Aleksander Aristovnik[1]

TWIN DEFICITS AND THE FELDSTEIN-HORIOKA PUZZLE: A COMPARISON OF THE EU MEMBER STATES AND CANDIDATE COUNTRIES

The article's main objective is to investigate the empirical link between the fiscal balance and the current account (i.e. the twin deficits phenomenon) in order to confirm one of the above theories. The article focuses on the EU member states and candidate countries which according to their different historical, political, economical and geographical characteristics are divided into 2 major groups, i.e. old EU member states (EU15) and new EU member states and candidate countries (EU12+3) in the 1995-2008 period. Additionally, the importance of the so-called Feldstein-Horioka puzzle in the considered countries is examined in order to draw some conclusions about the regions' integration with international capital markets. The empirical results suggest that budget deficits in the EU member states and candidate countries have generally signalled relatively high level of substitutability between private and public savings, implying a relatively low correlation between fiscal and external imbalances. Thus, the empirical results in general reject the validity of the twin deficit hypothesis.

Keywords: twin deficits, Feldstein-Horioka puzzle, capital mobility, the EU member states, candidate countries, panel data analysis.

Александер Арістовник

ПОДВІЙНИЙ ДЕФІЦИТ І ПАРАДОКС ФЕЛЬДШТЕЙНА-ХОРІОКИ: ПОРІВНЯННЯ КРАЇН-ЧЛЕНІВ ЄС І КРАЇН-КАНДИДАТІВ НА ЧЛЕНСТВО

У статті досліджено емпіричний зв'язок між бюджетним балансом і рахунком поточних операцій, зокрема, явище "подвійного дефіциту" і перевірено декілька теорій. Розглянуто держави-члени ЄС і країни-кандидати в члени, які відповідно до їхніх різних характеристик (історичних, політичних, економічних і географічних) діляться на дві групи, старі країни-члени ЄС (ЄС-15) і нові країни-члени ЄС та країни-кандидати (ЄС-12+3) в період 1995-2008 р. Визначено так званий парадокс Фельдштейна-Хоріоки в даних країнах і зроблено деякі виводи щодо інтеграції регіонів на міжнародних ринках капіталу. Емпіричні результати показали, що дефіцит бюджету в країнах-членах ЄС і країнах-кандидатах вказує на відносно високий рівень взаємозамінюваності між приватними і державними заощадженнями, маючи на увазі відносно низьку кореляцію між фіскальним і зовнішнім дисбалансом. Таким чином, емпіричні результати в цілому відкинули гіпотезу подвійного дефіциту.

Ключові слова: подвійний дефіцит, парадокс Фельдштейна-Хоріоки, мобільність капіталу, держави-члени ЄС, країни-кандидати в члени ЄС, аналіз панельних даних.

Таб. 4. Фор. 3. Літ. 42.

Александер Аристовник

ДВОЙНОЙ ДЕФИЦИТ И ПАРАДОКС ФЕЛЬДШТЕЙНА-ХОРИОКИ: СРАВНЕНИЕ СТРАН-ЧЛЕНОВ ЕС И СТРАН-КАНДИДАТОВ НА ЧЛЕНСТВО

В статье исследована эмпирическая связь между бюджетным балансом и счетом текущих операций, в частности, явление "двойного дефицита" и проверено несколько

[1] Associate Professor, Faculty of Administration, University of Ljubljana, Slovenia.

теорий. В статье рассмотрены государства-члены ЕС и страны-кандидаты, которые в соответствии с их различными характеристиками (историческими, политическими, экономическими и географическими) делятся на две основные группы, старые страны-члены ЕС (ЕС-15) и новые страны-члены ЕС и страны-кандидаты (ЕС-12+3) в период 1995-2008 годов. Кроме того, определен так называемый парадокс Фельдштейна-Хориоки в рассматриваемых странах и сделаны некоторые выводы об интеграции регионов на международных рынках капитала. Эмпирические результаты показали, что дефицит бюджета в странах-членах ЕС и странах-кандидатах указывает на относительно высокий уровень взаимозаменяемости между частными и государственными сбережениями, подразумевая относительно низкую корреляцию между фискальным и внешним дисбалансом. Таким образом, эмпирические результаты в целом отвергли справедливость гипотезы двойного дефицита.

Ключевые слова: двойной дефицит, парадокс Фельдштейна-Хориоки, мобильность капитала, государства-члены ЕС, страны-кандидаты в члены ЕС, анализ панельных данных.

