Review article
UDC: 339.7(4-12)
https://doi.org/10.18045/zbefri.2017.2.391

Current Account determinants in Southeast European (SEE) countries – panel approach*[1]

Radovan Kovačević[2]

Abstract

The aim of this paper is to examine the relation between the current account balance and its determinants for a sample of 9 SEE countries (Bulgaria, Croatia, Romania, Moldova, Serbia, Bosnia and Herzegovina, Macedonia, Montenegro, and Albania) over the period from 2000 to 2015. After we had established the existence of panel cointegration in the sample, we estimated cointegration equations using FMOLS and DOLS estimator. The results show that real effective exchange rate appreciation had an adverse effect on the current account, while the net inflow of direct foreign investments has a positive impact, as private remittances. The survey also confirmed that the current account deficit in the SEE countries is persistent. The results indicate that the structural changes in the SEE countries should be carried out in order to reduce the CA deficit. Also, the appreciation of the national currency should be avoided, since it will lead to an increase in the CA deficit.

Key words: *current account, persistence, real effective exchange rate, fiscal balance, SEE countries*

JEL classification: *F21, F32, F34*

1. Introduction

Theoretical and empirical research on the determinants and dynamics of the current account (CA) of individual SEE countries has increased in recent years. The reason lies in the fact that some of these countries are already members of the European

* Received: 17-04-2017; accepted: 21-12-2017

[1] This paper is part of the research project of the Ministry of Science and Technology of the Republic Serbia "The role of the state in the new model of economic growth in Serbia" (Contract number 179065).

[2] *Full Professor, University of Belgrade, Faculty of Economics, Kamenička 6, 11000 Belgrade, Serbia. Scientific affiliation: international economy, international finance, international capital market. Phone: +381 11 3021 144. E-mail: radovank@ekof.bg.ac.rs, rkovacevic7@gmail.com.*

Union (EU), while others are in the process of accession. Their commitment to the concept of a small open economy prompted researchers to analyse the condition and the dynamics of their CA at the time of the boom (before the crisis of 2008), and in the period after that. The CA in the literature is often seen as the ratio of savings and investments. This model shows that the current account deficit is acceptable in the phase of high investments or in the time of low income. The SEE countries with prominent investment needs are a good sample for the application of this model. The question of the determinants and dynamics of the CA for the SEE countries in the accession to EU is important.

The subject of research in this paper is the impact of macroeconomic factors on the creation of the CA deficit in SEE countries. In this paper, countries included in the SEE area are Albania (ALB), Bulgaria (BGR), Bosnia and Herzegovina (BiH), Croatia (HRV), Moldova (MDA), Macedonia (MKD), Montenegro (MNE), Romania (ROU), Serbia (SRB). We will use these abbreviations for countries (abbreviations are as in the World Bank, 2017) in our tables and charts.

Keeping in mind that all the SEE countries had growth of the CA deficit (a large gap between savings and investment), the question of sources for its financing is important. Growing CA deficits before 2008 were financed by foreign capital inflows. Increasing interest rates have stimulated the inflow of foreign resources. The increase in external debt led to an increase in the burden of paying off debts. Due to that, most countries in the SEE region have drastically improved their CA balances after the outbreak of the financial and economic crisis in 2008.

Countries that rely on the withdrawal of long-term capital, primarily in the form of direct foreign investments, could easily solve their problems of financing of the CA deficit.[3] Some authors believe that the boom in domestic demand for the period before 2008 was a more important cause of the CA deficit in the SEE countries than the loss of price competitiveness (Wyplosz, 2013). The decline in international capital market interest rates facilitated borrowing under favourable terms, which accelerated the accumulation of foreign debt and the increase in the CA deficit. The increase in debt has not been accompanied by the increase in capacity to service this debt. The appreciation of the national currency, spurred by large inflows of foreign capital, has led to deterioration in export competitiveness. Since the onset of the crisis, all the SEE countries have witnessed a significant reduction in their CA deficit.

The growth of domestic demand in the SEE countries before the outbreak of the global financial crisis in 2008 enabled the increase in import, which led to an increase in the CA deficit. Low interest rates in the world capital markets have

[3] It should be borne in mind that a large inflow of FDI in the Western Balkan countries went to non-tradable sectors (Kinoshita, 2011).

spurred capital inflows to the SEE countries. High domestic demand spurred economic growth. However, a significant increase in prices and wages, primarily due to the expected convergence of income, weakened the tradable sector in these countries. Due to that, the CA deficit of the SEE countries has grown substantially. The weaker export performance led to an increase in external indebtedness which made the SEE countries strongly affected by the global financial crisis. This paper investigates the determinants of CA imbalances in the SEE countries, focusing on the role played by foreign direct investment (FDI), the real effective exchange rate (REER) and private remittances (REM).

Sorsa et al. (2007) concluded that significant capital inflows to the SEE countries (Bulgaria, Croatia, Romania, and Serbia) contributed to income convergence towards EU levels. At the same time, they concluded that the increase in external imbalances and high credit growth are exposing the region to the financial risks. According to finding Lipschitz, Lane, and Mourmouras (2002), extensive capital inflow in the countries of central and Eastern Europe increased the sensitivity of these countries to the shifts in market sentiment. According to research conducted by Roubini and Setser (2004), strong credit growth significantly impedes the repayment of loans through pressure on the exchange rate, and with the reverse impact on the portfolio.

The primary hypothesis of this paper is that real exchange rate appreciation has a negative effect on the CA of SEE, while the net inflow of FDI has a positive effect. The net inflow of private remittances also has a positive impact. The second hypothesis of this paper is that the CA deficit in the SEE countries is persistent.

The main objective of this paper is to provide empirical evidence of the relationships between the balance of CA accounts and its principal determinants in the SEE countries.

This study contributes to the literature which investigates the relationship between CA and other macroeconomic variables. In particular, our research provides an empirical investigation of the interaction between the CA and important variables for the panel of the SEE countries: REER, FDI and *net foreign assets* (NFA).

The available limited literature referring to the current account of the SEE countries emphasizes the importance of trade openness and exchange rate on the fluctuations of the current account balance more than the inflow of foreign capital. Bearing in mind the volume of FDI inflows in these countries, as well as the net inflow of foreign capital, we included FDI and NFA in the panel analysis as independent variables and evaluated their impact on the CA. Our contribution relates to the introduction of these two financial variables into the panel analysis of the current account of the SEE countries. These variables are represented in similar analyses for developed and developing countries. The contribution of our paper is that

we have applied these variables in the panel analysis of the Southeast European countries sample.

The remainder of the paper is organized as follows. Section 2 gives literature review. Section 3 describes the empirical methodology. Section 4 outlines data collection and data description and results estimation. Section 5 provides results and discussion. Section 6 gives a conclusion with a suggestion for further research.

2. Literature review

The literature concerning the SEE countries mainly analyses the individual SEE country's CA, within the group of countries in transition in Central and Eastern Europe, or in the analysis of new members of the EU. The lack of literature that analyses the CA of the SEE as a group of countries represents the limitation of this research because the ability to compare current findings with previous surveys of the same block of countries has been reduced. However, this is also an incentive to examine the characteristics of the CA of these countries in this paper, and this study is the contribution to existing literature. In this section, we will point to a broader literature that analyses factors that influence the balance of the CA.

Most empirical investigations of the determinants of current account imbalance are mainly focused on developing countries and emerging Asian markets, while the CA determinants in the SEE countries are rare and they are produced on smaller samples, which can lead to disputable results. Our research also has this limitation. However, the reason for the panel data application to a relatively small sample of countries lies in the fact that all those had significant current account deficits before the crisis in 2008, which were financed by the inflow of external capital. Some of these countries have become members of the EU (Bulgaria, Romania, and Croatia), while others are candidates for EU membership. EU candidate countries are CEFTA members with similar current account problems (a deficit largely caused by structural factors), while EU members from this group of countries also face a current account deficit. The geographical proximity of these countries makes them natural trading partners, and the comparative performance of their economies recommends them for a model for panel analysis.

Herrmann and Jochem (2005) analysed the growing CA deficit of the new EU members from Central and Eastern Europe in the period before the crisis, 2007-2008. Based on the panel estimates of eight countries of central and eastern Europe (by quarters in the period from 1994 Q1 to 2004 Q4), the authors concluded that the deficit could be attributed to the phase of the economic development of these countries, and the relative income level and capital inflows. They found that the closing of the income gap was annulled to a large extent by the real appreciation.

These authors estimated that the effect of the budget deficit was moderate because these countries are largely financed from private savings. Real interest rates positively affected the CA[4].

On the case of peripheral Eurozone countries (Italy, Spain, Greece, and Ireland), Atoyan et al. (2013) came to the empirical evidence confirming that the main determinants of the CA during the boom before the recession in 2008 were cyclical factors: a large capital inflow, high credit activity, and low unemployment. The estimated coefficients with these variables are statistically significant and had expected signs: large capital inflows, high annual credit growth, and low employment that affected the CA deficit. The variable "openness" was not statistically significant in explaining fluctuations of the CA balance in these countries.

