

DETERMINANTS OF THE TRADE BALANCE IN THE WESTERN BALKAN COUNTRIES: A PANEL DATA APPROACH³

This study investigates the economic factors affecting the trade balance of six Western Balkan countries: Albania, Kosovo, Serbia, North Macedonia, Montenegro, and Bosnia Herzegovina, using data from 2000 to 2021. Key variables such as GDP growth rate, foreign direct investment (FDI), remittances, inflation rate, consumption, real effective exchange rate (REER), and fiscal balance are analyzed. The objective is to evaluate how these macroeconomic indicators influence the trade balance, providing insights for economic policies in the region to enhance competitiveness globally. Four econometric models, OLS, OLSR, RE, and FE, are employed, with the fixed effects (FE) model identified as the most appropriate. Results indicate that consumption, remittances, inflation rate, and foreign direct investments have a negative and significant impact on the trade balance of Western Balkan countries. To tackle trade deficits, the study suggests implementing structural economic reforms, increasing investment in sectors where comparative advantages exist, diversifying exports, and emphasizing higher value-added goods and services in the global value chain.

Keywords: Trade balance; Gross Domestic Product; Foreign direct investments; Consumption; Remittances; Inflation rate; Effective exchange rate

JEL: F1; F24; F31; E21; E31; O11

1. Introduction

A country's trade balance represents the difference between exports and imports. From economic theory, we know that the trade balance is influenced by many factors, such as the amount of production resources, productivity, foreign direct investments, trade policies, exchange rate, economic growth, inflation, consumption, or even remittances received from abroad. Determinants of the trade balance are considered of great interest by many economists, since with the reformation and opening of many small economies, trade exchanges have increased significantly, and many countries have joined free trade

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agreement initiatives, which were not necessarily accompanied by economic empowerment of these small and emerging economies.

There is a tendency to increase studies on the Western Balkans. Since the main trading partners of the Western Balkans are EU countries, understanding trade deficit determinants would help the region to speed up its growth trajectory and reduce the gap with those of the EU countries. Our study has been motivated by the role that trade volumes (exports, in particular) play in the overall growth and economic convergence of small economies to developed economies, the increasing importance of integration in the global value chain and by the aspirations of these countries to join the European Union.

1.1 Objectives of the study

The focus of this study is to analyze the macroeconomic determinants of the trade balance of the Western Balkan countries, concerning the post-war period (former Yugoslavia) and post-Communist period (Albania). The specific objectives include:

- Determining the relationship between real effective exchange rate and trade balance and reviewing whether the Marshall Lerner condition holds true.
- Determining the impact of other relevant macroeconomic factors for the region such as remittances, consumption, GDP growth rate, foreign direct investments, and fiscal balance.

1.2 Justification of the study

The trade deficit of the Western Balkans countries is one of the main causes of the current account deficit. Our main goal is to understand the causes and determinants of the trade balance and to provide a framework on which policymakers can better develop policies to improve the trade result. Some of the factors that have influenced the growth of the trade deficit are directly or indirectly related to the specifics of the transition period of the region that has led to a high dependence on imports and the long-term non-competitiveness of the domestic economy in relation to other competitive economies. Other causes of the trade balance deficit are related to changes in the terms of trade throughout the world, the large technological gap, the non-transparent and ineffective privatization process, insufficient foreign investment, permanent dependence on the import of most products and services, as well as inefficient state institutions.

1.3 Scope of the study

Since the trade balance is a broad and highly debated topic among scholars; hence the determinants of the trade balance can be numerous. However, in this paper, only macroeconomic factors have been considered. The basis for analysis in this paper is the period 2000-2021 for the six Western Balkans countries. We believe that the timespan reflects not only the trend but is sufficient to draw some important conclusions about the

behaviour of the and the relation of the macroeconomic factors with the trade balance. The paper aims to consider the trade balance development of the individual WB countries after the disintegration of former Yugoslavia and the post-Communist and political turmoil in Albania.

The paper further focuses on the theoretical aspects of the determinants of the trade balance and literature review, continuing with the description and clarification of the empirical methodology and the analysis of the empirical results. Whereas, in the last part, there is a summary of the main findings of the paper and the conclusions drawn from the paper.

1.4 Some theoretical aspects of trading behaviour and its determinants

Despite the growth of trade volume in the Western Balkan countries, benefits have been limited. The reasons vary; from heavy reliance on imports of consumer products and energy to an export structure dominated by low-value products. In addition, most of the imports are oriented towards products that do not bring any long-term benefits. The participation of capital products, which are considered profitable for the economy in the long term, is small compared to other European countries (see Table 1 in the appendix).

This behaviour of the trade balance was mainly influenced by the increase in domestic demand not being able to be met by domestic production, causing imports to be several times greater than exports. To understand the relationship between exports and imports in the Western Balkans, we shall look at the structure of the imports, because to boost domestic production, countries need inputs (capital goods) from abroad. Considering the current trade structure and despite the economic growth of the region in the last two decades, the contribution from exports is still low. Although, trade volumes and openness have increased over time, the higher share of merchandise exports which is labour-intensive and produces low-value products is very much present in the WB countries.

Various studies show that persistent negative trade balances are caused by various macroeconomic factors, from domestic consumption, price level, and fiscal balance (Gruber & Kamin B, 2007), (Brissimis, Hondroyannis, Papazoglou, & Vasardani, 2011), to exchange rates such as (Petrović & Gligorić, 2010), (Tutuenau, 2015).

There are theories explaining the impact of various determinants on the trade balance such as exchange rate on the trade balance, among others. We will review here the Marshall Lerner condition. This principle sets the criteria upon which, the devaluation of the currency might improve the trade balance. It shows how the elasticity of demand for exports and imports is important in determining whether devaluation of the currency would improve the trade balance or not. Devaluation increases the domestic currency against the foreign currency, hence raising the price of imports expressed in domestic currency. If the demand elasticity is high, then devaluation will cause a relatively large decrease in the volume of imports and might reach its effect. But when the elasticity is low, the reduction in the volumes might not be enough to offset the increase in the local currency price (Caves, Frankel, & Jones, 2007). In addition to that, the substitution and income effects play a role as well. If in the domestic market, there are a lot of substitutes for the imports, then this effect will be felt more by causing a decline in the imports. On the contrary, if the

imports are necessary and there are very few or no substitutes, then this effect will be limited or insignificant. The income effect is important if imports have a significant part in the consumer's budget. It is also important to consider that there is a time lag when it comes to seeing the effects, especially the substitution effect because it takes time for consumers to adjust their preferences accordingly.