Introduction. The extent to which variations in the stance of fiscal policy can lead to predictable developments in an open country's performance in the current account of the balance of payments remains a controversial issue. Generally, 2 competing views exist to explain variations in the current account as a consequence of public sector (in)stability. The traditional view argues that general government budget deficits cause current account deficits. In fact, public sector activity can have both direct and indirect effects on the current account balance. Construction projects by the public sector may require imports of investment goods, thereby exerting a direct influence on the external balance. Simultaneously, public sector activities affect total demand in the economy and an increase in them can also have some psychological effect. In addition, financing budget deficits by issuing bonds leads to higher consumption expenditure due to wealth effects and they raise interest rates. Ceteris paribus, these higher interest rates appreciate the currency and, because of the resulting loss in competitiveness, worsen the current account balance. The traditional view is challenged by adherents to the Ricardian equivalence hypothesis (Barro, 1989) which states that an increase in a budget deficit (through reduced taxes) will be offset by increases in private savings, insofar as the private sector full discounts the future tax liabilities associated with financing the fiscal deficit.

Thus, the purpose of the article is to test empirically the validity and rationale of the neoclassical (and Keynesian) theory and the Ricardian equivalence hypothesis in the old EU member states (EU15) and new EU member states and candidate countries (EU12+3). Additionally, the importance of the FH puzzle in the considered countries is examined in order to draw some conclusions about the regions' integration with international capital markets. Therefore, the relationship between budget and current account deficits and other selected current account determinants are tested using panel data for 30 countries in the 1995-2008 period.

The article is organized as follows. The next section briefly summarizes theoretical considerations of twin deficits hypothesis/FH puzzle and their empirical tests are presented in the third section. The final section provides the concluding remarks and some policy implications.

1. Theoretical background and empirical methodology. Simple national accounting identities help shed light on the macroeconomic determinants of current account

fluctuations. According to the absorption theory of the balance of payments (Alexander, 1952), the current account is the excess of gross national product (GNP_t) over absorption (A_t):

$$CA_t = GNP_t - (C_t + G_t + I_t) = GNP_t - A_t, \qquad (1)$$

where C_t, G_t, and I_t stand for private consumption, government purchases and investment. In addition, note that the difference between a country's national product and private and government consumption is national savings that are the sum of private and government savings. As a result, the current account is also equal to the difference between national savings, S_t, and investment:

$$CA_t = S_t - I_t = S_t^p - I_t^p + (T_t - G_t), \qquad (2)$$

where a current account surplus must be matched by a private sector surplus ($S_t^p > I_t^p$) and/or public-sector surplus ($T_t > G_t$). By analogy, a current account deficit must be matched by a private sector deficit and/or public sector deficit (i.e. the twin deficit problem). When an economy starts to run a current account deficit, policymakers will want to see whether there has been a decrease in (private) savings, increase in investment, and/or increase in budget deficit. However, there is a sound reason to worry about a country's long-term prospects if the onset of the current account deficit reflects lower (private) savings or a larger budget deficit[2]. In both cases, the country is borrowing abroad or running down its foreign assets to sustain or raise consumption, whether by the private sector or the public sector. Yet, there is less cause to worry when the onset of a current account deficit reflects an increase in investment. Namely, a country is then raising its capital stock more quickly and therefore raising its future output faster.

Suppose that current taxes are held constant and ($S_t^p - I_t^p$) remains the same and stable, an increase in temporary purchases will raise the government budget deficit ($G_t - T_t$) which in turn affects the current account. In this way, a government budget deficit resulting from increased purchases reduces the nation's current account surplus or widens a nation's current account deficit (Abel, Bernanke, 2001). Another aspect of the twin deficits phenomenon could be the positive effect of budget deficits on interest rates. In fact, in a small open economy an increase in the budget deficit leads to an increase in interest rates. The increase in interest rates induces capital inflows leading to an appreciation of domestic currency. A twin deficits situation arises as the appreciation deteriorates net exports and, in turn, worsens the current account (Kearney, Monadjemi, 1990)[3].

---

[2] Proponents of the so-called Lawson doctrine emphasized that an increase in a current account deficit that results from a shift in private sector behavior should not be a matter of concern at all. On the other hand, the public budget balance is a matter of public policy concern and the focus should be on this (Corden, 1994). Nevertheless, several financial crises, like Mexico (1994), occurred despite the absence of large fiscal imbalances.

