TWIN DEFICIT HYPOTHESIS IN THE SOUTH EAST EUROPEAN AND CENTRAL EAST EUROPEAN UNION COUNTRIES IN THE COURSE OF MACROECONOMIC, INSTITUTIONAL AND DIFFERENT CRISIS FACTORS

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Abstract

This paper aims to provide an empirical assessment of the twin deficit hypothesis in 6 South East European countries and 11 Central East European Union countries, using yearly data for the 2000-2022 period. The empirical model using Fixed Effects with Driscoll and Krey standard errors with time and country fixed effects confirm the twin deficit hypothesis with a flow of causation from fiscal to current account deficit in both groups of countries. The research also controls for the impact of other macroeconomic factors (GDP growth, real effective exchange rate, output gap, inflation, FDI), financial factors (monetary credit to the private sector), and institutional factors (transition progress, economic freedom, legal and property rights and governance indicators) on to current account deficit. The interaction between fiscal deficit and COVID-19 dummy outlines a current account deficit-widening effect, whereas when interacting with the Eurozone debt crisis dummy, fiscal deficit appears with an undistinguished effect on to current account deficit. The findings also outline narrowing (widening) effect of fiscal deficit on to current account deficit during the presence (absence) of the financial crisis. System GMM estimates confirm persistent effects of the current account deficit.

Keywords: *Twin Deficit, Fixed Effects, System GMM, Transition countries.*

JEL classification: *F32, F37*

1. INTRODUCTION

Economic theory suggests that persistent fiscal deficit (FD hereafter) will lead to a current account deficit (CAD hereafter) unless either household savings increase or private investment decreases to make for the gap. The relationship between the FD and CAD is becoming increasingly important in the recent years in the developing and developed countries, once considering different economic and financial turmoil's during the past decade and a half the countries went through, like: COVID-19, eurozone debt crisis and international financial crisis, thus worsening their internal and external economic performance. Therefore, an empirical assessment of the co-movement of fiscal and trade balance should consider the endogenous adjustment of both variables to fiscal shocks and output. Hence, by treating additional non-fiscal shocks for this co-movement, like institutional and financial factors the paper complements a line of research, focusing on the transmission of fiscal shocks on the current account balance in 6 South East European countries[1]

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(SEE-6 hereinafter) and 11 - Central East European Union countries[2] (CE-EU-11 hereinafter).

This study contributes to the literature of twin deficit hypothesis for transition countries, by giving insights into the dynamics between the fiscal and current account balance, by addressing also institutional and financial determinants as identified by Bernanke (2005), once considering the importance of institutional efficiency on achieving low and stable current account position in line with the Treaty of European Commission (Dauti 2024). The development of financial system encourages savings, throughout the reduction of transaction costs and smoothing risk management, thus causing positive impact on current account. On the other hand, throughout the quality of institutions transition countries can improve export performance, thus narrowing the deficit in the current account. By addressing the research question related to the impact of institutional and financial determinants on CAD, this research extends the previous empirical evidence on panel-level data for the transition countries of SEE-6 and CE-EU-11 countries. There are three-research questions addressed in the study: What is the size and direction of the impact of FD on CAD in the two group of countries, SEE-6 and CE-EU-11? Does the size of CAD is significantly dependent upon macroeconomic, financial and institutional related factors and what is the impact of FD interacted with different crisis factors on CAD?

The findings confirm the twin deficit hypothesis which is going from fiscal to CAD in both group of countries, SEE-6 and CE-EU-11 respectively. This relationship is undistinguished from the Eurozone Debt Crisis, whereas its magnitude is largely dependent upon the COVID-19 pandemic and financial crisis, which favours enhancement impact of FD on the CAD during the absence of financial crisis period and the presence of the pandemic period. The positive relationship between fiscal and CAD, also confirms the Keynesian absorption theory, which explains the positive impact of fiscal on CAD via short run expansionist fiscal policies due to increase of aggregate demand pressures (Dauti 2024). The findings suggest that the CAD was triggered by macroeconomic related factors such as: GDP growth, real effective exchange rate, inflation, FDI and output gap, then financial related factors of monetary credit to the private sector in GDP terms as well as institutional-related factors, some of which are narrowing the deficit in the current account (transition progress, economic freedom, control of corruption, voice and accountability), and other are enhancing the deficit in the current account (political risk, regulatory index, government effectiveness and legal and property rights).

The paper is organized as follows. The coming section presents the theoretical framework on twin deficit hypothesis. The third section reviews the latest empirical evidence on twin deficit hypothesis in the transition countries, trying to identify the gap in the literature, which will be subject to an empirical assessment. Section four describes the methodology, method of analysis, and hypothesis. Section five considers the descriptive analysis of the SEE-6 and CE-EU-11 countries and their behaviour with respect to cyclical movement of CAD. Section six presents the econometric framework and empirical analysis. Section seven discusses the results, while the last section concludes the study and addresses some policy recommendations.

2. Theoretical framework

Following Misztal (2012) the outline of the macroeconomic relationship between FD and CAD is proofed, starting from the national income equation, as follow:

$$Y = C + I + G + NX \quad (1)$$

Where, Y is GDP, C is consumption, I is investment, G is government expenditure and NX is positive net exports, $NX > 0$. To outline the impact of CAD we specify, $NX < 0$, since the deficit in the current account could be present in cases when exports are lower than imports, assuming remittances and other secondary incomes are zero. Rearranging equation (1), with the specified condition: $NX < 0$, yield:

$$Y = C + I + G - NX$$
$$Y = C + I + G - (IM - EX)$$

Assuming remittances, secondary incomes and other factors which constitute the CAD are zero, we have: $CA = NX$; where $CA = IM - EX$. Therefore, the following equation yield:

$$Y = C + I + G - CA \quad (2)$$

Considering the macroeconomic identities: $C + I = Y = C + S$ yield $I = S$ (3). Rearranging (3) and (2), yield:

$$Y = C + S + G - CA \quad (4)$$

Expressing equation (4) in terms of savings, yield:

$$S = Y - C - G + CA \quad (5)$$

Assuming constant government expenditure ($G = 0$) and the condition $I = Y - C$, yield:

$$S = I + CA \quad (6)$$

Since the national savings are consisted by the savings generated by the private sector S_p and savings generated by the governmental sector S_g, yield:

$$S = S_p + S_g \quad (7)$$

Private savings S_p are the part of personal disposable income (income after tax, TA), which is not consumed, whereas, public savings are the difference between the government revenue (taxes, *TA*) and budget expenditures, which include government purchases (*G*) and government transfers (TR). Therefore, the two-equation system of private and public savings, respectively can be written as follows:

$$\begin{cases} S_p = YD - C = (Y - TA) - C \\ S_g = TA - (G + TR) = TA - G - TR \end{cases} \quad (8)$$

