50)
rta	0.277*** (4.93)	0.0997*** (3.33)	0.272*** (4.04)	0.0964*** (4.49)
Year Fixed Effects	Yes	Yes	No	No
Country Fixed Effects	Yes	No	No	No
Country-Pair Fixed Effects	No	Yes	No	Yes
Country-Year Fixed Effects	No	No	Yes	Yes
Within R-Squared	0.77	0.38	0.78	0.91
Observations	100550	100550	100550	100524
t statistics in parentheses				
* p<0.05, ** p<0.01, *** p<0.001				

The use of country-year fixed effects helps to account for time-invariant heterogeneity in exporters and importers but doesn't control for unobserved heterogeneity in country-pairs. The last model is estimated by using country-pair fixed effects on top of the country-year fixed effects. Column 4 provides the results from this estimation. Here all the country specific time-variant and bilateral time-invariant variables are absorbed by the use of fixed-effects described above. All the estimates from this column have the same sign but not the same magnitude nor are significant at the same critical levels. Currency is highly insignificant whilst CEFTA is significant at only 10% critical level. It shows that if both countries are part of CEFTA, the

export flows from origin to destination will increase by 0.157% on average. RTA is again statistically significant at 1%, but the magnitude is lower. This explains that the estimates in the previous columns for CEFTA and RTA have been overestimated due to omitted variable bias. However, by obtaining both economically and statistically significant estimates in all four specifications provides us with enough evidence to claim that "*CEFTA has had a positive impact on its members' export flows*".

In the methodology section, it was discussed that the estimate of CEFTA might potentially be biased due to a correlation between CEFTA and RTA. Appendix D presents results from re-estimating the four models from the main hypothesis, but now without the dummy RTA. In general, there is no notable difference in the results, expect some slight movements in the magnitudes. This leads us to conclude that the correlation between CEFTA and RTA doesn't have any significant impact on the estimates presented in Table 1.

5.2 CEFTA1992 versus CEFTA2006-7

The results so far have been quite plausible by confirming that CEFTA's mission to increase economic integration and enhance export flows between its members, has been fulfilled. However, because CEFTA has been signed twice by two different group of countries, one would expect that the effect has to differ amongst these two group of countries. In the introduction section, a few arguments were discussed to explain why CEFTA1992 is expected to have delivered higher results than CEFTA 2006-7. Moreover, we discussed the blockade to Kosovar exports that was settled by Serbia and Bosnia-Herzegovina when Kosovo started to use the stamp "Republic of Kosovo" on its products. All of these factors are expected to contribute to the impact of CEFTA2006-7.

In general, the estimates are ambiguous due to the opposing signs in the four columns of Table 3. When using country-year fixed effects the CEFTA2006_7 is quite large of magnitude and statistically significant in the meantime. On the other hand, when on top of country-year fixed effects, bilateral fixed effects are added, the CEFTA2006_7 estimate becomes negative and it is still highly significant. One of the drawbacks from inferring conclusions based on the estimates from using only country-year fixed effects is the lack of accountability for bilateral unobserved heterogeneity. Therefore, we will base our conclusion by interpreting the estimates from Column 4 because it allows for additional heterogeneity in country-pairs.