[3] Several studies supported the twin deficits hypothesis, such as Darrat (1988) and Bachman (1992) for the USA, Vamvoukas (1997) for Greece, Kulkarni et al. (2001) for Mexico, India and Pakistan, Islam (1998) for Brazil, Akbostanci et al. (2001) for Turkey, Fidrmuc (2003) for Hungary and Poland, and Afonso and Rault (2008) for Austria, Belgium, the Czech Republic, Ireland, Latvia, and Malta.

On the other hand, many economists support the alternative view (intertemporal approach) exemplified by the Ricardian theory (Barro, 1989) and suggest that the decline in public saving is offset by an equal increase in private saving, and that national saving remains unaffected. In other words, the proponents of Ricardian equivalence stress that, in order to analyze macroeconomic phenomena, it is necessary to take into account the intertemporal saving and investment decisions of the private sector. In these models, the current account is viewed as the solution to a dynamic optimization problem where the objective is to allocate consumption optimally over time. The current account balance is seen as the change in net assets of an economy. In addition, the government budget deficit is the result of a cut in current taxes, with current and planned future government purchases unchanged. With government purchases, G_t, unchanged and with output, Y_t, held constant at its full-employment level, the tax cut will cause national saving to fall only if it causes private consumption, C_t, to rise.

Based on previous theoretical and empirical findings reported by Bussiere et al. (2004), Herrmann and Jochem (2005), Marinheiro (2006), and Nickel and Vansteenkiste (2008), empirical analysis will be applied to assess the model where the current account balance represents the dependent variable for country i in time t. The observation covers 2 dimensions: a cross-sectional observation of individual units (i) and an observation of time series (t). The equation of the dynamic panel model is as follows:

$$CA_{it} = \alpha_i + \lambda_t + \beta_0 CA_{it-1} + \beta_1 FB_{it} + \beta_2 RELGDP_{it} + \beta_3 I_{it} + \beta_4 REER_{it} + v_{it} \tag{3}$$

α_i stands for the effects which are common to all countries and do not change in time, β stands for partial regression coefficients for the selected independent variables (e.g., public finance balance (*FB*), investments (*I*), relative real GDP p.c. (*RELGDP*) and real effective exchange rate (*REER*)). λ_t stands for time effects characteristic of an individual year but constant for all countries, v_{it} represents the errors of the regression model due to a random effect, which are characteristic of an individual country and year.

The main difference between the panel and pooled OLS models lies in the use of the methodology of fixed effect models (FEM) or random effect models (REM). The FEM fixes part of the error (deviation) in the estimated values as a constant, whereas the REM allows for variation of this part of unexplained deviations. Using the Hausman test for the existence of statistically significant differences between the estimated regression coefficients which had been calculated based on the FEM or REM, we verify the zero hypothesis that the effects of individual countries do not correlate with other variables included in the model in all the studied cases[4].

---

[4] A potential concern in our model (3) specification is the endogeneity of some explanatory variables, reflected in correlation between these variables and error term causing biased and inconsistent estimates. In fact, budget deficits could be influenced by investments. According to Greene (2002), as lagged values of budget deficits are relatively highly correlated to their contemporaneous values and relatively independent of current account deficits, one-year-lagged values of budget deficit was used as an instrument. Nevertheless, the results are principally supportive of the conclusions based on the presented panel data estimates (even when estimating coefficients by GMM technique).

The theoretical and previous empirical findings generate our expectation that there is a positive correlation between the public finance balance and the current account balance in the EU27 and the candidate countries. In view of the fact that the public finance deficit often means borrowing in foreign financial markets and thus contributes to the current account deficit, a positive sign is expected in front of the regression coefficient. The real convergence of countries and the forecast higher income in the future lead to borrowing which, obviously, debits the current account of the balance of payments. Another burden is the fact that the catching-up process actually attracts investments. Due to the above, a negative sign is expected in front of the estimated regression coefficient. Appreciation of the real exchange rate in line with the theoretical expectations causes international competitiveness to deteriorate, along with the current account balance, which is why the expected estimate of the abovementioned regression coefficient is negative. The empirical data analysis is based on the STATA 11.0 statistical program.