Substituting the savings generated by the public sector in equation (7), in combination with equation (6), yield:

$$S_p + TA - G - TR = I + CA$$
$$S_p + TA - G - TR - I = CA$$
$$CA = S_p - I - G - TR + TA$$

Thus, current account balance can be presented in the following form:

$$CA = S_p - I - (G + TR - TA) \quad (9)$$

Expressing the budget balance as $B = G + TR - TA$, the final equation of CAD is:

$$CA = S_p - I - B \quad (10)$$

Equation (10), gives support to twin deficit hypothesis (changes in the balance of the fiscal budget are reflected in the changes in the balance of current account), assuming constant difference between private savings and investments. Following equation (10), other macroeconomic and institutional related factors are added in the model, as suggested by Bitzis et al. (2008) and Altayligil and Çetrez (2020). Following Misztal (2012), the subjected equation for estimation purpose is as below:

$$CA = S_p - I - B + M + F + I \quad (11)$$

Where, *M* denote the macroeconomic factors, *F* captures the financial factors and *IN* denote institutional related factors. Hence, based on expression (9, 10 and 11), a high degree of correlation of national savings and investments mean a parallel changes in the budget deficit and the current account deficit simultaneously (Misztal 2012).

3. LITERATURE REVIEW

The twin deficit hypothesis supports the causal effect of FD on the CAD and *vice versa* (Mosayeb and Saleh 2009). As per hypothesis of the Feldstein-Horioka puzzle, FDs, and current account balance interact mutually (Fidrmuc 2003). Based on the Keynesian absorption approach, in the case of full employment, an increase in budget deficit leads to a CAD due to an increase in aggregate demand (Blanchard and Giavazzi 2002). According to this approach, a higher FD will increase disposable income, which would lead to higher domestic absorption and, consequently, import demand will increase, thereby worsening CAD (Mohanty 2019). The classical approach argues for the significant impact of FD on macroeconomic factors like savings, investments, price of production factors, income distribution, exchange rate, and size of trade (Misztal 2012). The twin deficit hypothesis is also explained by the Mundell-Fleming model, which in regard to the relationship between FD and CAD, take into account additional factors, like interest rate and exchange rate (Wang 2020). In this way, budget deficit (surplus) triggered by fiscal expansion (restriction), causes the CAD (surplus), due to increase (decrease) of interest rate, leading to inflow (outflow) of foreign (domestic) capital and domestic currency appreciation (depreciation). Finally, the last hypothesis related to causal relationship between fiscal and current account balance is the Feldstein-Horioka hypothesis, which advocates for a long run correlation between domestic savings and investments (Misztal 2012). The twin deficit hypothesis assumes that a FD has a tendency to cause a CAD, which is usually manifested throughout the interest and exchange rate channels, explained within the framework of Mundel - Fleming model (Neaime 2015). For instance, Turan and Karskas (2018) when examining the twin deficit hypothesis for CEE countries found valid evidence for for the Czech Republic, Hungary, and Slovakia but not for the case of Poland, Croatia, Romania, and Slovenia in the long run. In addition, Furceri and Zdzienicka (2020) by examining the twin deficit hypothesis for the developing countries using NARDL approach, found that an increase in the government budget balance in GDP terms, improves the current account balance by 0.8 percentage points, in GDP terms. Some additional studies of the twin deficit hypothesis in transition economies are presented in Table 1.

However, the empirical literature with regard to the validity of the twin deficit hypothesis in SEE countries is rather scarce. The SEE countries recently have been enforced to finance their investment needs from external sources, thus being exposed to debts and hence FDs, due to their intentions for the EU approximation path, which via second-round effects have triggered a deficit in the current account. The Central East EU countries have also overcome this process in their earlier intentions for the EU convergence path up to 2004 and 2007. In addition to that fact, the selected sample countries have been more vulnerable to external shocks, provoked by different crisis circumstances, such as: the international financial crisis,

Table 1. Summary of the latest empirical findings on twin deficit hypothesis for transition countries

Author	Sample	Methodology	Findings
Mirdala (2015)	European transition economies	Vector auto-regression methods	Current account deteriorations were predominantly related to negative FDs, while current account enhancements were predominantly associated with positive FDs.
Ganchev et al. (2012)	CEE countries	OLS panel regress The vector autoregressive analysis (VAR)	Support of twin deficit hypothesis in the OLS panel regression. VAR analysis does not support the Twin Deficit Hypothesis, especially for Bulgaria and Estonia.
Siničáková and Šuliková (2014)	Baltic countries (Estonia, Latvia and Lithuania)	Vector error correction model (VECM) and Granger causality tests and forecast variance de-composition	Enhanced twin deficit hypothesis in the long run, in Estonia and Lithuania, and deteriorating impact of CAD on budget balance for the whole sample of three Baltic countries.
Bölükbaş et al. (2018)	EU -27 and Turkey.	Panel Granger causality tests.	Evidence of bidirectional causality between budget deficit (BD) and CAD (CAD) in sixteen of the twenty-eight countries and Turkey and a unidirectional causality from BD to CAD was also noticed in five EU countries.

Notes: Summary papers with empirical studies.

Eurozone debt crisis, and COVID-19, thus aggravating the sustainability of public finances, i.e., the FD, which could have triggered the deficit in the current account balance. In this context, this research fills the gap in the literature of twin deficit hypothesis by treating also the impact of FD interacted with crisis related factors on CAD in transition economies of SEE-6 and developed economies of CE-EU-11 countries.

4. METHODOLOGY AND METHOD OF ANALYSIS

The paper will try to shed light on the impact of FD on the CAD of the CE-EU-11 and SEE-6 countries, relying on a yearly panel data set for the period 2000-2022. The reduced form of the equation for the estimation purpose is as follows:

$$CAD_{it} = \beta_1 X_{it} + \beta_2 M_{it} + \beta_3 F_{it} + \beta_4 IN_{it} + \beta_5 X_{it} \times D_i + \theta_i + \gamma_t + u_{it} \quad (12)$$

Where CAD_{it} is the dependent variable denoting the CAD as a share of GDP, of the CE-EU-11 and SEE-6 countries, X_{it} is the FD variable, in GDP terms, M_{it} is the vector of macroeconomic related variables, F_{it} is the vector of financial related variables, IN_{it} is the vector of institutional related variables, D_{it} is the dummy variables denoting the SEE countries, COVID-19, financial crisis dummy, and Eurozone Debt Crisis dummy. θ_i is country Fixed Effects and γ_t is year Fixed Effects. u_{it} is the usual standard error. Extending the approach of Bitzis et al. (2008) and Altayligil and Çetrez (2020), the

equation for estimating the impact of FD on CAD in the selected countries is the following:

$$\begin{aligned} CAD_{it} = {} & a_0 + a_1 FD_{it} + a_2 REER_{it} + a_3 Y_{gap_{it}} + a_4 X_{gap_{jt}} \\ & + a_5 FDI_{it} + a_6 GR_{it} + a_7 CPI_{it} + a_8 MSC_{it} + a_9 TP_{it} \\ & + a_{10} EF_{it} + a_{11} LPR_{it} + a_{12} RI_{it} + a_{13} PR_{it} + a_{14} CC_{it} + a_{15} GE_{it} \\ & + a_{16} VA_{it} + a_{17} FD_{it} \times D_1 + a_{18} FD_{it} \times D_2 \\ & + a_{19} FD_{it} \times D_3 + a_{20} FD_{it} \times D_4 + \theta + \gamma + u_t \quad (13) \end{aligned}$$