There are also several perspectives that try to explain the relationship between the fiscal balance and trade balance (current account balance). The first approach, known as the 'twin deficit' hypothesis, which has its source in the Mundell-Fleming model, says that the fiscal (budgetary) deficit causes a deficit in the current account and the trade balance. The mechanism of how this happens is that the increase in the fiscal deficit means an increase in general expenses, which also affects imports if the share of imports is significant to the economy which is the case for the region. On the other hand, the other approach suggests that economic agents are rational, and they increase their savings because they expect future tax increases to pay for fiscal deficits and increased spending.

The main drivers for the continuous trade deficit of the Western Balkan countries during all these years can fall into several categories:

Minor diversification of exports: Exports from Western Balkan countries often concentrate on a few products and services, such as raw materials, low-value-added items, or agricultural products. In general, these products are more sensitive to changes in prices and global demand, hence directly affecting the trade deficit (Ilahi, et al., 2019).

Weak competition: the collapse of the former Yugoslavia brought most of the countries of the Western Balkans into conflict. The conflicts have weakened most economic sectors of these countries, as is the case with Kosovo and Bosnia and Herzegovina. Factors including weak physical and legal infrastructure, limited and unfavourable access to financing, an inefficient judicial system to resolve various commercial disputes and highly bureaucratic public administration have impacted the competitiveness and productivity of these countries. The authors, Sanfey, Milatović & Krešić (2016) mention exactly these factors for the stagnation in the convergence (approach) with the standard and income of the EU countries.

Dependence on imports: Western Balkan countries are highly dependent on imported goods from abroad, including energy, equipment, and consumer goods. The lack of domestic production capacity to meet the needs and demands of necessary goods and services has caused any change in prices at the international level of the basic products to bring deterioration not only of the trade balance but also an increase in the budget cost and economy in general.

Challenges related to economies in transition: the transition has brought numerous challenges for Western Balkan countries; from the need to begin the privatization of public enterprises to the necessity to rebuild their physical infrastructure, which has often been accompanied by problems that have influenced the trade balance results as well, as it is suggested by (Ilahi, et al., 2019).

Weak political stability and regional dynamics: the failure to solve the political problems between the WB countries also affects the commercial relations between them, presenting barriers to achieving the export potential of these countries (Ilahi, et al., 2019).

Other structural problems, related to the emigration of the labour force, may present problems in the medium and long term by limiting the production capacities and export potential of the region (OECD, 2022).

The trade deficit in the Western Balkans is one of the main causes of the current account deficit of these countries. Our main goal is to gain insights into the determinants of the trade balance and to understand the intuition behind the results.

2. Literature Review

International trade has grown significantly in recent decades. The data from the World Trade Organization (WTO) show that the ratio of trade exchanges as a percentage of GDP increased from about 25% in 1970 to 57%, reached in 2021. (World Bank, 2022). There are numerous studies on the determinants of the trade balance. However, there is a limited number of studies in Western Balkan countries. Meanwhile, a considerable amount of work has been done on studying developing countries in large markets, such as in Asia. In this section, we will review some previous works of researchers on this topic.

A paper by Kovacevic, (2017) studied the current account balance of nine Southeast European countries (Bulgaria, Croatia, Romania, Moldova, Serbia, Bosnia and Herzegovina, North Macedonia, Montenegro, and Albania) for the period 2000-2015 using the Dynamic OLS (DOLS) model and Fully Modified OLS (FMOLS). The results showed that the appreciation of the local currency exchange rate harms the current account, while inflows from foreign direct investments and remittances have a positive impact, but this is more pronounced in the long term. Analyzing the determinants of the current account deficit for five candidate countries for EU integration (Albania, Croatia, North Macedonia, Serbia, and Turkey), Bucevska (2017), has found that the most influential factors in the current account balance are mainly, the real GDP growth rate, the level of development of the financial system as well as the degree of commercial integration.

In a study about the impact of Bosnia and Herzegovina's market liberalization on major trading partners, the authors, Kurtovic, Halili, & Maxhuni (2017), using the gravity model⁴ showed that the exports of products from Bosnia and Herzegovina marked an increase with the rise in the macroeconomic indicators of the trading partners, considered as dummy variables, and it also affected the decrease of imports in some sectors, affecting the reduction of the deficit trade for the period from 2005 to 2014. Also, Kurtović (2017), has analyzed the impact of the devaluation of the official currency of Albania (LEK) on the country's trade balance. By collecting the quarterly data, the author has found evidence that

⁴ *The Gravity model explains that the trade exchanges between two countries depend on the relative size of the economies of those countries and the geographic distance between them.*

the devaluation of the effective exchange rate has had a positive impact on Albania's trade balance for the period (1994-2015).

The authors, Ari & Cergibozan (2017), studied the dynamics of Turkey's trade balance for the period 1987-2015. According to J-curve hypothesis, an increase in the real effective exchange rate (REER)⁵ initially deteriorates and then improves the trade balance when the export and import adjust to prices. Based on their results the devaluation of domestic currency improves the trade balance in the long run. Whereas an increase in national income and income in foreign trade partner countries negatively affects the country's trade balance.

Other studies for European countries present the impact of combined macroeconomic policies on the current account balance and consequently the trade balance. The authors, Duarte & Schnabl (2015), point out that the increase in capital flows, which encourages public spending and increased consumption, influenced the increase in the deficit of many countries in Europe. Meanwhile, Germany and some Northern European countries combined expansive monetary policy with tight fiscal policy, influencing capital outflows and increasing current account surpluses.

Investigating the links between globalization, institutions, foreign direct investment (FDI), and the current account for twenty-three Asian countries over the period from 1998 to 2013, the authors, Sahoo, Babu, & Dash (2013) concluded that institutional reforms may induce more FDI inflows. However, this may lead to deterioration of the current account by encouraging imports as well as increased demand for investment in the domestic economy. After controlling for other exogenous variables, the study finds that FDI inflows and institutional reforms have a negative and significant impact on the current account balance/trade balance of the examined countries.

In another study, Türkay (2014) used the Johansen cointegration test using annual data for the period 1980-2022. His results showed that the Marshall-Lerner condition is valid for Turkey, but only in the long run. While for the short-term period, no significant relationship was found between the exchange rate and the trade balance. Meanwhile, Rajkovic, Bjelić, Jaćimović, & Verbić (2020) studied the effect of the devaluation of the local currency in the function of improving the trade balance for 18 countries for the period 1990-2016. According to their findings, the change in the exchange rate, especially in periods of economic crises, does not have a major impact on the trade balance, and other factors such as government spending, external demand, and foreign investments have a greater role in the trade balance. This is very much related to the absorption approach which states that the current account imbalances can be considered as the difference between domestic spending and domestic output. In other words, imports may go down either through expenditure decrease on imports as the real purchasing power declines due to an increase in foreign prices or through switching to relatively cheaper domestic goods and services. But, if domestic production depends on imported intermediate goods, then the aggregate output

