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# Testing the Triple Deficits in the Emerging Economies of Europe

**Summary:** In the literature, increases in the ratio of current deficit to gross domestic product (GDP) are considered a crisis indicator, and budget and savings deficits are deemed to be significant causes of the current deficit. This situation, called the triple deficit hypothesis in the literature, is analyzed with the panel dynamic ordinary least square (panel DOLS) and fully modified ordinary least squares (FMOLS) using 2000-2019 data for Bulgaria, Czechia, Estonia, Latvia, Lithuania, Hungary, Malta, Romania, and Slovenia, which are generally referred to as the emerging economies of Europe. The results showed a long term relationship between the variables. Accordingly, budget and private savings deficits increase the current deficit in the long term. The causality analysis found a reciprocal causal relationship between the variables, such that while budget and private savings deficits cause an increase in the current deficit, increases in the current deficit also increase the budget and private savings deficits. Thus, the triple deficit hypothesis is valid in these countries.

**Keywords:** Triple deficit, Current deficit, Budget deficit, Private savings deficit.

**JEL:** E60, F30, H62.

There are many studies in the literature focusing on budget deficits observed along with the current account deficit after 1980. In this case, it is believed that there is a relationship between the budget deficit and the current account deficit and that increases in budget deficits cause an increase in the current account deficit. However, the fact that the current account deficit has increased while the budget deficit decreased necessitates a reconsideration of the relationship between these two variables. Therefore, the concept of a twin deficit was expanded by adding private sector savings and investment balance to the equation (Hüseyin Şen and Ayşe Kaya 2020, pp. 465-466).

The reason the private sector savings deficit is included in the evaluation is that under the current conditions, the need to make investments to the extent of creating savings is eliminated. With the liberalization of capital movements, it is possible to invest on a larger scale than just domestic savings. In such a situation, if emerging financing needs are met from abroad, the savings-investment deficit, just like the budget deficit, should be expected to play a role in the current deficit (Yusuf Ekrem Akbaş, Fuat Lebe, and Fatma Zeren 2014, p. 139).

The study tested the triple deficit hypothesis, which focuses on the relationship between the current account balance, the budget balance, and the private sector savings balance for nine developing countries using data from the period 2000-2019. In testing

the triple deficit hypothesis, cointegration relationship and causality analysis tests are utilized. In this context, the study first investigates the cointegration relationship between savings deficit, current account deficit, and budget deficit to determine whether the variables affect each other in the long run. If there is a relationship in the long run, causality analysis is performed in the short run to determine the direction of the relationship between the variables. In this respect, causality analysis is applied in this study.

In Sections 1 and 2 of this paper, the theoretical and empirical literature on the triple deficit hypothesis is examined. Section 3 contains the descriptive and explanatory statistical information of the data used in the empirical section of the study and explains the econometric method used. Section 4 presents the results of the panel cointegration test as well as the other test results. The last section is reserved for the evaluation of the results obtained.

## 1. Theoretical Literature

Today, policymakers and economists accept that the main determinant macroeconomic variables for ensuring stability in the short and long terms are the current account balance, the budget balance, and the saving balance. The twin deficit hypothesis, focusing on the relationship between the budget deficit and the current account deficit, constitutes the focus of various studies on the subject. Additionally, since insufficient savings cause both the budget deficit and the current account deficit, private sector savings were also included in the scope, and the triple deficit hypothesis model rose to prominence. The concept of a triple deficit has gained importance because the current account deficit has increased in many developed countries, while their budget deficits tend to decrease (Merter Akıncı and Ömer Yılmaz 2012, pp. 2-3).

Two different explanations have been offered of the relationship between the budget deficit and the current account deficit. While the first of these explanations suggests that the budget deficit directly or indirectly causes the current account deficit, the second suggests that a relationship cannot be established between the two variables. While the Keynesian income-expenditure approach and the Mundell-Fleming model are among the explanations that accept the existence of a relationship between these variables, the second view is called the Ricardian equivalence hypothesis (Farzane Bagheri, Khosrow Piraee, and Salma Keshtkaran 2012, p. 78).