Most of the research related to the new EU member countries is more focused on capital flows and less on the CA imbalance that results from these flows. Abiad et al. (2007) found that the capital inflow in the European emerging market countries facilitated the creation of the instability of the balance of payments in the period before the crisis.

Berger and Nitsch (2010) investigated effects of the introduction of euro on the eurozone CA imbalance. They found that the introduction of the euro contributed to the increase of the CA deficit, with asymmetric effects on trade competitiveness. Although this deficit grew, Chen et al. (2012) found that it is mainly financed by intra-euro area capital inflows, mostly by buying government securities and using cross-border interbank lending, which allowed a continuous growth of external imbalances.

Schmitz and Hagen (2011) found in their paper that several countries in the eurozone had a large deficit or surplus compared to the nearly balanced state of the eurozone as a whole. The authors use these inequalities as an indicator of net capital flows between eurozone members, and indicate that these net capital flows follow the differences in per-capita income.

Purfield and Rosenberg (2010) analysed the results of adjustment of the CA in the Baltic countries during the crisis in 2008-2009. They said that the strategy of internal devaluation, which was conducted in those countries in the period from 2008 to 2009, was based on the large fiscal adjustment and the adjustment of nominal wages. This strategy had the task to improve the CA.

Duarte and Schnabel (2014) analysed the channels of CA adjustment in emerging countries for the period after the financial crisis in 2008. They analysed the effectiveness of the exchange rate against the economic policy measures. They

[4] The increase in real interest rates leads to a reduction in current spending, with a positive impact on the CA.

found that the exchange rate channel is not sufficient to achieve a sustainable CA position. This channel had a significant role only in the countries of Latin America. The findings of these authors show that relatively tight monetary policies are the main determinant of the CA in the countries of East Asia. In contrast to these countries, fiscal policy has a stronger impact on the CA.

Huntington (2015) examined the connection between oil trade and CA for 91 countries in the period 1984-2009. It was found that the net exports of oil are a significant factor for the CA surplus, while net oil imports do not often affect the CA deficit.

Kumar Das (2016) conducted empirical research on the current account for the sample of developed, emerging and developing countries. This study showed that CA balance is negatively correlated with commodity price, real effective exchange rate and real GDP growth for developed countries. However, commodity prices and trade openness are positively correlated to CA for emerging countries.

Herrman and Jochem (2013) analysed CA dynamics in EU countries with different exchange rate regimes. They concluded that CA adjustment is difficult in countries that are members of a monetary union. Also, the CA balance in member countries is more persistent than in countries with fixed-rate regimes due to the lower flexibility in interest rates.

Cesaroni and De Santis (2016) investigated CA dispersion within EU member countries and found that it increased progressively since the 1990s. The authors analysed determinants of CA imbalances in eurozone countries, focusing on the financial integration. They found that financial integration influenced significantly CA deterioration in peripheral countries. The analysis revealed that business cycle played an important role in the growing of the CA deficit in OECD countries, whereas the importance of competitiveness diminished over time.

Bucevska (2017) analysed determinants of the CA deficit in five EU candidates and potential candidates. Using panel analysis, the author found that GDP growth rate and a degree of trade integration are more important CA determinants than other variables. The paper shed light on other factors that could have a significant influence on the CA balance: crude oil trade balance, the level of financial development, and relative per capita income. The results of this paper suggest that the status of the EU candidate does not have any impact on the CA balance. The author of the article assessed that further economic development of an EU candidate will increase domestic savings and improve their CA balance.

Based on the published literature review, it is noted that different empirical results generate different estimates regarding the determinants of the current account imbalance. This opens space for further research. Thus, the main objective of this research is to check the influence of selected determinants on the current account of

the SEE countries. Special attention is paid to the impact of REER, NFA, and FDI on the CA of the SEE countries.

3. Methodology

The countries covered by our sample all have a geographical similarity (the SEE group of countries). Some countries from this group have completed the transition to market economies, while in other countries this process is near the end. Several countries from the sample are EU members (Croatia, Bulgaria, and Romania), while Albania, Serbia, Macedonia FRY, Montenegro, and Serbia are in the process of EU accession (candidates), and Bosnia and Herzegovina has the status of a potential candidate. Moldova has concluded an EU Association Agreement. So, all the countries in the sample are involved in European integrations.

According to the regional grouping, the World Bank places all countries from our sample in the region of Europe and Central Asia. Also, the countries in our sample are in the same group at the level of 2015 GNI per capita of national income (Upper middle income, ranging from $4,036 to $12,475), except for Moldova, which is classified the group of middle-income countries (Middle income, from $1,026 to $12,475).

A potential constraint on the panel approach is that the significance of the explanatory variables may vary between countries. This heterogeneity, as well as differences in the size of countries, can affect the validity of parameter estimates. This is the limit of our research. However, the similarities between countries in our sample with respect to fluctuations in the CA balance, as well as other similarities, justify the application of the panel technique.

The countries in our sample have similar characteristics of the CA balance. Namely, before the global crisis of 2008, the CA deficit in these countries grew. In the post-crisis period, some countries have managed to achieve smaller CA surpluses (Croatia and Bulgaria), while in other countries the CA deficit has been reduced. Common to all countries in the sample is the similarity of the economic structure, a significant inflow of FDI, as well as their reliance on external borrowing. Trade between the countries in our sample, especially those belonging to the Western Balkans, has been increasing in recent years.

In this paper, we test the impact of selected macroeconomic variables on the CA of the SEE countries. We have applied panel approach and have assessed the following equation:

$$CA_{it} = \beta_i + \beta_1 \cdot CA_{it-1} + \beta_2 \cdot FISBAL_{it} + \beta_3 \cdot FDI_{it-1} + \beta_4 \cdot REER_{it-1} + \\ + \beta_5 \cdot NFA_{it} + \beta_6 \cdot SIG_{it} + \beta_7 \cdot REM_{it} + \varepsilon_{it} \quad (1)$$

where the coefficients are as defined above. In a further check of the robustness of the results, we estimated the following equation:

$$CA_{it} = \beta_i + \beta_1 \cdot CA_{it-1} + \beta_2 \cdot FISBAL_{it} + \beta_3 \cdot FDI_{it-1} + \beta_4 \cdot REER_{it-1} + \\ + \beta_5 \cdot NFA_{it} + \beta_6 \cdot SIG_{it} + \beta_7 \cdot REM_{it} + \beta_8 \cdot CRISESDUMMY_{it} + \\ + \beta_9 \cdot DC_{it} + \beta_{10} \cdot REGULAT_{it} + \varepsilon_{it} \quad (2)$$

(β_i cover fixed country effects).

In these equations, CA is dependent variable. A set of explanatory variables has been selected according to their relevance in the literature. The parameters β_i, β_1, β_2, β_3, β_4, β_5, β_6, β_7, β_8, β_9 and β_{10} represent the coefficients that will be assessed. Finally, the error term is denoted by ε. The index *i* represent the individual dimension (country index), and *t* represent the temporal dimension.

To evaluate these models, we will first apply a panel unit root test to determine whether the panel of the time series is stationary.

In order to check for stationarity in panel time series, we will test the existence of a unit root. In this paper, we are going to apply several unit root tests which assume cross-section independence (mutual independence of individual units of an intersection). Those are: 1. Levin-Lin-Chu test (LLC), 2. Im-Pesaran-Shin test (IPS), 3. Breitung test, 4. Fisher-ADF and Fisher-PP test, 5. Hadri test. LLC, Breitung and Hadri test accepts that there is a common unit root process, an IPS and Fisher-ADF and PP test allow for individual unit root processes. The results of the unit root test are presented in Appendix Table A2.

For the assessment cointegration equations in the panel, we will use FMOLS and DOLS estimators. Hansen (1992) started from the assumption that there is one cointegration vector. Consider the following cointegration equation:

$$y_{it} = X'_{it}\beta + D'_{1it}\gamma_{1i} + u_{1it} \quad (3)$$

for cross-section *i* and periods *t*, whereby $D_{it} = (D'_{1it}, D'_{2it})'$ are deterministic trend regressors, while n are stochastic regresors X_t under the influence of the system of equations:

$$X_t = \hat{\Gamma}'_{21} D_{1t} + \hat{\Gamma}'_{22} D_{2t} + \hat{\in}_{2t} \quad (4)$$

$$\Delta \in_{2it} = u_{2it} \quad (5)$$

the p_1-vector of D_{1it} regressors are included into both cointegration equation and the regression equation, while p_2-vector of D_{2it} are deterministic trend regressors, which are included in the regression equation but not included in the cointegration equation. Cointegration relationship between Y and X is homogeneous across

cross-sections, although the specification allows for the possibility of cross-section specific deterministic effects.