Where the $i = 1, 2, \ldots, n$ is the country index, $t = 1, 2, \ldots, t$ is the time index, denoting the years from 2000 to 2022. The empirical model assumes that CAD of the SEE-6 and CE-EU-11 countries is a function of FD denoted by FD_{it}[3], macroeconomic related variables (real effective exchange rate denoted by, $REER_{it}$ SEE-6 and CE-EU-11 output gap denoted by $Y_{gap_{it}}$, EU-14 output gap denoted by $X_{gap_{jt}}$, foreign direct investments FDI_{it}, economic growth GR_{it} and consumer price index CP_{it}), financial related variables (monetary sector credit to private sector as a share of GDP denoted by MSC_{it}) and institutional related variables (transition progress TP_{it}, economic freedom EF_{it}, legal and property rights LPR_{it}, regulation index RI_{it}, political risk PR_{it}, control of corruption CC_{it}, government effectiveness GE_{it} and voice and accountability VA_{it}), as well as the interaction terms between FD with SEE dummy $FD_{it} \times D_1$, COVID dummy $FD_{it} \times D_2$, financial crisis dummy $FD_{it} \times D_3$ and Eurozone debt crisis dummy $FD_{it} \times D_4$. Based on the interaction between FD and the dummy variables, D_1 and D_2, the aim of the study is to differentiate the impact of FD on CAD across two

group of countries, SEE countries and CE-EU countries, and across two periods, the pandemic period and the non-pandemic period, respectively. On the grounds of the interaction terms between FD and the dummy variables, D_3 and D_4 the study will distinguish current account related factor of FD, during the financial crisis period and the Eurozone debt crisis period, respectively.

4.1. Hypothesis

Having regard the specified research questions, the following hypothesis hold:
1. Ho (Ha): FD has no evident (has evident) impact on CAD
2. Ho (Ha): Macroeconomic related factors have no evident (have evident) impact on CAD
3. Ho (Ha): Institutional related factors have no evident (have evident) impact on CAD
4. Ho (Ha): Financial related factor has no evident (has evident) impact on CAD.
5. Ho (Ha): There are no evident (are evident) differences in the relationship between FD and CAD between SEE-6 and CE-EU-11 countries, as well as between different crisis period, like: COVID-19, international financial crisis and eurozone debt crisis on the relationship between FD and CAD.

## 5. DATA DESCRIPTION AND EMPIRICAL ANALYSIS

To outline the cyclical behaviour of the CAD due to different crisis periods, the descriptive analysis is navigated on the grounds of four different periods, 2000-2008 capturing the pre-international financial crisis period, 2009-2012 outlining the Eurozone debt crisis period, 2013-2019 considering the pre-COVID crisis period and 2020-2022 capturing the COVID-19 crisis period. This scenario is also outlined in the empirical part of the study[4].

5.1. Comparative statistics of CAD between SEE and CE-EU

Figure 1 shows that all 6 SEE countries are prone to chronic CADs (relative to GDP) over the last two decades. The highest deficit was recorded in the period before the Global Financial Crisis (GFC hereafter), followed by the post-GFC period and the Covid-19 crisis. Among SEE countries, the highest deficit in the current account during the COVID-19 crisis was recorded in Montenegro (21.25 percent), followed by Albania (8.61 percent) and Kosovo (-7.21), which is an indication of the distressing effect of the pandemic. The same countries suffered due to the Eurozone Debt Crisis period. On the other hand, more stable positions on the basis of CAD were observed in Serbia and North Macedonia, during the four observed periods, thus making these countries more sustainable based on their external economic performance. The reason that could lie behind the scope of widening the CAD in the SEE-6 countries is the experienced large losses in terms of trade due to the increase of global prices for energy imports (Aristovnik, 2006). The surplus level

Figure 1. CAD as a share of GDP in SEE countries (in percent)
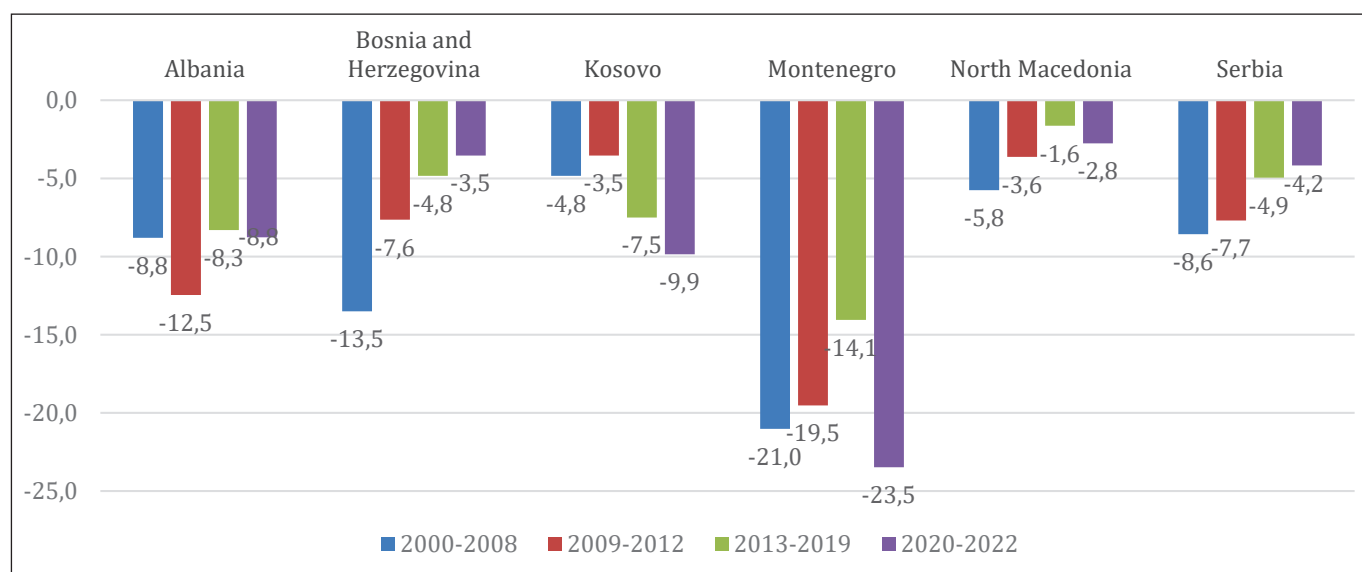
Source: IMF - International Monetary Fund (2024-a) World Economic and International Surveys, World Economic Outlook Database and authors' calculations.