Table 3: Estimates for the second hypothesis				
Dependent Variable lnexports	(1)	(2)	(3)	(4)
	Country FE (Benchmark)	Country-Pair FE	Country-Year FE	Country-Pair and Country-Year FE
lngdpc_origin	0.536***	0.682***		
	(11.87)	(15.43)		
lngdpc_destination	0.783***	0.846***		
	(22.73)	(27.60)		
lnpopulation_origin	-0.937***	-0.392*		
	(-4.68)	(-2.02)		
lnpopulation_destination	0.300	0.437**		
	(1.89)	(3.05)		
lndistance	-1.580***		-1.579***	
	(-40.79)		(-39.86)	
contiguity	0.410***		0.401***	
	(3.45)		(3.35)	
language	0.613***		0.609***	
	(5.63)		(5.56)	
currency	-0.443***	-0.160***	-0.486***	-0.00955
	(-6.30)	(-5.11)	(-5.47)	(-0.26)
landlocked	0.457**		0.465**	
	(3.20)		(3.25)	
CEFTA	0.468***	0.0946	0.505***	0.318***
	(4.66)	(1.19)	(4.85)	(4.03)
CEFTA2006_7	2.017***	-0.0417	2.284***	-0.421***
	(8.01)	(-0.22)	(9.15)	(-3.35)
rta	0.272***	0.0996***	0.265***	0.0977***
	(4.84)	(3.32)	(3.93)	(4.55)
Year Fixed Effects	Yes	Yes	No	No
Country Fixed Effects	Yes	No	No	No
Country-Pair Fixed Effects	No	Yes	No	Yes
Country-Year Fixed Effects	No	No	Yes	Yes
Within R-Squared	0.77	0.38	0.78	0.92
Observations	100550	100550	100550	100524
t statistics in parentheses * p<0.05, ** p<0.01, *** p<0.001				

The estimates from the benchmark model show that CEFTA2006-7 has actually had a higher impact than CEFTA1992 and this is highly significant. Although with a different magnitude, the estimate from column 3, where country-year fixed effects are employed, has the same sign and it is highly significant too. On the other hand, whenever country-pair fixed effects are added, this estimate becomes negative. Furthermore, in Column 2, this estimate is insignificant which leads us to believe that there is no clear difference on the impacts of the two agreements. However, Column 4, which is expect to deliver the most accurate estimates,

gives a positive estimate of CEFTA which is also very significant. Unlike CEFTA, the estimate of RTA remains positive and highly significant under each of the estimations, although its magnitude changes which causes no issues. The positive sign of CEFTA under Column 4 leads us to accept the second hypothesis that CEFTA1992 has been more effective than CEFTA2006-7.

5.3 Robustness Check

Datasets from CEPII have been widely used for testing the effect of economic integration agreements by using gravity models. The dataset "TRADHIST" is used with the purpose of checking whether our obtained results are robust. It includes around 225 exporters and 225 importers with a time span from 1827 to 2014. One would ask why not use this dataset for the main estimations which have been described above. However, my dataset differs from "TRADHIST" in a few segments. First, we use only 71 countries in our dataset and many of these countries are not included in the "TRADHIST" dataset due to their historical occurrences. Most importantly, countries such as Serbia, Montenegro and Kosovo are not part of it. These three countries are part of CEFTA2006-7 and without their presence in the dataset, the estimate of CEFTA would be biased. Second, "TRADHIST" doesn't have variables such as population, currency, landlocked, and RTA. However, for the robustness check, we use variables from this dataset such as GDP instead of GDP per capita, colonial relationship and GATT. For instance, variable such as distance, contiguity, language, and CEFTA are similar to my dataset. Regarding the observations; countries used in the robustness check will be included in the appendices while years before 1990 have been dropped due to the bias that might arise due to their inclusion.

The same procedure as explained in the methodology section will be used. Four models will be estimated with the same employment of fixed effects. The estimates from these tests are provided in Table 4. In general, there are no noticeable differences compared to the main hypothesis regressions. The estimates from the benchmark model, Column 1, are all both economically and statistically significant. The estimate of CEFTA is only slightly lower in magnitude. In the second column where country-pair and year fixed effects are employed deliver similar estimates too. However, here CEFTA estimate become highly significant compared to the main hypothesis output where CEFTA was insignificant.

