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Impact of Trade Agreements with EU on the Reduction in Trade Balance Deficit of Bosnia and Herzegovina

Safet Kurtovic*and Sead Talovic

Faculty of Economics, Dzemal Bijedic University of Mostar, Bosnia and Herzegovina
Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina

Abstract: The main objective of this paper is to study the effect of the liberalization of trade with the European Union (EU) and its impact on trade deficit reduction in Bosnia and Herzegovina (B&H). The paper analyzes data time series in the period 2005-2013. We have applied the economical gravity model and econometric dynamic panel data techniques: panel data models (PD), fixed effect models (FE) and random effect models (RE). It has been established that trade liberalization positively impacts the reduction of B&H trade deficit, i.e. that export X_{it}, import M_{jt}, gross domestic product GDP_{it}, GDP_{jt}, gross domestic product per capita $GDPPC_{it}$ and the dummy variable sharing a common border $CBORD_{ij}$ are statistically significant, while gross domestic product per capita $GDPPC_{jt}$ and other dummy variables are statistically insignificant.

Keywords: Gravity model, trade, liberalization, deficit, export, import
JEL Classification: F1, F15

1. Introduction

B&H went through difficult times in its recent past during the war raging from 1992 to 1995. The war caused great economic devastation. This was followed by the post-war reconstruction of the country and the adoption of the economic development model of an open economy. During this period, the country undertook numerous economic reforms in the field of privatization of state property, trade liberalization and enhancement of banking sector and fiscal framework. B&H has achieved certain progress; however, it is still among the poorest European countries (Wiel van De, 2013).

In order to bring the Western Balkan countries closer to Euro-Atlantic integrations, EU initiated the Stabilization and Association Agreement (SAA) with the Western Balkan countries at the Summit held in Zagreb in 2000. This Agreement anticipated for each of the Western Balkan countries to sign the Stabilization and Association Agreement with the EU. The Agreement regulated the liberalization of trade between the EU and the signatory countries, gradual harmonization of legislation, integration of programmes and policies with the EU as well as regional cooperation between the signatories. The main instrument of regional cooperation in the area of trade policy is the creation of the Free Trade Agreement. The Free Trade Agreement was replaced by CEFTA 2006 (Bartlett, 2008). CEFTA 2006 has its roots in the previous CEFTA Agreement established in 1992 by Hungary, Poland and Czechoslovakia. After the establishment they were joined by Slovenia in 1996, Romania in 1997, Bulgaria in 1999, Croatia in 2003 and Macedonia in 2006 (Zenic-Zeljkovic, 2011). In 2006, Bulgaria, Romania, Albania, Bosnia and Herzegovina, Croatia, Macedonia, Kosovo, Moldova, Montenegro and Serbia negotiated changes to and enlargement of the original CEFTA which would become the new CEFTA 2006. The negotiations had support from the Stabilization Pact for South-East Europe and the European Commission. CEFTA 2006 entered into force in July 2007 (Mostetsching, 2011). In 2008, B&H signed the Stabilization and Association Agreement with the EU and the Interim Agrement on trade and trade-related matters (Saputo, 2011). In 2013, it signed the Agreement with EFTA (European Free Trade Association), which represents the association of markets of Switzerland, Norway, Iceland and Liechtenstein. This Free Trade Agreement regulates trade in industrial and agricultural products and fish. Apart from the stated agreements, B&H signed several more bilateral agreements on free trade with countries in the region and beyond it.

High trade balance deficit in B&H and several other Eastern European transition countries is one of the main causes of current account deficit (Hlivanjak, 2010). We find that certain factors affected the growth of trade balance deficit. Primarily, war directly or indirectly led to high dependence on imports and long-term non-competitiveness of economy with respect to exporting to the world market. Unlike its neighbours, B&H achieved slower progress in the area of enhancing the integration process. On the way to Euro-Atlantic integration, B&H is the furthest down the line. Other causes of trade balance deficit pertain to changes in trade conditions worldwide, great technological gap, poorly implemented privatization, structure of received foreign investments, permanent dependence on imports of most products and services, as well as to unreformed and inefficient economic system's state institutions. Considering the trade balance in the period 1998-2013, a permanent presence of trade balance deficit is evident. Trade deficit went from 23.2% in 1998 to 29.6% in 2013, i.e. it amounted to -1.806,219 billion euros in 1998 and -3.471,506 billion euros in 2013 (BHAS, 2006). Trade deficit nominally increased in the period 1998-2013 by -1.665,287 billion euros. During the 2000's, trade deficit in B&H was rather high. In 2006, it amounted to a record-setting 45.3%. In 2007 and 2008 trade deficit decreased to 42.7% and 41.2% respectively (BHAS, 2008). With the economic crisis taking place in 2008 all over the world, particularly in the EU, trade deficit in B&H moved in quite equal intervals from 2009 onwards. Thus, trade deficit amounted to -30.3% in 2009, 29.4% in 2010, -31.2% in 2011 and -32.8% and -29.6% in 2012 and 2013 respectively (Van de Wiel, 2013). In 2013, the share of trade deficit as compared with the GDP amounted to 38.7%, which is a high deficit for a small and underdeveloped economy.

Trade deficit decreased by 3.2% in 2013 compared to 2012. The main reason for its decrease is the recovery of EU countries. Namely, their coming out of the recession lead to an increase in demand for semi-products and raw materials from B&H. Based on data for 2014, trade deficit increased by 6.5% compared to 2013. Basically, the main reason for the increase in trade deficit is an increase in imports of chemical products, food and technology, i.e. B&H dependence on imports of the products in question increased based on indicators showing a positive growth in industrial production during the entire year, as well as growth in final consumption.

However, if we consider imports and exports in relation to the EU countries in the period 2005-2013, we will notice that imports increased from 3.998,327 billion euros in 2005 to 4.657,870 billion euros in 2013, while exports increased from 1.893,467 billion euros in 2005 to 3.155,786 billion euros in 2013. Traditionally, B&H exports the most to Croatia in the amount of 1.000,282 billion euros or 14.3%, followed by Germany in the amount of 887,012 million euros or 15.6% and Italy in the amount of 757,864 million euros or 12% of total exports. On the other hand, B&H's highest import is from Croatia in the amount of 610,808 million euros accounting for 12.9%, Germany 670,224 million euros or 11.4% and Italy 512,976 million euros or 9.8% of total imports (BHAS, 2008; 2014). Sector wise, B&H imports traditionally pertain mostly to mineral fuels and lubricants, machinery and transport devices, food and livestock, chemical products, products classified by material and various final products. On the other hand, it mostly exports products classified by material, raw materials except fuel and mineral fuels and lubricants. In 2013 there was a decrease in imports of food and livestock by 0.99%, minerals and lubricants by 0.1%, machinery and transport devices by 0.94%, chemical products by 0.99%, products classified by material by 1.07%, and various final products by 0.12% compared to 2012. In 2013, there was an increase in export of products classified by material by 0.95%, mineral fuels and lubricants by 1.33% and a decrease in export of raw materials except fuel by 0.98% compared to 2012 (BHAS, 2014).

EU is the main trade partner of B&H. Share of B&H exports - as compared with the total exports - to the EU amounted to 73.5%, while the share of import from the EU amounted to 60% of the total B&H imports in 2013. CEFTA countries are the second most important trade partner and they account for about 16% of exports and 11% of imports (European Commission, 2014). During 2013, B&H had a share of exports of 25.2% (exports to GDP ratio) and imports of 47.8% in GDP (imports to GDP ratio), while the share of total trade in GDP amounted to 73%. Ratio of EU trade with B&H was stable. In 2011 imports and exports amounted to 3.0% and 4.7% respectively. In 2012, imports and exports amounted to 3.0% and 4.8% respectively and during 2013 imports and exports amounted to 3.2% and 4.8% respectively. Trade deficit in 2011, 2012 and 2013 amounted to 1.8%, 1.8% and 1.5% respectively. Considering the period from 2009 to 2013, the average annual increase in B&H imports from the rest of the world amounted to 7.3%, while the average annual increase in exports amounted to 14.9%. B&H trade with the EU in the same time period has different indicators, i.e. imports increased by 13.8% on average, while exports increased by 5% annually (European Commission, 2014).

This paper's main objective is to study the effect of trade agreements that B&H signed with the EU on the reduction in B&H trade deficit. In accordance with that, we have attempted to establish whether liberalization of trade with the EU leads to intensified trade exchange and whether it causes a reduction in B&H trade deficit. In order to reach answers with respect to the set objectives, we included independent variables that are essential in measurement of the effect of trade liberalization on the reduction in B&H trade deficit. This means that we are going to measure the collective effect of independent variables such as export, import, GDP, GDPPC (gross domestic product per capita), real effective exchange rate, population, geographic distance between trade partner countries, signed free trade agreements with the EU, sharing a common border and similarity of language on the reduction in B&H trade deficit. Based on the results gained, we shall be able to find out what the main reasons for the occurrence of B&H trade balance deficit are and how to achieve its reduction by means of explanatory variables. This research paper sets the H_0 hypothesis that there is no significant impact of liberalization of trade with the EU on the reduction in B&H trade balance deficit.

$$H_0: \beta_1 = 1$$

There is also an alternative hypothesis set that there is a significant impact of liberalization of trade with the EU on the reduction of B&H trade balance deficit.

$$H_1: \beta_1 \neq 1$$

The paper consists of sections as follows: the introductory section provides the subject, research objectives and research hypotheses; Section 2 provides an overview of literature or research closely related to this paper's research subject; Section 3 describes the economic model; Section 4 describes econometric techniques and databases used in the research; Section 5 provides the empirical results of the research and, finally, Section 6 contains the Conclusion.

2. Literature Review

Fidrmuc and Fidrmuc (1999) co-authored the paper assessing the intensity of trade flows between transition countries of the Central and Eastern Europe. They studied the impact of membership of the said countries in trade associations. They applied the gravity model and determined that Central and Eastern European countries have not registered a significant increase in trade with EFTA countries. On the other hand, a significant increase has been achieved in trade with CEFTA countries, while the level of bilateral trade between the countries formerly constituting a common country has significantly dropped below the previous level. Christie (2002) explored the possibility of trade between the countries of South-East Europe. In his research he applied the gravity model on the basis of which he inspected the potential scope of trade between the given countries, as well as possible scenarios related to GDP levels, possible membership in economic institutions

worldwide, geographical distance, etc. Apart from this, the research has shown that the countries of South-East Europe cannot be viewed as a region that could provide an aggregate offer. Paas and Tafenau (2005) researched the regional trade integration of the EU countries, i.e. the creation of potential regional trade clusters. Their research covered the Baltic region and they applied the gravity model. They came up with the results saying that the geographic distance is statistically significant, i.e. that it positively affects the trade flows between the given countries. They also determined that the trade in the Baltic countries cannot be explained by the new trade theories because these are the economies with various comparative advantages. Kanda (2006) applied the theoretical model of trade balance and used it as the basis for estimating a quarterly regression model of B&H trade balance. His research came up with the results showing that B&H has a high trade balance deficit due to high interest rates charged on consumer and commercial credits and due to high government spending.