Figure 2. CAD as a share of GDP in CE EU-11 countries (in percent)
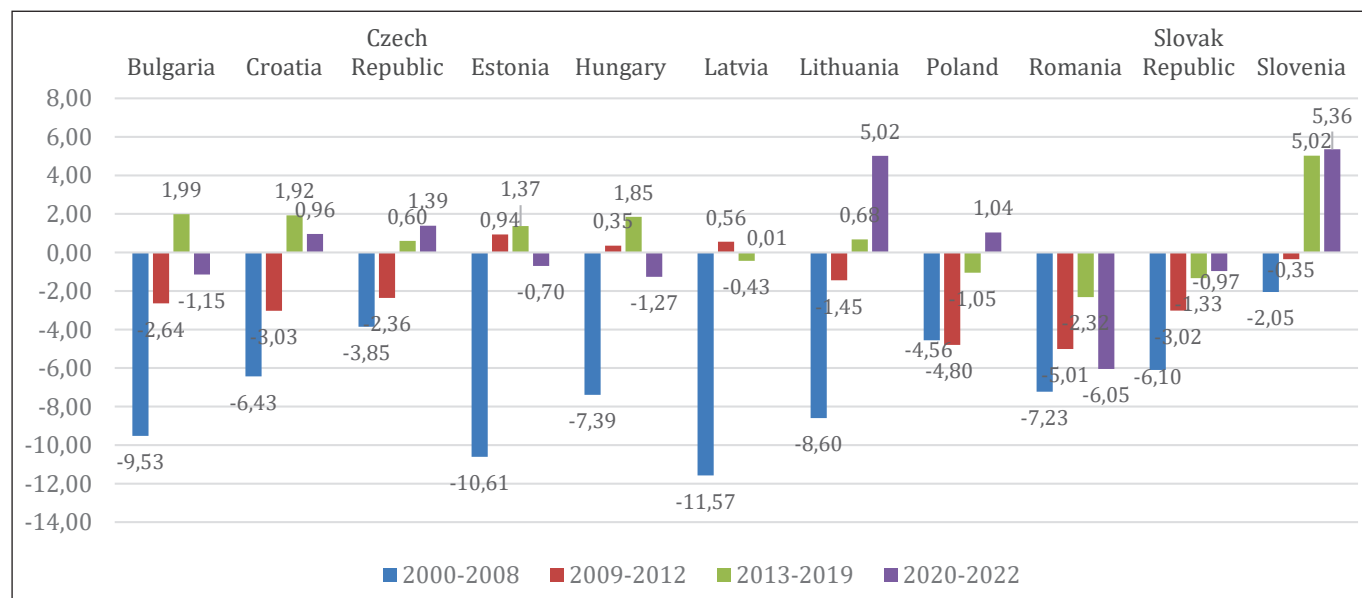
Source: IMF - International Monetary Fund (2024-b; 2024-c) World Economic and International Surveys, World Economic Outlook Database and authors' calculations.

of the current account in GDP terms could be reached only once for North Macedonia in 2018 (Figure 1).

In the CEE-EU countries, as shown in Figure 2, CADs built up to unsustainable levels before the pre–Global Financial Crisis period (2000-2008) indicating high growth and easy money in this period. This led to high growth of imports of consumer and investment goods as well as to surge in imports of financial capital needed to finance increased CADs. Half of the country's current account surpluses were sustained also during the Covid-19 period, while in half of the country's CADs were below 1 percent of GDP. This is a notable difference as compared to SEE countries that were running high CADs throughout the period under investigation. The positive balances of the CAD as a share of GDP, which mainly happened in the yearly periods afterwards, 2013-2019 could be due to contractions in the domestic demand and external financing constraints.

However, in some of the CE-EU countries, like Poland, Romania and the Slovak Republic, which are not members of the European Monetary Union (EMU), the deficit in the current account remained still problematic during the same yearly period, 2013-2019 and a period afterward, 2020-2022, a situation which could be attributed to real exchange rate over evaluations.

6. ECONOMETRIC ASSESMENT

For the purpose of estimating the CAD - FD nexus model, the study will rely on static estimation techniques like Fixed Effect with Driscoll and Kraay standard errors with country and yearly dummies (FEDK hereinafter) and dynamic panel estimation techniques like System GMM, as a robustness check to FEDK estimates.

6.1. Static panel analysis: Fixed Effects with Driscoll and Kraay standard errors

Fixed Effects with Driscoll and Kraay standard errors (FEDK) are used in the panel samples where the time series, 'T' exceeds the number of panels 'N', assuming that the standard nonparametric time-series covariance matrix estimator is robust to general forms of cross-sectional, temporal dependence, as well as to heteroscedasticity and autocorrelation (Hoechle 2007). In the FEDK model, we use two-time lags and account for time and country Fixed Effects, also. Assuming the linear regression of a model.

$$y_{it}=x'_{it}\theta+\varepsilon_{it}, \; i=1,2,.., N; \; t=1,2,.., N \quad (14)$$

Where, the dependent variable y_{it} is a scalar, x'_{it} is a vector of independent variables, θ represent the

vector of unknown coefficients, i denotes the cross-sectional units and t denotes time dimension of the sample and ε_{it} represent the scalar disturbance term. It is assumed that the regressors x'_{it} to be uncorrelated with the scalar disturbance term ε_{it}.

6.2. Dynamic panel analysis: System GMM

To check for the robustness of our results obtained using the static panel data techniques, we run dynamic panel data regression using Arrellano-Bover/Blundell/Bond estimation procedure (Arrellano and Bover 1995; Blundell and Bond 1998). The basic dynamic panel model to be estimated is as follows:

$$y_{it} = \sum_{j=1}^{p} a_j y_{i,t-1} + x_{it}\beta_1 + c_{it}\beta_2 + v_i + \varepsilon_{it} \qquad (15)$$

Where a_j and p are the parameters to be estimated, x_{it} is a column vector of exogenous regressors, c_{it} is the column vector of endogenous regressors, while β_1 and β_2 are row vectors enclosing parameters to be estimated. v_i is the individual panel level effect and ε_{it} is the disturbance term. Model (15) assumes that v_i and ε_{it} are independent for each i over all t. In all cases, the dependent variable and output gap are endogenous, and other explanatory variables are treated as exogenous. We utilize the lag limit of the dependent variable and other endogenous components and collapse the instruments, to treat the instruments' eruption.