Table 4: Estimates for the Robustness Check				
Dependent Variable lnexports	(1)	(2)	(3)	(4)
	Country FE (Benchmark)	Country-Pair FE	Country-Year FE	Country-Pair and Country-Year FE
lngdp_origin	0.398***	0.502***		
	(17.44)	(23.12)		
lngdp_destination	0.626***	0.739***		
	(31.79)	(41.66)		
lndistance	-1.538***		-1.537***	
	(-71.94)		(-71.36)	
contiguity	0.855***		0.835***	
	(8.84)		(8.60)	
language	0.754***		0.743***	
	(19.79)		(19.47)	
colonial_relationship	1.077***		1.076***	
	(12.23)		(12.27)	
GATT	0.364***	0.214***	0.683***	0.282***
	(13.49)	(11.21)	(10.95)	(6.17)
CEFTA	0.938***	0.621***	0.970***	0.748***
	(8.62)	(6.54)	(8.67)	(6.53)
Year Fixed Effects	Yes	Yes	No	No
Country Fixed Effects	Yes	No	No	No
Country-Pair Fixed Effects	No	Yes	No	Yes
Country-Year Fixed Effects	No	No	Yes	Yes
Within R-Squared	0.71	0.15	.72	0.88
Observations	486885	486885	486733	485399
t statistics in parentheses * p<0.05, ** p<0.01, *** p<0.001				

In Column 3, where country-year fixed effects are used, all the estimates are significant both economically and statistically while their magnitudes differ slightly. Finally, CEFTA becomes significant at 1% in the fourth column compared to its significant level at only 10% in the main estimations. These differences in magnitudes and significance levels might be an outcome of a measurement error that arises due to the choice of countries that have been used as a sample in my dataset. However, because these differences are fairly small, it leads us to believe that the 71 countries in my dataset are a good sample of the whole population. Having proven that CEFTA estimate is both economically and statistically significant under all estimation is another evidence that CEFTA has had a positive impact on its members' exports.

6. Limitations

The use of gravity models to investigate the effect of economic integration agreements, currency unions or even migration flows, has been widely criticized because of the endogeneity issues, omitted variable bias and reverse causality. The introduction of fixed effects to control for unobserved heterogeneity in both countries and country-pairs was a big turn for the effectiveness of gravity models. Fixed-effects have been helpful dealing with issues such as endogeneity and omitted variable bias. This paper used multiple fixed-effects estimators to account for unobserved characteristics such as multilateral trade resistance, endogenous prices, cultural similarities, etc. However, one issue that is always present in gravity models is whether these FTA variables are really exogenous. More specifically, is there a common factor included in the error term that has a role on determining the level of export flows and also whether the two countries are part of a common free trade agreement. The use of fixed effects is quite helpful to account for endogeneity in this case, but it can't solve the entire problem. Moreover, another econometrical issue that arises on the use of gravity models of trade is whether the model suffers from reverse causality. Does the trade flow from origin to destination country determine whether there is an FTA in force where the two countries are part of it? Baier and Bergstrand (2004) find out the likelihood that an FTA is in force between two countries mainly depends on three factors; how large and economically similar the two countries are, how remote from the rest of the world they are and finally how far from one another they are.

Another limitation is the measurement error which can be an outcome of the selection bias, missing variable and the exports which have been dropped when their value was 0. The robustness check is helpful to overcome the selection bias because it includes all countries in the world. Although it serves as a better measure, still many export flows were 0 and had to be dropped from that dataset too.

Besides these econometrical issues, there were some other limitations when the dataset was built. First, many observations were missing because the dataset includes years from 1990 to 2014 and as such in the early 1990s many information is missing for developing countries. Second, countries like Czech and Slovak Republics were still a single state until 1993, Serbia and Montenegro until 2006 while countries such as Bosnia-Herzegovina, Moldova and Kosovo declared their independence later on. Having had to deal with missing observations for these countries is a big issue because all of them have been or still are part of CEFTA. The biggest limitation was the omission of Kosovo in most of datasets available online. However, the data

on exports and GDP per capita for Kosovo has been found in Kosovo Agency of Statistics and it includes years from 2004 and onwards.

7. Conclusion and Policy Recommendations

This paper aimed to investigate the effect of CEFTA on its members' export flows. Generally, the results have been very plausible as we found that CEFTA has indeed assisted these countries increase export flows to one another. The widely used gravity model of trade was employed to investigate the relationship of interest. The dataset although being unbalanced with a numerous missing observations, was still helpful in delivering results when compared to another dataset titled "TRADHIST". CEFTA, being an economic integration agreement seems to have been very helpful in increasing cooperation between countries as it resulted in 8 out of 15 countries joining the EU at different points on time.