According to the Keynesian view, decreasing tax rates or increasing public expenditures will reduce national savings and cause a budget deficit. However, due to the increase in total demand, national income will also increase, and this will cause a current account deficit through imports (N. Gregory Mankiw 2015, p. 406). The indirect effect of the budget deficit on the current account deficit is that the increase in budget deficits causes a current account deficit through increased interest rates (Şen and Kaya 2020, pp. 10-11).

Contrary to the Keynesian view, the Ricardian equivalence hypothesis suggests that the budget deficit due to tax reliefs will not affect the current account balance. For example, when public spending is considered constant and no limits are set on borrowing, the tax relief will not make any difference in national savings. The citizens will predict that the current tax relief will cause an increase in tax rates in the future;

therefore, the budget deficit will be balanced with the increase in private savings. Consequently, it would not be wrong to state that this policy will not affect the current account balance (George A. Vamvoukas 2010, p. 1094).

Theoretically, it is possible to show the concept of the triple deficit through national income accounts. Under the open economy assumption, national income is calculated using Equations (1) and (2), as follows:

$$Y = C + I + G + (X - M), \tag{1}$$

$$Y = C + S + T. \tag{2}$$

In Equation (1), *C* refers to private sector expenditures, *I* to investment, *G* to public expenditures, *X* to exports, and *M* to imports. In Equation (2), national income is expressed in terms of total personal income, *S* refers to savings, and *T* refers to taxes. Using Equations (1) and (2), Equation (3) is obtained, as follows:

$$I + G + X = S + T + M. \tag{3}$$

If we rewrite Equation (3), we will have Equation (4), as follows:

$$(X - M) = (S - I) + (T - G). \tag{4}$$

According to Equation (4), the total of the private sector savings-investment balance and the public sector income-expenditure balance is equivalent to the current account balance. If the balances in Equation (4) have deficits, $(S - I)$ will be called the savings deficit, $(T - G)$ will be called the budget deficit, and $(X - M)$ will be called the current deficit. The relationship between the budget deficit $(T - G)$ and the current deficit $(X - M)$ in this equation is regarded in the literature as the twin deficit hypothesis (Bagheri, Piraee, and Keshtkaran 2012, pp. 78-79). The triple deficit hypothesis refers to a situation in which the savings deficit and the budget deficit cause the current account deficit (Akbaş, Lebe, and Zeren 2014, p. 139).

The concept of a triple deficit emerged because despite decreasing budget deficits, many countries are unable to achieve improvements in their current account balance (Gyorgy Szakolczai 2006, p. 41). This phenomenon is often observed in countries that are trying to grow beyond their potential, despite insufficient domestic savings. The budget and savings balance in the equation is called internal balance, and the foreign trade balance is called external balance. Based on the equation, while both internal balances have a deficit, the current account balance is expected to have a deficit in the same amount (Bagheri, Piraee, and Keshtkaran 2012, p. 79). This situation, which can be called the balance of imbalance, gains importance in determining alternative policies with regard to the changes that will occur in the three balance elements (Hilmi Çoban and Eda Balıkçıoğlu 2016, p. 272).

## 2. Empirical Literature

Although there are many studies in the literature on the twin deficit hypothesis, there have been only a few studies of triple deficits where the savings-investment balance is included. It is safe to say that a triple deficit is generally observed in countries that are attempting to grow beyond their potential despite their insufficient domestic savings rates. Therefore, studies of triple deficits have mainly examined developing countries.

Of course, there are also studies in the literature testing the triple deficit hypothesis in the economies of developed countries.

A study that tested the existence of the twin and triple deficit hypotheses for 15 European Union member states using data on net savings, budget, and current account balance for the period 2002-2013 found that the triple deficit hypothesis was only valid for Poland, Portugal, Spain, and Sweden (Süleyman Bolat, Süleyman Değirmen, and Ahmet Şengönül 2014, p. 610). Another study in which the authors expanded the scope of the group of included companies and increased the number of countries to 23 European countries yielded results supporting the twin and triple deficits and also noted that there were countries where causality among the variables could not be determined (Bolat, Değirmen, and Şengönül 2015).

Another study in which the 2002-2013 data of 24 transition economies were assessed with dynamic panel data analysis concluded that the findings did not support the existence of the triple deficit. The study did not determine a relationship between the current account deficit and the savings deficit (Çoban and Balıkçıoğlu 2016, p. 278).

