TWIN DEFICITS AFTER COVID PANDEMIC: EVIDENCE FROM CENTRAL EUROPEAN COUNTRIES

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Abstract

Twin deficit hypothesis states that there is a positive correlation between budget and trade deficits. The widely accepted Keynesian approach explains their correlation through the changes of interest rates and domestic currency appreciation. As a result, causal relationship leading from budget imbalance to external imbalance can be expected.

This paper is focused on testing the twin deficit hypothesis in 5 Central European countries – Austria, Czechia, Hungary, Poland and Slovakia. The regression model based on quarterly OECD data covering 2010-2022 period provides some mixed results as Czechia and Hungary show positive correlation between deficits and current account balances. However, results for remaining countries do not support the traditional twin deficit hypothesis. When analyzing the covid-19 effects, it was shown that the linkage between fiscal and external balances weakened in all countries from the sample during the years of pandemic.

I. Introduction

In recent years, the twin-deficit hypothesis, positing a causal linkage between fiscal deficits and current account deficits, has regained prominence and taken center stage in policy discussions. This proposition initially appeared during the 1980s when a notable deterioration in the U.S. current account balance coincided with a substantial upsurge in the federal budget deficit. Since then, many theoretical and empirical studies have been published on this topic. While the results, although mixed, mostly confirm the correlation of fiscal and external imbalances, the results are significantly different in terms of causality and transmission mechanism between the two variables.

In this paper, we focus on testing the twin deficit hypothesis in Central European countries, namely Austria, Czechia, Hungary, Poland and Slovakia. The objective is to examine a) whether the correlation between fiscal and trade deficits exists in selected countries and b) whether their relationship was affected by economic changes (both internal and external) connected withCovid-19 pandemic.

The rest of the paper is organized as follows. Section 2 provides brief review of relevant literature. Theoretical framework is presented in section 3. The data, model specification and empirical findings are provided in section 4. The final section concludes the study.

II. Literature Review

The relationship between budget and current account deficits started to draw researchers' attention in the 1980's. At that time record budget deficit and current account deficit emerged in many countries, including the United States. The twin deficits hypothesis asserts that an increase in budget deficit will cause a similar increase in current account deficit (see section 3 for further details). However, the results turned to be really mixed. They differ even in case of using different econometric techniques and model specifications for the same country data. Many studies supported widely accepted argument by Feldstein (1986) that assumed causal relationship from budget to trade deficits,

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like Abell (1990), Islam (1998), Vamvoukas (1999), Aqeel and Nishat (2000), Leachman and Francis (2002), Cavallo (2005) and Erceg, Guerrieri, and Gust (2005), Furceri and Zdzienicka (2018) or Afonso and Coelho (2023). However, other researchers such as Laney (1984), Bernheim (1987), Miller and Russek (1989), Dewold and Ulan (1990), Enders and Lee (1990), Boucher (1991), Winner (1993), Kim (1995), Papaioannou, Kei-Mu Yi (2001) and Kaufmann et al. (2002) did not find a stable long-run relationship between the two deficits. Darrat (1988), Kearney and Monadjemi (1990) and Normandin (1999) have reported evidence supportive of bi-directional causality between the twin deficits. Some studies as Anoruo and Ramchander (1998) or Alkswani (2000) support the reverse causality running from current account to budget deficit. Studies with really mixed results (Gale and Orszag (2003) or Reitschuler and Crespo Cuaresma (2004) can be also found.

III. Theoretical Framework

Economic reasoning for connection between budget deficit and current account balance may be obtained from elementary macro identities. Let's start with the national income identity,

$$Y = C + I + G + (X - M) \tag{3.1}$$

where Y, C, I and G stands for national income, private consumption, investment spending and government expenditures respectively. X and M represents values of exports and imports of goods and services.

Total national savings can be created both by private and public sector. Hence, we can write

$$S = S_P + S_G \tag{3.2}$$

where S stands for total national savings, while S_P and S_G represents private and public savings. As private savings are a result of excess national income over private consumption and taxes paid (T), we get

$$S_P = Y - C - T \tag{3.3}$$

Public savings arise from difference between government revenues and government expenditures(G), hence

$$S_G = T - G \tag{3.4}$$

Combining relationships stated above, current account balance cen be expressed as

$$NX = (Y - T - C) + (T - G) - I, \text{hence } \boldsymbol{NX = S - I} \tag{3.5}$$

or better

$$NX = (S_P - I) + (T - G) \tag{3.6}$$

Based on the equation (3.6) we can state that for given extent to which the investment is financed by private savings, the current account balance (approximated by NX) and budget balance should move together (i.e. they are TWINS).