A second hypothesis was tested to find whether the two CEFTA agreements differ in the magnitude of how beneficial they were to its members. As hypothesized, CEFTA1992 seems to have delivered better results although this effect remains ambiguous due to the unobserved heterogeneity in country-pairs between the first and second groups of countries. Furthermore, besides serving as a benchmark, "TRADHIST" served also as a robustness check dataset and delivered very similar results as the employed dataset. Although gravity models frequently suffer from econometrical issues such as endogeneity, omitted variable bias and reverse causality, the use of fixed effects helps in accounting for these issues.

Having found an economic and statistical significance of CEFTA on exports, this thesis suggests that policymakers have to focus on strengthening the engagement of countries in these economic integration agreements. Although facilitating cooperation in the Western Balkan might be difficult due to numerous bilateral conflicts in the past while some of them continue to exist, the EU has an enormous influence in decision-making in these countries. Intuitively, economic agreements like CEFTA are likely to be successful because they aim to further integrate countries in a wider market. CEFTA's objectives, in particular, are to provide a preparation to its countries on a further integration towards the EU. As such, current members which are mostly located in Western Balkans, should establish stronger relationships between each-other as most of them are official candidates to join the EU. Countries such as Bosnia-Herzegovina, Kosovo and Moldova should try to get the most out of CEFTA as they haven't received the candidate status yet. However, the EU should work harder on making sure that the agreement is being well implemented so all countries can benefit more from it.

References

Adam, A., Mchugh, J., & Kosma, T. (2003). Trade Liberalization Strategies: What Could South Eastern Europe Learn From Cefta and Bfta? *IMF Working Papers, 03*(239)

Anderson, J.E. and E. Van Wincoop (2001),' Gravity with Gravitas: A Solution to the Border Puzzle', *National Bureau of Economic Research,* NBER Working Paper 8079

Anderson, J.E. (1979), 'A Theoretical Foundation for the Gravity Equation', *American Economic Review* Vol. 69: 106-116

Anderson, J. E., & Yotov, Y. V. (2016). Terms of trade and global efficiency effects of free trade agreemnts, 1990–2002. *Journal of International Economics, 99*, 279-298.

Baier, S. L., & Bergstrand, J. H. (2004). Economic determinants of free trade agreements. *Journal of International Economics, 64*(1), 29-63.

Baier, S. L., & Bergstrand, J. H. (2007). Do free trade agreements actually increase members' international trade? *Journal of International Economics, 71*(1), 72-95.

Baier, S. L., & Bergstrand, J. H. (2009). Estimating the effects of free trade agreements on international trade flows using matching econometrics. *Journal of International Economics, 77*(1), 63-76.

Begovic, S. (2011). The Effect of Free Trade Agreements on Bilateral Trade Flows: The Case of Cefta. *Zagreb International Review of Economics & Business, 14*(2), 51-69.

Bergstrand, Jeffrey H. "The Generalized Gravity Equation, Monopolistic Competition, and the Factor- Proportions Theory in International Trade." *Review of Economics and Statistics*, February 1989, *71*(1), pp. 143-53.

Bergstrand, J. H., Larch, M., & Yotov, Y. V. (2015). Economic integration agreements, border effects, and distance elasticities in the gravity equation. *European Economic Review, 78*, 307-327.

Bussiere, M., Fidrmuc, J., & Schnatz, B. (2005). Trade Integration of Central and Eastern European Countries. *European Central Bank: Working Paper Series, 545*.

Castilho, M., Menéndez, M., & Sztulman, A. (2012). Trade Liberalization, Inequality, and Poverty in Brazilian States. *World Development, 40*(4), 821-835.

CEFTA Secretariat. (2012). Summary and Highlights. Retrieved May 16, 2016, from http://www.wipo.int/edocs/lexdocs/treaties/en/cefta/trt_cefta.pdf

Central European Free Trade Agreement - CEFTA 2006. (n.d.). Retrieved May 16, 2016, from http://www.cefta.int/

Deardorff, A. (1997), 'Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World?', in Frankell, J.A. (1997), *The Regionalization of the World Economy*, University of Chicago Press, Chicago, U.S.A.