The database consists of annual data for the dependent variable of the current account balance and an independent variable for the sample of 30 countries in the period from 1995 to 2008. The basic data sources include the World Development Indicators (WDI), the OECD database and the Eurostat. In the assessment of the model, the dependent variable is the balance of the current account of the balance of payments (CA), expressed as % of GDP (a negative value shows a current account deficit). Independent variables in the model, besides the dependent lag variable, include the balance of the public finance balance as % of GDP (FB), domestic investment as % of GDP (I), relative income per capita (RELGDP) and the variable of the real effective exchange rate (REER).

2. Empirical results. According to the theoretical expectations, the correlation coefficients show different correlation values between the public finance balance and the current account of the balance of payments in the investigated countries. The correlation between the abovementioned variables is the highest in the EU15 group. Partial correlation coefficients vary within the group. It is interesting that negative values were observed for Greece, Italy, Luxembourg and Sweden. The EU15 group also included the countries which generated high positive values of partial correlation coefficients, which also confirms the hypothesis of the existence of a twin deficit. These coefficients exceeded 0.7 of a percentage point in Germany, the Netherlands and Ireland. Partial correlation coefficients for the EU12+3 countries showed positive and statistically significant values only for Macedonia, where the increase in the public finance deficit by 1 percentage point resulted in an increase in the current account deficit by 0.547 of a percentage point. The remaining 9 countries in this group recorded negative values of partial correlation coefficients (Table 1). The correlation between domestic investments and the current account is in line with the theoretical expectations, although certain exceptions exist (Sweden and Great Britain). A stronger correlation between investments and the current account was observed in the countries which are more integrated in international financial flows, i.e. the EU15. Similar was observed in the countries of the EU12+3 group where the highest coefficients were mainly seen in the countries of CEE.

Table 1. **Partial correlation coefficients of the EU27+3 (1995-2008)**

Country	Correlation coefficient (CA-I)	Correlation coefficient (CA-FB)	Country	Correlation coefficient (CA-I)	Correlation coefficient (CA-FB)
EU15	**-0.3761*****	**0.1928*****	*EU12+3*	**-0.0248**	**-0.1271***
Austria	-0.7702***	0.0903	Bulgaria	-0.955***	0.1897
Belgium	-0.7523***	0.0057	Czech R.	-0.6321**	-0.1760
Denmark	-0.7340**	0.2283	Cyprus	-0.7867***	-0.4304
France	-0.5438*	0.1249	Estonia	-0.6095**	-0.5546*
Greece	-0.8609***	0.6341**	Macedonia	-0.7523***	0.5465*
Finland	-0.1476	-0.6245**	Croatia	0.2063	-0.1599
Ireland	-0.7816***	0.7513***	Latvia	-0.5950*	-0.5833*
Italy	-0.3682	-0.3495	Lithuania	-0.8430***	0.3091
Luxemburg	-0.7005**	-0.5273*	Hungary	0.0415	-0.2193
Germany	-0.8325***	0.8087***	Malta	-0.6811**	-0.5171
Netherlands	-0.2797	0.7926***	Poland	-0.7081**	-0.1393
Portugal	-0.7158**	0.1169	Slovenia	-0.8476***	0.4974
Spain	-0.7195**	0.4884	Slovakia	-0.8256***	0.4851
Sweden	0.4786	-0.0309	Romania	-0.1306	0.0194
Great Britain	0.0354	0.2051	Turkey	0.3167	-0.6969**

Notes: ***, **, * denote significance at the levels of 1%, 5% and 10%, respectively.
Source: WDI (World Bank), 2009; Eurostat, 2009; own calculations.

The estimates of the regression coefficients derived from various models are shown in Table 2. Standard deviations are relatively low for most variables included in the model, which means that the estimated values approximate the true value of the model. Some deviations were seen in the REER and RELGDP variables, mainly as a result of oscillations between the countries. As regards the basic hypothesis of the model, the estimated correlation between the public finance deficit and current account deficit is the most important. In the first assessed model which includes all 30 countries in the 1995-2008 period, it was estimated that the correlation was weak, negative and statistically insignificant in all 4 aspects. However, similarly to what the Breusch-Pagan/Cook-Weisberg test showed (Table 2), the model which includes all 30 studied countries is partial due to the problem of heteroskedasticity.