⁵ The REER in this paper is defined as $REER = E \cdot P_f / P_d$, where E is the exchange rate expressed as domestic currency units per one unit of foreign currency, P_f is the average foreign prices in the basket of several foreign currencies (trading partners) and P_d is the average prices in the local currency. It is CPI based.

might fall rather than rise due to the rise in import prices. Authors, Herrmann & Jochem (2005) analyzed the determinants of trade balance in Central and Eastern European countries based on quarterly data from 1994 to 2004. According to their results, income per capita has a large effect on the level of private savings which largely explains current account and trade balance deficits. The lack of currency overvaluation has helped these countries to exclude the exchange rate as a factor in the trade deficit. Also, Mirdala (2016) studied the issue of whether the real exchange rate is one of the main factors of the persistent current account deficit. The data consists of the period 2000-2007 (before the financial crisis) and the period 2000-2014. According to the findings of this paper, countries on the periphery of the eurozone suffer more from the exchange rate change, and the negative effect on the trade balance lasts longer than in other eurozone countries. On the other hand, authors Holinski, Kool, & Muysken (2012) analyzed the problem of the divergence of the current account imbalance and the trade balance between the countries in the south and the north of the eurozone. The authors have based the study on the data of the eurozone countries for the period 1992-2007. For the northern countries, which almost continuously have had a positive (surplus) trade balance (current account), it has helped them to maintain fiscal consolidation and greater competitiveness in trade. While, for the southern part, a decrease of 10 percentage points (in terms of GDP) in the level of private sector savings is considered the main factor for the trade and current account deficit.

Based on quarterly trade balance data of four Central European countries and three Baltic countries for the period 1992-2006, using methods for panel data, Horvath & Veselkova (2008) concluded that transitory shocks in the income of these countries are the main factors that have influenced the changes in the trade balance.

On the other hand, Farzanegan & Hassan (2019) have analyzed the economies of Middle Eastern and North African countries, which are highly dependent on remittances. This study, which examined the role of remittances in the trade balance of 11 countries using regression analysis for panel data, showed that inflows from remittances have fueled the trade deficit. It also turned out that the final effect of remittances depends on the level of domestic capital formation. The results are also stable after controlling for other trade deficit factors such as income, inflation, exchange rate, and country institutions. Also, Tung (2018) studied the effect of remittances for 17 countries in the Asia-Pacific region for the period 1980-2015. Using the OLS, 2-SLS, and PGMM methods, the author has evidenced that the flow of remittances hurt the trade balance, which may imply that the increase in income from remittances is more import-oriented. Whereas the effect of the exchange rate was positive for these countries. In other studies, on the impact of remittances on the trade balance of the region, Ademi, Luma, & Bela (2022) examined the impact of remittances on the trade balance of North Macedonia using quarterly data for the period 2003-2019. In this paper, a distinction is made between formal remittances, measured by workers' compensation, and informal remittances, measured by private transfers. According to the results of this paper, private transfers have a significant impact and improve the trade balance, while workers' compensation significantly worsens the trade balance.

Using the OLS method for data from 1980 to 2012 for Tanzania, Shawa & Shen (2013) found that consumption expenditure, government expenditure, inflation, and the appreciation of the real exchange rate had a negative effect on the trade balance, (but it

resulted to be insignificant by statistic tests) while direct foreign investment, foreign exchange, human capital, exploitable natural resources, foreign income, and trade liberalization had a positive effect on the trade balance.

There are also empirical studies on the impact of the fiscal balance on the trade balance and the current account. Bussière, Fratzscher & Müller (2004) analyzed the factors affecting the current account of thirty-three OECD countries for the period 1998-2002, through the intertemporal model. Using the GMM (General Method of Moments) and IV (instrumental variables) methods they concluded that the fiscal balance, relative income, and relative investment are important factors for the current account in the medium term. (Erceg, Guerrieri, & Gust, 2005) have analyzed the impact of fiscal changes on the US trade balance using a DGE (SIGMA) open economy model. Some economists believe that the fiscal and trade deficit in the US is not related because of US capital formation increasing more than US savings due to stronger productivity growth than in the rest of the world. While others believe that the trade deficit has increased because the government deficit is much larger than before and that the share of private savings to GDP has declined over time. In this paper, they examined the effects of two fiscal changes: an increase in government spending and a reduction in the tax rate on labour income. According to the findings, it is concluded that the fiscal deficit had a relatively small effect on the US trade balance, regardless of whether the source is an increase in spending or a reduction in taxes. According to the results, an increase in the fiscal deficit by one percentage point of GDP causes the trade balance to worsen by less than 0.2 percentage points of GDP.

Altayligil & Çetrez (2020) studied the macroeconomic, institutional, and financial aspects of the current account balance and consequently, the trade balance using the panel data methods. The study was conducted using data for the period between 1986 and 2013 for ninety-seven developing and developed countries. According to the findings, the current account balance can be related to factors such as fiscal balance, economic growth, terms of trade, exchange rate, trade openness, stage of economic development, financial market development, macroeconomic stability, and institutional quality. An increase in the rate of economic growth, real effective exchange rate, fiscal deficit, and trade openness increased the current account deficit.

Gerceker, Ozmen, & Mucuk (2019) studied the relationship between public expenditure and trade deficit using Bootstrap and Fourier Toda causality and Yamamoto tests, using data for the period 1987-2017 for the economy of Turkey. According to their results, there is no causal relationship between public expenditures (excluding transfers and personnel expenditures) and the trade deficit.

3. Research Methodology and Empirical Analysis

3.1 Data and Econometric Model Specification

For this study, annual data sources for the period 2000-2021 were used. Data for all variables (except the real effective exchange rate) are obtained from World Bank data publications, Eurostat, and the statistical agencies of the respective countries. (World Bank,

2021). As for the real exchange rate, the data is provided by the publications Bruegel Datasets (Darvas, 2021) which contains data on the effective exchange rate for 178 countries.

The methodology involves employing panel data analysis to examine data from six Western Balkan countries (Albania, Kosovo, Serbia, North Macedonia, Montenegro, and Bosnia & Herzegovina) spanning the years 2000 to 2021. The study draws on pertinent literature in the field, including works by Kovacevic (2017), Ademi, Luma, & Bela (2022), Herrmann & Jochem (2005), Tung (2018), and Shawa & Shen (2013).

Table 1. Description of the variables of the empirical research

Variables	Abbreviations	Sources	Measure
1 Trade Balance	TB	WB/Others	% of GDP
2 Economic Growth	GDP	WB/Others	% of GDP
3 Remittances	REM	WB/Others	% of GDP
4 Foreign Direct Investments	FDI	WB/Others	% of GDP
5 Inflation Rate	INF	WB/Others	% of GDP
6 Consumption	CON	WB/Others	% of GDP
7 Real effective exchange rate	REER	Bruegel dataset	Index
8 Fiscal Balance	FB	WB/Others	% of GDP

In selecting an econometric model suitable for panel data, the choice between fixed and random effects offers distinct advantages. The utilization of fixed effects in panel data regression facilitates the analysis of data across numerous entities over an extended timeframe while controlling for variables not directly addressed in the study. Additionally, this approach allows for the mitigation of heterogeneity among countries and the inclusion of specific factors that may vary across observations.