Kandogan (2007) applied the gravity model in his paper in order to research the effect of trade on trade integrations. He introduced new variables into the gravity model such as year, exporter, importer and bilateral trade. He established that different trade blocs or integrations have different levels of trade depending on the level of integration, sector coverage, etc. Trade blocs with similar culture, language and geographical distance register increased trade. In the case of monetary and customs unions a weaker trade intensity has been noted. Begovic (2011) studied the fact that trade agreements do not necessarily lead to increase in trade between countries. The subject of her research was CEFTA 2006. In the research she applied the gravity model and reached the conclusion that liberalization does not lead to improvement of trade within the region, i.e. to improvement of trade performances between CEFTA member countries. Caporale et al. (2008) studied the impact of free trade agreements on trade flows between EU-15 and the Central and Eastern European countries i.e. Bulgaria, Hungary, Poland and Romania. They based their research on the application of the gravity model and the fixed effect vector decomposition technique – FEVD. The results of their research have shown that the Central and Eastern European countries have an imbalance between imports and exports, i.e. a low coverage of imports with exports with EU-15 countries, which leads to trade balance deficit or trade asymmetry. Free Trade Agreement did not contribute to changes in export structure for the countries exporting to EU-15 (The European Monetary Union – 15), i.e. export of labor-intensive products and a high elasticity of demand of EU-15 countries are still present. Pjerotic (2008) analyzed the effects of trade liberalization in the South-East European countries in her paper; namely, she analyzed the structure of trade between the member countries i.e. the intra-trade flows. Caporale et al. (2009) researched the Free Trade Agreement between EU-15 and the Central and Eastern European countries. They applied the gravity model and generalized method of moments in order to analyze the effect of the agreements' variables. They established that there was a trade deficit in the case of the Central and Eastern European countries (CEE). They also noted a positive trend in terms of the access of the CEE countries to the high-tech products, consumer products, capital and semi-products. Apart from this, they noticed an increase in horizontal investment towards CEE countries, which caused imports of technology and parts and an increase in trade deficit. Mojsovska - Blazevski and Peterski (2010) researched the problem of trade of the Western Balkan countries with the EU and CEFTA 2006, with a special overview of Macedonia. Having applied the gravity model, they concluded that trade relations between countries depend on the GDP level. Additionally, they determined that the income levels are not the same within the Free Trade Agreement and CEFTA 2006. The main reason for this is the existence of invisible trade barriers. In her doctoral dissertation Hlivnjak (2010) studied the current account deficit and its sustainability. She established that the current account deficit in B&H was not caused by exchange rate misalignment and that there was therefore no need to adjust the peg. The main reason behind the B&H current account deficit was its high trade deficit. In order to study the reasons for the high trade deficit, she applied the gravity model and econometric panel techniques. High trade deficit is explained by the country's export-import structure and a negative effect of the CEFTA Agreement and other free trade agreements on B&H economy.

Gjipali et al. (2012) researched the effect of intra-regional trade between the South-East Europe countries. They applied the gravity model and established that there is a significance in terms of historical, cultural and political factors, i.e. that they positively impact the improvement of trade flows between the given countries. On the other hand, there was no significance noted in the case of geographical distance. In his research, Nastic (2013) applied the gravity model to measure the potential export growth opportunities in B&H and identify attractive potential markets. Additionally, he explored the reasons for the reduction in exports from B&H to certain markets. Braha et al. (2014) studied the effect of liberalization of trade of the EU with the Western Balkan countries. They applied the gravity model and established that exports positively affect the growth of GDP, as well as that exports decrease with the increase in geographical distance between trade partners. Finally, the research showed that there is a positive significance of the increase in exports for the enhancement of competitiveness of the Western Balkan countries. Azat (2014) studied the correlation between the economic indicators of the CEE countries. He used GMM model and Shapiro-Francia Normality Test. This research is concerned with the measurement of economic progress of the CEE countries i.e. their potential to join the EU integration process. Robu et al. (2014) studied the impact of the free trade agreement with the EU requires the inclusion of Moldova in the European Area, and opportunities for Moldova regarding the access to goods and services offered on the European market and the development and promotion of implemented structural reforms to increase the competitiveness of products and the national economy.

3. The Economic Model

The gravity equation became a popular tool beginning in the early 1960s to explain actual aggregate gross bilateral trade flows. The mainstream theory – and empirical evaluation of it – in the 1960s was concerned instead with explaining the pattern and commodity composition of trade. Ricardo's theory of comparative advantage and the Heckscher-Ohlin model were basically silent on aggregate gross bilateral trade flows. By contrast, the study of aggregate gross bilateral trade flows has been referred to as the analysis of the "volume" of trade (Bergstrand and Egger, 2010).

The gravity model of trade (GMT) bears a strong similarity to Newton's formula of gravitation. In this model, the two trading areas could be viewed as celestial objects and the value of trade could be viewed as the gravitational pull. Gravity models utilize the gravitational force concept as an analogy to explain the volume of trade, capital flows, and migration among the countries of the world. Jan Tinbergen used an analogy with Newton's universal law of gravitation to describe the patterns of bilateral aggregate trade flows between two countries A and B as "proportional to the gross national products of those countries and inversely proportional to the distance between them,"(Chaney, 2011). The trade (~gravitational pull) is dependent on the GDPs (~mass) of the two trading areas, and their physical distance. The bigger the GDP (~mass) between the two trading areas (~celestial objects) the greater is the trade (~gravitational pull). The trade between the two areas decays exponentially as distance increases (~ decrease in gravitational pull by the square of distance). The similarities end there as GMT can take other variables like infrastructure (~sources of friction) (Beronilla et al.). Thus a mass of goods or labor or other factors of production supplied at origin i, Y_i, is attracted to a mass of demand for goods or labor at destination j, E_j, but the potential own is reduced by the distance between them, d_{ij}. Strictly applying the analogy

$$X_{ij} = Y_i E_j / d_{ij}^2 \tag{1}$$

gives the predicted movement of goods or labor between i and j, X_{ij} (Anderson, 2011).

The gravity model is based on the assumption that trade between countries depends positively on their size and inversely on distance. Economically rich and geographically close countries trade more among themselves than with third countries. In its simplest form, the gravity equation states that the bilateral trade between two countries is directly proportional to the product of the countries' GDPs. Thus, larger countries will tend to trade more with each other, and countries that are more even in their relative sizes will also trade more (Braha et al. 2014). The basic form of the gravity equation is as follows (Batra, 2004)

$$Trade_{ij} = \frac{\alpha \; x \; GDP_i \; x \; GDP_j}{Distance_{ij}} \tag{2}$$

where $Trade_{ij}$ is the value of the bilateral trade between country i and j, GDP_i and GDP_j are country i and j's respective gross domestic incomes. $Distance_{ij}$ is a measure of the bilateral distance between the two countries and i and j is a constant of proportionality.

Ravenstein pioneered the use of gravity for migration patterns in the 19th century UK. Tinbergen and Poyhonen did the first econometric studies of trade flows based on the gravity equation, for which they gave only intuitive justification. Jan Tinbergen is credited as the first to specify econometrically what has become a benchmark "traditional" gravity equation for studying international trade flows. Using a specification similar to equation (2), Tinbergen estimated (Bergstrand and Egger, 2010)

$$\ln PX_{ij} = \; ln\beta_o + \beta_1 lnGDP_i + \beta_2 lnGDP_j + \beta_3 lnDIST_{ij} + \beta_4 ADJ_{ij} + \beta_5 EIA1_{ij} + + \beta_6 EIA2_{ij} + ln\varepsilon_{ij.} \tag{3}$$

where ADJ, $EIA1$, and $EIA2$ are dummy variables with values of 1 if two countries share a common land border, are members of the British Commonwealth, and are members of the Benelux free trade agreements, respectively (and zero otherwise).

Linnemann added more variables and went further toward a theoretical justification in terms of a Walrasian general equilibrium system, but the Walrasian model tends to include too many explanatory variables for each trade flow to be easily reduced to the gravity equation (Deardorff, 1988). He explained exports of country i to country j in terms of the interaction of three factors: potential supply of exports of the country i, potential demand of imports from the country j and a factor representing trade barriers. Potential export supply is a positive function of the exporting country's income level and can also be interpreted as a proxy for product variety. Potential import demand is a positive function of the importing country's income level. Barriers to trade are a negative function of trade costs, transport costs, tariffs (Caporale et al. 2008). We will be using the modified gravity model displayed by McCallum (1995), where the simplest version of the estimated equation can be written as follows

$$X^{ij} + X^{ji} = \left(\frac{2}{Y^W}\right) Y^i Y^j \; . \tag{4}$$

This gives our simplest derivation of the gravity equation, where the bilateral exports from country to country are proportional to the product of their gross domestic products (GDPs). Accordingly, the McCallum model is adjusted for logarithmic form by adding the supplementary variables (Braha et al. 2014)

$$\ln x_{ij} = \alpha_1 + \alpha_2 lny_i + \alpha_3 lny_j + \alpha_4 lnd_{ij} + \alpha_5 \delta_{ij} + \epsilon_{ij}. \tag{5}$$

Here x_{ij} is exports from region i to region j, y_i and y_j are gross domestic production in regions i and j, d_{ij} is the distance between regions i and j, and $\delta_{ij}$is a dummy variable equal to one for inter-provincial trade and zero for state-province trade (Anderson and Wincoop, 2001).

In trade-theory, the gravity equation in its most basic and frequently used form is specified as (Gao, 2009)

$$ln\, X_{ij} = \beta_0 + \beta_1 lnY_i + \beta_2 ln\, Y_j + \beta_3 ln\, D_{ij} + \beta_4 ln\, F_{ij} + \mu_{ij}. \quad (6)$$

where X_{ij} is the amount of trade between country i (host) and country j (home), Y is the nominal GDP of each country, D_{ij} is the distance between the two countries, and F_{ij} represents any other factors that might affect the amount of trade conducted between country i and j. Miscellaneous F_{ij} factors are frequently represented by dummy variables. This is because more often than not, these factors tend to remain constant for each individual country. In conjunction with the economic size N_i of a country is its market size, meaning larger countries have greater potential markets which would attract more firms to export to that country. To account for this possibility, some theories have suggested an extension of the gravity model to include the population size of each country into the equation

$$ln\, X_{ij} = \beta_0 + \beta_1 lnY_i + \beta_2 ln\, Y_j + \beta_3 ln\, N_i + \beta_4 ln\, N_j + \beta_5 ln\, D_{ij} + \beta_6 ln\, F_{ij} + \mu_{ij.} \quad (7)$$

In this extended model, the economic size coupled with the actual size of the countries is supposed to account for the market potential of a country that serves to predict trade value (Gao, 2009). A high level of income in the exporting country indicates a high level of production, which increases the availability of goods for export. Therefore β_1 is expected to be positive. The coefficient of Y_j, β_2 is also expected to be positive since a high level of income in the importing country suggests higher imports. The coefficient estimate for population of the exporters, β_3, may be negatively or positively signed, depending on whether the country exports less when it is big (absorption effect) or whether a big country exports more than a small country economies of scale. The coefficient of the importer population, β_4, also has an ambiguous sign, for similar reasons. The distance coefficient is expected to be negative since it is a proxy of all possible trade costs. The coefficients of all these trade β_5 variables are expected to be positive (Martinez - Zarazoso, 2003).