Dollar, D., & Kraay, A. (2004). Trade, Growth, and Poverty. *The Economic Journal, 114*(493), F22-F49.

Edwards Dudley, R. (1993). The Pursuit of Reason: The Economist, 1843-1993. Hamish Hamilton.

Edwards, S. (1993). Openness, Trade Liberalization, and Growth in Developing Countries. *Journal of Economic Literature, 31*(3), 1358-1393.

Egger, Peter, 2000. A note on the proper econometric specification of the gravity equation. *Economics Letters* 66, 25–31.

Fouquin, M., & Fugot, J. (2016, May). Two Centuries of Bilateral Trade and Gravity Data: 1827-2014. Retrieved November 11, 2016, from *Historical Bilateral Trade and Gravity Dataset*.

Francois, J. F., Mcqueen, M., & Wignaraja, G. (2005). European Union–developing country FTAs: overview and analysis. *World Development*, 33(10), 1545-1565.

GAP. (2011). Kosovo in CEFTA: In or Out? *Institute GAP*

Glick, Reuven and Rose, Andrew K. "Does a Currency Union Affect Trade? The Time Series Evidence." NBER Working Paper No. 8396, *National Bureau of Economic Research*, July 2001.

Gomes, L. (2003). The Economics and Ideology of Free Trade: An Historical Review. Edward Elgar Publishing.

Hamanaka, S. (2013). A note on detecting biases in assessing the use of FTAs. *Journal of Asian Economics*, 29, 24-32.

Harrison, A. (1996). Openness and growth: A time-series, cross-country analysis for developing countries. *Journal of Development Economics, 48*(2), 419-447.

Harvey, D. (2005). *A brief history of neoliberalism*. Oxford: Oxford University Press.

Hur, J., & Park, C. (2012). Do Free Trade Agreements Increase Economic Growth of the Member Countries? *World Development, 40*(7), 1283-1294.

I-Hui Cheng and Howard J. Wall, "Controlling for Heterogeneity in Gravity Models of Trade and Integration," *Federal Reserve Bank of St. Louis Review*, January/February 2005, pp. 49-64.

Jukic, E. (2012, July 31). Bosnian Exports Already Hit By Croatian EU Membership. *BalkanInsight*.

Keynes, J. M. (1936). *The general theory of employment, interest and money*. New York: Harcourt, Brace.

Kis-Katos, K., & Sparrow, R. (2015). Poverty, labor markets and trade liberalization in Indonesia. *Journal of Development Economics, 117*, 94-106.

Linnemann, Hans. *An Econometric Study of International Trade Flows*. Amsterdam: North-Holland, 1966.

Mankiw, Gregory (2003). *Macroeconomics*, Fifth Edition, Chapter 7

Marx, K., & Rjazanov, D. B. (1930) [1848]. *The Communist Manifesto*. New York: International.

Mátyás, László. "Proper Econometric Specification of the Gravity Model." *The World Economy*, May 1997, *20*(3), pp. 363-68.

McCallum, John. "National Borders Matter: Canada- U.S. Regional Trade Patterns." *American Economic Review*, June 1995, *85*(3), pp. 615-23.

Milekic, Sven, and Sasa Dragojlo. "Croatia Stalls Serbia's EU Negotiations." *BalkanInsight* 07 Apr. 2016:

NAFTA Secretariat. Nafta-sec-alena.org (June 9, 2010).

Ricardo, D. (1951) [1821]. On the Principles of Political Economy and Taxation. Cambridge University Press.

Rose, Andrew K. "One Money, One Market: The Effect of Common Currencies on Trade." *Economic Policy: A European Forum*, April 2000, *15*(30), pp. 7-33.

Smith, A. (1993) [1776]. Inquiry into the Nature and Causes of the Wealth of Nations. Oxford University Press.