6.3. Empirical analyses

The baseline results outline significantly positive effect of FD on CAD, hence confirming the presence of twin deficit hypothesis triggered by the increase in aggregate demand, which is in line with Keynesian absorption theory (Deskar 2018). These results also reveal positive and statistically significant impact of real effective exchange rate on the CAD in all the cases, with exception to the circumstance when the FD has interacted with the financial crisis dummy. This means that an increase (appreciation) in REER which is associated with expensive exports and cheaper imports, reflects to loss in trade competitiveness, wideness the deficit in the current account, thus impacting positively the CAD. Hence, from the estimates in table 3, a 10 percent appreciation (increase) of the real effective exchange rate, increases the deficit in the current account by 0.45 percent. As concern to the impact of cyclical components on CAD, denoted by $Y_{gap_{it}}$ and $X_{gap_{jt'}}$ the results from column (1) reveal statistically significant and negative coefficient of SEE-6 and CE-EU-11 output gap, denoted by $Y_{gap_{it'}}$ thus signaling for low level of aggregate demand in SEE-6

and CE-EU-11 countries, below their most efficient capacity. Hence, 1 percent increase in the SEE-6 and CE-EU-11 output gap, decreases CAD by 7.65 percent, ceteris paribus (Table 2: column 1). The negative and statistically significant coefficient of EU-14 output gap denoted by $X_{gap_{jt}}$ indicates for insufficient help of the EU-14 countries toward the recovery process of the SEE-6 and CE-EU-11 countries economic conditions, meaning that the higher actual aggregate demand in the EU-14 countries is associated with decreasing of the CAD of the SEE-6 and EU-14 countries, mostly via export increase of the SEE-6 and CE-EU-11 countries due to higher demand of the EU-14 countries. The findings suggest that the presence of FDI in SEE-6 and CE-EU-11 countries decreases the deficit in the current account, which is mainly to export promotion of FDI located in transition countries, thereby reducing the deficit in the current account. Focusing on the estimates from column 1 (Table 2: column 1), a 1 percent increase in FDI, decreases the CAD by 0.19 percent, on average, ceteris paribus. The coefficient of growth is statistically significant at a 10 percent level of significance, laying on a negative relationship with the CAD, implying a decrease of growth by 0.16 percent, per 1 percent increase of CAD, *ceteris paribus*. This is a reflection that export of intermediate and technology goods could deteriorate the deficit in the current account, as found by Chinn et al. (2003) suggesting that a rise in domestic output growth generates larger CADs. The financial sector development denoted by $MSCP_{jt}$ is found to narrow the CAD in the SEE-6 and CE-EU-11 countries by 1 percent, per 10 percent increase of monetary credit to private sector, *ceteris paribus*. The majority of institutional factors are confirmed to be significantly related to CAD, some of which are narrowing this deficit (transition progress, economic freedom and voice and accountability) and some others are enhancing this deficit (political risk, regulatory index and government effectiveness). In all these cases, the institutional performance should enable better export performance and subsequently impact negatively the deficit in the current account. Referring to the results with regular variables (column 1), 1 percent increase in the performance of transition progress, economic freedom and voice and accountability, decreases the deficit in the current account, on average, by 1.39 percent, 3.14 percent and 0.1 percent, respectively, *ceterus paribus*. On the other hand, 1 percent increase in the performance of political risk, regulatory index and government effectiveness, increases the deficit in the current account, on average, by 1.12 percent, 0.19 percent and 0.1 percent respectively, *ceterus paribus*.

Table 2. Results from the Fixed Effects with Driscoll and Kraay standard errors with time and country dummies

Dep. Variable CAD_{it}	(1) Regular variables	(2) SEE interaction	(3) Covid-19 interaction	(4) Financial crisis interaction	(5) Eurozone debt crisis interaction
FD_{it}	0.102**	0.0577	0.0999*	0.143**	0.0729
	(0.0492)	(0.0650)	(0.0486)	(0.0566)	(0.0548)
$REER_{it}$	0.0448**	0.0431**	0.0444**	0.0401**	0.0476**
	(0.0180)	(0.0175)	(0.0178)	(0.0173)	(0.0176)
$Y_{gap_{it}}$	-7.643*	-7.786*	-7.784*	-7.584*	-7.197*
	(4.175)	(4.169)	(4.452)	(4.066)	(4.022)
$X_{gap_{jt}}$	-0.565*	-0.586*	-0.585**	-0.571*	-0.564*
	(0.288)	(0.289)	(0.262)	(0.288)	(0.274)
FDI_{it}	-0.198**	-0.202**	-0.197**	-0.196**	-0.204**
	(0.0778)	(0.0777)	(0.0761)	(0.0792)	(0.0775)
GR_{it}	-0.236*	-0.230*	-0.234*	-0.243*	-0.255*
	(0.132)	(0.134)	(0.130)	(0.136)	(0.147)
CPI_{it}	-0.00395	-0.00471	-0.00278	-0.00353	-0.00830
	(0.0289)	(0.0286)	(0.0321)	(0.0283)	(0.0292)
MSC_{it}	-0.0943***	-0.0942***	-0.0945***	-0.0944***	-0.0944***
	(0.0289)	(0.0288)	(0.0292)	(0.0288)	(0.0291)
TP_{it}	-1.399***	-1.348***	-1.401***	-1.371***	-1.362***
	(0.393)	(0.350)	(0.398)	(0.392)	(0.418)
EF_{it}	-3.141***	-3.093***	-3.151***	-3.199***	-3.045***
	(0.908)	(0.924)	(0.893)	(0.926)	(0.887)
LPR_{it}	1.128*	1.004	1.126*	1.134*	1.182*
	(0.625)	(0.720)	(0.632)	(0.627)	(0.648)
RI_{it}	0.928**	0.928*	0.958*	1.032**	0.819*
	(0.447)	(0.457)	(0.470)	(0.481)	(0.447)
PR_{it}	0.00297	0.00237	0.00304	0.00754	0.00454
	(0.0134)	(0.0137)	(0.0134)	(0.0122)	(0.0139)
CC_{it}	-0.0546	-0.0545	-0.0554	-0.0582*	-0.0528
	(0.0324)	(0.0322)	(0.0324)	(0.0334)	(0.0323)
GE_{it}	0.100**	0.0967**	0.100**	0.0976**	0.1000**
	(0.0428)	(0.0428)	(0.0427)	(0.0422)	(0.0432)
VA_{it}	-0.0938***	-0.0894***	-0.0938***	-0.0839***	-0.0973***
	(0.0173)	(0.0177)	(0.0172)	(0.0192)	(0.0195)
$FD_{it} \times D_1$		0.123			
		(0.159)			
$FD_{it} \times D_2$			0.0557		
			(0.160)		
$FD_{it} \times D_3$				-0.726***	
				(0.0999)	
$FD_{it} \times D_4$					0.157
					(0.131)
Constant	27.88***	27.66***	27.79***	27.10***	27.46***
	(5.756)	(5.605)	(5.905)	(6.193)	(6.016)
within R-squared	0.6607	0.6555	0.6544	0.6607	0.6555
Observations	391	391	391	391	391
Number of groups	17	17	17	17	17
Time and country Fixed Effects	Yes	Yes	Yes	Yes	Yes

Notes: Dependent variable CAD_{it}, is CAD as a share of GDP. Standard errors in brackets, ***, ** and * indicate significance of coefficients at 1, 5 and 10 per cent, respectively. D_1 and D_2 are the SEE and COVID-19 dummy; D_3 and D_4 denote the financial and eurozone debt crisis dummy, respectively.