Table 2. **Summary of empirical results for the entire studied period (1995-2008) — EU27+3**

Explanatory Variables	TWO-WAY FE	TWO-WAY RE
CA_{it-1}	0.4161 (0.0443; 0.000)	0.7937 (0.0325; 0.000)
FB_{it}	-0.0544 (0.0393; 0.170)	-0.0302 (0.03522; 0.391)
$RELGDP_{it}$	-3.4340 (3.9459; 0.385)	3.8309 (0.7374; 0.000)
I_{it}	-0.5336 (0.0551; 0.000)	-0.21766 (0.0369; 0.000)
$REER_{it}$	0.9696 (3.0380;0.750)	1.5990 (2.2159; 0.470)
Adj. R^2	0.6044	0.9737
No. of countries	30	30
No. of obs.	390	390
Hausman test	188.35 (0.000)	
Breusch-Pagan Lagrangian multiplier test	10.31 (0.0013)	

Notes: the values of standard errors and p-values are presented in the parenthesis, respectively.
Source: WDI (World Bank), 2010; Eurostat, 2010; own calculations.

Table 3. **Summary of empirical results
for the entire studied period (1995-2008) — EU15**

Explanatory Variables	TWO WAY FE	TWO WAY RE
CA_{it-1}	0.726 (0.0596; 0.000)	0.9154 (.0366; 0.000)
FB_{it}	-0.00314 (0.07857; 0.968)	0.00757 (0.0537; 0.888)
$RELGDP_{it}$	-0.5417 (5.5404; 0.922)	3.7091 (1.4795; 0.012)
I_{it}	-0.303 (0.0806; 0.000)	-0.1464 (0.0424; 0.001)
$REER_{it}$	-11.7607 (5.2753; 0.027)	-7.7224 (4.4942; 0.086)
Adj. R^2	0.9702	0.9922
No. of countries	15	15
No. of obs.	195	195
Hausman test	35.54 (0.0053)	
Breusch-Pagan Lagrangian multiplier test	1.36 (0.2438)	

Notes: the values of standard errors and p-values are presented in the parenthesis, respectively.
Source: WDI (World Bank), 2010; Eurostat, 2010; own calculations.

Table 4. **Summary of the empirical results
for the entire studied period (1995-2008) — EU12+3**

Explanatory Variables	TWO-WAY FE	TWO-WAY RE
CA_{it-1}	-0.0401 (0.049; 0.419)	0.1501 (0.0569; 0.008)
FB_{it}	-0.1297 (0.05547; 0.021)	-0.1835 (0.0628; 0.003)
$RELGDP_{it}$	2.232 (4.292; 0.604)	6.3327 (1.7603; 0.000)
I_{it}	-0.7573 (0.0644; 0.000)	-0.3907 (0.0595; 0.000)
$REER_{it}$	1.77368 (4.29789; 0.680)	-4.791022 (3.5999; 0.183)
Adj. R^2	0.0243	0.3954
No. of countries	15	15
No. of obs.	195	195
Hausman test	41.82 (0.0012)	
Breusch-Pagan Lagrangian multiplier test	73.46 (0.000)	

Notes: the values of standard errors and p-values are presented in the parenthesis, respectively.
Source: WDI (World Bank), 2010; Eurostat, 2010; own calculations.

The negative statistically insignificant correlation rejects the hypothesis of a twin deficit for the entire group and for both subgroups. From the policy perspective, the implementation of fiscal tightening may not diminish the current account deficit in the regions, which is in line with the findings of Afonso and Rault (2008). The estimates of the regression coefficients of the remaining independent variables confirm the theoretical correlation. The empirical analysis reveals much higher current account balance persistency in the EU15 than in EU12+3. Moreover, the relative income per capita shows the level of a country's development and it is therefore understandable that the catching-up process and thus the expected higher income in the future forced those countries which lag behind the EU27 average to increase their

borrowings so as to balance their long-term consumption. The key determinant of the current account is the share of domestic investment in GDP. The estimation of the regression coefficient showed that an increase in investments by 1 percentage point in the EU15 deepened the current account deficit by 0.303 of a percentage point on average, or by 0.757 of a percentage point in the EU12+3 countries (Tables 3 and 4).