Following Phillips and Moon (1999), the model employed here defines the long-run covariance matrices, Λ_i and Ω_i, for the errors in cross-section $u_{it} = (u_{1it}, u'_{2it})'$, and contemporaneous covariance matrix $\sum i$ (long-run average covariance matrices are $\Lambda = E(\Lambda_{i)}$ and $\Omega = E(\Omega_i)$). FMOLS assume that there is independence in the errors across cross-sections. The panel pooled FMOLS estimator for coefficient β is given as

$$\hat{\beta}_{FP} = (\sum_{i=1}^{N} \sum_{t=1}^{T} \bar{X}_{it} X'_{it})^{-1} \sum_{i=1}^{N} \sum_{t=1}^{T} (\bar{X}_{it} \bar{y}^{+}_{it} - \hat{\lambda}^{+}_{12}') \tag{6}$$

where

$\bar{y}^{+}_{it} = \bar{y}_{it} - \hat{\omega}_{12}\Omega^{-1}_{22}\hat{u}_2$ iz modified dependant variable and $\hat{\lambda}^{+}_{12} = \hat{\lambda}_{12} - \hat{\omega}_{12}\hat{\Omega}^{-1}_{22}\hat{\Lambda}_{22}$ is modified serial correlation correction term.

Dynamic OLS (DOLS) method for estimating cointegration equation in the panel can be realized by augmenting the cointegrating regression with lead and lag of the regressors. The following regression equation can be used (Pooled DOLS):

$$y_t = X'_t\beta + D'_{1t}\gamma_1 + \sum_{j=-q}^{r} \Delta X'_{t+j}\delta + \vartheta_{1t} \tag{7}$$

The model allows that the short-run dynamics coefficients δ can be cross-section specific.

The static panel regressors make it possible to compare the results with earlier findings. The dynamic panel technique provides the ability to verify the robustness (in this way to check how important estimated regression coefficient behaves when regression specification is changing by adding or omitting regressors). If the coefficients are plausible and robust, it is interpreted as evidence of a common structural validity.

4. Empirical data and analysis

Our empirical analysis of the dynamics of the CA in the SEE countries is based on annual time series data for 9 countries (Western Balkan countries towards EU accession - Bosnia and Herzegovina, Montenegro, Macedonia, Serbia, Albania), and Croatia, Bulgaria, and Romania as a member of the EU. Our main source is the *World Economic Outlook database (WEO)* provided by the IMF. For some variables, as the real exchange rate, we used other sources (European Central Bank - ECB) and own calculations. We normalized the data by using GDP ratios, except in the case of output (or income) itself. The dependent variable in the model is the ratio of the CA to GDP. Set explanatory variables are selected based on their importance in literature.

4.1. Data collection

This paper analyses the pattern of the SEE countries. The panel time series for nine countries are used in the analysis. The paper covered the period from 2000 to 2015. The sample has 144 observations. In some series, there are observations missing. Appendix tables A1 and A2 give the data sources and panel unit root test of the SEE countries, 2000-2015, respectively.

4.2. Data description

To explain the factors that influence the CA, we chose regress towards their economic importance and statistical significance. Explanatory variables are:

Current Account (CA) persistence. The CA fluctuation indicates, according to some empirical findings, a particular persistence. Fixed proportions of consumption and savings in the countries formed certain inertia in the CA movement. Therefore, we will include lagged values of the CA as % GDP in the analysis as independent variables. If the gap between the CA and its equilibrium level is persistent, the return to balance often requires significant costs.

Fiscal balance (FISBAL). It analyses the budget deficit/surplus as % of GDP. The hypothesis of twin deficits suggests a positive relationship between these two deficits (higher levels of public savings show the historical tendency of association with larger CA surplus). It is difficult to give a priori sign in front of the savings ratio. According to the Mundell-Fleming model, the budget deficit increases the interest rate in the country, as capital inflows go up, which in turn leads to an appreciation of a domestic currency.

Reduced export motivation due to the strengthening of a domestic currency contributes to the deterioration of the CA. The growth of the fiscal deficit reduces domestic savings and leads to deterioration of the CA. However, the Ricardian equivalence hypothesis negates any relationship between these two deficits. A higher level of public savings tends to agree with a large CA surplus.

Foreign direct investment (FDI). The share of FDI inflows in GDP (FDI as % of GDP) (Inward flow). Positive direct and indirect impact of FDI on national savings leads to an improvement of the CA in the long run. Greenfield FDI can encourage imports and the deterioration of the CA. Here, we use lagged series.

Real effective exchange rate. REER data for 2010 = 100. The exchange rate above 100 points to currency appreciation and worsening the competitive position of the country. REER we took as the log of an independent variable with a time lag to avoid the problem of endogeneity. The negative sign in the regression is expected because appreciation leads to deterioration in the competitiveness and causes a reduction in exports and increase in imports, which worsens the CA.

Saving-investment gap (SIG) is obtained as the difference between savings and investment as % of GDP. If the difference is positive, then the savings exceed investment, and it has positive effects on the CA. Otherwise, smaller savings pressure in the direction of expansion of the CA deficit. In our sample in all countries, domestic savings are insufficient to finance investments. Higher savings rates have a positive impact on the CA because greater savings reduce current domestic consumption and require less borrowing abroad. According to the standard intertemporal model, the dynamics of the CA is the result of the savings and investment relationship in a country. Since in our work we investigate a short-term to a medium-term empirical link between the CA and several relevant macroeconomic variables, SIG is one of the explanatory variables. This is consistent with theoretical and empirical literature. Low level of saving affects the reduction of investments in the long run, while in the short run it affects the occurrence or increase of the CA deficit. The difference between domestic investment and domestic savings in the short term can be covered by inflows of foreign capital, while a rebalancing of the current account has to be carried out over the long run. This can be achieved through changes in investments.

The initial level of net foreign assets (Net Foreign Asset (NFA)). (According to the World Bank as a source data, net foreign assets are the sum of foreign assets *held by monetary authorities* and deposit money banks, *less their foreign liabilities*. Data are in current local currency). NFA impact on the dynamics of the CA is not one-way. If a country has a positive balance of NFA, the disposal of these assets enables that country to form the CA deficit. In that case, the connection between the NFA and the CA is negative. It mainly occurs in the initial state of the NFA. On the other hand, a positive income account from a net foreign investment allows a positive effect of NFA to the CA.

The development of the financial system. It is widely believed that the deepening of the financial system increases the efficiency of resource allocation (facilitating diversification risk) and macroeconomic policy, especially in low-income countries (IMF, 2012). There are large numbers of empirical evidence in the literature that the development of the financial system is connected to the higher economic growth (Barjas et al., 2013; Dabla-Norris, E. et al., 2015). More recent studies have pointed out that the positive impact of the development of the financial system on economic growth feels to a certain point, beyond which further financial deepening may reduce the rate of economic growth (Arcand et al., 2012; Aizenman et al., 2015). To measure the depth of the financial benefits, several indicators were applied. In the banking sector, it is the ratio of liquid liabilities to GDP or a ratio of monetary aggregate M2 to GDP. Alternatively, the ratio of loans to the private sector to GDP was applied. In this paper, we used the last mentioned indicator (*DC as % of GDP*).

Since the development of a financial system encourages domestic investment, strengthening of financial intermediation and improvement of the quality of the

financial sector should be associated with worsening of the CA (Mendoza et al., 2009). According to the theory of precautionary saving, underdeveloped financial markets tend to form a large amount of foreign exchange reserves, which serve as a substitute for developed financial markets and absorb terms of trade shocks in absorbing the effects the terms of trade deteriorating (Eichengreen, 2006).[5] Therefore, it is expected that private loans have a negative impact on private savings and the CA.

Dummy crises (CRISESDUMMY). Crisis years were from 2009 to 2015 for all countries. The introduction of these dummy variables is intended to include the fact if the country was affected by the financial crisis or not[6]. A positive sign is expected.

(Private remittances) (REM). The data represent personal remittances received (% of GDP). Workers' remittances for the Western Balkans are an important source of income that can be spent or saved.

Regulatory Quality (REGULAT). This indicator is of a qualitative nature, and it is used in this paper as a control variable to check the robustness of results. This indicator is available starting from 2002 on an annual basis and contains the data for 1996, 1998, 2000. The data basically describe the institutional quality, and it is expected to have a positive impact on the CA. Improving the quality of institutions increases the efficiency of capital allocation. Governance estimates ranging from -2.5 (poor) to 2.5 (strong) performances (institutions of higher quality)[7]. Weaker institutions reduce investments yields adjusted for risk, and it worsens the CA balance. A positive sign is expected in front of these variables.

4.3. Empirical results

In order to assess the stationarity of panel time series, we conducted the panel unit root test estimates for the potential determinants of CA imbalances in the sample of nine countries. The results are given in the Table A2 in the appendix. To verify the existence of the unit root, we have used the first generation of unit root tests (LLC, IPS, Fisher type ADF and Fisher type PP).

Keeping in mind that the observed time series cover a shorter period (annual data for the period 2000-2015), in the analysis, we have used multiple unit root tests

[5] Terms of trade shocks, according to the findings by Adler et al. (2017), had a dominant influence on the creation of the CA balance for the period 1960-2015, while in developed countries other factors have a decisive influence on the CA balance.

[6] Lane and Milesi-Ferreti (2012) used various dummy variables. Some of them were not statistically significant in the aforementioned study.

[7] Higher quality institutions protect rights of investors better and contribute to increasing the rate of return (Gruber and Kamin, 2005:13).

in order to avoid the disadvantages of these tests that they demonstrate in a case of shorter time series. Only constant or constant along the trend is included in the equation for testing. The tests were applied to level the series and the first difference of variables.