Anderson and Wincoop used the gravity model to study the effect of a border between USA and Canada on each country's domestic trade. Their version of the model is a refined version of the McCallum Gravity Equation. Even though these researches were conducted to study effects that a national border has on trade within a country, the principle of remoteness is also relevant in international trade. Firstly, the basic model including remoteness is

$$ln\, X_{ij} = \beta_1 + \beta_2 lnY_i + \beta_3 ln\, Y_j + \beta_4 ln\, d_{ij} + \beta_5 ln\, REM_i + \beta_6 ln\, REM_j + \beta_7 ln\, \delta_{ij} + \varepsilon_{ij}. \quad (8)$$

Where remoteness of a region I is

$$REM_i = \sum_{m \neq j} d_{im}/y_m. \quad (9)$$

This is the average distance of region i from all trading partners except from j. This remoteness variable is very commonly used, although there is very little theoretical justification for such a variable. Also, using it doesn't increase the R^2 significantly. δ_{ij} = a dummy variable for whether the trade is within the country or with another country. This was the starting point of Anderson and van Wincoop's work. They were dissatisfied with the current theoretical backing for the theory, even though it did match very well with the empirics. Especially in their interest was to further develop the term of trade resistance, they divided it into three components: 1) bilateral trade barrier between regions i and j, 2) $i's$ resistance to trade with all regions and 3) $j's$ resistance to trade with all regions (Weckström, 2013).

4. The Econometric Model and Data

4.1. Data

The econometric analysis is based on the application of dynamic panel data techniques. Within this dynamic panel analysis, the data used pertains to trade flows between B&H and the EU in the time period between 2005 and 2013. We have opted for the given time series having in mind the fact that the Agency for Statistics of B&H officialy started registering data on trade exchange with the EU in 2005. The data was taken from the databanks of the Agency for Statistics of B&H, Central Bank of B&H, Ministry of Foreign Trade and Economic Relations and Eurostat.

4.2. Dynamic panel analysis

Our empirical analysis applies gravity model and econometric panel data models, fixed effect models, random effect models and the Hausman test. The gravity model is used in order to establish or assess the impact of trade liberalization on the reduction in trade balance deficit of B&H as compared to the EU. This paper's empirical specification is as follows:

$$Log(TB_{ijt}) = \beta_0 + \beta_1 \log(X_{it}) + \beta_2 \log(M_{jt}) + \beta_3 \log(GDP_{it}) + \beta_4 \log(GDP_{jt}) + \beta_5 \log(GDPPC_{it}) + \beta_6 \log(GDPC_{jt}) + \beta_7 \log(ER_{it}) + \beta_8 \log(ER_{jt}) + \beta_9 \log(Dist_{ij}) + \beta_{10} FTA_{ijt} + \beta_{11} CBord_{ij} + \beta_{12} Lang_{ij}, +, \dots, + \varepsilon_{ijt}. \quad (10)$$

Where TB_{ijt} - is the trade balance and that is the dependent variable. The explanatory variables used are X_{it} and M_{Jt} and they denote exports and imports respectively between countries i and j at time t with $i \neq j$, GDP_{it}, GDP_{jt} - Gross Domestic Product of country i and country j, $GDPPC_{it}$ - GDP per capita of country i and $GDPPC_{jt}$ per capita of country j, $REER_{it}$ - real effective exchange rate of country i during time period t. $REER_{it}$ – real effective exchange rate of country j during time period t. $Dist_{ij}$ - distance between country i and country j (kilometers), FTA_{ijt} - dummy variable that is equal to 1 if country i and country j have signed a free trade agreement with EU countries, $Cbord_{ij}$ - Common Border Dummy: 1 if common border between country i and j, 0 if otherwise, $Lang_{ij}$ - 1 if both countries have Similar Language (meaning same word root, understandable between each other), 0 if otherwise, ε_{ijt} - and the disturbance term, which is assumed to be normally distributed with a zero mean and a constant variance for all observations and to be uncorrelated.

4.2.1. Panel data models

An important advantage of panel data compared to time series or cross-sectional data sets is that it allows identification of certain parameters or questions, without the need to make restrictive assumptions. For example, panel data make it possible to analyze changes on an individual level. That is, panel data are not only suitable to model or explain why individual units behave differently but also to model why a given unit behaves differently at different time periods (for example, because of a different past). Because panel data sets are typically larger than cross-sectional or time series data sets, and explanatory variables vary over two dimensions (individuals and time) rather than one, estimators based on panel data are quite often more accurate than from other sources. Even with identical sample sizes, the use of a panel data set will often yield more efficient estimators than a series of independent cross-sections (where different units are sampled in each period). A second advantage of the availability of panel data is that it reduces identification problems. Although this advantage may come under different headings, in many cases it involves identification in the presence of endogenous regressors or measurement error, robustness to omitted variables and the identification of individual dynamics (Marno, 2004).

A panel data regression differs from a regular time-series or cross-section regression in that it has a double subscript on its variables, i.e. (Baltagi, 2005)

$$y_{it} = \alpha + X'_{it}\beta + u_{it}\ i = 1, \dots, N; t = 1, \dots, T. \tag{11}$$

with i denoting households, individuals, firms, countries, etc. and t denoting time. The i subscript, therefore, denotes the cross-section dimension whereas t denotes the time-series dimension. α is a scalar, β is $Kx1$ and x_{ij} is the itth observation on Kexplanatory variables. Most of the panel data applications utilize a one way error component model for the disturbances, with

$$u_{it} = \mu_i + v_{it}. \tag{12}$$

Where μ_i denotes the unobservable individuals-specific effect and v_{it} denotes the remainder disturbance. In vector form (11) can be written as (Baltagi, 2005)

$$y = \alpha l_{NT} + X\beta + \mu = Z\delta + u. \tag{13}$$

Where y is $NT\ x\ 1$, X is $NT\ x\ K, Z = [l_{NT} + X\beta + u], \delta' = (\alpha', \beta')$ and l_{NT} is a vector of ones of dimension NT. Aslo, (13) can be written as

$$u_{it} = Z_\mu \mu + v. \tag{14}$$

4.2.2. Fixed effect models

Panel data may have group effects, time effects, or both. These effects are either fixed effect or random effect. *A fixed effect model* assumes differences in intercepts across groups or time periods, whereas a random effect model explores differences in error variances. A one-way model includes only one set of dummy variables (e.g. firm), while a two way model considers two sets of dummy variables (e.g. firm and year). The functional forms of one-way panel data models are as follows

Fixed group effect model: $y_{it} = (\alpha + \mu_i) + X'_{it}\beta + v_{it}$where $v_{it} \sim IID(0, \sigma_y^2)$. (15)

Fixed group effect model: $y_{it} = (\alpha + X'_{it}\beta + (\mu_i + v_{it})$, where $v_{it} \sim IID(0, \sigma_y^2)$. (16)

The dummy variable is a part of the intercept in the fixed effect model and a part of error in the random effect model. $v_{it} \sim IID(0, \sigma_y^2)$ indicates that errors are independent and identically distributed (Panel data models, 2014).

The least squares dummy variables (LSDV) estimator is panel OLS including a set of $N - 1$ dummy variables which identify the individuals and hence an additional $N - 1$ parameters. Note that one of the individual dummies is dropped because we include a constant. Time-

invariant explanatory variables, z_i, are dropped because they are perfectly collinear with the individual dummy variables. The LSDV estimator of β is numerically identical with the FE estimator and therefore consistent under the same assumptions. The LSDV estimators of the additional parameters for the individual-specific dummy variables, however, are inconsistent as the number of parameters goes to infinity as $N-1$. This so-called incidental parameters problem generally biases all parameters in non-linear fixed effects models like the probit model (Schmidheiny, 2014).

The implied estimator for β is referred to as the least squares dummy variable (LSDV) estimator. Fortunately one can compute the estimator for β in a simpler way. It can be shown that exactly the same estimator for β is obtained if the regression is performed in deviations from individual means. Essentially, this implies that we eliminate the individual effects α_i first by transforming the data. To see this, first note that (Marno, 2004)

$$\bar{y}_i = \alpha_i + \bar{x}_i'\beta + \bar{\varepsilon}_i. \tag{17}$$

where $\bar{y}_i = T^{-1}\sum t\, y_{it}$ and similarly for the other variables. Consequently, we can write

$$y_{it} - \bar{y}_i = (x_{it} - \bar{x}_i)'\beta + (\varepsilon_{it} - \bar{\varepsilon}_i). \tag{18}$$

The transformation that produces observations in deviation from individual means is called the within transformation. The OLS estimator for β obtained from this transformed model is often called the within estimator or fixed effects estimator, and it is exactly identical to the LSDV estimator described above. It is given by (Marno, 2004)

$$\hat{\beta}_{FE}=(\sum_{i=1}^{N}\sum_{t=1}^{T}(x_{it} - \bar{x}_i)')^{-1}\sum_{i=1}^{N}\sum_{t=1}^{T}(x_{it} - \bar{x}_i)\,(y_{it} - \bar{y}_i). \tag{19}$$

The within fixed effect model does not use dummy variables, but uses deviations from group means. Thus, this model is the OLS of $(y_{it} - \bar{y}_{in}) = \beta'(x_{it} - \bar{x}_{in}) + (\varepsilon_{it} - \bar{\varepsilon}_{in})$ without an intercept. You do not need to worry about the incidental parameter problem any more. The parameter estimates of regressors are identical to those of LSDV. Since this model does not report dummy coefficients, you need to compute them using the formula $d_g^* = \bar{y}_{gm} - \beta'\bar{x}_{gm}$. Since no dummy is used, the within effect model has a larger degree of freedom for error, resulting in a small MSE (mean square error) and incorrect (larger) standard errors of parameter estimates. Thus, you have to adjust the standard error using the formula $se_k' = se_k\sqrt{\frac{df_{error}^{within}}{df_{error}^{LSDV}}} = s_k\sqrt{\frac{nT-k}{nT-n-k}}$. Finally, $R2$ of the within effect model is not correct because an intercept is suppressed (Panel data models, 2014).

4.2.3. Random effect models

In the random effects model (henceforth, quantities relating to the random effects model will be indicated by the superscript RE), θ_i^{RE} is considered as a positive random variable, with probability density function $g(\cdot)$. Given θ_i^{RE}, the annual claim numbers $N_{i,1}, N_{i,2},\ldots,N_{i,T}$ are independent. The joint probability function of $N_{i,1}, \ldots,N_{i,T}$ is thus given by (Boucher and Denuit, 2006)

$$Pr\left[N_{i,1} = n_{i,1}, \ldots, N_{i,T} = n_{i,T}\right]=\int_0^{\infty}\left[\prod_{t=1}^{T} exp\left(-\emptyset\lambda_{i,t}^{RE}\right)\frac{(\theta\gamma_{i,t}^{RE})^{n\,i,t}}{n\,i,t!}\right]g(\theta)d\theta.$$
(20)

A random effect model is estimated by generalized least squares (GLS) when the variance structure is known and feasible generalized least squares (FGLS) when the variance is unknown. Compared to fixed effect models, random effect models are relatively difficult to estimate (Panel data models, 2014).