3. Conclusions. The article's main objective was to investigate the empirical link between the fiscal balance and the current account (i.e. the twin deficit phenomenon). If twin deficit exists, the fiscal policy would be an effective measure to correct the current account imbalance. The article focuses on the EU member states and candidate countries which are according to their different (historical, political, economical and geographical) characteristics divided into 2 major groups, i.e. old EU member states (EU15) and new EU member states and candidate countries (EU12+3) in the 1995-2008 period. Additionally, the importance of the so-called Feldstein-Horioka (FH) puzzle in the considered countries is examined in order to draw some conclusions about the regions' capital markets integration. The empirical results suggest that budget deficits in the EU member states and candidate countries have generally signaled relatively high level of substitutability between private and public savings, implying a relatively low correlation between fiscal and external imbalances. Therefore, the empirical results mainly reject the validity of the twin deficit hypothesis. Moreover, the empirical results also suggest that, as originally claimed by Feldstein and Horioka (1980) in their seminal paper, the intertemporal theory of the current account partly failed to explain the relationship between domestic saving and investment in the EU15. Accordingly, the article provides evidence of a relatively high level of capital mobility in both subregions, most probably reflecting the process of establishment of a monetary union (in the EU15 region in the 1995-2003 period) and as a result of the completion of the EU pre-accession period (in the EU12+3 region in the 2004-2008 period). Additionally, relatively higher current account balance persistency in the EU15 can also be confirmed. However, given the partial equilibrium nature of this theory isolating the idiosyncratic sources of fluctuations by taking the heterogeneous responses to investment to global shocks into account should be considered in future research. Further, due to the relatively high heterogeneity within both regions certain other econometric techniques, like time-series analysis, could be applied in future empirical investigations.

References:

1. *Abel, A. B. and Bernanke, B. S.* (2001). Macroeconomics. Fourth Edition. Boston: Addison Wesley Longman, Inc. 640 p.

2. *Afonso, A.* (2006), Sustainability of Fiscal Policy in EU-15. Research Report, CESifo DICE Report.

3. *Afonso, A. and Rault, C.* (2007). What do we really know about fiscal sustainbility in the EU. A panel data diagnostic. European Central Bank, Working paper series no. 820, Frankfurt am Main.

4. *Afonso, A. and Rault, C.* (2008). Budgetary and External Imbalances Relationship. A Panel Data Diagnostic. European Central Bank, Working Paper Series No. 961., Frankfurt am Main.

5. *Alexander, S.* (1952). Effects of a Devaluation on a Trade Balance. IMF Staff Papers, Washington.

6. *Aristovnik, A.* (2007). How sustainable are external imbalances in selected transition countries?, Ekonomicky Casopis, 55(1), pp. 19-37.

7. *Aristovnik, A. and Bercic, B.* (2007). Fiscal Sustainability in Selected Transition Countires, Ekonomicky Casopis, 55(7), pp. 661-677.

8. *Bachman, D. D.* (1992). Why is the US current account deficit so large? Evidence from vector autoregressions, Southern Economic Journal, 59(2), pp. 232-240.

9. *Barro, R. J.* (1989). The Ricardian Approach to Budget Deficit, Journal of Economic Perspectives 3(2), pp. 37-52.

10. *Beck, N. and Katz, J. N.* (1996). Nuisance vs. substance: specifying and estimating time-series-cross models, Political Analysis, 6(1), pp. 1-36.

11. *Bilici, O., Erdil, E. and Yetkiner, H.* (2011). Determinants of Turkey's Trade Flows: Gravity Model Approach, Actual Problems of Economics, 118, pp. 265-279

12. *Blanchard, O.* (2006). Adjustment with the Euro: The Difficult Case of Portugal. MIT Department of Economics, Working paper No. 06-04. Cambridge.

13. *Blanchard, O. and Gaivazzi, F.* (2002). Current Account Deficits in the Euro Area. The End of the Feldstein Horioka Puzzle? Massachusetts Institute of Technology, Department of Economics, Working paper 03-05, Cambridge.

14. *Bussiere, M. and Fratzscher, M. and Muller, J. G.* (2004). Current account dynamics in the OECD and EU acceding countries - an intertemporal approach. European Central Bank, Working Paper Series No. 311, Frankfurt am Main.

15. *Cadez, S. and Czerny, A.* (2010). Carbon management strategies in manufacturing companies: An exploratory note , Journal for East European Management Studies, 15(4), pp. 348-360.

16. *Corden, W. M.* (1994). Economic Policy, Exchange Rates and the International System. Oxford: Clarendon Press. 331 p.

17. *Cuaresma Crespo, J. and Reitschuler G.* (2007). Is the Ricardian Equivalence Proposition an "Aerie Fairy" Theory for Europe? Economica, 74(296), pp. 682-694.