The econometric equation can be expressed in the following form:

$$TB_{it} = \beta_0 + \beta_1 X_{it} + \varepsilon_{it} \quad (1)$$

where TB represents the trade balance as a percentage of the GDP of the country i in the corresponding period t , X_{it} shows the vector of factors affecting the trade balance of the Western Balkan countries, the coefficient β is the value before the variable or parameter of interest, ε represents the term of error with zero mean and constant variance.

The dependent variable of the trade balance is expressed as a percentage of GDP. A positive value of this variable means an excess (surplus) of the trade balance, while a negative value means a trade deficit. If we rewrite equation 1., presenting all elements (factors) that are included in X_{it} , then we have:

$$TB_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 REM_{it} + \beta_3 IHD_{it} + \beta_4 INF_{it} + \beta_5 CON_{it} + \beta_6 REER_{it} + \beta_7 BF_{it} + \varepsilon_{it} \quad (2)$$

β_i represents the coefficient that will be estimated by the econometric model, TB – trade balance, GDP – annual growth rate of the Gross Domestic Product, REM – remittances,

INF – inflation rate, CON – consumption, REER – real effective exchange rate, BF – fiscal balance and ε represents the error term. All variables are expressed as a percentage of GDP, except for the real exchange rate REER, which is presented as an index with a numerical value and GDP growth rate which is shown as a yearly increase (year over year).

Considering the expectations for the coefficients and their signs, then β_1 is expected to have a negative sign since an increase in the GDP rate would lead to an increase in consumption, which in the region accounts for more than 80% of its GDP (average of the period 2000-2021) and is largely import-oriented. Remittances are also expected to have a negative impact on the trade balance and consequently, the β_2 coefficient might have a negative sign. Although, remittances have been increasing in most of the countries of the region, they have mostly been oriented towards the consumption of basic products and not towards capital investment that could increase the export capacity of the Balkan countries. On the other hand, foreign direct investments' impact on the trade balance is considered ambiguous, depending on the level and size of foreign investments. If the countries are in the initial stage of investment, importing machinery and other necessary equipment for the investment in the host country, can worsen the trade balance. Whereas, in the medium and long term, the effect might be positive because of the increase in domestic production capacities. In the case of Western Balkan countries, the sign of the coefficient β_3 is expected to be negative or undetermined.

The inflation rate effect on the trade balance extends to several dimensions. In the case of the Western Balkans, due to the dominance of imports over exports, an increase in the price level β_4 would adversely affect the cost of imported goods, making imports more expensive and ideally switching consumers to locally produced goods, if they are cheaper. However, since the boost of local production depends heavily on the import of intermediate capital goods that are imported from above, the inflation effect in the WB might be considered imported inflation since the share of imported goods is high and indirectly affects the price of the locally produced products as well. While an increase in household consumption expenditure can worsen the economy's trade balance. In principle, economic growth can lead to an increase in the purchasing power of households and businesses. This demand can be met by importing foreign goods if the domestic economy cannot produce sufficiently to meet domestic demand. In other words, if an economy grows significantly, increasing the standard of living of its citizens and enabling them to consume more foreign or domestic goods. Therefore, the coefficient of β_5 is expected to have a negative sign.

An increase in the exchange rate means a depreciation of the value of the local currency. Devaluation in the local currency can cause the price of foreign goods to rise relative to domestic goods. However, this would require the Marshall-Lerner condition to be present as explained above. Therefore, the sign of the coefficient β_6 might be positive or ambiguous.

The coefficient of β_7 of the fiscal balance might be positive or negative, depending on the extent to which government expenditures have influenced the growth of investments or domestic consumption. One way to understand the relation between fiscal balance and trade deficit is that when the governments run a budget deficit through a combination of tax cuts or spending increases the aggregate demand. Some of the increase will lead to higher

imports, which in the case of the Western Balkan countries is quite significant. Hence, the sign of the coefficient for the region is expected to be negative or ambiguous.

3.2 Data analysis and empirical results

The following table presents aggregated statistical indicators for the studied variables of the Western Balkan countries.

Table 2. Descriptive statistics

Variables	Obs	Mean	Std. Dev.	Min	the Max
TB	128	-22.73	9.61	-56.80	-4.92
GDP	128	3.32	3.58	-15.31	12.76
REM	119	11.11	5.52	1.98	28.39
FDI	128	7.65	6.26	0.00	37.27
INF	125	4.65	11.15	-2.41	95.00
CON	132	97.31	9.63	79.5	137.23
REER	132	96.08	9.19	47.60	115.19
BF	130	-2.45	3.01	-10.93	8.43

Note: For some variables, there was no available data for several years, therefore there are fewer observations.

Montenegro had the largest trade deficit during this period with 56.80% in 2008 due to higher growth of imports than exports. Also, the share of travel and tourism (service exports) was affected by the financial crisis of 2008. Meanwhile, Table 3 presents the comparative values of the determining factors of the trade balance, for the period before and during the pandemic (Covid-19). The values before the pandemic refer to the period until 2019 (including), while those during the pandemic (2020-2021).

Table 3. Comparison of data before and during the pandemic (Covid-19)

Variables	Before the Pandemic		During the Pandemic	
	Mean	Std. Dev.	Mean	Std. Dev.
TB	-23.52	9.61	-18.28	9.49
GDP	3.53	2.71	1.37	8.38
REM	11.30	5.67	10.24	4.83
FDI	7.91	6.61	5.93	3.38
INF	5.17	11.96	1.69	1.52
CON	98.50	9.55	90.51	6.89
REER	95.19	9.11	102.37	8.16
BF	-2.23	2.91	-5.09	3.33

All variables experienced a significant decrease during the pandemic period, reflecting the impact of economic activity closures in the region. For instance, the mean trade balance decreased from -23.52% before the pandemic to -18.28% during the pandemic. Similarly, GDP growth, remittances, foreign direct investment, inflation, and consumption all showed declines during the pandemic compared to the pre-pandemic period.

Table 4. Correlation matrix analysis

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) TB	1.00							
(2) GDP	-0.17	1.00						
(3) REM	-0.53	0.18	1.00					
(4) FDI	-0.23	-0.01	-0.29	1.00				
(5) INF	-0.13	0.18	-0.09	0.14	1.00			
(6) CON	-0.72	-0.02	0.42	0.14	0.04	1.00		
(7) REER	0.02	-0.07	-0.28	0.16	0.03	-0.05	1.00	
(8) BF	-0.15	0.49	-0.06	0.08	0.09	0.24	-0.06	1.00

The coefficient between the net trade balance variable and GDP growth rate is $r = -0.17$, which shows us that there is a weak negative relationship. So, when we have an increase in the GDP rate, the trade balance worsens (the trade deficit increases).