We can also use GLS to solve the serial correlation problem here. In order for the procedure to have good properties, it must have large N and relatively small T. We assume that we have a balanced panel, although the method can be extended to unbalanced panels. Deriving the GLS transformation that eliminates serial correlation in the errors requires sophisticated matrix algebra, but the transformation itself is simple. Define (Wooldridge, 2002)

$$\lambda = 1 - [\sigma_u^2/(\sigma_u^2 + T\sigma_\alpha^2)]^{1/2}. \tag{21}$$

which is between zero and one. Then, the transformed equation turns out to be

$$y_{i,t} - \lambda\bar{y}_i = \beta_0(1-\lambda) + \beta_1(x_{it1} - \lambda\bar{x}_{i1})+, \ldots, +\beta_k(x_{itk} - \lambda\bar{x}_{ik}) + (v_{it} - \lambda\bar{v}_{ik}). \tag{22}$$

where the over bar again denotes the time averages. This is a very interesting equation, as it involves a quasi-demeaned data on each variable. The transformation in (22) allows for explanatory variables that are constant over time, and this is one advantage of random effects (RE)

over either fixed effects or first differencing. This is possible because RE assumes that the unobserved effect is uncorrelated with all explanatory variables, whether they are fixed over time or not (Wooldridge, 2002). There is a range of situations in which the random effects model may be preferable to the fixed effects model for estimating β, regardless of whether the assumption of "random" effects can be plausibly said to match the true data generating process (Clark and Linzer, 2012).

4.2.4. The Hausman test

The Hausman test is the standard procedure used in empirical panel data analysis in order to discriminate between the fixed effects and random effects model (O'Brien and Patacchini, 2006). Durbin and Wu introduced the idea that if a model is correctly specified, two consistent methods should produce estimates that are very close. Hausman, following a similar reasoning, developed a test that is based on looking for a statistically significant difference between an estimator that is consistent whether or not the null is true, and an estimator that is efficient (and consistent) under the null hypothesis, but inconsistent otherwise. He proves that asymptotically the test statistic has a chi-square distribution, with a number of degrees of freedom equal to the number of unknown regression parameters when no misspecification is present (Dehon et al. 2008).

The Hausman test is designed to detect violation of the random effects modeling assumption that the explanatory variables are orthogonal to the unit effects. If there is no correlation between the independent variable (s) and the unit effects, the estimates of β in the fixed effects model ($\hat{\beta}_{FF}$) should be similar to estimates of β in the random effects model ($\hat{\beta}_{RE}$). The Hausman test statistic H is a measure of the difference between the two estimates (Clark and Linzer, 2012)

$$H = (\hat{\beta}_{RE} - \hat{\beta}_{FE})'\left[Var(\hat{\beta}_{FE}) - Var(\hat{\beta}_{FE})\right]^{-1}(\hat{\beta}_{RE}\text{-}\hat{\beta}_{FE}). \quad (23)$$

Under the null hypothesis of orthogonality, H is distributed chi-square with degrees of freedom equal to the number of regressors in the model. A finding that $p < 0.05\%$ is taken as evidence that, at conventional levels of significance, the two models are different enough to reject the null hypothesis, and hence to reject the random effects model in favor of the fixed effects model. If the Hausman test does not indicate a significant difference ($p < 0.05\%$), however, it does not necessarily follow that the random effects estimator is "safely" free from bias, and therefore to be preferred over the fixed effects estimator. In most applications, the true correlation between the covariates and unit effects is not exactly zero (Clark and Linzer, 2012). Hausman tests in individual-specific effects model and dynamic model are evaluated and compared through their probability of making mistakes. There are two types of mistakes the tests would make. If the fixed effects are not present, but the Hausman test incorrectly rejects the null hypothesis, then Type I error occurs. If the fixed effects are present, but the Hausman test accepts the null hypothesis, then Type II error occurs. The Hausman test in the model which has a larger probability of making mistakes is less efficient than the other one (Liu, 2010).

5. Estimation Results

Having applied the gravity model and panel data techniques, we have reached certain results presented in the Table 1. Based on these results, we have established that liberalization of trade with the EU significantly affected the reduction in B&H trade balance deficit. Naturally, the results confirm the earlier researches' conclusion that trade agreements between transition countries and developed economies have certain impact on trade flows enhancement and, hence, on trade balance deficit reduction. In order to study the effect of the liberalization of B&H trade with the EU, we have observed the effect of independent variables such as export, import, GDP, GDP per capita, real effective exchange rate and dummy variables on the dependent variable i.e. trade balance.

Based on the results gained, we note that there is symmetry in the case of export, import and gross domestic product, while there is asymmetry registered in the case of other variables. Export from B&H or X_{it} has a $p - value$ of 0.0399%, which is lower than the determined value level of 0.05%, and based on which we reject the null hypothesis $H_0: \beta_1 = 1$ and accept the alternative hypothesis $H_1: \beta_1 \neq 1$. Increase in exports, as compared to reduction in imports, led to a reduction in trade balance deficit in B&H. In the last few years, B&H has increased its export of products to the EU, while it simultaneously reduced import from the EU. The main reason for the increase in exports from B&H to the EU is the coming out of the recession of the main trade partners of B&H. In the case of EU import from B&H, M_{jt} has a $p - value$ of 0.0000%, which is statistically significant, and based on which we reject the null hypothesis $H_0: \beta_1 = 1$ and accept the alternative hypothesis $H_1: \beta_1 \neq 1$. The increase in import of raw materials, semi-products and assemblies from B&H to the EU is the result of growth of industrial production in the leading trade partners of B&H. On the other hand, gross domestic product of B&H i.e. GDP_{it} has a $p - value$ of 0.0539% that is insignificant at the level of determined value of 0.05%, but is statistically significant at the level of determined value of 0.10%, which means that it positively affects the reduction in B&H trade deficit. Increase in B&H GDP leads to an increase in import of products from the EU i.e. in the import of technology, components and final products. Gross domestic product of the EU i.e. GDP_{jt} has a $p - value$ of 0.0768% that is insignificant at the level of determined value of 0.05%, but is statistically significant at the level of determined value of 0.10% i.e. positively affects the reduction in B&H trade balance deficit, and based on which we can reject the null hypothesis $H_0: \beta_1 = 1$ and accept the alternative hypothesis $H_1: \beta_1 \neq 1$. Increase in GDP of the EU brings along an increase in production and, consequently, an increase in imports of raw materials and semi-products from B&H. Gross domestic product per capita in B&H i.e. $GDPPC_{it}$ has a $p - value$ of 0.0574%, which is statistically significant at the level of determined value of 0.10% and based on

which we can reject the null hypothesis $H_0: \beta_1 = 1$ and accept the alternative hypothesis $H_1: \beta_1 \neq 1$. GDP per capita in B&H registered a minor increase in the observed time period 2005 - 2013, which resulted in decreased imports from the EU. GDP per capita in the EU i.e. $GDPPC_{jt}$ has a $p - value$ of 0.5528% that is statistically insignificant, i.e. negatively affects the increase in imports from B&H; therefore, we cannot reject the null hypothesis $H_0: \beta_1 = 1$. Negative effect of the given variable on the reduction in B&H trade balance deficit is explained by the fact that B&H exports are based on raw materials and products with lower level of final processing, which accounts for high elasticity of the EU final consumers' demand. Real effective exchange rates $REER_{it}$ and $REER_{jt}$ have $p - values$ of 0.2327% and 0.7564% respectively, which means that they are statistically insignificant and that, based on them, we cannot reject the null hypothesis $H_0: \beta_1 = 1$. Real effective exchange rate in B&H has been somewhat overvalued against the euro and other currencies of EU countries that are not members of the monetary union, which negatively affected exports by causing higher increase in imports, and also caused an increase in trade balance deficit. In the case of dummy variables such as FTA_{ijt}, $DISTA_{ijt}$ and $Lang_{ij}$, $p - values$ are 0.3243%, 0.1698%, 0.2119% and they are not statistically significant, while $CBORD_{ij}$ has a $p - value$ of 0.0745%, which is statistically significant at the level of determined value of 0.10%. Finally, based on Prob(F-statistic) with a $p - value$ of 0.000026%, Durbin-Watson stat. with a $p - value$ of 1.993114% and other statistics, we can emphasize that the liberalization of B&H trade with the EU positively affects the reduction in B&H trade deficit.

Within the fixed effect models (FE), we explained the existence of correlation between independent variables and bilateral specific effects. Table 2 shows the results of FE models. Based on determined results, we conclude that X_{it} , M_{jt} have a $p - value$ of 0.0000% and GDP_{it} has a $p - value$ of 0.0370%, implying that these are significant values positively affecting the reduction in B&H trade deficit. This is an example of symmetric effect. The opposite is the case with GDP_{jt} andd $GDPPC_{it}$ where the $p - values$ are 0.1431% and 0.2020%, which renders them insignificant. In the case of $GDPPC_{jt}$, $REER_{it}$ and $REER_{jt}$, $p - values$ are 0.0000%, 0.0000% and 0.0105% respectively, which means that they are statistically significant i.e. that they positively affect the reduction in trade deficit. FE models do not include dummy variables. Also, in the case of random effects models (RE) only X_{it} and M_{jt} have a $p - value$ of 0.0000%, which renders them statistically significant, while other independent variables are insignificant i.e. negatively affect the reduction in B&H trade deficit.

Application of Hausman Test shows that there is a greater statistical significance of independent variables affecting the dependent variable within fixed effects models than within random effects models. Test Summary results show that cross-section random has a $p - value$ of 0.0000%, which means that we reject the hypothesis stating that there is no serious correlation between explanatory variables, based on which we reject the RE model and accept the FE model that provides a better explanation of the effect of independent variables on the dependent variable (Table 4).

6. Conclusion

Post-war recovery of B&H economy was accompanied by numerous difficulties in the area of undertaken economic reforms that were supposed to strengthen the local economy and make it more competitive in the world market. The implemented reforms did not provide expected results and this negatively affected the economic situation in B&H. Accordingly, B&H registered negative trends in almost every field of economic activity, with significant increase in imports over exports. During the time period 1998 – 2013, trade deficit was rather high, which represents a major threat to the stability of B&H current account balance. There are several reasons for such a high trade balance deficit in B&H. Firstly, B&H economy is not competitive in the world market and represents an inferior importer of products and services. The country has not carried out necessary structural reforms to make the economy more competitive, which would in turn enhance exporting activities and reduce the exceptionally high trade balance deficit. Secondly, as a consequence of non-implementation of economic reforms, B&H exports are based on products classified by material, raw materials, inedible products, except fuels, mineral fuels and lubricants, while B&H is a great importer of food, mineral fuels and lubricants, products classified by material, machinery and transport devices. High deficit is mainly caused by the imports of four categories of products: mineral products, machinery, transport equipment and consumer products. There is price inelasticity of demand for these products in B&H. Thirdly, structure of B&H product exports is of low diversity and relies on only a few raw material basis products, which does not provide a great opportunity for enhancing wider diversification of export products. Fourthly, the success of exports largely depends on the level of organization and qualification of the state institutions in charge of improvement of exports and achieving better rating for B&H economy. Fifthly, structure of foreign direct investment is mostly vertical, which both implicitly and explicitly led to a situation where foreign companies present in B&H increased their imports of technology, assemblies and parts and thus indirectly contributed to the increase in trade deficit.