The history of the European Union: 1945 - 1959. (n.d.)from http://europa.eu/about-eu/eu-history/1945-1959/index_en.htm

Tinbergen, Jan. *Shaping the World Economy: Suggestions for an International Economic Policy*. New York: The Twentieth Century Fund, 1962.

Whaples, Robert (2006). "Do Economists Agree on Anything? Yes!". *The Economists' Voice* **3** (9).

WORLD TRADE ORGANIZATION. (n.d.). Retrieved May 16, 2016, from https://www.wto.org/english/thewto_e/whatis_e/what_we_do_e.htm

Appendices

Appendix A: Countries included in the study

Countries included in the study		
Albania	France	Moldova
Algeria	Georgia	Montenegro
Angola	Germany	Netherlands
Argentina	Greece	New Zealand
Armenia	Hungary	Nigeria
Australia	Iceland	Norway
Austria	India	Poland
Azerbaijan	Indonesia	Portugal
Belarus	Iran	Romania
Belgium	Iraq	Russian Federation
Bosnia and Herzegovina	Ireland	Saudi Arabia
Brazil	Israel	Serbia
Bulgaria	Italy	Slovak Republic
Canada	Japan	Slovenia
Chile	Kazakhstan	South Africa
China	Korea	Spain
Colombia	Kosovo	Sweden
Croatia	Latvia	Switzerland
Cyprus	Lithuania	Turkey
Czech Republic	Luxembourg	Ukraine
Denmark	Macedonia	United Kingdom
Egypt	Malaysia	United States
Estonia	Malta	Venezuela
Finland	Mexico	

Appendix B: CEFTA Countries

CEFTA Countries	CEFTA 1992 Countries	CEFTA 2006-7 Countries
Albania	Bulgaria	Albania
Bosnia and Herzegovina	Czech Republic	Bosnia and Herzegovina
Bulgaria	Hungary	Kosovo
Croatia	Poland	Macedonia
Czech Republic	Romania	Moldova
Hungary	Slovak Republic	Montenegro
Kosovo	Slovenia	Serbia
Macedonia		Croatia*
Moldova		
Montenegro		
Poland		
Romania		
Serbia		
Slovak Republic		
Slovenia		
*Croatia has been part of both agreements, 2003-2006 with the first group countries and 2007-2013 with the second group of countries.		

Appendix C: Construction of CEFTA Dummy

Years	Country	Joined	Left
1992	Hungary	1992	2004
	Poland	1992	2004
	Czech Republic	1992	2004
	Slovak Republic	1992	2004
	Slovenia	1996	2004
	Romania	1997	2007
	Bulgaria	1999	2007
Part of Both	Croatia	2003	2013
2006 - 2007	Macedonia	2006	-
	Montenegro	2007	-
	Bosnia and Herzegovina	2007	-
	Kosovo	2007	-
	Albania	2007	-
	Moldova	2007	-
	Serbia	2007	-

Countries leave CEFTA upon European Union accession. Therefore, they continue to have free trade between them and the CEFTA dummy will remain 1 whenever the first seven countries export to one another. However, it will be 0 when they trade with a country that joined CEFTA in 2006-2007. In the case of Croatia, the dummy CEFTA when a former member is exporting or importing from Croatia will remain 1 because they continue to have free trade.

Appendix D: Estimations without RTA

Dependent Variable lnexports	(1) Country FE (Benchmark)	(2) Country-Pair FE	(3) Country-Year FE	(4) Country-Pair and Country-Year FE
lngdpc_origin	0.532*** (11.75)	0.679*** (15.33)		
lngdpc_destination	0.779*** (22.64)	0.842*** (27.45)		
lnpopulation_origin	-1.011*** (-5.07)	-0.421* (-2.17)		
lnpopulation_destination	0.230 (1.46)	0.412** (2.87)		
lndistance	-1.631*** (-42.71)		-1.631*** (-42.33)	
contiguity	0.412*** (3.41)		0.403*** (3.31)	
language	-0.388*** (-5.41)	-0.150*** (-4.71)	-0.434*** (-4.79)	-0.0141 (-0.39)
currency	0.634*** (5.78)		0.633*** (5.73)	
landlocked	0.431** (2.96)		0.437** (2.98)	
CEFTA	1.128*** (9.39)	0.121 (1.47)	1.196*** (9.51)	0.187** (3.00)
Year Fixed Effects	Yes	Yes	No	No
Country Fixed Effects	Yes	No	No	No
Country-Pair Fixed Effects	No	Yes	No	Yes
Country-Year Fixed Effects	No	No	Yes	Yes
Within R-Squared	0.77	0.38	0.78	0.92
Observations	100550	100550	100550	100524