Table 1: Panel cointegration tests of the SEE countries

Test	Intercept			
Pedroni residual cointegration (within dimension test statistics) Alternative hypothesis: common AR coeff.	Panel v-Stat.	Panel rho-Stat.	Panel PP-Stat.	Panel ADF-Stat.
	-2.05 0.98*	2.58 1.00*	-3.86 0.00*	-2.68 0.00*
	Weighted statistic			
	-1.97 0.98*	2.69 1.00*	-4.10 0.00*	-2.76 0.00*
Pedroni residual cointegration (between dimension test statistics) Alternative hypothesis: individual AR coeff.	Group rho	Group PP	Group ADF	
	4.12 1.00*	-7.38 0.00*	-4.33 0.00*	
	Intercept and trend			
Pedroni residual cointegration (within dimension test statistics) Alternative hypothesis: common AR coeff.	Panel v-Stat.	Panel rho-Stat.	Panel PP-Stat.	Panel ADF-Stat.
	-2.42 0.99*	3.19 1.00*	-9.56 0.00*	-5.24 0.00*
	Weighted statistic			
	-2.38 0.99*	2.96 1.00*	-10.23 0.00*	-5.02 0.00*
Pedroni residual cointegration (between dimension test statistics) Alternative hypothesis: individual AR coeff.	Group rho	Group PP	Group ADF	
	4.43 1.00*	-12.33 0.00*	-4.69 0.00*	
Kao residual cointegration test	ADF stat.			
	-6.13 0.00*			

Note: * p-values. The null hypothesis for Pedroni test is: No cointegration. Deterministic intercept and trend are included in the equation; Automatic lag length selection based on SIC with lags from 0 to 1; Newey-West automatic bandwidth selection and Bartlett kernel. The null hypothesis for Kao test is: No cointegration. No deterministic trend; Automatic lag length selection based on SIC with a max lag of 2; Newey-West automatic bandwidth selection and Bartlett kernel.

Source: Author's calculations using E-views

According to the results in the Table A2 in the appendix, we can see the existence of a unit root at the level of the majority of panel time series, with the level of significance of 5%. Structural breaks in most of the observed time series reduce the reliability of the conclusions based on IPS test. Then we examined the stationarity of time series at the level of the first difference.

The results showed that all the panel time series are stationary (Xt~I(1)), with the exception of FDI and REER variable whose stationarity of first difference is not confirmed by Hadri test. Since all the series, according to most tests, are stationary at the first difference, we conducted a test of the existence of cointegration relationships between the CA and other variables. The Pedroni and Kao tests were implemented (Table 1). With these tests, we can test the null hypothesis that the residuals of estimated cointegration equation are nonstationary.

Having established the existence of cointegration, the next step is to estimate the coefficients of the cointegration equation in order to examine the long-term relationship between the variables using Pedroni's between dimension FMOLS and DOLS estimators. The estimated coefficients are given in Table 2.

Applied cointegration equation is with fixed effects. The panel time series of annual data were used. The model has been estimated for the whole sampling period (2002-2015). The estimation of FMOLS models is based on the pooled estimation, where as the cross-section specific trend regressor uses only a constant. Reviews of dynamic model (DOLS) are based on the use of constants as a deterministic component of cointegration equation.

The results in Table 2 show that the selected factors have a long-term impact on the CA of the SEE countries. It can be seen from the full sample that the estimated coefficients using FMOLS estimators are statistically significant at the 1% level for most of the explanatory variables (excluding REER and NFA). A variable REER is included in the evaluation with the time lag.[8] The signs of the estimated coefficients are in line with theoretical expectations. Negative sign with NFA agrees with the theoretical point of view according to which in the initial stages of the accumulation of NFA (positive balance), the expansion of the CA deficit can be expected. The coefficient of the CA (-1) indicates the persistence of the CA deficit. The findings show that the estimated coefficients for the remittances are statistically significant, while a positive sign means that remittances contribute to the growth of domestic savings. Therefore, they have a positive effect on the balance of payments.

[8] The liberalization in the SEE countries encouraged the inflow of foreign capital, which caused the appreciation of their currencies. The increase in public spending of these countries encouraged the appreciation of their currencies further.

Table 2: CA determinants in the SEE countries – Panel FMOLS and DOLS Test Results, Full sample 2000-2015

Variable	FMOLS	DOLS
Current account – CA(-1)	0.22 (0.00)	0.11 (0.12)
Fiscal Balance – FISBAL	-0.55 (0.00)	-0.43 (0.00)
Foreign Direct Investment – LOGFDI(-1)	-2.05 (0.00)	-2.10 (0.00)
Saving Investment Gap - SIG	0.48 (0.00)	0.60 (0.00)
Real Effective Exchange Rate – LOGREER(-1)	-6.42 (0.00)	-6.50 (0.04)
Lagged Net Foreign Asset – NFA(-1)	-0.04 (0.00)	-0.03 (0.40)
Personal Remittances – REM	0.42 (0.00)	0.48 (0.00)

Note: FMOLS: Cointegration equation deterministics: C; First-stage residuals use heterogeneous long-run coefficients; Long-run covariance estimates (Bartlett kernel, Newey-West fixed bandwidth; P-values in parentheses. DOLS: Cointegration equation deterministics (C); Long-run covariance estimates (Bartlett kernel, Newey-West fixed bandwidth used for coefficient covariances; P-values in parentheses. Static OLS leads and lags specification. Panel method: Pooled estimation, Estimation method: Cointegration Regression. Most of the regressors are not in the logarithmic term due to the negative value of the panel time series, because of which the series could not be transformed into logarithmic.

Source: Author's calculation

We reached similar conclusions using DOLS estimator. The coefficient at the REER for the whole period is statistically significant at the 10% level, while most other coefficients are significant at the 1% level (coefficients with the NFA and the CA (-1) are not significant). Negative sign with the NFA is not surprising since the positive balance of NFA gives the opportunity to countries to intervene in the foreign exchange market and allow for an increase in the CA deficit. This development is registered in the initial stages of a positive balance of NFA. Coefficients of the fiscal balance (FISBAL) during the entire period are statistically significant.

The estimated coefficient of the SIG (saving-investment gap) was also statistically significant for the whole period. A positive sign indicates that the reduction in the gap between savings and investment reduces the CA deficit. The results of these tests clearly indicate that the variables included in the analysis are cointegrated. This means that the included regressors well explain the movement of the CA in the panel of the SEE countries.

In this analysis, we have tried to include several additional explanatory variables in the model, which are not presented in Table 2. The next variables were included in the model: Trade openness, Terms of trade, Government Debt, Relative income (compared to EU countries), Age dependency ratio, General government final consumption expenditure, and several artificial variables (EU Accession dummy variable, the exchange rate regime dummy variable). However, the estimated coefficients associated with these variables were not statistically significant, and the signs were mostly in line with theoretical expectations. Therefore, all these indicators in the final selection of explanatory variables have been given up.

4.4. Robustness

In order to verify the robustness of our results, we have conducted the test of robustness for the coefficient. We carried out the test by introducing new variables (CRISESDUMMY, DC, REGULAT). Reviews are by FOLMS, sample 2000-2015 (table 3).

The scores of the cointegration vectors are presented in column 1 of Table 3. In columns 2, 3 and 4, we have introduced additional variables (dummy variable CRISESDUMMY, home loans private sector – DC, and dummy variable REGULAT, respectively) in order to test the adaptability of the estimated model. All the estimated coefficients in column 2 are statistically significant in the range from 1 to 10% (only the coefficient with the dummy being insignificant with the application of the estimator DOLS). However, after the introduction of the other two variables (DC and REGULAT), the specification in the columns 3 and 4 of Table 3 showed that all the estimated coefficients by estimator FMOLS were statistically significant (with the exception of variable REER which was not statistically significant after the introduction of the variable DC), and that a few coefficients estimated by the estimator DOLS were not significant (with variable FISBAL and REER in column 3, and with the variable REER, column 4).

In applying the test of robustness, we have introduced additional variables. Although the introduction of new variables slightly increased the adaptability of the estimated model, their impact on the CA can be seen. This particularly refers to an artificial variable CRISESDUMMY, which reveals the significant impact of the crisis from 2008 on the CA balance of the SEE countries. It can, therefore, be concluded that the estimated coefficients of the explanatory variables by applying the estimators FMOLS and DOLS are robust. An interesting result is obtained regarding the relationship between the CA and fiscal balance.