This paper analyzed the effect of liberalization of trade with the EU and its impact on the reduction in trade deficit in B&H. To that effect, we have applied dynamic panel data techniques (panel method, fixed effects and random effects model), while we used gravity model when performing estimation. The research has shown that liberalization of B&H trade with the EU has a positive effect on enhancement of trade flows and reduction in trade deficit. Accordingly, we have established that export X_{it}, import M_{jt}, gross domestic product GDP_{it}, GDP_{jt}, gross domestic product per capita $GDPPC_{it}$ and the dummy variable sharing a common border $CBORD_{ij}$ are statistically significant, while $GDPPC_{jt}$ and other dummy variables are statistically insignificant. This research can serve as a basis for future research regarding the effect of trade integrations such as EFTA and CEFTA 2006 on the reduction in B&H trade balance deficit.

Endnotes

*Corresponding Author: Faculty of Economics, Dzemal Bijedic University of Mostar, Tel: +38761760955; e-mail: safetkurtovic@yahoo.com. Postal Address: Mithada Hujdura Hujke bb, 88 000, Mostar, Bosna and Herzegovina. Sead Talovic Ph.D. Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina, Tel: +38761386523; e-mail: sead.talovic@bih.net.ba. Postal Address: Musala 9, 71 000, Sarajevo, Bosnia and Herzegovina.

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Table 1. The effect of trade liberalization on the reduction in B&H trade balance deficit

Dependent Variable: TBIJT
Method: Panel Least Squares
Sample: 2005 2013
Periods included: 9
Cross-sections included: 28
Total panel (unbalanced) observations: 247

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(XIT)	18622.25	9013.237	2.066100	0.0399
LOG(MJT)	-166663.8	37271.00	-4.471674	0.0000
LOG(GDPIT)	4158516.	2146002.	1.937797	0.0539
LOG(GDPJT)	85574.37	48151.91	1.777175	0.0768
LOG(GDPPCIT)	-4274642.	2238591.	-1.909524	0.0574
LOG(GDPPCJT)	37777.44	63553.40	0.594420	0.5528
LOG(_REERIT)	4358715.	3642791.	1.196532	0.2327
LOG(_REERJT)	-116977.6	376647.4	-0.310576	0.7564
LOG(DISTIJ)	-170171.3	123573.9	-1.377082	0.1698
FTAIJT	138245.6	139970.2	0.987679	0.3243
CBORDIJ	-515228.1	287565.9	-1.791687	0.0745
LANG	193718.4	154744.8	1.251857	0.2119
C	-22960856	18058084	-1.271500	0.2048

R-squared	0.163380	Mean dependent var	-111154.8
Adjusted R-squared	0.120476	S.D. dependent var	512656.5
S.E. of regression	480784.2	Akaike info criterion	29.05542
Sum squared resid	5.41E+13	Schwarz criterion	29.24013
Log likelihood	-3575.344	Hannan-Quinn criter.	29.12978
F-statistic	3.808072	Durbin-Watson stat	1.993114
Prob(F-statistic)	0.000026		

Source: Author's
Note: ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Table 2. Fixed Effects models

Dependent Variable: TBIJT
Method: Panel Least Squares
Sample: 2005 2013
Periods included: 9
Cross-sections included: 28
Total panel (balanced) observations: 252

Variable	Coefficient	Std. Error	t-Statistic	Prob.
XIT	1.000000	8.16E-15	1.23E+14	0.0000
MJT	-1.000000	7.53E-16	-1.33E+15	0.0000
GDPIT	-3.88E-12	1.85E-12	-2.098763	0.0370
GDPJT	1.20E-14	8.17E-15	1.469839	0.1431
GDPPCIT	9.49E-12	7.42E-12	1.279778	0.2020
GDPPCJT	1.69E-12	2.24E-13	7.523630	0.0000
REERIT	4.02E-09	3.81E-10	10.54048	0.0000
REERJT	-1.43E-10	5.55E-11	-2.581692	0.0105
C	-4.21E-07	3.87E-08	-10.89750	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	1.000000	Mean dependent var	-108950.6
Adjusted R-squared	1.000000	S.D. dependent var	507762.0
S.E. of regression	5.14E-09	Akaike info criterion	-35.20238
Sum squared resid	5.71E-15	Schwarz criterion	-34.69817
Log likelihood	4471.500	Hannan-Quinn criter.	-34.99950
F-statistic	6.99E+28	Durbin-Watson stat	1.726102
Prob(F-statistic)	0.000000		

Source: Author's
Note: ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Table 3. Random Effects Models

Dependent Variable: TBIJT
Method: Panel EGLS (Cross-section random effects)
Sample: 2005 2013
Periods included: 9
Cross-sections included: 28
Total panel (balanced) observations: 252
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
XIT	1.000000	2.56E-15	3.91E+14	0.0000
MJT	-1.000000	6.64E-16	-1.51E+15	0.0000
GDPIT	4.96E-15	1.76E-12	0.002810	0.9978
GDPJT	-2.17E-16	5.40E-16	-0.402002	0.6880
GDPPCIT	-1.79E-13	7.15E-12	-0.025066	0.9800
GDPPCJT	-1.63E-15	2.18E-14	-0.074537	0.9406
REERIT	4.54E-11	3.77E-10	0.120228	0.9044
REERJT	-3.70E-11	3.23E-11	-1.144423	0.2536
C	0.000000	3.76E-08	0.000000	1.0000

Effects Specification	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	5.14E-09	1.0000

Weighted Statistics

R-squared	1.000000	Mean dependent var	-108950.6
Adjusted R-squared	1.000000	S.D. dependent var	507762.0
S.E. of regression	4.60E-10	Sum squared resid	5.15E-17
F-statistic	3.82E+31	Durbin-Watson stat	0.647024
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	1.000000	Mean dependent var	-108950.6
Sum squared resid	5.15E-17	Durbin-Watson stat	0.647024

Source: Author's
Note: ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Table 4. Hausman Test

Correlated Random Effects - Hausman Test
Equation: EQ01
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	277.019847	8	0.0000

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
XIT	1.000000	1.000000	0.000000	0.1479
MJT	-1.000000	-1.000000	0.000000	0.5138
GDPIT	0.000000	0.000000	0.000000	0.0000
GDPJT	0.000000	-0.000000	0.000000	0.3241
GDPPCIT	-0.000000	-0.000000	0.000000	0.0000
GDPPCJT	0.000000	-0.000000	0.000000	0.0000
REERIT	0.000000	0.000000	0.000000	0.0000
REERJT	0.000000	-0.000000	0.000000	0.1650

Cross-section random effects test equation:
Dependent Variable: TBIJT
Method: Panel Least Squares
Sample: 2005 2013
Periods included: 9
Cross-sections included: 28
Total panel (balanced) observations: 252

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.09E-06	7.77E-08	-14.03357	0.0000
XIT	1.000000	1.64E-14	6.10E+13	0.0000
MJT	-1.000000	1.51E-15	-6.61E+14	0.0000
GDPIT	1.42E-11	3.72E-12	3.812036	0.0002
GDPJT	1.60E-14	1.64E-14	0.972401	0.3319
GDPPCIT	-6.78E-11	1.49E-11	-4.549468	0.0000
GDPPCJT	2.00E-12	4.50E-13	4.453361	0.0000
REERIT	1.05E-08	7.66E-10	13.71226	0.0000
REERJT	1.11E-10	1.11E-10	0.996248	0.3202

Effects Specification

Cross-section fixed (dummy variables)

R-squared	1.000000	Mean dependent var	-108950.6
Adjusted R-squared	1.000000	S.D. dependent var	507762.0
S.E. of regression	1.03E-08	Akaike info criterion	-33.80751
Sum squared resid	2.30E-14	Schwarz criterion	-33.30330
Log likelihood	4295.746	Hannan-Quinn criter.	-33.60463
F-statistic	1.73E+28	Durbin-Watson stat	2.404928
Prob(F-statistic)	0.000000		

Source: Author's
Note: ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Appendix

Table 5. Variable definitions

Variable	Data sources
TB_{ijt} - is the trade balance and that is the dependent variable	Author's calculation
X_{it} and M_{Jt} denote exports and imports respectively between countries i and j at time t with $i \neq j$	Agency for Statistics of Bosnia and Herzegovina
GDP_{it}, GDP_{jt} - Gross Domestic Product of country i and country j,	Eurostat Central Bank of Bosnia and Herzegovina
$GDPPC_{it}$ - GDP per capita of country i; $GDPPC_{jt}$ – GDP per capita of country j,	Eurostat Central Bank of Bosnia and Herzegovina
$REER_{it}$ - real effective exchange rate of country i; $REER_{jt}$ - real effective exchange rate of country j.	Eurostat Central Bank of Bosnia and Herzegovina
$Dist_{ij}$ - distance between country i and country j (kilometers)	CEPII http://www.cepii.fr
FTA_{ijt} - dummy variable that is equal to 1 if country i and country j have signed a free trade agreement with EU	Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina, CEFTA 2006 portal
$CBord_{ij}$ – Common Border Dummy: 1 if common border between country i and j, 0 if otherwise	Author's calculation
$Lang_{ij}$ - if both countries have Similar Language (meaning same word root, understandable between each other), 0 if otherwise	Author's calculation