Keynesian View

Although we demonstrated that budget and trade deficit should change in the same direction, there's been a huge theoretical debate about the causality and trasmission mechanism between them. The most common (Keynesian) view is based on simple IS-LM (or better, IS-LM-BP) analysis. If budget deficits are financed domestically, it should lead to higher demand for loanable funds and result in higher interest rates. If they are financed by foreign capital inflows, it should lead to higher demand for domestic currency. Both situations cause currency appreciation and consequently fall of net exports. However, Keynesian approach works even in fixed exchange rate regime. Increased national income caused by budget deficit pushes the demand for imported goods and services up. As a result, trade deficit occurs. We can conclude that the described mechanism assumes the causality leading from budget balance to trade balance.

Ricardian View

Ricardian view (although connected to the name of David Ricardo, mainly based on famous paper by Robert Barro (1974)) is based on the equivalence of taxes and debt as methods of financing the government expenditures. Assuming rational forward-looking agents with infinite decision-making horizon, any budget deficit is perceived as temporary. As households expect the tax increases in the future, they save any increase of their disposable income caused by the deficit. As fall of public savings is fully offset by an increase of private savings (see for example equations 3.3 and 3.4 in case of a tax reduction), there are no pressures on interest rate and exchange rate, so there should be no change of the net exports. Ricardian view states that there's no causal relationship between budget and trade deficits.

Although there are many more theoretical approaches trying to explain the relationship between fiscal and external imbalances the Keynesian and Ricardian views are the most accepted ones. For mor detailed review of theories explaining the twin deficit hypothesis, see Macháček and Wroblowský (2004) or a nice discussion of channels for twin deficits provided by Afonso and Coelho (2023).

Data and Methodology

This study focuses on twin deficits in Central European countries, namely Austria, Czechia, Hungary, Poland and Slovakia. For this purpose, quarterly data from OECD statistics is used, covering the 2010-2022 period.

Quarterly data is used to obtain sufficiently large data sample. However, it brings some problems as budget balance data usually do not make sense when used on higher than annual frequencies. To get over this issue, quarterly change of public debt as % of GDP is used as a proxy variable for budget deficit. For external balance, we use the current account balance as % of GDP.

Descriptive evidence

Let's start with some descriptive evidence. Although it can't be taken as a serious proof, it can provide a feeling for the data and the lag structure involved (if any). Table 1 shows the correlation coefficients between the current account and budget balances for time lags and leading 1-3 periods:

Table 1: Correlations between current account and budget balances

	t-3	t-2	t-1	t	t+1	t+2	t+3
Austria	0,106	-0,123	-0,016	-0,065	-0,324	-0,146	-0,245
Czechia	0,281	0,083	0,121	0,219	0,132	0,016	0,023
Hungary	0,061	0,016	-0,023	0,018	-0,048	-0,027	-0,020
Poland	-0,154	-0,173	-0,233	-0,187	-0,156	-0,124	-0,132
Slovakia	-0,221	-0,255	-0,196	-0,090	-0,023	0,012	-0,051

The results support the view that external and fiscal balances are connected to some extent. According to the traditional Keynesian view the correlation between both variables should be positive and fiscal balance should lead the trade balance. These are the results that we get for Czechia and partly for Hungary, where there's a lag of trade deficit, but the correlation is quite small. All other countries show a negative correlation between the two balances. The general conclusion that can be reached by these simple correlations is that the theory that budget deficits lead to current account deficits does not seem to hold for the whole sample. However, simple correlations can introduce the picture but cannot provide answers to such complex questions and issues. Because of that, we now provide some regression analysis.

IV. Regression Analysis

In this section, we use slightly adjusted approach that was use by Salvatore (2006). He examined the value of current account balance as a function of budget balance, economic growth in domestic economy and abroad and lagged value of current account. This lagged value reflects the lagged values

of budget balance that can be expected as factors affecting the current account value but can't be used in the regression due to their intercorrelation. Hence, following equation will be tested:

$$CA_t = \alpha_0 + \alpha_1 BB_t + \alpha_2 GD_t + \alpha_3 GEU_t + \alpha_4 CA_{t-4} \qquad (4.1)$$

where CA is the current account balance, BB is the budget balance, GD is the annual growth in domestic economy and GEU is the annual growth rate in the EU. EU growth was used as a proxy for economic growth abroad as all analyzed countries trade most of their goods and services with their EU partners. CA_{t-4} stands for one year (4 quarters) lagged value of current account. To answer whether twin deficits exist in Central European countries, we are mainly interested in parameter α_1, while we expect a negative sign of parameter α_2 and positive signs of α_3 and α_4. Estimated values are presented in table 2:

Table 2 Results of eq. 4.1 estimation

	constant	BB_t	GD_t	GEU_t	CA_{t-4}	R^2	DW
Austria	0,0241	-0,2041*	-0,1025	0,2866*	0,8562**	0,77	1,86
Czechia	0,6141*	0,3052**	-0,2145*	0,4111*	0,9101**	0,82	2,03
Hungary	0,0028	0,0101*	-0,1170	0,2145*	0,7546**	0,78	1,95
Poland	-0,1004	-0,0021	-0,3151	-0,0014	0,8211**	0,59	1,87
Slovakia	-0,2036*	-0,2401*	-0,1687**	0,0623	0,8896**	0,71	1,76

The estimates of parameters α_2, α_3 and α_4 have correct signs and they are mostly statistically significant at 10% or 5% levels. The R^2 values vary from 0,59 in case of Poland to 0,82 in case of Czechia. Durbin – Watson statistics doesn't indicate any remaining serial correlation of the error term.

If we turn our attention to α_1 parameter, we get mixed results. They indicate similar results as obtained in the descriptive analysis. While results for Czechia and Hungary support the twin deficits hypothesis, results for Austria, Poland and Slovakia show negative correlation between budget and trade balances.

V. Effects of Covid-19 Pandemic

The latest data (both reflecting budget and trade balances) are probably heavily affected by the pandemic. All countries from the sample suffered serious fiscal problems due to decreased budget revenues. They also massively increased their spendings to health care and to support of affected individuals and industries. The trade patterns were seriously disrupted too. As a result, we can expect that excluding the Q2/2020 – Q4/2022 data should affect the estimated results.

Re-estimation of equation 4.1 shows that there are minor changes in α_2, α_3 and α_4 parameters and their sign remain correct. There are also no changes in their statistical significance. However, the re-estimated α_1 parameters show some interesting results. Comparison of initial and re-estimated parameters with exclusion of covid data are presented in table 3:

Table 3: Comparison of α1 parameters

	BB_t original	BB_t new
Austria	-0,2041*	-0,2351*
Czechia	0,3052**	0,3233**
Hungary	0,0101*	0,0103*
Poland	-0,0021	0,0023
Slovakia	-0,2401*	-0,2865*

The absolute values of estimated parameters increased for all countries and they keep their statistical significance and sign (with exception of Poland). These results may indicate that Covid and post-Covid era weakened the linkage between external and fiscal balances in Central European countries.

VI. Results Discussion and Conclusion

The results of descriptive and regression analysis show some mixed results. They indicate the validity of twin deficit hypothesis in Czechia and Hungary. On the other hand, results for Austria, Poland and Slovakia support negative relationship between budget and trade balances. Although the results are not complex enough to fully support it, the euro can be a possible explanation. Countries with their own currency (Czechia, Hungary) behave according to the twin deficit theory. Austria and Slovakia have adopted euro, which makes the widely accepted transmission mechanism through currency appreciation more complicated. As there's no chance for nominal appreciation within the eurozone countries, the appreciation must occur in real terms but the adjustment of price levels is not perfect and takes some time. The question mark, however, remains in case of Poland as its estimated parameters do not support the euro argument stated above. However, Poland is a bit specific compared to other countries in the sample, as it is more closed country with substantially higher share of primary sector on total GDP. We also need to keep in mind that the results for Poland show lowest R^2 and statistically insignificant values of most parameters.

Excluding the Covid data brings higher absolute values of estimated BB coefficients for all countries. This can be interpreted as a weakening of linkage between budget and trade deficits in all countries from the sample during the pandemic. While the fiscal balances were driven by unprecedent need for active fiscal measures in many areas, the international trade volumes were affected by broken international supply chains, capacity problems with distribution, decreased production factors mobility etc. However, the quantification of effects of pandemic on twin deficits will require more time and more data from post-covid recovery years.

References

Abell, J. D. (1990). Twin Deficits During the 1980s: An Empirical Investigation. *Journal of Macroeconomics*, 12(1), 81-96. Doi: 10.1016/0164-0704(90)90057-h.

Afonso, A. & Coelho, J. C. (2023). Twin deficits through the looking glass: time-varying analysis in the Euro area. *Economic Change and Restructuring,* 56(4), 2087-2110. Doi: 10.1007/s10644-023-09534-4.

Alkswani, M. A. (2000). The Twin Deficits Phenomenon in Petroleum Economy: Evidence from Saudi Arabia. Presented at the Seventh Annual Conference, *Economic Research Forum* (ERF), 26-29 October, Amman, Jordan.

Anoruo, E. & Ramchander, S. (1998). Current Account and Fiscal Deficits: Evidence from Five Developing Economies of Asia. *Journal of Asian Economics*, 9(3), 487-501. Doi: 10.1016/S1049-0078(99)80099-2.