Table 3: Test of robustness (system FMOLS and DOLS estimation)

Variable	Estimator	1	2	3	4
Current account – CA(-1)	FMOLS	0.18***	0.19***	0.18***	0.21***
	DOLS	0.16**	0.17**	0.15**	0.19***
Fiscal Balance – FISBAL	FMOLS	-0.40***	-0.35***	-0.21***	-0.35***
	DOLS	-0.39***	-0.34**	-0.19	-0.25*
Foreign Direct Investment – LOGFDI(-1)	FMOLS	-1.56***	-1.42***	-1.16***	-0.90***
	DOLS	-1.84***	-1.73***	-1.37**	-1.11*
Saving Investment Gap – SIG	FMOLS	0.61***	0.59***	0.53***	0.49***
	DOLS	0.60***	0.58***	0.52***	0.51***
Real Effective Exchange Rate – LOGREER(-1)	FMOLS	-3.91***	-5.41***	-0.49	2.29***
	DOLS	-4.86	-6.52*	-1.25	0.74
Net Foreign Asset – NFA	FMOLS	-0.08***	-0.08***	-0.96***	-0.08***
	DOLS	-0.09**	-0.09**	-0.10**	-0.12***
Personal Remittances – REM	FMOLS	0.54***	0.55***	0.47***	0.54***
	DOLS	0.48***	0.48***	0.41***	0.43***
CRISESDUMMY	FMOLS		0.85***	2.66***	3.11***
	DOLS		0.77	2.76**	3.05***
DC	FMOLS			-0.10***	-0.12***
	DOLS			-0.11***	-0.11***
REGULAT	FMOLS				-2.41***
	DOLS				-1.98

Note: as in table 2. *** significance at 1% level, ** significance at 5% level, * significance at 10% level. Panel method: Pooled estimation.

Source: Author's calculation

According to the findings in Table 3, the estimated coefficients with fiscal balance are statistically significant (with one exception, in column 3) and have a negative sign. Although it is expected that the reduction in the fiscal deficit leads to a reduction in the CA deficit, the result did not confirm these expectations.[9] The negative sign with the estimated coefficient for variable REGULAT (Regulatory Quality) deviates from expectations (this variable belongs to a group of governance indicators)[10]. The role of these variables is to approximate the ability of the government to implement measures and policies that can improve the development of the private sector. Generally speaking, this variable has a duty to assess the quality of institutions in a country. The estimated coefficient for domestic loans to the private sector is statistically significant at the 1% level (in both versions of the applied estimators) and has the expected sign. By checking the robustness of the estimated cointegrating vector we have found that the applied model is robust.

[9] Belke and Dreger (2013) found a negative sign with fiscal deficit to three peripheral EU members.

[10] For the governance concept see Eichengreen (2010).

5. Results and discussion

Empirical results of applied methodology in this paper are presented in this section. We are discussing the economic significance of the obtained results. Pedroni (1999) and Kao (1999) panel cointegration test is used for checking cointegration. The null hypothesis of absence of cointegration has been rejected by testing. Cointegration equation is estimated by panel FMOLS and DOLS estimators. A significant impact of FDI on the CA balance has also been noted. Actually, most of the countries in the region use the net inflow of FDI to cover the CA deficit. The net inflow of FDI has contributed positively to export performance of the observed countries. It was pointed out, however, that the income of foreign investors increases the CA deficit over time. Besides, there is a potential risk associated with this type of financing of the CA in a case of a sudden capital outflow.

Our study revealed a negative relationship between the CA and the NFA balance. Also, in the case of the analysed countries, it was concluded that the appreciation of the real effective exchange rate contributes to the expansion of the CA deficit. In order to assess the impact of individual determinants of the CA deficit of the analysed SEE countries, cointegration equation is estimated. The signs of the estimated coefficients are consistent with theoretical expectations. For NFA a negative sign is typical, and this agrees with the theoretical explanation according to which the expansion of the CA deficit could be expected in the initial stages of the accumulation of NFA (positive balance). The estimated coefficients for remittances are statistically significant for the whole observed period. The fiscal balance did not significantly affect the CA balance over the whole period although the coefficients are statistically significant.

Analysing the impact of selected macroeconomic variables on the CA balance of the SEE countries using the panels for the period 2000-2015, we have shown that the CA balance depends on the selected variables. Cointegrating equations were evaluated using FMOLS and DOLS estimators. The model has led to the following results.

A few results are highlighted. Selected variables in this paper have a long-term impact on the balance of the CA of the SEE countries. The results of the applied model in this paper show that the current account in the SEE countries is persistent.

The negative sign with the fiscal balance in our survey is in line with the theoretical expectation and shows that the SEE countries with a budget deficit remain in the current account deficit area. The increase in the fiscal deficit is due to the rise in the deficit of the CA (so-called twin deficit hypothesis). On the other hand, the strengthening of the fiscal balance leads to the improvement of the CA. This connection is stronger at a fixed exchange rate. The SEE countries have made huge budget deficits before the outbreak of the global financial crisis in 2008. That deficit was financed largely by borrowing abroad, which can bring about external

debt repayment problems. These results are consistent with the results obtained by Abbas et al. (2011) that provide empirical evidence that strengthening the fiscal balance contributes to the improvement of the CA balance sheet.

The CA deficit growth in most SEE countries was linked to a credit boom that was financed from outside, feeding domestic consumption and real estate investment. The decline in lending since the crisis in 2008 led to the contraction of the CA deficits. This was preceded by a worsening of the savings-investment balance in the SEE countries. It is important that countries should increase the inflow of foreign exchange funds in order to repay foreign debt. The results of our research are in line with recent findings in this research area, but also contain a new element by incorporating the savings-investment relationship. So, in addition to the facts presented in other studies, our findings draw attention to the long-term consequences of the mismatch between SEE savings and investments on their CA. The policy implications of the results obtained in our paper are clear. They suggest that it is necessary to stimulate domestic savings in the SEE countries to improve CA performance. Also, it is necessary to increase savings in the region and to redirect it (intermediate) into production projects that will increase the capacity of the economy to produce products for export. Therefore, the SEE countries should pay attention to the increase of domestic savings.

The estimated coefficient with remittances in our work shows that the CA balance sheet of the SEE countries was positively influenced by remittances inflows. In fact, the inflow of remittances contributed to the growth of domestic savings, which reduced the need for borrowing abroad. Stimulating the inflow of these funds could strengthen their role in mitigating the CA deficit.

This paper obtained negative sign with NFA. This means that the gap between significant investments and less domestic savings was financed by borrowing abroad. This leads to the conclusion that the GDP growth in the SEE countries has a persistent negative effect on the CA balance. Our findings are consistent with the results obtained by Abiad et al. (2007), which found that capital inflows into European transition countries before the outbreak of the global financial crisis in 2008 facilitated the formation of the balance of payments deficit of these countries. It should be borne in mind, however, that if a deficit arises from higher rates of investment, it can be converted into a CA surplus in the coming years if investments are directed to the tradable sector. For the SEE countries, it is essential that foreign funds are increasingly targeted to that sector.

Our research identified a negative link between FDI and CA deficits. The impact of this variable on the CA SEE was confirmed, as the FDI inflow has contributed to the growth of the CA deficits. FDI in the SEE countries is concentrated in the service sector (financial intermediation, trade, real estate), which does not stimulate the export potential of the economy for a long time. A higher inflow of FDI also gives a

higher possibility of transferring modern technology to a host country, which could result in the more significant sophistication of exports. Through this channel, the value of exports could increase, which could reduce its CA deficits. Therefore, it is necessary to direct the FDI into the export sector. The aim is to keep the CA deficit of the SEE countries at a sustainable margin.

The results obtained in our paper show that market forces are encouraging the SEE countries to rebalance CA imbalances. This adjustment was mainly achieved by reducing imports. Previously, capital primarily went into consumption rather than investment. According to the CA deficit, the SEE countries are sensitive to the global volatility of capital flows.

The SEE countries' current account profile suggests that they need structural reforms and improvements in export competitiveness. The structural characteristics of those countries have caused a significant imbalance in their trade balance. Export is insufficiently diversified, and countries specialize in the export of resource-based products, which are characterized by a low added value. Structural changes should reduce the dependence on external financing. Financing the deficit by FDI and long-term capital creates fewer problems than an increase in short-term debt. The inflow of short-term assets reduces the level of exports due to the overvaluation of the currency and increase in the deficit. A country faces serious problems when this capital starts to leave the country. A large CA deficit can be a reason for the capital flight.

Estimated coefficients with REER in this paper have a negative sign. This means that the REER appreciation worsened the terms of trade and generated the growth of the CA deficit in observed countries. A large inflow of foreign capital in the SEE countries before the outbreak of the global crisis in 2008 contributed to the appreciation of their currencies. Therefore, it is necessary to monitor the movement of the exchange rate. A restrictive fiscal policy is recommended in case of a currency appreciation to prevent loss of competitiveness and deterioration of the current account. The SEE countries have begun to reduce the fiscal deficit after the outbreak of the global financial crisis in 2008. Our data has confirmed the findings of Duarte and Schnabl (2014), according to which the exchange rate channel is not sufficient to achieve a sustainable CA balance sheet. Our findings, however, show that the appreciation of the real exchange rate of the SEE countries before the outbreak of the global financial crisis of 2008 affected the decline in the competitiveness of their exports and the worsening of the CA balance. In the SEE countries, there is a negative impact of the real exchange rate on the CA balance throughout the entire research period.

In the applied model in our paper, the importance of trade openness as an independent variable is also tested. In spite of the fact that the obtained coefficients with this variable were not statistically significant, the obtained signs agree with

theoretical expectations. The CA balance shows a positive relationship with trade openness. Our analysis led us to the conclusion that greater trade openness deteriorates CA's deficit because the SEE countries with increasing openness deepen previously formed deficits. It is, therefore, necessary that the SEE countries increase investment in the tradable sectors in order to encourage exports and reduce their trade and the CA deficit. It should be kept in mind that the openness of the economy includes both exports and imports, which have an opposite effect on the CA. A positive link between the CA and trade conditions suggests that the terms of trade improvement can reduce the CA deficits of the SEE countries. Financial openness could lead to financial instability through a current account deficit.