3.3 Analysis of econometric models

Four econometric models have been condensed for analysis: firstly, employing the ordinary least squares technique (OLS); secondly, utilizing ordinary least squares with error term minimization (OLSR); thirdly, employing fixed effects (FE); and finally, utilizing random effects (RE). According to the F-statistic (0.0000), all four models exhibit statistical significance at the 1% level.

The following econometric models are presented for estimating the parameters of economic variables, along with tests to assess multicollinearity and heteroscedasticity in the data.

Table 5. Summary of the results of econometric models

Variables	OLS	OLSR	FE	RE
GDP	-0.364* (-2.07)	-0.364 (-1.58)	-0.197 (-1.33)	-0.364* (-2.07)
REM	-0.668*** (-5.02)	-0.668*** (-5.25)	-0.638** (-3.29)	-0.668*** (-5.02)
FDI	-0.349*** (-4.02)	-0.349*** (-4.44)	-0.200* (-2.38)	-0.349*** (-4.02)
INF	-0.257 (-1.54)	-0.257 (-1.50)	-0.714*** (-4.51)	-0.257 (-1.54)
CON	-0.611*** (-7.69)	-0.611*** (-6.35)	-0.604*** (-7.52)	-0.611*** (-7.69)
REER	-0.104 (-1.18)	-0.104 (-1.13)	-0.142* (-2.05)	-0.104 (-1.18)
BF	0.234 -1.13	0.234 -0.99	0.138 -0.75	0.234 -1.13
_cons	58.66*** -5.36	58.66*** -4.13	60.58*** -6.31	58.66*** -5.36
N	114	114	114	114
R2	0.6762	0.6762	0.6691	0.6332
F	0.0000	0.0000	0.0000	0.0000

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Among the 114 observations conducted, the two-panel data models (FE and RE) were examined. Notably, the model featuring fixed effects stands out with the highest explanatory dimension, boasting a determination coefficient (r^2) of 66.91%. Furthermore, to identify the suitable econometric model for our dataset, the Hausman test was employed. The rationale for choosing the fixed effects model is to analyze the impact of variables that vary over time. It is designed to explore the relationship between independent and dependent variables within an entity. This is the assumption that something may impact independent variables and we need to control for this, and the rationale behind the assumption of the correlation between the entities error term and independent variables. Because the FE model was chosen for the selected data set, the structural changes between countries are not significant. For example, when we consider the financial crisis of 2008-2009, the average credit to the private sector (as % of GDP) in all the countries is below 50%. Hence, we claim that the periods of crisis would not create significant heterogeneous structural breaks and would not lead to inconsistent slope coefficient estimates. The Hausman Test is used to determine the choice between the models.

Table 6. Selection of the most suitable model for study

Hausman Test	Coef.
Chi-square test value	72.59
P-value	0.0000

Based on the p-value of this test ($p=0.0000$), we consider that the difference in the coefficient is systematic, and in cases where this difference is systematic, we prefer to use the model with fixed effects.

Table 7. Results of the model with the fixed effects technique

TB	Coef.	St. Err.	t-value	p-value	95% Conf	Interval]	Sig
GDP	-.19	.14	-1.33	.18	-.49	.09	
REM	-.63	.19	-3.29	.01	-1.02	-.25	***
FDI	-.20	.08	-2.38	.01	-.36	-.03	**
INF	-.71	.15	-4.51	.00	-1.02	-.49	***
CON	-.60	.08	-7.52	.00	-.76	-.44	***
REER	-.14	.06	-2.05	.04	-.27	-.01	**
BF	.13	.18	0.75	.45	-.22	.50	
Constant	60.57	9.60	6.31	.00	41.52	79.63	***
Mean dependent var	-22.46		SD dependent var		8.99		
R-squared	0.66		Number of obs		114		
F-test	29.18		Prob > F		0.00		
Achaic crit. (AIC)	648.43		Bayesian crit. (BIC)		670.32		

Note: * $p<0.1$, ** $p<0.05$, *** $p<0.01$

According to the findings of the fixed effects model, economic growth exhibits a negative impact on the trade balance ($\beta_1 = -0.19$) but without reaching statistical significance while remittances ($\beta_2 = -0.63$) attain the significance observed at the 1% level. Similarly, foreign direct investments show a negative effect ($\beta_3 = -0.20$), significant at the 5% level, while inflation ($\beta_4 = -0.71$) and consumption ($\beta_5 = -0.60$) also demonstrate negative impacts, both significant at the 1% level. Additionally, the real effective exchange rate ($\beta_6 = -0.14$)

exhibits a significant negative impact at the 5% level. Conversely, the fiscal balance appears to positively influence the trade balance ($\beta_7 = 0.13$), although this effect does not achieve statistical significance.

The table presenting the testing for multicollinearity, the VIF (Variance inflation factor) test was used for this purpose and based on the average of this test (1.44) we consider that the data does not suffer from the multicollinearity problem. The same conclusion can be drawn from the correlation matrix.

Table 8. Testing for multicollinearity of data

	VIF	1/VIF
REM	1.80	.55
CON	1.65	.60
GDP	1.62	.61
BF	1.60	.62
FDI	1.24	.80
REER	1.10	.90
INF	1.08	.92
Mean VIF	1.44	-

Table 9. Testing data for heteroskedasticity

Breusch-Pagan	Value
chi2(1)	1.22
Prob > chi2	0.2692

While the table above presents the results of the Breusch Pagan Langrangian test for testing the data for heteroscedasticity, where based on the results of this test ($P = 0.2692$) we consider that the error term has a constant variance, so the data is homoscedastic and is not presented the problem of heteroscedasticity.

3.4 Discussion of results

According to our findings, the trade balance of the Western Balkan countries was negatively impacted by remittances, foreign direct investments, consumption, the inflation rate, and the real effective exchange rate. The sign of the remittance coefficient is also consistent with the findings of Ademi, Luma, & Bela (2022) who estimated that there was a negative relationship between remittance inflows from workers' compensation and the trade balance due to the tendency of individuals to consume imported goods as domestic disposable incomes increased. Even the findings of Tung, (2018), who studied the effect of remittances for 17 countries in the Asia-Pacific region for the period 1980-2015 are consistent with our results. Also, the evidence from the consumption is by the findings of the authors Wen & Shimek (2007), who evidenced a connection between the increase in consumption and the increase in (trade deficit) in the USA. Whereas Ahad (2017) in his study found evidence for a negative relationship between the inflation rate and the trade balance for the country of Pakistan. Of the other independent variables, according to Helpman (1984), foreign direct investment might have a negative impact in the short term

on the trade balance, and in our study, this indicator was found significant as well. According to another paper, Shawa & Shen (2013), estimated that FDI had a positive impact on Tanzania's trade balance, unlike the estimated results of this paper. Whereas the findings on the changes in the effective exchange rate according to Arize (1994); Kovacevic, (2017); and Bucevska (2017), could impact the trade balance, but only in the long term, this may vary from country to country and are consistent with the estimates of our model.