Another study for the examination of the validity of the twin and triple deficit hypothesis focused on the six post-communist countries, namely Russia, Poland, Ukraine, Romania, the Czech Republic and Hungary. By using the data for the period 1985-2015, the authors conclude that there was no relationship between the variables, budget deficits, external deficits, and private saving-investment deficits. In other words, they confirm the Ricardian view (Şen and Kaya 2020, pp. 479-482).

The validity of the triple deficit hypothesis for the period 1998-2014 was tested in BRIC (Brazil, Russia, India, and China) and MINT (Mexico, Indonesia, Nigeria, and Turkey) countries. The study evaluated the two groups of countries separately and obtained results supporting the triple deficit hypothesis in BRIC countries and the twin deficit hypothesis in MINT countries. A one-way causal relationship was determined between the savings deficit and the current account deficit and between the savings deficit and the budget deficit in MINT countries with a twin deficit (Feyza Balan 2016, p. 68).

For five South Asian countries, namely India, Pakistan, Bangladesh, Sri Lanka, and Nepal, the triple deficit hypothesis was tested using 1985-2015 data, and it was found that the budget deficit and the savings deficit had a positive effect on the current account balance. The causality test revealed that the savings deficit was the cause of the budget balance and the current account balance; and that there was a two-way causality between the budget deficit and the current account deficit. The study revealed the validity of the triple deficit hypothesis (Shruti Shastri, A. K. Giri, and Geetilaxmi Mohapatra 2017, p. 292).

Using data for the period 2005-2017, the triple deficit hypothesis was tested for 23 upper-middle-income countries adopting the World Bank classification. The causality test conducted in the study determined that there is one-way causality from the budget deficit to the current account deficit and a two-way causal relationship between the current account deficit and the savings deficit and between the savings deficit and the budget deficit. Consequently, results supporting the triple deficit hypothesis were obtained for the studied period for the examined countries (Şenay Saraç 2019, p. 90).

Based on this theory, Australia aimed to have a surplus in the budget to take control of the current deficit, which reached 4% of the GDP; however, the desired result could not be achieved. In theory, although it is accepted that budget deficits successively affect the current account balance through interest rates and exchange rates, it has also been observed that each has separate effects. Therefore, apart from the budget deficit, other factors affecting the current account deficit, such as the real interest rate and the real exchange rate, are included in the regression model. Consequently, the Ricardian equivalence hypothesis was supported in a study for the period 1983-1989 (L. E. Winner 1993, p. 83).

An attempt was made to explain the current account deficit by the savings-investment, budget, and trade deficits using the autoregressive distributed lag (ARDL) method, which was preferred for testing triple deficits for Sri Lanka in the period 1970-2005. The study concluded that an increase in the budget deficit and the savings deficit variables increased the current account deficit; in other words, the triple deficit hypothesis was valid (Khorshed Chowdhury and Ali Salman Saleh 2007, pp. 16-17).

A study conducted using data from the United States of America (USA) for the period 1960-2013 concluded that the capital and financial account balances, including the financial balance, the current account balance, and the balance of payments, move together in the long term; in other words, they are cointegrated. The study also concluded that the financial balance and financial account of the current account can be attributed to the Granger cause (Tuck Cheong Tang 2014, p. 10).

A study covering data for the period 1980-2014 for Pakistan determined that the current account deficit and the budget deficit, and the capital and financial account deficits are interrelated in the long term and that the causality in the relationship is from the current deficit to the budget deficit and the capital and financial accounts. These results verify the validity of the triple deficit hypothesis (Wajid Ali and Azizullah Kakar 2017, p. 8).

## 3. Data Set and Econometric Method

### 3.1 Data Set

The sample of the study consists of the countries that joined the European Union in the 2000s. The majority of these countries are former communist countries and are now called developing European countries. The selected countries are Bulgaria, Czechia, Hungary, Romania, and Slovenia from Central European countries; Estonia, Latvia, and Lithuania from North Eastern European countries; and finally, Malta. This sample selection constitutes the originality of the study since the test of the triple deficit hypothesis in these countries has not been adequately analyzed in the literature, and availability of the data on the variables was a significant factor in determining the countries to be included in the study.