In order to test the robustness of the obtained results, additional explanatory variables were included in the model. A significant impact of the 2008 crisis on the CA balance of the SEE was revealed. On the whole, the obtained results confirmed the robustness of the estimated model in our research.

6. Conclusion

The objective of this paper is to assess the impact of selected macroeconomic variables on the CA of the SEE countries. The research has been carried out by a method that allows checking the direction of each variable's impact on the CA. Our results show that the direction of influence of the selected explanatory variables on the CA is consistent with the theoretical approach. The results of our research proved a research hypothesis of our paper that selected variables have a strong influence on CA in the SEE countries. According to the empirical research, the paper confirms the hypothesis that REER appreciation has a negative effect on the CA, while the net inflow of FDI has a positive impact, as the REM. The second hypothesis of our paper that the CA deficit in the SEE countries is persistent has also been proved. The main contribution of this paper is that there is a strong relationship of currency appreciation in the SEE countries and their CA deficit. Also, this paper contributes to the literature on the CA balance of the SEE countries by using the panel FMOLS and DOLS test results, as it focuses to examine the long-term relationship between the variables. The limitation of our study lies in the length of time series of relevant variables. Namely, for most of the Western Balkan countries, which are included in the SEE sample, data have been available for the period since 2000. For the previous years, they are incomplete. This has led us to use the period from 2000 onwards in our analysis. Another significant constraint is a relatively small number of works related to the CA of the SEE countries as a group. This makes it difficult to compare the results of our research with similar previous research. Our results have some policy implications. If the goal in the SEE countries is to reduce the CA deficit, the structural changes in their economies should be carried out, in order to increase their external competitiveness. Our findings are consistent with the leading CA theories. Less-developed regions,

such as the SEE countries, can increase export competitiveness by exporting products of lower technological intensity, using cheaper labour. Based on the results of our study, it can be recommended that in the formulation and implementation of monetary and overall economic policy, the appreciation of the national currency should be avoided, since it leads to an increase in the CA deficit. It should also be considered that a large net FDI inflow in the SEE countries has a positive impact on the CA balance. A higher inflow of REM affects the reduction of the CA deficit and should create a framework for potentially higher inflows of these funds. Based on our findings in this study, we can make some recommendations for future research. First of all, it is necessary to comprehensively assess the impact of accumulated FDI in the SEE countries on the sustainability of the existing CA deficit. The risks of FDI income outflows on the balance of CA should be included in that research. Strengthening of the financial sector and deepening financial intermediation represents an increasingly significant factor of CA balance and should be included as important factors for future research. Such research could be extended by investigating the effects of different levels of economic development among the SEE countries on their CA balance.

References

Abbas, S.M.A. et al. (2011) "Fiscal Policy and the Current Account", *IMF Economic Review*, Vol. 59, No. 4, pp. 603–629, doi: 10.1057/imfer.2011.22.

Abiad, A., Leigh, D., Mody, A. (2007) "International Finance and Income Convergence: Europe is Different" (*IMF Working Paper* WP/07/64), Washington, D.C.: International Monetary Fund, doi: 10.5089/9781451866285.001.

Adler, G., Magud, N.E., Werner, A. (2017) "Terms-of-Trade Cycles and External Adjustment" (*IMF Working Paper* WP/17/29), Washington, D.C.: International Monetary Fund, doi: 10.5089/9781475578485.001.

Aizenman, J., Jinjarak, Y., Park, D. (2015) "Financial Development and Output Growth in Developing Asia and Latin America: A Comparative Sectoral Analysis" (*NBER Working Paper* 20917), Cambridge, Massachusetts: National Bureau of Economic Research, doi: 10.3386/w20917.

Arcand, J.L., Berkes, E., Panizza, U. (2012) "Too Much Finance?" (*IMF Working Paper* 12/161), Washington, D.C.: International Monetary Fund, doi: 10.5089/9781475504668.001.

Atoyan, R., Manning, J., Rahman, J. (2013) "Rebalancing: Evidence from Current Account Adjustment in Europe" (*IMF Working Paper* WP/13/74), Washington, D.C.: International Monetary Fund, doi: 10.5089/9781484384046.001.

Belke, A., Dreger, C. (2013) "Current Account Imbalances in the Euro Area: Does Catching up Explain the Development?", *Review of International Economics*, Vol. 21, No. 1, pp. 6–17, doi: 10.1111/roie.12016.

Berger, H., Nitsch, V. (2010) "The Euro's Effect on Trade Imbalances" (*IMF Working Paper* WP/10/226), Washington, D.C.: International Monetary Fund, doi: 10.5089/9781455208913.001.

Bucevska, V. (2017) "Current Account Deficit in the EU Candidate and Potential Candidate Countries: A Panel Analysis", *Economic Themes*, Vol. 55, No. 3, pp. 305–318.

Cesaroni, T., De Santis, R. (2016) "Current Account 'Core–Periphery Dualism' in the EMU", *The World Economy*, Vol. 39, No. 10, pp. 1514–1538. doi: 10.1111/twec.12418.

Chen, R., Milesi-Ferretti, G.M., Tressel, Th. (2012) "External Imbalances in the Euro Area" (*IMF Working Paper* WP/12/236), Washington, D.C.: International Monetary Fund, doi: 10.5089/9781475524673.001.

Dabla-Norris, E. et al. (2015) "Identifying Constraints to Financial Inclusion and Their Impact on GDP and Inequality: A Structural Framework for Policy" (*IMF Working Paper* 221), Washington, D.C.: International Monetary Fund, doi: 10.5089/9781498381598.001.

Duarte, P., Schnabl, G. (2015) "Macroeconomic Policy Making, Exchange Rate Adjustment and Current Account Imbalances in Emerging Markets", *CESifo Working PaperSeries* No. 5064, doi: 10.1111/rode.12168.

Eichengreen, B. (2006), "Insurance underwriter or financial development fund: what role for reserve pooling in Latin America?" (*NBER Working Paper* No. 12451), Cambridge, MA.: National Bureau of Economic Research, doi: 10.3386/w12451.

Eichengreen, B. (2010), "Imbalances in the Euro Area", Available at: <http://eml.berkeley.edu/~eichengr/Imbalances_Euro_Area_5-23-11.pdf> [Accessed: January 20, 2017].

Gruber, J.W., Kamin, S.B. (2005) "Explaing the Global Pattern of Current of Current Account Imbalances" (*Discussion Paper* No. 846), Washington D.C.: Board of Governors of the Federal Reserve System, doi: 10.2139/ssrn.854224.

Hansen, B.E. (1992) "Efficient estimation and testing of cointegrating vectors in the presence of deterministic trends", *Journal of Econometrics*, Vol. *53*, pp. 87-121, doi: 10.1016/0304-4076(92)90081-2.

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" (Discussion Paper Series 1: Economic Studies No 32/2005), Frankfurt am Main: Deutche Bundesbank.

Herman, S. and Jochem, A. (2013) "Current account adjustment in EU countries: Does euro-area membership make a difference? (Discussion Paper No. 49), Frankfurt am Main: Deutche Bundesbank.

Huntington, H.G. (2015) "Crude Oil Trade and Current Account Deficits", *Energy Economics*, Vol. 50, pp. 70–79, doi: 10.1016/j.eneco.2015.03.030.

IMF (2012) "Enhancing Financial Sector Surveillance in Lowincome Countries: Financial Deepening and Macrostability". Available at: <https://www.imf.org/external/np/pp/eng/2012/041612.pdf> [Accessed: March 17, 2016]

Kao, C. (1999) "Spurious Regression and Residual-Based Tests for Cointegration in Panel Data", *Journal of Econometrics*, Vol. 90, No. 1, pp. 1–44, doi: 10.1016/s0304-4076(98)00023-2.

Kinoshita, Y. (2011), "Sectoral Composition of FDI and External Vulnerabilty in Eastern Europe" (IMF Working Paper, 123), Washington, D.C.: International Monetary Fund, doi: 10.5089/9781455263400.001.

Kumar Das, D. (2016), "Determinants of current account imbalance in the global economy: a dynamic panel analysis", *Journal of Economic Structures*, Vol. 5, No. 8, pp. 1–14, doi: 10.1186/s40008-016-0039-6.

Lane, Ph.R., Milesi-Ferretti, G.M. (2012) "External Adjustment and the Global Crisis", *Journal of International Economics*, Vol. 88, No. 2, pp. 252–265, doi: 10.1016/j.jinteco.2011.12.013.

Lipschitz, L., Lane, T., Mourmouras, A. (2002) "Capital Flows to Transition Economies: Master or Servant?", (*IMF Working Paper* 10/2/02), Washington, D.C.: International Monetary Fund, doi: 10.5089/9781451842791.001.

Mendoza, E.G. et al. (2009), "Financial Integration, Financial Development, and Global Imbalances", *Journal of Political Economy*, Vol. 117, No. 3, pp. 371–416, doi: 10.1086/599706.