18. *Darrat, A. F.* (1988). Have large budget deficits caused rising trade deficits? Southern Economic Journal 54(4), pp. 879-887.

19. *Evans, P.* (1988). Do budget deficits affect the current account? Unpublished paper, Ohio State University.

20. *Feldstein, M. and Horioka, C.* (1980). Domestic Saving and International Flows. Economic Journal 90(358), pp. 314-329.

21. *Fidrmuc, J.* (2003). The Feldstein-Horioka Puzzle and Twin Deficits in Selected Economies, Economics of Planning, 36(2), pp. 135-152.

22. *Franco D. and Balassone F. and Francese M.* (2003). The Debate on European Fiscal Rules. Focus on Transition, 1/2003.

23. *Greene, W. H.* (2002). Econometric Analysis. Fifth Edition, New York: Prentice Hall. 1026 p.

24. *Hauner, D. and Kumar, M. S.* (2006). Fiscal Policy and Interest Rates: How Sustainable Is The "New Economy"? IMF Working Paper, WP/06/112.

25. *Herrmann, S. and Jochem, A.* (2005), Determinants of current account developments in the Central and East European EU member states - consequences of the enlargment of the Euro area. Discusion Paper Series, Economic Studies No. 32, Frankfurt am Main.

26. *Hsiao, C.* (2006). Panel Data Analysis: advantages and challenges. University of Southern California, Institute of Economic Policy Research, IEPR Working Paper 06.49.

27. *Hutchison, M. M. and Singh, N.* (1993). Long-term international capital mobility: new evidence from equilibrium real interest rate linkages. Federal Reserve Bank of San Francisco, Pacific Basin Working Paper Series, No. 93-06.

28. *Islam, M.* (1998). Brazil's Twin Deficits: An Empirical Examination, Atlantic Economic Journal 26(2), pp. 121-129.

29. *Kandogan, Y.* (2004). Trade creation and diversion effects of Europe's regional liberalization agreements. University of Michigan-Flint, Working Paper No. 07.

30. *Kayikci, F.* (2012). Solvency of Current Account Deficits in Turkey, Actual Problems of Economics, 128, pp. 387-398.

31. *Kearney, C. and Monadjemi, M.* (1990). Fiscal Policy and Current Account Performance: International Evidence on the Twin Deficits, Journal of Macroeconomics 12(2), pp. 197-219.

32. *Kulkarni, K. G. and Erickson, E. L.* (2001). Twin Deficit Revisited: Evidence from India, Pakistan and Mexico, Journal of Applied Business Research, 17(2), pp. 97-100.

33. *Levy, D.* (2003). Is the Feldstein-Horioka puzzle really a puzzle?, in: G. Agiomirgianakis; T. Biswas; J. Coakley; C. Tsoukis ed. Advances in International Economics and Finance, Kluwer Academic Publishers, pp. 49-66.

34. *Marinheiro, C. F.* (2008). Ricardian Equivalence, Twin Deficits, and the Feldstein-Horikoa puzzle in Egypt, Journal of Policy Modeling 30(6), pp. 1041-1056.

35. *Milesi-Ferretti, G. M. and Razin A.* (1996). Sustainability of Persistent Current Account Deficits. NBER Working Paper, No. 5467.

36. *Miller, N. C.* (2002). Balance of Payments and Exchange Rate Theories. Cheltenham: Edward Elgar Publishing Limited. 192 p.

37. *Nickel, C. and Vansteenkiste, I.* (2008). Fiscal policies, the current account and Ricardian equivalence. European Central Bank, Working Paper Series No. 935, Frankfurt am Main.

38. *Obstfeld, M. and Rogoff, K.* (1996). Foundations of International Macroeconomics, Cambridge, MA: MIT Press. 832 p.

39. *Ponikvar, N., Tajnikar, M. and Pusnik, K.* (2009). Performance ratios for managerial decision?making in a growing firm. Journal of Business Economics and Management, 10(2), pp. 109-120.

40. *Simar, L. and Wilson, P.* (2003). Efficiency analysis: the statistical approach, lecture notes.

41. *Vamvoukas, G. A.* (1999). The Twin Deficits Phenomenon: Evidence from Greece, Applied Economics, 31(9), pp. 1093-1100.

42. *Zajc Kejzar, K.* (2011). Does Foreign Direct Investment Induce Domestic Mergers? Open Economies Review, 22(2), pp. 271-291.

Стаття надійшла до редакції 19.09.2012.