The data used in this study consist of the current account balance, the budget balance, and the private sector savings balance. Data for nine countries for the period 2000-2019, with measurements in each country's national currency, were obtained from the AMECO database. The study period started in 2000 due to data limitations. Although some countries in the sample have data for earlier years, data for all three

variables are available for all countries in the sample from 2000 onwards. The main reason for limiting the sample to nine countries is the lack of data in other countries with similar characteristics for the relevant period. Therefore, the study period is set as 2000-2019.

The budget balance, the current account balance, and the private sector savings balance data were included in the analysis in proportion to the gross domestic product (GDP) as measured in the national currencies of the included countries. Definitions of data and other details are provided in Table 1.

**Table 1** General Information on Variables

| Variables | Definition | Period | Source |
|---|---|---|---|
| CAB | Current account balance (% GDP) | 2000-2019 | AMECO |
| BB | Budget balance (% GDP) | 2000-2019 | AMECO |
| SIB | Private sector saving-investment balance (% GDP) | 2000-2019 | AMECO |

**Source:** Authors' calculations.

Descriptive statistical information showing the central tendency and central distribution of the data is provided in Table 2. In Table 2, while the arithmetic mean indicates the central tendency of the data, the standard deviation and maximum and minimum values indicate the central distribution measure of the data.

**Table 2** Descriptive Statistics for Variables

| Variables | #of observations | Average | Std. deviation | Min. value | Max. value |
|---|---|---|---|---|---|
| CAB | 180 | −0.01 | 0.04 | −0.19 | 0.11 |
| BB | 180 | −0.01 | 0.02 | −0.14 | 0.03 |
| SIB | 180 | 0.05 | 0.04 | −0.07 | 0.17 |

**Source:** Authors' calculations.

As is evident in Table 2, the data set used consists of a total of 180 observations covering 20 years and nine units. While the current account and budget deficits of the countries used in the sample take a negative value, the private savings balance takes a positive value. Within this context, it is safe to say that the countries that constitute the study sample generally have current account deficit and budget deficit problems.

## 3.2 Econometric Method

The triple deficit hypothesis is tested using the panel cointegration analysis method for the countries that constitute the study sample. However, before estimating the cointegration analysis, the properties of the panel data should be determined. Within this context, testing the assumptions of cross-sectional dependence among the units of panel data analysis and the homogeneity of the panel data plays an important role in the selection of effective and consistent tests to be used in cointegration analysis. The test that will be effective in stationarity analysis is determined according to the cross-sectional dependence result. While first-generation panel unit root tests are used in cases with no cross-sectional dependence, second and third-generation panel unit root

tests, which consider the cross-sectional dependence, are used in cases with cross-sectional dependence.

Whether there is a correlation between units is investigated using Pesaran (M. Hashem Pesaran 2004) cross-section dependence (CD) and Breusch-Pagan (Trevor S. Breusch and Adrian R. Pagan 1980) Lagrange multiplier (LM) tests.

The analysis of the mutual cointegration relationship between variables is carried out by estimating the model provided in Equation (5).

$$CA_{it} = \partial_{it} + \rho BD_{it} + \beta PSI_{it} + \mu_{it} . \quad (5)$$

Since the panel consisting of the data used in the study is heterogeneous, Westerlund (Joakim Westerlund 2007) panel cointegration analysis, which gives consistent and effective results in heterogeneous panels, is used.

The direction and magnitude of the long-run relationship between the variables are determined by the Fully Modified Least Squares (FMOLS) method developed by Peter Phillips and Bruce Hansen (1990) and the Dynamic Least Squares (DOLS) method developed by James H. Stock and Mark W. Watson (1993). Among these methods, the FMOLS method corrects deviations in standard fixed effect estimators (due to problems such as autocorrelation and heteroskedascity), while the DOLS method is a method that can also correct deviations in static regression (especially due to endogeneity problems) by including dynamic elements in the model.