Pedroni, P. (1999) "Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors", *Oxford Bulletin of Economics and* Statistic, Vol. 61, No. 1, pp. 653–670, doi: 10.1111/j.1468-0084.2006.00452.x.

Phillips, P.C., Moon, H.R. (1999) "Linear Regression Limit Theory for Nonstationary Panel Data", *Econometrica,* Vol. 67, No. 5, pp. 1057–1111, doi: 10.1111/1468-0262.00070.

Purfield, C., Rosenberg, C. B. (2010) "Adjustment under a Currency Peg: Estonia, Latvia and Lithuania during the Global Financial Crisis 2008–09" (*IMF Working Paper* 10/213), Washington, D.C.: International Monetary Fund, doi: 10.5089/9781455205448.001.

Roubini, N., Setser, B. (2004) "*Bailouts or Bail-ins? Responding to Financial Crises in Emerging Economies*", Washington, D.C.: Institute for International Economics.

Schmitz, B., von Hagen, J. (2011) "Current Account Imbalances and Financial Integration in the Euro Area", *Journal of International Money and Finance*, Vol. 30, No. 8, pp. 1676–1695, doi: 10.1016/j.jimonfin.2011.08.003.

Sorsa, P. et al. (2007) "Vulnerabilities in Emerging SEE - How Much Cause for Concern?" (*IMF Working Paper* WP/07/236), Washington, D.C.: International Monetary Fund, doi: 10.5089/9781451868005.001.

World Bank (2017), Data Bank, World Development Indicators.

Wyplosz, C. (2013) "Europe's Quest for Fiscal Discipline", *European Economy Economic Papers* 498. Brussels: European Commission, doi: 10.2765/43864.

Determinante tekućeg računa zemalja jugoistočne Evrope – panel pristup[1]

Radovan Kovačević[2]

Sažetak

Svrha ovog rada je ispitati odnos između bilance tekućeg računa i njenih determinanti za uzorak od 9 zemalja jugoistočne Europe (Bugarska, Hrvatska, Rumunjska, Moldavija, Srbija, Bosna i Hercegovina, Makedonija, Crna Gora i Albanija) tijekom razdoblja od 2000. do 2015. godine. Nakon što smo ustanovili postojanje panel kointegracije u uzorku, procjenjujemo jednadžbe kointegracije pomoću FMOLS i DOLS procjenitelja. Rezultati pokazuju da realna efektivna aprecijacija tečaja negativno utječe na tekući račun, dok neto priljev inozemnih izravnih ulaganja ima pozitivan utjecaj, kao i privatne doznake. Istraživanje je također potvrdilo da je deficit na tekućem računu u zemljama SEE postojan. Rezultati ukazuju da bi se strukturne promjene u zemljama SEE trebale provesti kako bi se smanjio CA deficit. Također, aprecijaciju domaće valute treba izbjegavati, jer to dovodi do povećanja CA deficita.

Ključne riječi: *tekući račun, ustrajnost, realni efektivni devizni tečaj, fiskalna bilanca, zemlje jugoistočne Europe*

JEL klasifikacija: *F21, F32, F34*

[1] Ovaj rad dio je istraživačkog projekta Ministarstva znanosti i tehnologije Republike Srbije "Uloga države u novom modelu gospodarskog rasta u Srbiji" (ugovor broj 179065).

[2] *Redoviti profesor, Sveučilište u Beogradu, Ekonomski fakultet, Kamenička 6, 11000 Beograd, Srbija. Znanstveni interes: međunarodna ekonomija, međunarodne financije, međunarodno tržište kapitala. Tel.: +381 11 3021 144. E-mail: radovank@ekof.bg.ac.rs, rkovacevic7@gmail.com.*

Appendices

Table A1: Description of variables and sources

Variable	Label	Measurement Unit	Source
Current account balance	CA	as % GDP	IMF, *World Economic Outlook Database* (October 2016). http://www.imf.org/external/pubs/ft/weo/2016/02/weodata/ The data for Montenegro for 2000 are same as data for Serbia and Montenegro in 2000., IMF Country Report No. 05/13, January 2005, p. 28, Table 3.
Fiscal balance	FISBAL	as % GDP	IMF, *World Economic Outlook Database* (October 2016). http://www.imf.org/external/pubs/ft/weo/2016/02/weodata/
Foreign Direct Investment	FDI	as % GDP	UNCTAD Stat http://unctadstat.unctad.org/wds Accessed 8.01.2017. The data for Serbia and Montenegro for 2000-2007 are the same. The data for Macedonia for 2002 are from the World Bank, WDI.
Real Effective Exchange Rate	REER	Indexes	World Bank World Development Indicators (WDI). http://data.worldbank.org/data-catalog/world-development-indicators. Data for Albania and Bosnia and Herzegovina are from http://bruegel.org/publications/datasets/real-effective-exchange-rates-for-178-countries-a-new-database/ Accessed 10.01.2017. The data for Serbia: NBS, *Statistički bilten*, November 2016, p. 101. The data for Montenegro: until 2007 same as for Serbia, for the period 2008-2014 the data are euro REER for trade with 42 countries from EUROSTAT, http://ec.europa.eu/eurostat/web/products-datasets/-/teimf250 Accessed 08.01.2017.
Saving Investment Gap	SIG	Gross Domestic Saving as % GDP – Gross Capital Formation as % GDP) (constant dollars 2005)	World Bank, *World Development Indicators (WDI)*. http://data.worldbank.org/data-catalog/world-development-indicators. Accessed 08.01.2017.
Net Foreign Assets	NFA	as % of GDP (calculated as ratio NFA (current LCU) and GDP (current LCU)	World Bank, *World Development Indicators (WDI)*. http://data.worldbank.org/data-catalog/world-development-indicators. Accessed 08.01.2017.
Domestic credit to private sector	DC	as % GDP	World Bank, *World Development Indicators (WDI)*. http://data.worldbank.org/data-catalog/world-development-indicators. Accessed 08.01.2017. Instead of missing data for Montenegro for 2000. and 2001., the data for Serbia from same source are used.
Private remittances	REM	Personal remittances, received as % GDP	World Bank, *World Development Indicators (WDI)*. http://data.worldbank.org/data-catalog/world-development-indicators. Accessed on 08/01/2017. Montenegro and Serbia have data only for the period 2007-2013.
Regulatory Quality	REGULAT	Worldwide Governance Indicators (WGI)	http://data.worldbank.org/data-catalog/worldwide-governance-indicators Accessed 6.01.2017.

Source: Author's classification

Table A2: Panel Unit Root Test of SEE countries, 2000-2015

Variables	Method	Order	Deterministic terms	Statistics	Prob.*	Obs	Non Stationary (NS) or Stationary (S)
CA	LLC	Level	Constant	-1.66	0.05	133	S
			Constant and trend	-3.11	0.00	133	S
		First Difference	Constant	-7.67	0.00	124	S
			Constant and trend	-6.84	0.00	108	S
	IPS W-stat.	Level	Constant	-0.75	0.23	133	NS
			Constant and trend	-0.06	0.48	133	NS
		First Difference	Constant	-5.96	0.00	124	S
			Constant and trend	-4.58	0.00	117	S
	ADF -Fisher Chi-square	Level	Constant	20.21	0.32	135	NS
			Constant and trend	18.03	0.45	133	NS
		First Difference	Constant	66.28	0.00	124	S
			Constant and trend	52.55	0.00	117	S
	PP -Fisher Chi-square	Level	Constant	17.26	0.51	133	NS
			Constant and trend	27.38	0.07	135	NS
		First Difference	Constant	87.49	0.00	126	S
			Constant and trend	88.59	0.00	126	S
	Breitung t-stat.	Level					
			Constant and trend	-0.89	0.19	124	NS
		First Difference					
			Constant and trend	-5.02	0.00	108	S
	Hadri Z-stat.	Level	Constant	0.57	0.29		S
			Constant and trend	4.98	0.00		NS
		First Difference	Constant	1.08	1.14		S
			Constant and trend	4.09	0.00		NS
FISBAL	LLC	Level	Constant	-2.29	0.01	130	S
			Constant and trend	-2.90	0.00	131	S
		First Difference	Constant	-9.72	0.00	125	S
			Constant and trend	-8.28	0.00	123	S
	IPS	Level	Constant	-1.54	0.06	130	NS
			Constant and trend	-1.05	0.15	131	NS
		First Difference	Constant	-7.11	0.00	125	S
			Constant and trend	-4.67	0.00	123	S
	ADF -Fisher Chi-square	Level	Constant	24.80	0.04	135	S
			Constant and trend	21.40	0.26	131	NS
		First Difference	Constant	77.50	0.00	125	S
			Constant and trend	52.02	0.00	123	S
	PP -Fisher Chi-square	Level	Constant	29.86	0.04	135	S
			Constant and trend	17.73	0.47	135	NS
		First Difference	Constant	77.65	0.00	126	S
			Constant and trend	57.34	0.00	123	S
	Breitung	Level					
			Constant and trend	-3.09	0.00	122	S
		First Difference					
			Constant and trend	-3.23	0.00	114	S