4. Conclusions

This research is driven by the persistent trade deficit experienced by Western Balkan countries over several years. Utilizing data sourced from the World Bank, Eurostat and national agencies spanning from 2000 to 2021, the study focuses on Albania, Kosovo, Serbia, North Macedonia, Montenegro, and Bosnia and Herzegovina. Panel data results reveal significant impacts on the trade balance stemming from remittances, foreign direct investments, consumption, inflation rate, and the effective exchange rate. However, variables such as GDP growth rate and fiscal balance did not attain statistical significance within the model's evaluation. Among the employed models (OLS, OLSR, RE, FE), the fixed effects model is deemed most suitable, determined through the Durbin–Wu–Hausman test ensuring its consistency. While certain variables may not have exhibited significance, it doesn't discount their potential impact on the trade balance, with variations among countries potentially influencing regression outcomes. Notably, consumption, when expressed as a percentage of GDP, notably influences the trade balance of Western Balkan nations, suggesting policymakers focus on bolstering domestic production, particularly in sectors with higher consumption propensities. By encouraging domestic production, reliance on imports could be mitigated, ultimately narrowing the gap between exports and imports. Achieving this necessitates structural economic reforms and increased investments in sectors where these countries hold comparative advantages over others.

Remittances from immigrants working in Europe constitute a significant portion of external monetary inflows. However, these funds are typically directed towards consumption, driving up demand for imports and exacerbating trade imbalances, as shown by our model. Despite sporadic foreign direct investments, which have been limited due to political and economic instability, they have not significantly bolstered the region's export capacity. On the other hand, fiscal balance, despite having a positive coefficient it did not manage to attain the significance level on our model. Consumption is largely affected by the high share of consumer goods in total imports and the inflation rate is also impacted by the import's prices of the goods and products imported from the foreign markets.

This study can be considered a good orientation to analyze other countries in the future, as well as to focus on determining specific factors of individual countries. Likewise, other studies can also focus on sectoral analysis, assessing which industries have the greatest contribution to the countries' trade balance. The issue of trade balance determinants can be expanded by including other potentially influential variables, as well as focusing on specific industries.

References

- Ademi, R., Luma, Z. B., & Bela, B. (2022). The Impact of Remittances on the Trade Balance: Empirical Evidence from North Macedonia. *Theoretical Economics Letters*, 12, 649-711. doi:10.4236/tel.2022.123039
- Ahad, M. (2017). Impact of Financial Development on Trade Balance: An ARDL Cointegration and Causality Approach for Pakistan. *Global Business Review*, 18(5), 1199-1214. doi:10.1177/0972150917710152
- Altayligil, Y. B., & Çetrez, M. (2020). Macroeconomic, institutional and financial determinants of current account balances: a panel data assessment. *Economic Structures*, 9(49). doi:10.1186/s40008-020-00225-1
- Ari, A., & Cergibozan, R. (2017). Determinants of the Trade Balance in the Turkish Economy Conference Paper. *EBEEC Conference Proceedings*. doi: 10.18502/kss.v1i2.654
- Arize, A. C. (1994). Cointegration Test of a Long-Run Relation Between the Real Effective Exchange Rate and the Trade Balance. *International Economic Journal* 8(3): 1-9, 1-9. doi:10.1080/10168739400000001
- Brissimis, S., Hondroyannis, G., Papazoglou, C., & Vasardani, M. (2011). The determinants of current account imbalances in the Euro Area: a panel estimation approach. *Economic Change and Restructuring*, 46(3), 299-319. doi:10.1007/s10644-012-9129-0
- Bucevska, V. (2017). Current Account Deficits in the EU Candidate and Potential Candidate Countries: A Panel Analysis. *Economic Themes*, 55(3), 305-318. doi:10.1515/ethemes-2017-0017
- Bussière, M., Fratzscher, M., & Müller, G. J. (2004). Current Account Dynamics in OECD and EU Acceding Countries – An Intertemporal Approach. *SSRN ECB – WORKING PAPER SERIES*, NO. 311 / FEBRUARY 2004. doi:10.2139/ssrn.515074
- Caves, R. E., Frankel, J. A., & Jones, R. W. (2007). *World Trade and Payments*. Pearson Addison Wesley.
- Darvas, Z. (2021). <https://www.bruegel.org/>. Retrieved 2023, from <https://www.bruegel.org/publications/datasets/real-effective-exchange-rates-for-178-countries-a-new-database>
- Duarte, P., & Schnabl, G. (2015). Macroeconomic Policy Making, Exchange Rate. *Review of Development Economics*, 19(3), 531-544. doi:10.1111/rode.12168
- Erceg, C. J., Guerrieri, L., & Gust, C. (2005). Expansionary Fiscal Shocks and the Trade Deficit. *International Finance Discussion Papers – Federal Reserve*, 363-397. doi:10.1111/j.1468-2362.2005.00164.x
- Farzanegan, M. R., & Hassan, S. M. (2019). How Does the Flow of Remittances Affect the Trade Balance of the Middle East and North Africa? *Journal of Economic Policy Reform*, 23(2), 248-266. doi:https://doi.org/10.1080/17487870.2019.1609357
- Gerceker, M., Ozmen, I., & Mucuk, M. (2019). The Relationship Between Public Expenditures and Foreign Trade Deficit: The Case of Turkey. *Munich: International Conference on Advanced Research in Business, Management and Economics*. doi:https://www.doi.org/10.33422/2nd.icabme.2019.12.880
- Gruber, J., & Kamin B. S. (2007). Explaining the global pattern of current account imbalances. *Journal of International Money and Finance*, 26(4), 500-522. doi:https://doi.org/10.1016/j.jimonfin.2007.03.003
- Helpman, E. (1984). A Simple Theory of International Trade. *The Journal of Political Economy*, Vol. 92, No. 3 (Jun., 1984), pp. 451-471.
- Herrmann, S., & Jochem, A. (2005). Determinants of Current Account Developments in the Central and East European EU Member States – Consequences for the Enlargement of the Euro Area. *BundesBank Series 1 Discussion Paper No. 2005, 32*. doi:https://dx.doi.org/10.2139/ssrn.2785215
- Holinski, N., Kool, C., & Muysken, J. (2012). Persistent Macroeconomic Imbalances in the Euro Area: Causes and Consequences. *St. Louis: Federal Reserve Bank of St. Louis Review*, January/February 2012, 94(1), pp. 1-20. doi:https://doi.org/10.20955/r.94.1-20
- Horvath, J., & Veselkova, M. (2008). Trade Balance and Income Shocks: Experience of Transition Economies. *Transition Studies Review*, 15(2), 241-249. doi:http://dx.doi.org/10.1007/s11300-008-0001-x
- Ilahi, N., Khachatryan, A., Lindquist, W., Nguyen, N., Raei, F., & Rahman, J. (2019). Lifting Growth in the Western Balkans: The Role of Global Value Chains and Services Exports. *International Monetary Fund*. doi:http://dx.doi.org/10.5089/9781498314916.087
- Kovacevic, R. (2017). Current Account determinants in Southeast European. *Zbornik Radova Ekonomskog Fakulteta u Riceji*, 35(2), 391-424. doi:https://doi.org/10.18045/zbfri.2017.2.391
- Kurtović, S. (2017). The Effect of Depreciation of the Exchange Rate on the Trade Balance of Albania. *REVIEW OF ECONOMIC PERSPECTIVES*, 17(2), 141-158. doi:10.1515/revecp-2017-0007
- Kurtovic, S., Halili, B., & Maxhuni, N. (2017). The Effect of Trade Liberalization of Bosnia and Herzegovina with the Leading Trade Partners. *Applied Economics Quarterly*, 4(3), 69-86. doi:10.15640/jeds.v4n3a6
- Mirdala, R. (2016). Real Exchange Rates, Current Accounts and Competitiveness Issues in the Euro Area. *Vienna: FIW Working Paper N° 173*. doi:http://dx.doi.org/10.13140/RG.2.2.13284.58249