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Appendix E: Countries included in the Robustness Check

Aruba	Costa Rica	Haiti	Montenegro	El Salvador
Afghanistan	Cuba	Hungary	Mongolia	San Marino
Angola	Curaçao	Indonesia	Northern Mariana Islans	Somalia
Albania	Cayman Islands	Isle of Man	Mozambique	Saint Pierre and Miquelon
Andorra	Cyprus	India	Mauritania	Serbia
Netherlands Antilles	Czech Republic	Ireland	Martinique	South Sudan
United Arab Emirates	Czechoslovakia	Iran	Mauritius	Sao Tome and Principe
Argentina	Germany	Iraq	Malawi	Suriname
Armenia	Djibouti	Iceland	Malaysia	Slovak Republic
American Samoa	Dominica	Israel	Namibia	Slovenia
Antigua and Barbuda	Denmark	Italy	New Caledonia	Sweden
Australia	Dominican Republic	Jamaica	Nigeria	Swaziland
Austria	Algeria	Jordan	Nigeria	Sint Maarten
Azerbaijan	Ecuador	Japan	Nicaragua	Seychelles
Burundi	Egypt	Kazakhstan	Netherlands	Syria
Belgium	Eritrea	Kenya	Norway	Chad
Benin	Spain	Kyrgyzstan	Nepal	Togo
Burkina Faso	Estonia	Cambodia	Nauru	Thailand
Bangladesh	Ethiopia	Kiribati	New Zealand	Tajikistan
Bulgaria	Finland	Saint Kittis and Nevis	Oman	Turkmenistan
Bahrain	Fiji	South Korea	Pakistan	Timor-Leste
Bahamas	Falkland Islands	Kuwait	Panama	Tonga
Bosnia and Herzegovina	France	Laos	Peru	Trinidad and Tobago
Belarus	Faroe Islands	Lebanon	Philippines	Tunisia
Belize	Micronesia	Liberia	Palau	Turkey
Bermuda	Gabon	Libya	Papua New Guinea	Tuvalu
Bolivia	United Kingdom	Saint Lucia	Poland	Taiwan
Brazil	Georgia	Liechtenstein	Puerto Rico	Tanzania
Barbados	Ghana	Sri Lanka	North Korea	Uganda
Brunei	Gibraltar	Lesotho	Portugal	Ukraine
Bhutan	Guinea	Lithuania	Paraguay	Uruguay
Botswana	Guadeloupe	Luxembourg	State of Palestine	United States
Central African Republic	Gambia	Latvia	French Polynesia	Soviet Union
Canada	Guinea-Bissau	Macao	Qatar	Uzbekistan
Channel Islands	Equatorial Guinea	Morocco	Reunion	Saint Vincent and the Grenadines
Switzerland	Greece	Monaco	Romania	Venezuela
Chile	Grenada	Moldova	Russian Federation	Virgin Islands, U.S.
China	Greenland	Madagascar	Rwanda	Vietnam
Ivory Coast	Guatemala	Maldives	Saudi Arabia	Vanuatu
Cameroon	French Guiana	Mexico	Sudan	Samoa
Democratic Republic of Congo	Guam	Marshall Islands	Senegal	Yemen
Congo	Guyana	Macedonia	Singapore	Yugoslavia
Colombia	Hong Kong	Mali	Saint Helena	South Africa
Comoros	Honduras	Malta	Solomon Islands	Zambia
Cabo Verde	Croatia	Myanmar	Sierra Leona	Zimbabwe