6.4. Robustness check

Referring to the results from the FEDK estimates without country and year fixed effects, (Table 3, appendix), the estimated statistically significant coefficient of FD for the SEE countries, by 0.1 percent, [0.246(0.246-0.0947×0)], reinforces the positive association between these two deficits for both groups of countries, outlining that a 1 percent increase in the FD, increases CAD in the SEE countries by 0.24 percent, ceteris paribus. The interaction term of the FD with COVID-19 (D2) is also statistically significant, meaning that the economic size of the CAD between two periods (pandemic and non-pandemic period), varies on the grounds of its magnitude, with respect to changes in the level of FD. However, the estimated statistically significant coefficient of FD during the non-pandemic COVID-19 period, by 0.17 percent, [0.179(0.179+0.546×0)], reinforces the positive association between these two deficits during non-pandemic years. During the pandemic period, the impact of FD on CAD is much larger in economic terms, at about 0.725 percent, per 1 percent increase in FD, ceteris paribus [0.725(0.179+0.546 ×1)]. Focusing in Table 3, the interaction term of FD with international financial crisis is statistically significant, outlining the distinguished effect of FD on CAD caused by the international financial crisis. In the absence of a financial crisis, the estimated impact of FD on the CAD is positive, though in terms of the magnitude the impact is marginal, just 0.15 percent [0.153 (0.153-0.713×0)]. On the other hand, during the presence of financial crisis, the impact of fiscal on the CAD is negative [-0.56 (0.153-0.713×1)], meaning that a 1 percent increase in FD, decreases the CAD, on average by 0.56 percent, ceterus paribus. Bernanke (2005) suggests that the investment climate in developing countries could improve macroeconomic stability and hence the balance in the current account. The results from FEDK estimates, (Table 3), indicate an enhancement effect of the inflation rate, denoted by CPI_{jt} on the CAD by 0.06 percent, ceteris paribus. An increase of inflation in the domestic economy could attract imports of intermediate inputs and technology goods, causing an increase in the CAD. Among institutional factors, legal and property right is found to enhance the deficit in the current account, on average by 1.624 percent, whereas control of corruption is found to narrow the deficit in the current account, by average 0.11 percent, per 1 percent increase in the performance of institutional quality associated to legal and property rights and control of corruption, respectively, ceterus paribus.

Table 4 in the appendix, shows the system GMM estimates. These estimates report robust two-step GMM estimates which offer standard errors that are robust to heteroscedasticity and serial correlation (Roodman, 2006). Following Roodman (2006), we exclude the institutional proxies of governance-related indicators like: political risk, control of corruption, government effectiveness, and voice and accountability. To deal with the instrument's explosion, based on Roodman (2008) we consider the lag limit of the dependent variable and other endogenous regressors and collapse the instruments (Efendic and Pugh 2015). All system GMM estimates confirm the theoretically expected result that the CAD is subject to persistent effects. The results confirm that the increase of agglomeration effect of the deficit in the current account by 10 percent, results in an increase of CAD in the SEE and CE-EU countries, on average, by 6 percent, ceteris paribus. The empirical results from the system GMM model imply that there exists some lost dynamics in the static panel models, thus endorsing that the empirical findings of the static models should be recognized with alertness, since some of the significant explanatory variables reported in the static panel models become insignificant in the GMM specification, with the exception of the lagged dependent variable, foreign direct investment and economic growth.

7. RESULTS AND DISCUSSION

Based on the FEDK estimates with time and country fixed effects the research finds out that the CAD in the SEE-6 and CE-EU-11 countries during the observed period 2000-2022, was triggered by macroeconomic factors (fiscal deficit, real effective exchange rate, SEE-6 and CE-EU-11 output gap as well as EU-14 output gap, GDP growth, inflation rate and FDI), financial development factor (monetary credit to private sector) and many institutional related factors (transition progress, economic freedom, voice and accountability, political risk, regulatory index and government effectiveness and additionally legal and property rights and control of corruption) in the robustness check of FEDK estimates. The widening effect of FD on CAD is in line with the twin deficit hypothesis confirmed by previous empirical studies, signalizing the increase of debt potential in the country's economy. (Sadiku et al. 2018; Dauti and Voka 2020; Bucevska 2020). Concerning the impact of interaction terms between FD and associated country group dummy variable and related crisis dummy variable like: COVID-19, international financial crisis, and Eurozone Debt Crisis, on the CAD, the study finds the size of CAD does not vary on the grounds of its magnitude between SEE-6 and CE-EU-11 countries and Eurozone Debt and non-debt Crisis, whereas its magnitude varies between the

pandemic COVID-19 and non – pandemic period as well as between financial and non-financial crisis period. In all cases, the results imply that expansionist short run fiscal policies applied during the pandemic period in all sample countries lead to increase in the CAD. On the impact of domestic demand factors like SEE-6 and CE-EU-11 output gap, the results confirm the deteriorating effect of the output gap on the CAD, which comes through lowered domestic demand below its potential capacity, suggesting that actual domestic aggregate demand above its potential level, may also affect the elasticity of the CAD to cyclical movement. The negative and statistically significant coefficient of EU-14 output gap with respect to SEE-6 and CE-EU-14 CAD, implies that the EU-14 output gap does impact the elasticity of the CAD on the grounds of EU cyclical movement, which is a signal of important transaction between SEE-6 or CE-EU-11 and EU-14 economic agents, and therefore the net EU savings did help the recovery process of SEE-6 and CE-EU-11 external economic conditions. Also, the negative impact of growth on the CAD may be associated to the income convergence hypothesis of the faster-growing economies of the SEE-6 and CE-EU-11 countries with more advanced countries, since lowering the deficit for these countries, is impacted by growth element which potentially could be due to increase of net exports of intermediate and technology goods.

The negative coefficient of the financial sector variables, denoted by monetary sector credits to the private sector, in GDP terms, implies that the capital flows could transfer from SEE-6 and CE-EU-11 countries with underdeveloped financial institutions toward potentially EU-14 countries with well-developed financial institutions, and hence impact negatively the deficit in the current account. On the grounds of the positive relationship between real effective exchange rate and CAD, referring to the Keynesian absorption theory, appreciation, through its impact on the domestic production leads to a switch in spending from domestic to foreign goods due to cheaper imports and costly exports, leading to worsening of trade balance, thus increasing the deficit in the current account. The research outlines the importance of institutional performance on the level of current account balance of the SEE-6 and CE-EU-11 countries. In this regard, the study confirms that the efficiency of the institutions associated with transition progress, economic freedom, control of corruption and voice and accountability in the SEE-6 and CE-EU-11 countries is well established for allowing positive net exports of the respective countries, thus narrowing the deficit in the current account. On the other hand, the widening effect of institutional factors on CAD which are coming from political risk,

regulatory index, government effectiveness and legal and property rights, indicate that the country's' external balance on the current account balance is sensitive to misuse of constitutional means, governmental policies addressed for private sector developments, quality of public services and property rights, respectively, all of which are worsening the performance of external sector and obstructing export potentials, which via second round effect are contributing to the deficit in the current account.