Table 6. Data pertaining to B&H and EU from 2005 to 2013

Country	Years	Xit	Mjt	Tbijt	GDPit	GDPjt	GDPPCit	GDPPCjt	%ERit	%ERjt	Cbordij	FTAijt	Distij	Lang
AUT_	2005	50878	151963	-101085	8768	253009	2282	30800	100.01	100.00	0	0	746	0
AUT_	2006	160447	233258	-72811	10005	266478	2603	32200	102.33	100.87	0	0	746	0
AUT_	2007	188978	274030	-85052	11282	282346	2936	34000	99.82	100.68	0	0	746	0
AUT_	2008	212301	309991	-97690	12774	291930	3391	35100	101.30	101.11	0	0	746	0
AUT_	2009	166359	232840	-66481	12428	286188	3299	34300	102.66	103.05	0	0	746	0
AUT_	2010	240606	250064	-9458	12720	294207	3329	35200	101.85	100.76	0	0	746	0
AUT_	2011	316511	251392	65119	13177	308675	3378	36800	101.90	100.77	0	0	746	0
AUT_	2012	334775	257717	77058	13158	317213	3359	37600	101.20	100.11	0	0	746	0
AUT_	2013	351546	265509	86037	13446	322595	3375	38100	99.68	103.13	0	0	746	0
BEL_	2005	5899	20643	-14744	8768	311150	2282	29700	100.01	100.00	0	0	1659	0
BEL_	2006	26856	34257	-7401	10005	327368	2603	31100	102.33	101.29	0	0	1659	0
BEL_	2007	19103	48074	-28971	11282	345069	2936	32500	99.82	102.91	0	0	1659	0
BEL_	2008	21231	50918	-29687	12774	355066	3391	33200	101.30	105.85	0	0	1659	0
BEL_	2009	17265	38408	-21143	12428	349703	3299	32400	102.66	106.55	0	0	1659	0
BEL_	2010	30056	45202	-15146	12720	365747	3329	33600	101.85	103.80	0	0	1659	0
BEL_	2011	17000	47284	-30284	13177	379991	3378	34600	101.90	106.23	0	0	1659	0
BEL_	2012	17274	45815	-28541	13158	388254	3359	35100	101.20	105.52	0	0	1659	0
BEL_	2013	17935	47385	-29450	13446	395262	3375	35600	99.68	108.62	0	0	1659	0
BUG_	2005	0	0	0	8768	23582	2282	3000	100.01	100.00	0	0	595	1
BUG_	2006	0	0	0	10005	26828	2603	3500	102.33	102.40	0	0	595	1
BUG_	2007	25804	19386	6418	11282	31884	2936	4200	99.82	109.23	0	0	595	1
BUG_	2008	15813	42939	-27126	12774	36450	3391	4800	101.30	119.59	0	0	595	1
BUG_	2009	4507	38156	-33649	12428	36078	3299	4800	102.66	130.92	0	0	595	1
BUG_	2010	5713	27804	-22091	12720	36764	3329	4900	101.85	134.32	0	0	595	1
BUG_	2011	9378	36311	-26933	13177	40103	3378	5500	101.90	139.52	0	0	595	1
BUG_	2012	19272	38211	-18939	13158	40927	3359	5600	101.20	141.11	0	0	595	1
BUG_	2013	39137	38894	243	13446	41048	3375	5600	99.68	152.25	0	0	595	1
CIP_	2005	1714	948	766	8768	14906	2282	20200	100.01	100.00	0	0	1615	0
CIP_	2006	939	2735	-1796	10005	16098	2603	21400	102.33	99.50	0	0	1615	0
CIP_	2007	456	1805	-1349	11282	17406	2936	22700	99.82	98.16	0	0	1615	0
CIP_	2008	378	2380	-2002	12774	18769	3391	23900	101.30	98.58	0	0	1615	0
CIP_	2009	402	2103	-1701	12428	18423	3299	22800	102.66	100.04	0	0	1615	0
CIP_	2010	2546	1903	643	12720	19063	3329	23000	101.85	98.56	0	0	1615	0
CIP_	2011	1908	1962	-54	13177	19487	3378	22900	101.90	100.97	0	0	1615	0
CIP_	2012	13430	1947	11483	13158	19411	3359	22500	101.20	95.37	0	0	1615	0
CIP_	2013	4032	1781	2251	13446	18119	3375	21000	99.68	92.57	0	0	1615	0
CRO_	2005	241387	587253	-345866	8768	365084	2282	36512	100.01	100	0	1	373	1
CRO_	2006	327577	660720	-333143	10005	401978	2603	40208	102.33	102.32	1	1	373	1
CRO_	2007	557369	125225	432144	11282	439258	2936	43935	99.82	105.17	1	1	373	1
CRO_	2008	591480	1421354	-829874	12774	481298	3391	48135	101.30	109.29	1	1	373	1
CRO_	2009	482733	948515	-465782	12428	450907	3299	45093	102.66	111.37	1	1	373	1
CRO_	2010	547402	1052722	-505320	12720	450043	3329	45022	101.85	108.66	1	1	373	1
CRO_	2011	615820	1138395	-522575	13177	447086	3378	44737	101.90	105.98	1	1	373	1
CRO_	2012	595654	1126153	-530499	13158	439337	3359	43959	101.20	100.46	1	1	373	1
CRO_	2013	610808	1000282	-389474	13446	435615	3375	43678	99.68	101.21	1	1	373	1
CZ_	2005	11371	71368	-59997	8768	109394	2282	10700	100.01	100.00	0	0	1052	0
CZ_	2006	29410	157167	-127757	10005	123743	2603	12100	102.33	104.96	0	0	1052	0

CZ_	2007	31	155173	-155142	11282	138004	2936	13400	99.82	108.44	0	0	1052	0
CZ_	2008	38	151117	-151079	12774	160962	3391	15400	101.30	121.10	0	0	1052	0
CZ_	2009	38	130995	-130957	12428	148357	3299	14100	102.66	114.54	0	0	1052	0
CZ_	2010	39	140824	-140785	12720	156370	3329	14900	101.85	118.00	0	0	1052	0
CZ_	2011	53	167171	-167118	13177	163579	3378	15600	101.90	121.47	0	0	1052	0
CZ_	2012	49	139043	-138994	13158	160948	3359	15300	101.20	117.73	0	0	1052	0
CZ_	2013	78	126180	-126102	13446	157285	3375	15000	99.68	114.17	0	0	1052	0
DNM_	2005	1	9724	-9723	8768	212907	2282	39300	100.01	100.00	0	0	1052	0
DNM_	2006	3	15524	-15521	10005	225592	2603	41500	102.33	100.90	0	0	1844	0
DNM_	2007	4	18460	-18456	11282	233440	2936	42800	99.82	105.25	0	0	1844	0
DNM_	2008	3	21635	-21632	12774	241087	3391	43900	101.30	109.46	0	0	1844	0
DNM_	2009	4	20694	-20690	12428	230213	3299	41700	102.66	113.09	0	0	1844	0
DNM_	2010	3	19502	-19499	12720	241517	3329	43500	101.85	108.20	0	0	1844	0
DNM_	2011	3	17097	-17094	13177	246075	3378	44200	101.90	106.46	0	0	1844	0
DNM_	2012	5	16294	-16289	13158	250786	3359	44900	101.20	103.21	0	0	1844	0
DNM_	2013	6	19694	-19688	13446	252939	3375	45100	99.68	105.78	0	0	1844	0
EST_	2005	0	230	-230	8768	11260	2282	8300	100.01	100.00	0	0	2364	0
EST_	2006	0	1837	-1837	10005	13518	2603	10000	102.33	106.99	0	0	2364	0
EST_	2007	0	1249	-1249	11282	16241	2936	12100	99.82	121.99	0	0	2364	0
EST_	2008	1	1936	-1935	12774	16511	3391	12300	101.30	135.76	0	0	2364	0
EST_	2009	0	1600	-1600	12428	14138	3299	10600	102.66	137.58	0	0	2364	0
EST_	2010	0	1982	-1982	12720	14709	3329	11000	101.85	128.79	0	0	2364	0
EST_	2011	0	1496	-1496	13177	16404	3378	12300	101.90	125.58	0	0	2364	0
EST_	2012	0	1946	-1946	13158	17637	3359	13300	101.20	123.93	0	0	2364	0
EST_	2013	0	2639	-2639	13446	18739	3375	14200	99.68	131.69	0	0	2364	0
FIN_	2005	0	2240	-2240	8768	164387	2282	31300	100.01	100.00	0	0	2450	0
FIN_	2006	0	9070	-9070	10005	172614	2603	32800	102.33	100.18	0	0	2450	0
FIN_	2007	0	12207	-12207	11282	186584	2936	35300	99.82	99.47	0	0	2450	0
FIN_	2008	1	9305	-9304	12774	193711	3391	36500	101.30	103.09	0	0	2450	0
FIN_	2009	1	10344	-10343	12428	181029	3299	33900	102.66	109.62	0	0	2450	0
FIN_	2010	0	8290	-8290	12720	187100	3329	34900	101.85	104.45	0	0	2450	0
FIN_	2011	1	8069	-8068	13177	196869	3378	36500	101.90	105.62	0	0	2450	0
FIN_	2012	1	12552	-12551	13158	199069	3359	36800	101.20	105.70	0	0	2450	0
FIN_	2013	1	13035	-13034	13446	201341	3375	37000	99.68	109.14	0	0	2450	0
FRA_	2005	20	78330	-78310	8768	1771978	2282	28100	100.01	100.00	0	0	1762	0
FRA_	2006	44	107696	-107652	10005	1853267	2603	29200	102.33	101.00	0	0	1762	0
FRA_	2007	47	147713	-147666	11282	1945670	2936	30400	99.82	102.05	0	0	1762	0
FRA_	2008	51	179333	-179282	12774	1995850	3391	31000	101.30	103.40	0	0	1762	0
FRA_	2009	56	129005	-128949	12428	1939017	3299	30000	102.66	103.95	0	0	1762	0
FRA_	2010	44	139654	-139610	12720	1998481	3329	30800	101.85	102.27	0	0	1762	0
FRA_	2011	47	161585	-161538	13177	2059284	3378	31500	101.90	102.67	0	0	1762	0
FRA_	2012	50	164668	-164618	13158	2091059	3359	31900	101.20	100.04	0	0	1762	0
FRA_	2013	55	149852	-149797	13446	2113687	3375	32100	99.68	102.89	0	0	1762	0
GRE_	2005	4	22397	-22393	8768	199153	2282	18000	100.01	100.00	0	0	1244	0
GRE_	2006	8	22563	-22555	10005	217831	2603	19600	102.33	97.74	0	0	1244	0
GRE_	2007	5	26169	-26164	11282	232831	2936	20900	99.82	98.43	0	0	1244	0
GRE_	2008	4	54370	-54366	12774	242096	3391	21600	101.30	100.72	0	0	1244	0
GRE_	2009	4	58737	-58733	12428	237431	3299	21200	102.66	105.38	0	0	1244	0
GRE_	2010	5	80172	-80167	12720	226210	3329	20300	101.85	102.99	0	0	1244	0