## 4. Empirical Findings

Initially, a cross-sectional independence test, which examines whether there is a correlation between units, was carried out in this study. Whether there is a correlation between units is investigated using the Pesaran (2004) CD and Breusch-Pagan (1980) LM tests. According to the test results in Table 3, there is cross-sectional dependence between units among the three variables. Since the variables have cross-sectional dependence, stationarity analysis is carried out using the Pesaran (2007) cross-sectionally augmented Dickey Fuller (CADF) panel unit root test, which takes cross-sectional dependence into account in the stationary analysis. Test results are provided in Table 4.

**Table 3** Cross-Sectional Dependence Test

| Variables/Tests | Breusch-Pagan LM | Pesaran CD |
|---|---|---|
| CAB | 309,6195 (0.0000) | 16,80736 (0.0000) |
| BB | 123,0029 (0.0000) | 7,173950 (0.0000) |
| SIB | 189,6556 (0.0000) | 10,19550 (0.0000) |

**Notes:** The values in parentheses show the tests' probability values.

**Source:** Authors' calculations.

Since the panel CADF test statistics values provided in Table 4 have smaller absolute values than critical values, the basic hypothesis suggesting that the panel is not stationary cannot be rejected. Therefore, CAB, BB, and SIB variables are not stationary in terms of level values.

**Table 4** Pesaran CADF Test Results, I(0)

| Variables | T-bar statistic | Critical value (5%) | Probability |
|---|---|---|---|
| CAB | −1.805 | −2.340 | 0.414 |
| BB | −1.815 | −2.340 | 0.402 |
| SIB | −2.179 | −2.340 | 0.095 |

**Source:** Authors' calculations.

One of the basic assumptions of the cointegration test is that the variables are stationary in the same grade. The differences in the variables were noted, and stationarity analysis of the variables was conducted in line with this assumption. The stability analysis results of the variables' difference values are provided in Table 5. The basic hypothesis stating that the variables are not stationary was refuted since the T-bar statistical values of the variables were greater in absolute value than the 5% critical values. The tests' probability values also indicate rejection of the basic hypothesis. Therefore, it is concluded that the difference of variables is stationary I(I).

**Table 5** Pesaran (2007) CADF Test Results, I(I)

| Variables | T-bar test statistics | Critical value (5%) | Probability |
|---|---|---|---|
| CAB | −2.846 | −2.340 | 0.001 |
| BB | −3.249 | −2.340 | 0.000 |
| SIB | −3.043 | −2.340 | 0.000 |

**Source:** Authors' calculations.

Besides stationarity analysis, it is necessary to identify whether the panel data are homogeneous or heterogeneous in order to determine the appropriate cointegration test. Accordingly, Table 6 provides the results of the Swamy (P. A. V. B. Swamy 1970) S test, which was applied to determine whether the panel data are homogeneous or heterogeneous.

**Table 6** Swamy (1970) S Homogeneity Test

| Test | $\chi^2$ statistic | Prob. |
|---|---|---|
| Swamy S test | 86.05 | 0.0000 |

**Source:** Authors' calculations.

As is evident in Table 6, the basic hypothesis was rejected based on the $\chi 2$ test statistics and the probability value, and it was concluded that the parameters were not homogeneous; in other words, they varied from unit to unit. Therefore, the Westerlund (2007) panel cointegration test, which provides effective and consistent results in heterogeneous panels, was preferred for estimating the cointegration relationship between the series. The estimation results of the cointegration relationship between the current account balance and the savings investment balance are provided in Table 7.

**Table 7** Westerlund (2007) Panel Cointegration Test Results between the Variables Current Account and Saving Investment Balance

| Test statistics | Test statistics values | Probability values |
|---|---|---|
| $G_t$ | −3.646 | 0.000 |
| $G_a$ | −16.511 | 0.019 |
| $P_t$ | −10.540 | 0.000 |
| $P_a$ | −12.446 | 0.040 |

**Source:** Authors' calculations.

The null hypothesis that there is no cointegration between the series according to the probability values of the Gt, Ga, Pt, and Pa test statistics used in the cointegration analysis is thus rejected according to the four test statistics in Table 7. Accordingly, it is concluded that there is a long term relationship between the current account balance and the private savings balance and that they act together in the long term. Table 8 provides the results of the cointegration test between the current account balance and the budget balance.