- OECD. (2022). Labour Migration in the Western Balkans: Mapping Patterns, Addressing Challenges and Reaping Benefits. Paris: OECD. Retrieved from <https://www.oecd.org/south-east-europe/programme/Labour-Migration-report.pdf>
- Petrović, P., & Gligorić, M. (2010). Exchange Rate and Trade Balance: J-curve Effect. *PanoEconomicus*, 57(1), 23-41. doi:<http://dx.doi.org/10.2298/PAN1001023P>
- Rajkovic, M., Bjelić, P., Jaćimović, D., & Verbić, M. (2020). The impact of the exchange rate on the foreign trade imbalance during the economic crisis in the new EU member states and the Western Balkan countries. *Economic Research-Ekonomska Istraživanja*, 33(1), 182-203. doi:<https://doi.org/10.1080/1331677X.2019.1708771>
- Sahoo, M., Babu, M., & Dash, U. (2013). Effects of FDI flows on Current Account Balances: Do Globalisation and Institutional Quality Matter? *FORUM FOR RESEARCH IN EMPIRICAL INTERNATIONAL TRADE – FREIT*. Retrieved from <https://www.freit.org/WorkingPapers/Papers/ForeignInvestment/FREIT1000.pdf>
- Sanfey, P., Milatović, J., & Krešić, A. (2016). How the Western Balkans Can Catch Up. EBRD Working Paper No.185. London: European Bank for Reconstruction and Development. doi:<https://dx.doi.org/10.2139/ssrn.3119685>
- Shawa, M. J., & Shen, Y. (2013). Analyses of the Determinants of Trade Balance: Case Study of Tanzania. *International Journal of Business and Economics Research*, 2(6), 134-141. doi:10.11648/j.ijber.20130206.13
- Tung, L. T. (2018). Impact of Remittances inflows on trade balance in developing countries. *Economics and Sociology*, 11(4), 80-95. doi:10.14254/2071-789X.2018/11-4/5
- Türkay, H. (2014). The validity of Marshall-Lerner condition in Turkey: A cointegration approach. *Theoretical and Applied Economics*, XXI(10(599)), 21-32. doi:[https://ideas.repec.org/a/agr/journal/vxxiy2014i10\(599\)p21-32.html](https://ideas.repec.org/a/agr/journal/vxxiy2014i10(599)p21-32.html)
- Tutuenau, G. (2015). Measuring the Influence of the J-Curve Effect on Trade in Romanian Forest Products. *Theoretical and Applied Economics*, 22(4), 75-84. Retrieved from [https://ideas.repec.org/a/agr/journal/vxxiy2015i4\(605\)p75-84.html](https://ideas.repec.org/a/agr/journal/vxxiy2015i4(605)p75-84.html)
- UNCTAD. (2005). Developing countries in international trade 2005: Trade and Development Index. New York, Geneva: United Nations Conference on Trade and Development. doi:<https://dx.doi.org/10.2139/ssrn.983944>
- Wen, Y., & Shimek, L. M. (2007). The U.S. Consumption Boom and Trade Deficit. *Economic Synopses*. doi:<https://doi.org/10.20955/es.2007.24>
- World Bank. (2021). <https://data.worldbank.org/>. Retrieved 2023, from <https://data.worldbank.org/>
- World Bank. (2022). <https://data.worldbank.org/indicator>. Retrieved 2023, from <https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS>
- World Trade Organization. (2015). World trade and the WTO: 1995-2014. World Trade Organization: International Trade Statistics. Retrieved from https://www.wto.org/english/res_e/statis_e/its2015_e/its2015_e.pdf

APPENDIXES

Table 1.1 Imports: Capital goods 2000-2021 (in percent of total import of goods)

Import of capital goods (weighted average of the respective period)	2000-2005	2006-2010	2011-2015	2016-2021
Albania	18%	16%	12%	10%
Bosnia & Hercegovina	17%	17%	15%	16%
Montenegro		17%	14%	18%
Serbia	21%	20%	21%	22%
North Macedonia		17%	15%	17%
Kosovo		13%	11%	12%

Source: World Integrated Trade Solutions, UN Comtrade, national agencies

Table 1.2 Imports: Consumer goods 2000-2021 (in percent of total import of goods)

Imports of consumer goods (weighted average of the respective period)	2000-2005	2006-2010	2011-2015	2016-2021
Albania	45%	48%	46%	34%
Bosnia & Hercegovina ¹	42%	47%	56%	45%
Montenegro		51%	56%	55%
Serbia	34%	33%	33%	30%
North Macedonia	29%	29%	36%	37%
Kosovo ²		36%	37%	37%

¹ Data reflects the period 2003-2005.

² Data for the period 2006-2010, it refers only to the year 2010.