8. CONCLUSION

The current account balance is an important indicator for macroeconomic stabilization policies. The descriptive part of the research confirms the presence of chronic CADs in SEE countries implying an excess of domestic absorption over aggregate supply/income, a case which is not evident for the CE-EU-11 countries. Therefore, the purpose of this research was firstly to examine empirically a CAD-FD nexus model in the SEE-6 and CE-EU-11 countries. In addition to the empirical examination of the nexus model, other macroeconomic, financial, and institutional-related determinants of the CAD are tested individually, over the 2000-2022 period using standard panel estimates from the FEDK standard errors with country and year fixed effects. FEDK estimates without year and country fixed effects and System GMM estimates are reported as a robustness check. Investigating institutional factors in relation to CAD for the SEE and CE-EU countries is a novelty approach undertaken in this study and adds value to the empirical evidence on the grounds of the tested hypothesis related to the impact of institutional performance on current account balance in the transition countries. The limitation of the research is about the impact of interaction between institutional-related factors and macroeconomic factors on current account balance, which on the other hand could be considered as important factors behind the performance of current account balance in the selected sample of countries. Hence, a fruitful direction for future research would be to treat such interactions, once considering that SEE countries, especially, went through many institutional challenges associated with integration tasks into the EU. From the forward-thinking standpoint, the SEE countries face a wide structural challenge as they struggle to regulate their national fiscal policies in consistency with the EU agenda to make their economies adjustable to the EU values. In terms of policy recommendations, the selected group countries should improve the institutional performance associated to good governance and speed up

the transition progress in order to end up with more efficient external sector, which could contribute to export potentials and hence improve the balance in the current account.

Endnotes

1 Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia and Serbia
2 Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia
3 This variable constitutes the main interest of the study.
4 Data source and variable description is shown in the appendix, table 5.

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Appendix

Table 3. Robustness check: Results from the Fixed Effects with Driscoll and Kraay standard errors

Dep. Variable CAD_{it}	(1) Regular variables	(2) SEE interaction	(3) Covid-19 interaction	(4) Financial crisis interaction	(5) Eurozone debt crisis interaction
FD_{it}	0.213***	0.246***	0.179**	0.182**	0.236***
	(0.0681)	(0.0709)	(0.0676)	(0.0654)	(0.0815)
$REER_{it}$	0.0323	0.0335	0.0256	0.0394	0.0291
	(0.0244)	(0.0243)	(0.0244)	(0.0232)	(0.0256)
$Y_{gap_{it}}$	-15.27***	-15.11***	-15.41***	-14.62***	-15.59***
	(4.265)	(4.305)	(4.211)	(4.331)	(4.331)
$X_{gap_{jt}}$	-0.387***	-0.381***	-0.484***	-0.345**	-0.358**
	(0.135)	(0.135)	(0.124)	(0.137)	(0.138)
FDI_{it}	-0.281***	-0.277***	-0.257***	-0.283***	-0.273***
	(0.0654)	(0.0691)	(0.0621)	(0.0659)	(0.0641)
GR_{it}	-0.166*	-0.167*	-0.200**	-0.170*	-0.158*
	(0.0906)	(0.0934)	(0.0720)	(0.0880)	(0.0897)
CPI_{it}	0.0655***	0.0651***	0.0670***	0.0627***	0.0693***
	(0.0181)	(0.0181)	(0.0192)	(0.0186)	(0.0179)
MSC_{it}	-0.0827***	-0.0831***	-0.0881***	-0.0816***	-0.0855***
	(0.0252)	(0.0250)	(0.0258)	(0.0257)	(0.0259)
TP_{it}	-1.238**	-1.285***	-1.226**	-1.218**	-1.254**
	(0.473)	(0.436)	(0.476)	(0.481)	(0.476)
EF_{it}	-3.510***	-3.542***	-3.397***	-3.480***	-3.515***
	(0.985)	(0.996)	(0.995)	(0.990)	(0.988)
LPR_{it}	1.624**	1.706**	1.474*	1.659**	1.513*
	(0.715)	(0.777)	(0.732)	(0.717)	(0.757)
RI_{it}	2.375***	2.347***	2.444***	2.336***	2.455***
	(0.698)	(0.689)	(0.716)	(0.679)	(0.711)
PR_{it}	-0.0254	-0.0244	-0.0225	-0.0253	-0.0253
	(0.0167)	(0.0172)	(0.0163)	(0.0169)	(0.0170)
CC_{it}	-0.111***	-0.110***	-0.110***	-0.110***	-0.112***
	(0.0333)	(0.0318)	(0.0335)	(0.0327)	(0.0335)
GE_{it}	0.180***	0.181***	0.172***	0.183***	0.180***
	(0.0429)	(0.0421)	(0.0419)	(0.0425)	(0.0415)
VA_{it}	-0.0996***	-0.102***	-0.106***	-0.110***	-0.0979***
	(0.0258)	(0.0282)	(0.0243)	(0.0273)	(0.0244)
$FD_{it} \times D_1$		-0.0947			
		(0.144)			
$FD_{it} \times D_2$			0.546***		
			(0.169)		
$FD_{it} \times D_3$				0.274	
				(0.169)	
$FD_{it} \times D_4$					-0.134
					(0.145)
Constant	10.38	12.05	12.69	11.27	11.97
	(8.694)	(8.204)	(8.791)	(8.512)	(8.483)
within R-squared	0.5855	0.5857	0.5968	0.5882	0.5872
Observations	391	391	391	391	391
Number of groups	17	17	17	17	17

Notes: The dependent variable CAD_{it}, is the CAD as a share of GDP. Standard errors in brackets, ***, **, and * indicate the significance of coefficients at 1, 5, and 10 percent, respectively. D_1 and D_2 denote the Westen Balkan and COVID-19 dummy, respectively, D_3 and D_4 denote the financial and eurozone debt crisis dummy, respectively.