Aqeel, A & Nishat, M. (2000). The Twin Deficits Phenomenon: Evidence from Pakistan. *The Pakistan Development Review*, 39(4II): 535-550. Doi: 10.30541/v39i4IIpp.535-550.

Barro, R. J. (1974). Are Government Bonds Net Wealth? *Journal of Political Economy* 82(6): 1095-1117.

Boucher, J.L. (1991). The U.S. Current Account: A Long and Short Run Empirical Perspective. *Southern Economic Journal*, 58(1), 93-111. Doi: 10.2307/1060036.

Cavallo, M. (2005). Government Consumption Expenditures and the Current Account. *FRBSF Working Paper* 2005-03. http://www.frbsf.org/ publications/economics/papers/2005/wp05-03bk.pdf.

Darrat, A. F. (1988). Have Large Budget Deficits Caused Rising Trade Deficits? *Southern Economic Journal*, 54(4), 879-87. Doi: 10.2307/1059523.

Dewold, W. G. & M. Ulan, M. (1990). The Twin Deficit Illusion. *Cato Journal*, 10, 689-707.

Enders, W. & Lee, B. S. (1990). Current Account and Budget Deficits; Twin or Distant Cousins? *The Review of Economics and Statistics*, 72(3), 373-81.

Erceg, C. J., L. Guerrieri & Gust, C. (2005). Expansionary Fiscal Shocks and the Trade Deficit. *International Finance Discussion Paper* No. 2005(825), Federal Reserve Board.

Furceri, D. & Zdzienicka, A. (2018). Twin Deficits in Developing Economies. Working Paper No. 170, *International Monetary Fund*, 1-41.

Gale, W.G. & Orszag, P. R. (2003). Economic Effects of Sustained Budget Deficits. *National Tax Journal*, 56(3), 463-485. Doi: 10.17310/ntj.2003.3.02.

Islam, M. (1998). Brazil's Twin Deficits: An Empirical Examination. *Atlantic Economic Journal*, 26(2), 121-128. Doi: 10.1007/BF02299354.

Kaufmann, S., Scharler, J. & Winckler, G. (2002). The Austrian Current Account Deficit: Driven by Twin Deficits or by Intertemporal Expenditure Allocation? *Empirical Economics* 27(3), 529-42. Doi: 10.1007/s001810100094.

Kearney, C. & Monadjemi, M. (1990). Fiscal Policy and Current Account Performance: International Evidence on the Twin Deficits. *Journal of Macroeconomics*, 12(2), 197-219. Doi: 10.1016/0164-0704(90)90029-A.

Kim, K. H. (1995). On the Long Run Determinants of the US Trade Balance: A Comment. *Journal of Post Keynesian Economics*, 17(3), 447- 455. Doi: 10.1080/01603477.1995.11490039.

Laney, L. (1984). The Strong Dollar, the Current Account and Federal Deficits: Cause and Effect. *Federal Reserve Bank of Dallas Economic Review*, 1, 1-14.

Leachman, L. L. & Francis, B. (2002). Twin Deficits: Apparition or Reality? *Applied Economics*, 34(9), 1121-1132. Doi: 10.1080/00036840110069976.

Macháček, M. & Wroblowský, T. (2004). Zdvojené deficity: Sourozenci, nebo otec a syn? In *Teoretické praktické aspekty veřejných financí*. Praha: VŠE.

Miller, S. M., & Russek, F. S. (1989). Are the Twin Deficits Really Related? *Comentary Policy Issues*, 7(4), 91-115. Doi: 10.1111/j.1465-7287.1989.tb00577.x.

Normandin, M. (1994). Budget Deficit Persistence and the Twin Deficits Hypothesis. Working Paper No. 1994(31), *Center for Research on Economic Fluctuations and Employment*, Universite du Quebec, Montreal.

Papaioannou, S. & Yi, K. M. (2001). The Effects of a Booming Economy on the U.S. Trade Deficit. *Current Issues in Economics and Finance*, Federal Reserve Bank of New York, 7(2).

Reitschuler, G. & Crespo Cuaresma, J. (2004). Ricardian Equivalence Revisited: Evidence from OECD countries. *Economic Bulletin*, 5(16), 1-10.

Salvatore, D. (2006). Twin Deficits in the G-7 Countries and Global Structural Imbalances. *Journal of Policy Modeling*, 28(6), 701–712. Doi: 10.1016/j.jpolmod.2006.06.003.

Vamvoukas, G. (1999). The Twin Deficits Phenomenon: Evidence from Greece. *Applied Economics*, 31(9), 1093-1100. Doi: 10.1080/000368499323571.

Winner, L. E. (1993). The Relationship of the Current Account Balance and the Budget Balance. *American Economist*, 37(2), 78-84. Doi: 10.1177/056943459303700213.