**Table 8** Westerlund (2007) Cointegration Test Results between the Variables Current Account and Budget Balance

| Test statistics | Test statistics values | Probability values |
|---|---|---|
| $G_t$ | −3.545 | 0.000 |
| $G_a$ | −16.393 | 0.021 |
| $P_t$ | −7.975 | 0.028 |
| $P_a$ | −9.616 | 0.370 |

**Source:** Authors' calculations.

The null hypothesis is rejected based on the three test statistics in Table 8. Accordingly, it is concluded that there is a cointegration relationship between the current account balance and the budget balance and that they act together in the long term.

**Table 9** Westerlund (2007) Cointegration Test Results between the Variables Saving Investment and Budget Balance

| Test statistics | Test statistics values | Probability values |
|---|---|---|
| $G_t$ | −4.348 | 0.000 |
| $G_a$ | −24.365 | 0.000 |
| $P_t$ | −9.339 | 0.000 |
| $P_a$ | −14.087 | 0.005 |

**Source:** Authors' calculations.

Table 9 provides the results obtained from testing the cointegration between the savings investment balance and the budget balance. The null hypothesis is rejected based on the four test statistics. Accordingly, it is concluded that there is a long term relationship between the private savings balance and the budget balance.

Panel pooled DOLS estimation was performed after the determination of the cointegration relationship between the series to determine the direction and coefficients of the cointegration model, i.e., the long term relationship, thus estimating the

long term coefficients in the panel. Panel pooled DOLS estimation and FMOLS estimation results are provided in Table 10.

**Table 10** Panel DOLS and FMOLS Estimation Results

| Countries/Dependent variable (CA) | *BD* | *SI* |
|---|---|---|
| Panels DOLS estimation results (pooled) | | |
| Panel | 0.2915**<br>(7.294) | 0.6399**<br>(9.384) |
| Panels FMOLS estimation results | | |
| *Panel* | 2.0628*** | 0.3859*** |

**Notes:** **, and *** denotes that the coefficients are statistically significant at the 5% and %1 significance level, respectively.

**Source:** Authors' calculations.

Table 10 shows the long term cointegration coefficients for the entire panel. The long term cointegration coefficient between the current account deficit and the budget deficit is observed in Column 2 in Table 10. The coefficient is positive and statistically significant throughout the panel. In other words, an increase in the budget deficit generally increases the current account deficit, such that a one-unit increase in the budget deficit increases the current account deficit by 0.29 units. Similarly, the FMOLS estimation shows the same results. Namely, an increase in the budget deficit generally increases the current account deficit. In other words, a one-unit increase in the budget deficit increases the current account deficit by 2.06 units.

Column 3 in Table 10 contains the long term coefficients between the current account deficit and the private savings deficit. The long term coefficient is positive and statistically significant throughout the panel. There is a positive relationship between the private savings deficit and the current account deficit in the long term. The increase in the private savings deficit also has an increasing effect on the current account deficit, such that a one-unit increase in the private savings deficit increases the current account deficit by approximately 0.64 units. Similarly, a positive relationship was found according to FMOLS estimation. Namely, one-unit increase in the private savings deficit increases the current account deficit by approximately 0.38 units.

**Table 11** VECM Model Estimation Results

| Dependent variable: CA | Coefficient | t-statistics |
|---|---|---|
| ECT(-1) | -0.168** | -2.18 |
| D(CA(-1) | 0.074 | 0.794 |
| D(CA(-2) | -0.070 | -0.738 |
| D(BD(-1) | 0.483*** | 4.546 |
| D(BD(-2) | 0.484*** | 3.679 |
| D(SA(-1) | 0.041 | 0.309 |
| D(SA(-2) | 0.346** | 2.412 |

**Notes:** ** and *** indicates statistically significant at % 5 and %1, respectively.

**Source:** Authors' calculations.

Since there is a cointegration vector between the variables, the cointegration relationship should be taken into account when conducting causality analysis. For this reason, the VECM model is estimated between cointegrated variables and causality

analysis is performed based on the model estimation. In the absence of cointegration relationship between variables, causality analysis is performed by estimating the classical VAR model. In this context, since there is a cointegration relationship between the variables, the VECM model shown in Table 11 was estimated and causality analysis was performed through this model. As expected in the estimated model, the coefficient of adjustment was found to be negative (-0.168) and statistically significant. Table 11 presents the results of short term causality analysis among the variables.