Source: World Integrated Trade Solutions, UN Comtrade, national agencies

Table 2. Trade volume of Western Balkan countries, 2000-2021 (in mil eur)

Years	Export (outside region)	Imports (outside region)	Trade balance			Export/import ratio (%)
			Value	Basic index 2000=100	Chain index	
2000	4,159	13,228	- 9,069	100.00	-	31
2001	4,338	16,269	- 11,931	131.56	131.56	27
2002	4,502	19,291	- 14,789	163.07	123.95	23
2003	4,690	20,473	- 15,783	174.03	106.72	23
2004	5,553	25,119	- 19,566	215.75	123.97	22
2005	4,305	17,102	- 12,797	141.11	65.40	25
2006	5,973	19,710	- 13,737	151.47	107.35	30
2007	6,699	25,150	- 18,451	203.45	134.32	27
2008	7,842	30,174	- 22,332	246.25	121.03	26
2009	6,469	22,749	- 16,280	179.51	72.90	28
2010	15,025	30,717	- 15,692	173.03	96.39	49
2011	17,651	34,880	- 17,229	189.98	109.79	51
2012	17,567	34,517	- 16,950	186.90	98.38	51
2013	20,363	34,007	- 13,643	150.44	80.49	60
2014	21,233	35,562	- 14,330	158.01	105.04	60
2015	22,500	36,689	- 14,189	156.46	99.02	61
2016	24,354	38,685	- 14,331	158.02	101.00	63
2017	27,800	43,681	- 15,880	175.10	110.81	64
2018	30,806	48,532	- 17,726	195.46	111.62	63
2019	32,384	52,015	- 19,631	216.46	110.75	62
2020	30,569	47,852	- 17,282	190.56	88.03	64
2021	39,234	61,380	- 22,146	244.19	128.14	64

Source: Eurostat, national agencies, and authors' calculations

Table 3. Expenditure components of GDP, 2011 and 2021 (% relative to GDP)

	Households and non-profit institutions serving households		General government		Gross fixed capital formation		Changes in inventories and acquisitions less disposals of valuables		External balance of goods and services	
	2011	2021	2011	2021	2011	2021	2011	2021	2011	2021
Bosnia and Herzegovina	83.2	67.9	23.1	19.0	22.0	21.5	0.2	6.6	-23.8	-14.7
Montenegro ⁽¹⁾	81.6	81.2	21.1	22.6	19.5	27.9	-0.2	3.3	-22.0	-35.0
North Macedonia	73.9	67.7	18.1	16.0	23.5	22.5	3.4	9.8	-19.0	-16.1
Albania	78.3	76.7	11.0	11.9	29.4	24.4	2.0	0.5	-22.8	-13.4
Serbia	75.5	67.6	18.9	16.3	17.5	22.8	0.8	3.9	-12.8	-10.7
Kosovo	87.5	85.9	12.7	11.6	31.2	31.8	4.9	3.0	-36.2	-32.3

⁽¹⁾ 2020 data instead of 2021 Source: Eurostat, national statistics agencies

Table 4. Econometric models' results from STATA

OLS linear regression

Net trade balance of GDP	Coef.	St. Err.	t-value	p-value	95% Conf	Interval]	Sig
GDP growth rate	-.364	.176	-2.07	.041	-.714	-.015	**
Remittances of GDP	-.668	.133	-5.02	0	-.932	-.404	***
FDI of GDP	-.349	.087	-4.02	0	-.521	-.177	***
Inflation rate	-.257	.167	-1.54	.126	-.588	.073	
Consumption of GDP	-.611	.079	-7.69	0	-.768	-.453	***
REER	-.104	.088	-1.18	.24	-.279	.071	
Fiscal Balance of GDP	.234	.207	1.13	.26	-.176	.643	
Constant	58.656	10,938	5.36	0	36,971	80.342	***
Mean dependent var		-22,466	SD dependent var			8,990	
R-squared		0.676	Number of obs			114	
F-test		31.621	Prob > F			0.000	
Achaic crit. (AIC)		710.694	Bayesian crit. (BIC)			732.583	

*** $p < .01$, ** $p < .05$, * $p < .1$

Linear regression OLSR

Net trade balance of GDP	Coef.	St. Err.	t-value	p-value	95% Conf	Interval]	Sig
GDP growth rate	-.364	.231	-1.58	.118	-.823	.094	
Remittances of GDP	-.668	.127	-5.25	0	-.92	-.416	***
FDI of GDP	-.349	.079	-4.44	0	-.505	-.193	***
Inflation rate	-.257	.171	-1.50	.135	-.597	.082	
Consumption of GDP	-.611	.096	-6.35	0	-.801	-.42	***
REER	-.104	.093	-1.13	.263	-.288	.079	
Fiscal Balance of GDP	.234	.236	0.99	.324	-.234	.701	
Constant	58.656	14.2	4.13	0	30.504	86.809	***
Mean dependent var		-22,466	SD dependent var			8,990	
R-squared		0.676	Number of obs			114	
F-test		28,420	Prob > F			0.000	
Achaic crit. (AIC)		710.694	Bayesian crit. (BIC)			732.583	

*** $p < .01$, ** $p < .05$, * $p < .1$

Regression results: FE

Net trade balance of GDP	Coef.	St. Err.	t-value	p-value	95% Conf Interval]	Sig
GDP growth rate	-.197	.148	-1.33	.186	-.49	.096
Remittances of GDP	-.638	.194	-3.29	.001	-1.023	-.253 ***
FDI of GDP	-.2	.084	-2.38	.019	-.367	-.034 **
Inflation rate	-.714	.158	-4.51	0	-1.028	-.4 ***
Consumption of GDP	-.604	.08	-7.52	0	-.763	-.445 ***
REER	-.142	.069	-2.05	.043	-.279	-.005 **
Fiscal Balance of GDP	.138	.184	0.75	.457	-.228	.504
Constant	60,579	9.606	6.31	0	41.522	79,636 ***
Mean dependent var		-22,466	SD dependent var			8,990
R-squared		0.669	Number of obs			114
F-test		29.180	Prob > F			0.000
Achaic crit. (AIC)		648.433	Bayesian crit. (BIC)			670.323

*** $p < .01$, ** $p < .05$, * $p < .1$

Regression results: RE

Net trade balance of GDP	Coef.	St. Err.	t-value	p-value	95% Conf Interval]	Sig
GDP growth rate	-.364	.176	-2.07	.039	-.71	-.019 **
Remittances of GDP	-.668	.133	-5.02	0	-.929	-.407 ***
FDI of GDP	-.349	.087	-4.02	0	-.519	-.179 ***
Inflation rate	-.257	.167	-1.54	.123	-.584	.069
Consumption of GDP	-.611	.079	-7.69	0	-.766	-.455 ***
REER	-.104	.088	-1.18	.237	-.277	.069
Fiscal Balance of GDP	.234	.207	1.13	.258	-.171	.639
Constant	58.656	10,938	5.36	0	37.219	80,094 ***
Mean dependent var		-22,466	SD dependent var			8,990
Overall r-squared		0.676	Number of obs			114
Chi-square		221.348	Prob > chi2			0.000
R-squared within		0.633	R-squared between			0.741

*** $p < .01$, ** $p < .05$, * $p < .1$