Variables	Method	Order	Deterministic terms	Statistics	Prob.*	Obs	Non Stationary (NS) or Stationary (S)
FISBAL	Hadri Z-stat.	Level	Constant	2.35	0.01		NS
			Constant and trend	3.01	0.00		NS
		First Difference	Constant	0.87	0.20		S
			Constant and trend	8.50	0.00		NS
FDI	LLC	Level	Constant	-3.49	0.00	132	S
			Constant and trend	-4.45	0.00	131	S
		First Difference	Constant	-10.04	0.00	122	S
			Constant and trend	-8.59	0.00	120	S
	IPS	Level	Constant	-2.10	0.02	132	S
			Constant and trend	-1.70	0.04	131	S
		First Difference	Constant	-7.86	0.00	122	S
			Constant and trend	-5.39	0.00	120	S
	ADF -Fisher Chi-square	Level	Constant	28.59	0.13	135	NS
			Constant and trend	25.97	0.10	131	NS
		First Difference	Constant	86.67	0.00	126	S
			Constant and trend	60.51	0.00	120	S
	PP -Fisher Chi-square	Level	Constant	24.80	0.13	135	NS
			Constant and trend	22.28	0.22	135	NS
		First Difference	Constant	109.75	0.00	126	S
			Constant and trend	92.83	0.00	126	S
	Breitung	Level					
			Constant and trend	3.72	0.00	122	S
		First Difference					
			Constant and trend	-5.76	0.00	111	S
	Hadri Z-stat.	Level	Constant	2.31	0.01		NS
			Constant and trend	4.21	0.00		NS
		First Difference	Constant	0.70	0.24		S
			Constant and trend	6.70	0.00		NS
REER	LLC	Level	Constant	-4.50	0.00	133	S
			Constant and trend	-0.57	0.28	134	NS
		First Difference	Constant	-6.57	0.00	126	S
			Constant and trend	-5.62	0.00	121	S
	IPS	Level	Constant	-2.54	0.01	133	S
			Constant and trend	1.65	0.95	134	NS
		First Difference	Constant	-4.48	0.00	126	S
			Constant and trend	-3.24	0.00	121	S
	ADF -Fisher Chi-square	Level	Constant	35.33	0.01	133	S
			Constant and trend	11.42	0.88	134	NS
		First Difference	Constant	50.43	0.00	126	S
			Constant and trend	38.20	0.00	121	S
	PP -Fisher Chi-square	Level	Constant	53.41	0.00	135	S
			Constant and trend	20.61	0.30	135	NS
		First Difference	Constant	62.34	0.00	126	S
			Constant and trend	60.72	0.00	126	S

Variables	Method	Order	Deterministic terms	Statistics	Prob.*	Obs	Non Stationary (NS) or Stationary (S)
REER	Breitung	Level					
			Constant and trend	2.65	1.00	125	NS
		First Difference					
			Constant and trend	-4.61	0.00	112	S
	Hadri Z-stat.	Level	Constant	5.79	0.00		NS
			Constant and trend	6.17	0.00		NS
		First Difference	Constant	3.50	0.00		NS
			Constant and trend	2.90	0.00		NS
SIG	LLC	Level	Constant	0.21	0.58	134	NS
			Constant and trend	-2.95	0.00	133	S
		First Difference	Constant	-8.28	0.00	126	S
			Constant and trend	-5.92	0.00	123	S
	IPS	Level	Constant	0.50	0.69	134	NS
			Constant and trend	0.03	0.51	133	NS
		First Difference	Constant	-6.52	0.00	126	S
			Constant and trend	-4.60	0.00	123	S
	ADF -Fisher Chi-square	Level	Constant	16.11	0.58	134	NS
			Constant and trend	15.97	0.59	133	NS
		First Difference	Constant	70.98	0.00	126	S
			Constant and trend	50.58	0.00	123	S
	PP -Fisher Chi-square	Level	Constant	15.59	0.62	135	NS
			Constant and trend	27.05	0.08	135	S
		First Difference	Constant	72.36	0.00	126	S
			Constant and trend	82.26	0.00	126	S
	Breitung	Level					
			Constant and trend	0.17	0.57	124	NS
		First Difference					
			Constant and trend	-4.34	0.00	114	S
	Hadri Z-stat.	Level	Constant	4.34	0.00		NS
			Constant and trend	5.01	0.00		NS
		First Difference	Constant	1.03	0.15		S
			Constant and trend	1.73	0.04		NS
NFA	LLC	Level	Constant	0.37	0.64	129	NS
			Constant and trend	-1.06	0.14	122	NS
		First Difference	Constant	-9.33	0.00	122	S
			Constant and trend	-7.59	0.00	123	S
	IPS	Level	Constant	-0.24	0.40	129	NS
			Constant and trend	-0.65	0.26	131	NS
		First Difference	Constant	-6.32	0.00	122	S
			Constant and trend	-4.14	0.00	123	S
	ADF -Fisher Chi-square	Level	Constant	23.39	0.18	129	NS
			Constant and trend	22.67	0.20	131	NS
		First Difference	Constant	69.04	0.00	122	S
			Constant and trend	49.94	0.00	123	S

Variables	Method	Order	Deterministic terms	Statistics	Prob.*	Obs	Non Stationary (NS) or Stationary (S)
NFA	PP -Fisher Chi-square	Level	Constant	27.50	0.07	135	S
			Constant and trend	41.68	0.00	135	S
		First Difference	Constant	65.48	0.00	126	S
			Constant and trend	56.68	0.00	126	S
	Breitung	Level					
			Constant and trend	-1.82	0.03	122	S
		First Difference					
			Constant and trend	-1.67	0.05	114	S
	Hadri Z-stat.	Level	Constant	5.50	0.00		NS
			Constant and trend	4.02	0.00		NS
		First Difference	Constant	0.89	0.19		S
			Constant and trend	7.46	0.00		NS
DC	LLC	Level	Constant	-4.45	0.00	130	S
			Constant and trend	1.47	0.93	130	NS
		First Difference	Constant	-4.25	0.00	125	S
			Constant and trend	-5.87	0.00	126	S
	IPS	Level	Constant	-1.28	0.10	130	NS
			Constant and trend	2.35	0.99	130	NS
		First Difference	Constant	-2.72	0.00	125	S
			Constant and trend	-2.90	0.00	126	S
	ADF -Fisher Chi-square	Level	Constant	24.31	0.15	130	NS
			Constant and trend	11.64	0.87	130	NS
		First Difference	Constant	37.15	0.01	125	S
			Constant and trend	38.06	0.00	126	S
	PP -Fisher Chi-square	Level	Constant	18.36	0.43	135	NS
			Constant and trend	8.24	0.97	135	NS
		First Difference	Constant	33.42	0.02	126	S
			Constant and trend	38.79	0.00	126	S
	Breitung	Level					
			Constant and trend	2.38	0.99	121	NS
		First Difference					
			Constant and trend	1.69	0.05	117	S
	Hadri Z-stat.	Level	Constant	4.99	0.00		NS
			Constant and trend	3.74	0.00		NS
		First Difference	Constant	0.38	0.35		S
			Constant and trend	4.24	0.00		NS
REM	LLC	Level	Constant	-5.78	0.00	119	S
			Constant and trend	0.06	0.52	119	NS
		First Difference	Constant	-3.49	0.00	111	S
			Constant and trend	-9.31	0.00	115	S
	IPS	Level	Constant	-4.66	0.00	119	S
			Constant and trend	0.93	0.82	119	NS
		First Difference	Constant	-3.40	0.00	111	S
			Constant and trend	-5.47	0.00	115	S

Variables	Method	Order	Deterministic terms	Statistics	Prob.*	Obs	Non Stationary (NS) or Stationary (S)
REM	ADF -Fisher Chi-square	Level	Constant	53.52	0.00	119	S
			Constant and trend	15.76	0.61	119	NS
		First Difference	Constant	43.19	0.00	111	S
			Constant and trend	68.50	0.00	115	S
	PP -Fisher Chi-square	Level	Constant	33.69	0.01	125	S
			Constant and trend	13.22	0.78	125	NS
		First Difference	Constant	58.60	0.00	111	S
			Constant and trend	81.77	0.00	116	S
	Breitung	Level					
			Constant and trend	3.46	1.00	110	NS
		First Difference					
			Constant and trend	1.23	0.11	106	NS
	Hadri Z-stat.	Level	Constant	5.36	0.00		NS
			Constant and trend	6.27	0.00		NS
		First Difference	Constant	3.47	0.00		NS
			Constant and trend	0.97	0.17		S

Note: S – Stationary, NS – Non stationary. *Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. Null hypothesis for all tests (except Hadri test) is that unit root exists, while alternative hypothesis is that the variable is stationary. Null hypothesis for Hadry test is no unit root, alternative is that there is a unit root. Significance level is 5%. Wherever it was needed, the lag length was automatically determined by the SIC with a maximum of two lags, the kernel is based on Bartlett, the bandwidth is based on New-West.High autocorrelation leads to severe size distortion in Hadri test, leading to over-rejection of the null. It is a balance panel.

Source: Author's calculations based on econometric software: EViews 8