Table 4. Robustness check: Results from the System GMM estimates

Dep. Variable CAD_{it}	(1) Regular variables	(2) SEE interaction	(3) Covid-19 interaction	(4) Financial crisis interaction	(5) Eurozone debt crisis interaction
CAD_{it-1}	0.652***	0.582***	0.624***	0.589***	0.613***
	(0.0973)	(0.107)	(0.0922)	(0.170)	(0.191)
FD_{it}	0.0834	0.0861	0.129	0.0974	0.129
	(0.202)	(0.221)	(0.156)	(0.240)	(0.232)
$REER_{it}$	0.0171	0.0300	-0.00852	0.0246	0.0315
	(0.0237)	(0.0279)	(0.0369)	(0.0528)	(0.0549)
$Y_{gap_{it}}$	-2.285	-8.375	-6.489	-7.235	-7.339
	(9.223)	(10.72)	(9.869)	(13.25)	(14.34)
$X_{gap_{jt}}$	-0.0348	-0.00377	-0.0928	0.00170	-0.0161
	(0.115)	(0.109)	(0.139)	(0.223)	(0.255)
FDI_{it}	-0.222***	-0.228***	-0.193**	-0.209*	-0.188
	(0.0747)	(0.0751)	(0.0885)	(0.110)	(0.113)
GR_{it}	-0.353**	-0.344**	-0.386***	-0.342*	-0.318*
	(0.141)	(0.137)	(0.130)	(0.176)	(0.174)
CPI_{it}	-0.00112	0.00117	0.000132	-0.00121	-0.00117
	(0.0109)	(0.0106)	(0.0120)	(0.0103)	(0.0102)
MSC_{it}	-0.0158	-0.0146	-0.00778	-0.0210	-0.0183
	(0.0196)	(0.0175)	(0.0222)	(0.0200)	(0.0224)
TP_{it}	-0.0323	-0.0118	0.0736	-0.0366	0.0203
	(0.0326)	(0.0423)	(0.125)	(0.327)	(0.329)
EF_{it}	-2.110***	-1.619**	2.919	-2.199	-0.423
	(0.672)	(0.696)	(6.278)	(9.761)	(9.576)
LPR_{it}	1.437**	1.677*	0.311	1.997*	1.755
	(0.577)	(0.836)	(1.686)	(1.111)	(1.147)
RI_{it}	1.143	1.324*	-1.137	1.690	0.248
	(0.842)	(0.743)	(2.888)	(8.728)	(8.828)
$FD_{it} \times D_1$		0.0724			
		(0.199)			
$FD_{it} \times D_2$			0.305		
			(0.284)		
$FD_{it} \times D_3$				0.0345	
				(0.246)	
$FD_{it} \times D_4$					-0.0886
					(0.136)
Constant	-1.001	-9.525	-13.94	-8.537	-11.16
	(4.605)	(8.651)	(16.97)	(15.45)	(14.95)
AR test (1), (2) in 1st diff.	(0.016), (0.601)	(0.015), (0.583)	(0.013), (0.499)	(0.025), (0.657)	(0.028), (0.628)
No of instruments	18	19	19	20	20
F statistics, (p value)	695.22	786.89	18.20	583.15	257.04
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Sargan test overd. rest, p	0.001	0.001	0.001	0.002	0.001
Hansen test overd. rest, p	0.308	0.435	0.376	0.002	0.348
GMM instruments for levels					
Diff. in Hans test for ex. of ins	0.157	0.172	0.128	0.183	0.180
Hans test for excluding groups	0.577	0.875	0.941	0.801	0.706
GMM (CAD_{it}, $collapse(x,y)$)	(1,2)	(1,2)	(1,2)	(1,2)	(1,2)
Hans test for excluding groups	0.577	0.071	0.073	0.328	0.260
Difference (null H = exog.)	0.431	0.910	0.798	0.382	0.408
GMM (FD_{it}, $collapse(x,y)$)	(2,3)	(2,3)	(2,3)	(2.4)	(2.4)
Hans test for excluding groups	0.162	0.193	0.270	0.191	0.147
Difference (null H = exogenous)	0.416	0.553	0.390	0.465	0.479
Observations (nr of groups)	374 (17)	374 (17)	374 (17)	374 (17)	374 (17)

Notes: Dependent variable CAD_{it}, is the CAD as a share of GDP. Standard errors in brackets, ***, **, and * indicate the significance of coefficients at 1, 5, and 10 percent, respectively. D_1 and D_2 denote the Westen Balkan and COVID-19 dummy, respectively, D_3 and D_4 denote the financial and eurozone debt crisis dummy, respectively. x, y denote the lag limits used for endogenous regressors.

Table 5. Variable description and data source

Variables	Definition	Expected sign of each regressor in	Estimated sign of each regressor	Source
CAD_{it}	CAD as a share of GDP			IMF, world economic outlook (WEO), database of January 2024-a, 2024-b and 2024-c
FD_{it}	FD, Government structural balance as a percentage of potential GDP, general government cyclicality adjusted balance for nonstructural elements, beyond the economic cycle.	+	+	World Bank (2024-a) World Economic Outlook
$REER_{it}$	Real Effective Exchange Rate	+/-	+	IMF - International Monetary Fund (2024-d)
$Y_{gap_{it}}$	Cyclical components of output gap in SEE-6 and CE-EU-11 countries. Measured as a percentage difference of actual GDP (aggregated demand) from trend – potential GDP, (aggregate supply), as calculated with the Hodrick-Prescott filter.	-/+	-	Own calculation using data of GDP from IMF, world economic outlook (WEO), database of January 2024-e
$X_{gap_{jt}}$	Cyclical components of output gap in EU-14 countries. Measured as a percentage difference of actual GDP (aggregated demand) from trend – potential GDP, (aggregate supply), as calculated with the Hodrick-Prescott filter	-/+	-	Own calculation using data of GDP from IMF, world economic outlook (WEO), database of January 2024-e
FDI_{it}	Net inflow of Foreign direct investment as a percentage of GDP, data sourced from World Bank	-/+	-	World Bank (2024-e)
GR_{it}	Economic growth. Percentage change of real GDP	-/+	-	IMF - world economic outlook (WEO), database of April 2024-e
CPI_{it}	Consumer Price Index, end of period	+	+	World Bank (2024-f)
MSC_{it}	Monetary sector credit to private sector (% GDP)	+/-	-	World Bank (2024-g)
TP_{it}	For calculation of transition progress measurement, four EBRD transition indicators are included, such are: the index of infrastructure reform, the index of foreign exchange market (FOREX) and trade liberalization, the index of banking sector reforms and the index of non-bank financial institutions following Mrak and Rojec, 2013;	-	-	EBRD (2024)
EF_{it}	Economic freedom	-	-	Fraser Institute (2024)
LPR_{it}	Legal and property rights	-	+	Fraser Institute (2024) World Bank (2024-c)
RI_{it}	Regulation index, in percentile rank	-	+	Fraser Institute (2024)
PR_{it}	Political risk, in percentile rank	-	+	World governance indicator, World Bank (2024-d)
CC_{it}	Control of corruption, in percentile rank	-	-	World governance indicator, World Bank (2024-d)

GE_{it}	Government effectiveness, in percentile rank	-	+	World governance indicator, World Bank (2024-d)
VA_{it}	Voice and Accountability, in percentile rank	-	-	World governance indicator, World Bank (2024-d)
d_1	d_1 stands for the SEE Countries and $d_1=0$, captures the benchmark category of the CE-EU member states			Own knowledge
d_2	d_2 stands for the pandemic year of 2020 and $d_2=0$ captures the benchmark category of the normal years without pandemic			Own knowledge
d_3	d_3 stands for the global financial turmoil year of 2008 and $d_3=0$ is for the rest years			Own knowledge
d_4	d_4 stands for Eurozone debt crisis period, considering the years from 2009 to 2012 and $d_4=0$ is the benchmark category of the years without such crisis,			Own knowledge

Source: Authors' calculations