According to the panel causality analysis results reported in Table 12, a causal relationship is observed from the budget balance and the private savings balance to the current account balance. Similarly, there is a causal relationship from the current account balance and the private savings balance to the budget balance. There is also a causal relationship from the current account balance and the budget balance to the private savings balance. This result indicates that there is a bidirectional causality relationship between the variables.

**Table 12** Panel Causality Analysis Results

| Variables | Chi-square test statistics | Probability value |
|---|---|---|
| *BB→CAB* | 6.789 | 0.009*** |
| *SIB →CAB* | 52.163 | 0.000*** |
| *PANEL* | 5.936 | 0.001*** |
| *CAB →BB* | 23.465 | 0.009*** |
| *SIB →BB* | 68.391 | 0.000*** |
| *PANEL* | 24.315 | 0.000*** |
| *CAB →SIB* | 78.160 | 0.000*** |
| *BB →SIB* | 10.562 | 0.014** |
| *PANEL* | 10.562 | 0.014** |

**Notes:** ** indicates a 5% significance of the causal relationship *** indicates a 1% significance.

**Source:** Authors' calculations.

## 5. Conclusion

Since the current account balance is an important macroeconomic variable for many countries, there have been many studies aimed at preventing this variable from increasing with respect to the GDP. The twin balance hypothesis argues that budget deficit created by governments have a negative effect on the current account balance and that increases in budget deficits also cause the current account deficit. Of course, there are various explanations for the relationship between these two macroeconomic variables. For example, while according to the Keynesian view, an increase in the budget deficits may have an indirect or direct effect on the current account balance, the Ricardian view suggests that a decrease in public savings will not have an impact on the current account balance, since it will be compensated for by prescient economic units through increased private sector savings.

While addressing the budget balance and current account balance in the twin deficit hypothesis, the fact that there are studies with different results than predicted has highlighted the need to elaborate the hypothesis. Based on this need, and especially the idea of liberalization that prevailed in the 1980s, private sector savings were also included in this equation. As a result of the liberalization of capital, the capital

requirements met by foreign sources have become a factor that directly affects the current account balance through exchange rates. Therefore, the equation used in the twin deficit hypothesis was expanded by adding the private sector savings balance, and the modified version is called the triple deficit hypothesis.

In the triple deficit hypothesis, which was first applied to developing countries with high capital needs and then tested using the data of developed countries, different results were obtained according to the country, the data, and the method used, as is the case in every empirical study. Therefore, there are studies supporting the triple or twin deficit hypothesis, or the Ricardian equivalence hypothesis.

Within the scope of this study, the data for Bulgaria, Czechia, Latvia, Lithuania, Hungary, Malta, Romania, and Slovenia (developing European countries) were taken from the European Commission's AMECO database, and the validity of the triple deficit hypothesis for the specified countries was empirically tested.

The empirical results obtained in the study show that there is a cointegration relationship between the current account balance, the budget balance, and private savings in the countries that constitute the study sample. In other words, the cointegration test result determined that the variables act together in the long term and affect each other. The long term coefficient estimates suggest that there is a positive relationship between the budget balance and the current account balance. This means that the increase in budget deficits in these countries will increase the current account deficits in the long term. There is a similar situation between the current account balance and the private saving-investment balance. Accordingly, the increase in the private savings balance negatively affects (increases) the current account deficits. Additionally, the current account deficits also have an increasing effect on the budget deficit and the private savings deficit in the long term, which is another important finding of the study.

The causality analysis results show that the savings deficit and the budget deficit are important determinants of the current account deficit. In this sense, it was determined that the savings deficit and the budget deficit are the causes of the current account deficit in the mentioned countries and that there is a causal relationship from the current account deficit to the budget and savings deficits. This can be considered an indicator that the current account deficit, the savings deficit, and the budget deficit trigger each other in the sampled countries. Based on these conclusions, it is safe to say that the triple deficit hypothesis is valid in the countries that constitute this study's sample.

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