GRE_	2011	6	111695	-111689	13177	207752	3378	18700	101.90	103.38	0	0	1244	0
GRE_	2012	9	93142	-93133	13158	194204	3359	17500	101.20	95.62	0	0	1244	0
GRE_	2013	14	83991	-83977	13446	182438	3375	16500	99.68	89.14	0	0	1244	0
IRL_	2005	0	9139	-9139	8768	169153	2282	40700	100.01	100.00	0	0	2637	0
IRL_	2006	0	16224	-16224	10005	183759	2603	43000	102.33	102.29	0	0	2637	0
IRL_	2007	1	18495	-18494	11282	196749	2936	44700	99.82	108.01	0	0	2637	0
IRL_	2008	1	22165	-22164	12774	186870	3391	41600	101.30	116.94	0	0	2637	0
IRL_	2009	1	19890	-19889	12428	168114	3299	37000	102.66	111.18	0	0	2637	0
IRL_	2010	1	20759	-20758	12720	164931	3329	36200	101.85	99.56	0	0	2637	0
IRL_	2011	1	20736	-20735	13177	171042	3378	37400	101.90	96.05	0	0	2637	0
IRL_	2012	0	23102	-23102	13158	172755	3359	37600	101.20	91.16	0	0	2637	0
IRL_	2013	0	21273	-21273	13446	174791	3375	38000	99.68	96.80	0	0	2637	0
ITA_	2005	154	311303	-311149	8768	1490409	2282	25600	100.01	100.00	0	0	1272	0
ITA_	2006	365	521795	-521430	10005	1549188	2603	26500	102.33	101.35	0	0	1272	0
ITA_	2007	398	130882	-130484	11282	1610305	2936	27400	99.82	102.71	0	0	1272	0
ITA_	2008	431	777631	-777200	12774	1632933	3391	27600	101.30	105.10	0	0	1272	0
ITA_	2009	359	635655	-635296	12428	1573655	3299	26400	102.66	107.64	0	0	1272	0
ITA_	2010	441	618863	-618422	12720	1605694	3329	26800	101.85	104.66	0	0	1272	0
ITA_	2011	493	706473	-705980	13177	1638857	3378	27300	101.90	105.07	0	0	1272	0
ITA_	2012	480	730821	-730341	13158	1628004	3359	27000	101.20	103.01	0	0	1272	0
ITA_	2013	513	757864	-757351	13446	1618904	3375	26700	99.68	106.02	0	0	1272	0
LAT_	2005	0	109	-109	8768	13733	2282	6100	100.01	100.00	0	0	2055	0
LAT_	2006	0	110	-110	10005	17240	2603	7800	102.33	113.42	0	0	2055	0
LAT_	2007	0	42	-42	11282	22624	2936	10300	99.82	139.30	0	0	2055	0
LAT_	2008	0	87	-87	12774	24403	3391	11200	101.30	158.35	0	0	2055	0
LAT_	2009	0	315	-315	12428	18816	3299	8800	102.66	137.54	0	0	2055	0
LAT_	2010	0	381	-381	12720	18015	3329	8600	101.85	123.21	0	0	2055	0
LAT_	2011	0	1519	-1519	13177	20197	3378	9800	101.90	122.96	0	0	2055	0
LAT_	2012	1	930	-929	13158	22217	3359	10900	101.20	122.99	0	0	2055	0
LAT_	2013	1	1001	-1000	13446	23265	3375	11600	99.68	130.92	0	0	2055	0
LIT_	2005	20	579	-559	8768	21002	2282	6300	100.01	100.00	0	0	1858	0
LIT_	2006	2	647	-645	10005	24079	2603	7400	102.33	109.54	0	0	1858	0
LIT_	2007	2	606	-604	11282	29041	2936	9000	99.82	110.98	0	0	1858	0
LIT_	2008	1	1128	-1127	12774	32696	3391	10200	101.30	116.10	0	0	1858	0
LIT_	2009	13	1106	-1093	12428	26935	3299	8500	102.66	113.78	0	0	1858	0
LIT_	2010	1	1349	-1348	12720	28001	3329	9000	101.85	104.41	0	0	1858	0
LIT_	2011	7	1634	-1627	13177	31247	3378	10300	101.90	104.70	0	0	1858	0
LIT_	2012	1	2617	-2616	13158	33314	3359	11200	101.20	102.77	0	0	1858	0
LIT_	2013	1	2566	-2565	13446	34956	3375	11800	99.68	105.44	0	0	1858	0
LUX_	2005	1	1056	-1055	8768	29771	2282	63900	100.01	100.00	0	0	1499	0
LUX_	2006	14	3499	-3485	10005	33304	2603	70400	102.33	101.96	0	0	1499	0
LUX_	2007	13	2930	-2917	11282	35953	2936	74800	99.82	103.46	0	0	1499	0
LUX_	2008	14	2273	-2259	12774	37523	3391	76700	101.30	108.00	0	0	1499	0
LUX_	2009	3	4928	-4925	12428	36094	3299	72400	102.66	113.90	0	0	1499	0
LUX_	2010	18401	4663	13738	12720	39371	3329	77600	101.85	110.76	0	0	1499	0
LUX_	2011	27209	3357	23852	13177	42410	3378	81700	101.90	112.62	0	0	1499	0
LUX_	2012	23583	3963	19620	13158	43812	3359	82400	101.20	112.68	0	0	1499	0
LUX_	2013	25466	2944	22522	13446	45288	3375	83100	99.68	116.88	0	0	1499	0
HUG_	2005	44406	127524	-83118	8768	90027	2282	8900	100.01	100.00	0	0	554	0

HUG_	2006	84413	201798	-117385	10005	90951	2603	9000	102.33	94.95	0	0	554	0
HUG_	2007	112187	244887	-132700	11282	101241	2936	10100	99.82	103.93	0	0	554	0
HUG_	2008	104248	367925	-263677	12774	107150	3391	10700	101.30	104.74	0	0	554	0
HUG_	2009	46899	205183	-158284	12428	93372	3299	9300	102.66	94.40	0	0	554	0
HUG_	2010	64512	213096	-148584	12720	97815	3329	9800	101.85	94.19	0	0	554	0
HUG_	2011	84859	193889	-109030	13177	100351	3378	10100	101.90	94.35	0	0	554	0
HUG_	2012	59011	211138	-152127	13158	98699	3359	9900	101.20	91.07	0	0	554	0
HUG_	2013	70927	225753	-154826	13446	100537	3375	10200	99.68	89.13	0	0	554	0
MAL_	2005	1	1291	-1290	8768	5142	2282	12700	100.01	100.00	0	0	1254	0
MAL_	2006	592	289	303	10005	5386	2603	13300	102.33	103.77	0	0	1254	0
MAL_	2007	1	30	-29	11282	5758	2936	14200	99.82	107.36	0	0	1254	0
MAL_	2008	396	53	343	12774	6129	3391	15000	101.30	110.21	0	0	1254	0
MAL_	2009	109	109	0	12428	6139	3299	14900	102.66	111.64	0	0	1254	0
MAL_	2010	27	499	-472	12720	6600	3329	15900	101.85	108.22	0	0	1254	0
MAL_	2011	1011	837	174	13177	6893	3378	16600	101.90	112.24	0	0	1254	0
MAL_	2012	1846	602	1244	13158	7213	3359	17200	101.20	112.66	0	0	1254	0
MAL_	2013	1054	703	351	13446	7544	3375	17900	99.68	114.96	0	0	1254	0
NDL_	2005	11159	39219	-28060	8768	540656	2282	33100	100.01	100.00	0	0	1700	0
NDL_	2006	21546	56783	-35237	10005	573444	2603	35100	102.33	99.23	0	0	1700	0
NDL_	2007	29064	72484	-43420	11282	608729	2936	37200	99.82	100.57	0	0	1700	0
NDL_	2008	38812	93036	-54224	12774	635794	3391	38700	101.30	102.38	0	0	1700	0
NDL_	2009	31698	68415	-36717	12428	617650	3299	37400	102.66	104.86	0	0	1700	0
NDL_	2010	41354	65436	-24082	12720	631512	3329	38000	101.85	101.68	0	0	1700	0
NDL_	2011	71967	76071	-4104	13177	642929	3378	38500	101.90	102.45	0	0	1700	0
NDL_	2012	63884	76594	-12710	13158	640644	3359	38200	101.20	101.96	0	0	1700	0
NDL_	2013	56470	82750	-26280	13446	642851	3375	38300	99.68	104.07	0	0	1700	0
GER_	2005	133552	499881	-366329	8768	2297820	2282	27900	100.01	100.00	0	0	1402	0
GER_	2006	341918	724632	-382714	10005	2390200	2603	29000	102.33	96.76	0	0	1402	0
GER_	2007	389691	891120	-501429	11282	2510110	2936	30500	99.82	95.33	0	0	1402	0
GER_	2008	467059	978935	-511876	12774	2558020	3391	31100	101.30	95.46	0	0	1402	0
GER_	2009	416248	713613	-297365	12428	2456660	3299	30000	102.66	99.47	0	0	1402	0
GER_	2010	555230	728581	-173351	12720	2576220	3329	31500	101.85	95.01	0	0	1402	0
GER_	2011	621694	842816	-221122	13177	2699100	3378	33000	101.90	94.89	0	0	1402	0
GER_	2012	618716	882368	-263652	13158	2749900	3359	33600	101.20	93.83	0	0	1402	0
GER_	2013	670224	887012	-216788	13446	2809480	3375	34200	99.68	97.84	0	0	1402	0
POL_	2005	19343	69853	-50510	8768	244822	2282	6400	100.01	100.00	0	1	1396	0
POL_	2006	46631	71193	-24562	10005	273418	2603	7200	102.33	101.29	0	1	1396	0
POL_	2007	35403	86416	-51013	11282	313654	2936	8200	99.82	104.86	0	1	1396	0
POL_	2008	30389	105110	-74721	12774	363692	3391	9500	101.30	119.24	0	1	1396	0
POL_	2009	26655	126869	-100214	12428	314689	3299	8200	102.66	95.17	0	1	1396	0
POL_	2010	39819	126893	-87074	12720	359816	3329	9300	101.85	103.20	0	1	1396	0
POL_	2011	51408	153962	-102554	13177	377028	3378	9800	101.90	100.53	0	1	1396	0
POL_	2012	50304	213207	-162903	13158	386143	3359	10000	101.20	96.91	0	1	1396	0
POL_	2013	47296	201162	-153866	13446	395962	3375	10300	99.68	97.43	0	1	1396	0
POR_	2005	1298	2227	-929	8768	158653	2282	15100	100.01	100.00	0	0	3122	0
POR_	2006	3230	8286	-5056	10005	166249	2603	15800	102.33	99.10	0	0	3122	0
POR_	2007	4799	11496	-6697	11282	175468	2936	16600	99.82	98.71	0	0	3122	0
POR_	2008	3820	13559	-9739	12774	178873	3391	16900	101.30	99.19	0	0	3122	0
POR_	2009	2703	9457	-6754	12428	175448	3299	16600	102.66	99.21	0	0	3122	0

POR_	2010	1965	6891	-4926	12720	179930	3329	17000	101.85	96.73	0	0	3122	0
POR_	2011	5092	4725	367	13177	176167	3378	16700	101.90	94.74	0	0	3122	0
POR_	2012	3036	6274	-3238	13158	169668	3359	16100	101.20	89.47	0	0	3122	0
POR_	2013	3727	9170	-5443	13446	171211	3375	16400	99.68	91.75	0	0	3122	0
ROM_	2005	0	0	0	8768	80226	2282	3800	100.01	100.00	0	1	884	0
ROM_	2006	0	0	0	10005	98419	2603	4600	102.33	106.82	0	1	884	0
ROM_	2007	28771	60911	-32140	11282	125403	2936	6000	99.82	120.15	0	1	884	0
ROM_	2008	45578	71670	-26092	12774	142396	3391	6900	101.30	129.50	0	1	884	0
ROM_	2009	29011	55476	-26465	12428	120409	3299	5900	102.66	112.69	0	1	884	0
ROM_	2010	36934	68159	-31225	12720	126746	3329	6300	101.85	113.92	0	1	884	0
ROM_	2011	31603	96109	-64506	13177	133306	3378	6600	101.90	107.18	0	1	884	0
ROM_	2012	58384	88286	-29902	13158	133806	3359	6700	101.20	100.70	0	1	884	0
ROM_	2013	62270	94245	-31975	13446	144282	3375	7200	99.68	105.92	0	1	884	0
SLK_	2005	2342	19694	-17352	8768	39335	2282	7300	100.01	100.00	0	0	727	0
SLK_	2006	10858	42375	-31517	10005	45436	2603	8400	102.33	104.74	0	0	727	0
SLK_	2007	25645	68880	-43235	11282	56064	2936	10400	99.82	113.78	0	0	727	0
SLK_	2008	19613	78550	-58937	12774	65679	3391	12100	101.30	123.63	0	0	727	0
SLK_	2009	16487	46116	-29629	12428	63799	3299	11800	102.66	134.37	0	0	727	0
SLK_	2010	24067	46289	-22222	12720	67204	3329	12400	101.85	130.44	0	0	727	0
SLK_	2011	56295	59040	-2745	13177	70160	3378	13000	101.90	131.31	0	0	727	0
SLK_	2012	42144	59246	-17102	13158	72185	3359	13400	101.20	128.80	0	0	727	0
SLK_	2013	61460	61433	27	13446	73593	3375	13600	99.68	128.61	0	0	727	0
SLO_	2005	113688	242815	-129127	8768	29235	2282	14600	100.01	100.00	0	0	516	1
SLO_	2006	321926	440061	-118135	10005	31561	2603	15700	102.33	100.27	0	0	516	1
SLO_	2007	68880	452278	-383398	11282	35153	2936	17400	99.82	101.14	0	0	516	1
SLO_	2008	314381	492546	-178165	12774	37951	3391	18800	101.30	103.64	0	0	516	1
SLO_	2009	236794	388047	-151253	12428	36166	3299	17700	102.66	109.57	0	0	516	1
SLO_	2010	312780	413559	-100779	12720	36220	3329	17700	101.85	108.66	0	0	516	1
SLO_	2011	361390	423638	-62248	13177	36868	3378	18000	101.90	107.68	0	0	516	1
SLO_	2012	334029	410751	-76722	13158	36006	3359	17500	101.20	105.15	0	0	516	1
SLO_	2013	351004	385690	-34686	13446	36144	3375	17500	99.68	106.24	0	0	516	1
ESP_	2005	6081	26205	-20124	8768	930566	2282	21300	100.01	100.00	0	0	2569	0
ESP_	2006	16794	38190	-21396	10005	1007974	2603	22700	102.33	102.35	0	0	2569	0
ESP_	2007	17437	53250	-35813	11282	1080807	2936	23900	99.82	105.85	0	0	2569	0
ESP_	2008	18603	61428	-42825	12774	1116207	3391	24300	101.30	110.51	0	0	2569	0
ESP_	2009	19786	68627	-48841	12428	1079034	3299	23300	102.66	109.42	0	0	2569	0
ESP_	2010	27000	76542	-49542	12720	1080913	3329	23200	101.85	105.19	0	0	2569	0
ESP_	2011	37310	117549	-80239	13177	1075147	3378	23000	101.90	103.81	0	0	2569	0
ESP_	2012	49829	82596	-32767	13158	1055158	3359	22600	101.20	96.81	0	0	2569	0
ESP_	2013	55126	73123	-17997	13446	1049181	3375	22500	99.68	97.11	0	0	2569	0
SWE_	2005	3647	30794	-27147	8768	313218	2282	34700	100.01	100.00	0	0	2488	0
SWE_	2006	11954	39384	-27430	10005	334877	2603	36900	102.33	99.05	0	0	2488	0
SWE_	2007	18284	43368	-25084	11282	356434	2936	39000	99.82	102.18	0	0	2488	0
SWE_	2008	23758	54668	-30910	12774	352317	3391	38200	101.30	101.32	0	0	2488	0
SWE_	2009	17052	45630	-28578	12428	309679	3299	33300	102.66	94.37	0	0	2488	0
SWE_	2010	26155	38736	-12581	12720	369077	3329	39400	101.85	98.91	0	0	2488	0
SWE_	2011	27661	44146	-16485	13177	404946	3378	42900	101.90	106.28	0	0	2488	0
SWE_	2012	25030	34603	-9573	13158	423341	3359	44500	101.20	109.31	0	0	2488	0
SWE_	2013	35468	36674	-1206	13446	436342	3375	45500	99.68	112.53	0	0	2488	0

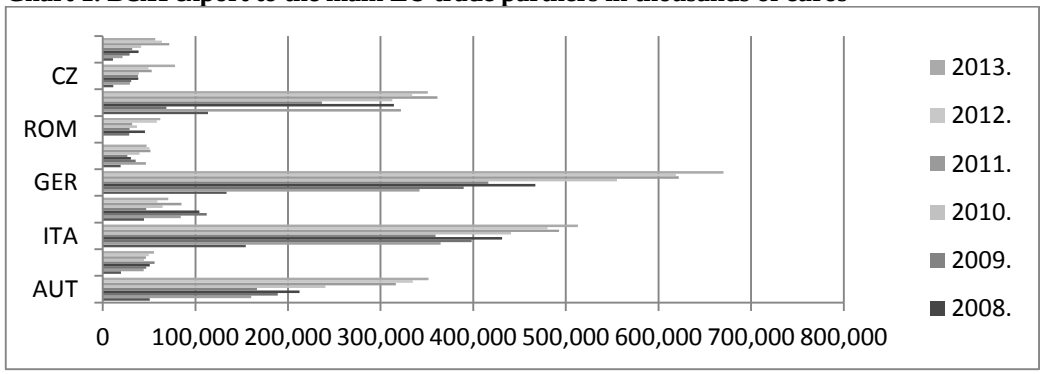
UK_	2005	21957	25071	-3114	8768	1940129	2282	32100	100.01	100.00	0	0	2022	0
UK_	2006	8312	35223	-26911	10005	2059064	2603	33900	102.33	103.20	0	0	2022	0
UK_	2007	11186	42439	-31253	11282	2164065	2936	35300	99.82	106.36	0	0	2022	0
UK_	2008	31894	53636	-21742	12774	1907212	3391	30800	101.30	91.31	0	0	2022	0
UK_	2009	14872	47843	-32971	12428	1663573	3299	26700	102.66	82.29	0	0	2022	0
UK_	2010	16522	50223	-33701	12720	1816615	3329	28900	101.85	84.71	0	0	2022	0
UK_	2011	13713	51961	-38248	13177	1863941	3378	29500	101.90	82.79	0	0	2022	0
UK_	2012	15684	51961	-36277	13158	2041491	3359	32000	101.20	86.75	0	0	2022	0
UK_	2013	22513	65265	-42752	13446	2017194	3375	31500	99.68	85.41	0	0	2022	0

Table 7. List of Free Trade Agreements between the EU and B&H

Country	EU		EFTA	CEFTA	Turkey
	ATP	ITA			
Bosnia and Herzegovina	2000	2008	2013	2007	2003

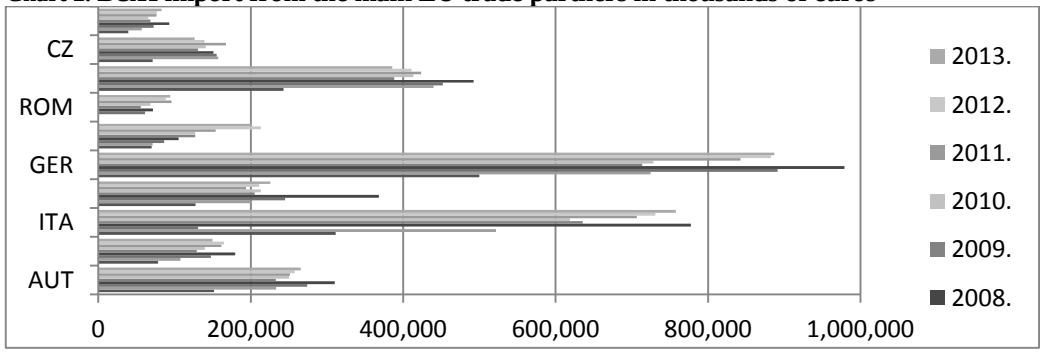
Source: Own compilation based on the Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina database and CEFTA portal
∗ATP – Autonomous Trade Preferences, ∗∗ITA – Internal Trade Agreement

Chart 1. B&H export to the main EU trade partners in thousands of euros



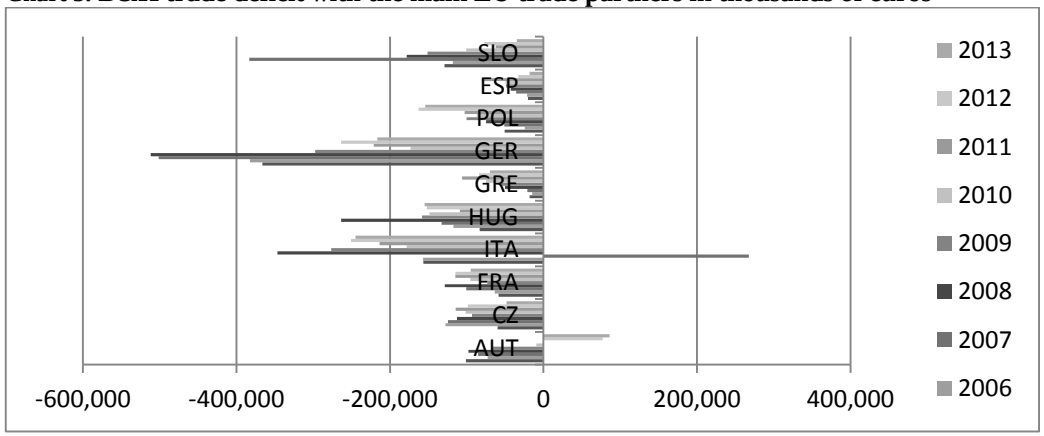
Source: Author's calculation based on the data from the Agency for Statistics of B&H

Chart 2. B&H import from the main EU trade partners in thousands of euros



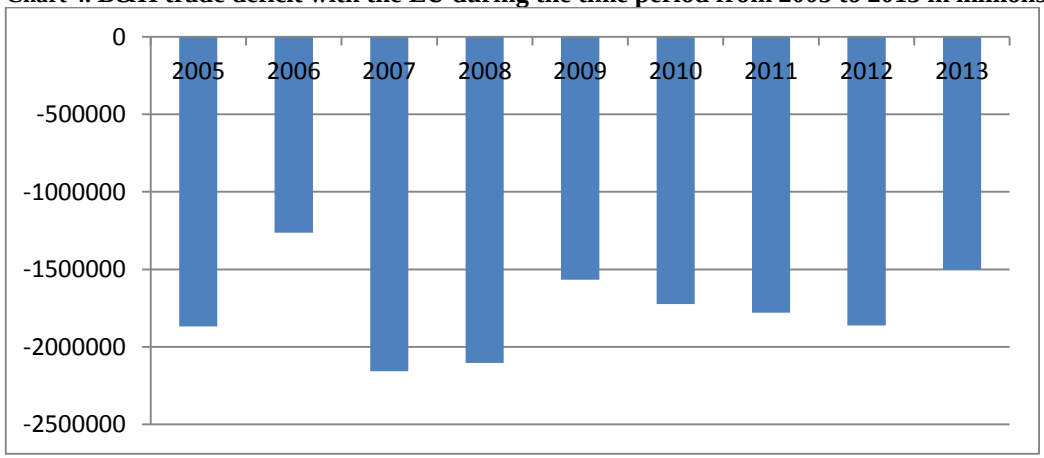
Source: Author's calculation based on the data from the Agency for Statistics of B&H

Chart 3. B&H trade deficit with the main EU trade partners in thousands of euros



Source: Author's calculation based on the data from the Agency for Statistics of B&H

Chart 4. B&H trade deficit with the EU during the time period from 2005 to 2013 in millions of euros



Source: Author's calculation based on the data from the Agency for Statistics of B&H and Eurostat