DO GOVERNMENT EXPENDITURES AND TRADE DEFICITS AFFECT EACH OTHER IN THE SAME WAY? EVIDENCE FROM TURKEY

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Source / Izvornik: **Ekonomski vjesnik : Review of Contemporary Entrepreneurship, Business, and Economic Issues, 2017, 30, 169 - 180**

Journal article, Published version
Rad u časopisu, Objavljena verzija rada (izdavačev PDF)

Permanent link / Trajna poveznica: https://urn.nsk.hr/urn:nbn:hr:145:022865

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Download date / Datum preuzimanja: **2024-03-29**



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UDK: 336.14(560)
Preliminary communication

Received: December 28, 2016
Accepted for publishing: February 23, 2017

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Abstract

The purpose of this study is to determine the causality between trade deficits and government expenditure for the Turkish economy in different time horizons and in the case of different shock types between year 1987 and 2014. By doing so, we aim to understand whether the twin deficit hypothesis is valid in the Turkish economy or whether government expenditures have more ability to cause the movements of trade deficit. To do this, we employ asymmetric causality test developed by Hatemi-J (2012) and Hatemi-J and Roca (2014) and rolling windows causality test developed by Balcilar et al. (2010) methods. Results obtained from all tests imply that there is a bi-directional causality between variables. Different from other causality analysis, asymmetric causality analysis results indicate that an increase in government expenditures reduces trade deficit contrarily to existing literature. This means twin divergence hypothesis might be valid in the Turkish economy instead of twin deficit hypothesis.

Keywords: Asymmetric causality, government expenditures, trade deficit, twin divergence hypothesis

1. Introduction

The conventional view about trade deficit claims that the source of deficit in trade is deficit in governments' budget and together they are called twin deficit hypothesis. The effect of budget deficit on trade deficit can be explained by components of the budget. These are government expenditures and taxes. Standard economic reasoning suggests that government borrowing decreases the domestic supply of funds available to finance new investments, which leads to an inflow of funds from overseas. In short, budget deficit may well produce trade deficits (Bernheim, 1988). On the other hand, the validity of twin deficit hypoth-

esis is questioned by different economists yielding some different results. According to another point of view, the causation linkage is between government expenditures and trade deficit rather than budget deficit. Mankiw (2006), Elwell (2008) and Kayhan et al. (2013) indicate that an increase in government expenditures rather than budget deficit might induce a trade deficit. In short, there is a uni-directional causality running from increasing government expenditures to increasing trade deficit and the main reason of increasing trade deficit is the increasing government expenditures, not budget deficit. Moreover, Kim and Roubini (2008), Muller (2008) and Blanchard and Perotti (2002) prefer to use 'twin divergence' instead of 'twin deficit' hypothesis and claim that the correlation between binary variables is negative, an improvement in trade balance worsens the other or vice versa. Interestingly, they explain the convergence relation between fiscal policies and trade deficit via government expenditures.

The case of Turkey in last fifteen years might support some Mankiw (2006) and Elwell's (2008) implications and Kim and Roubini's (2008) claims. High budget deficit and trade deficit problems were the main concerns which the Turkish government had to deal with in the last decades of the 20th century for the Turkish economy. The Turkish economy has experienced high trade deficit problem since the year that export-led growth model has been put into application in the economy, which was after 1980. The deficit in the current account has not been closed for more than thirty five years. While the government's high debt rate is a big problem for economic stability, existing high trade deficit problem raises another question, namely whether budget deficit is responsible for trade deficit. The case of the Turkish economy was interpreted as an indicator of twin deficit hypothesis in the economy by Akbostanci and Tunc (2002), Gunaydin (2004), Unsal (2006), Sever and Demir (2007), Celik et al. (2008), Erdinc (2008), Acaravci and Ozturk (2008), Gok and Altay (2007), and Yaprakli (2010).

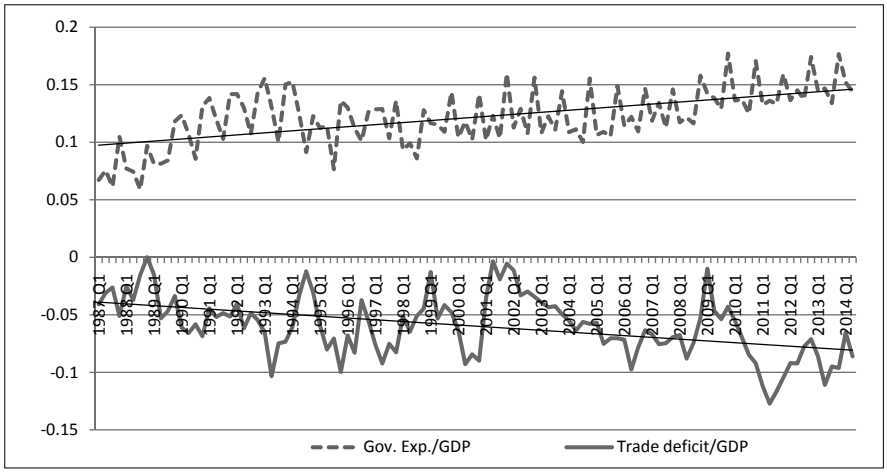
The validity of twin deficit hypothesis has begun to be discussed after the success of "Transition Program into a Powerful Economy" implemented by the ruling government, which included essential modifications such as independence of the central bank, implementing fiscal discipline and privatization of public production. Just after the crisis of 2001, the budget imbalance problem was solved by ensuring fiscal discipline. The rate of budget deficit to gross domestic product (hereafter, GDP) was 16% in 2001 when the crisis occurred, whereas it was only 1.7% in 2005. But, despite the improvement in the balance of government budget, the current account deficit is still an important issue for the economy.

The trend of trade deficit during these years has been upward. The data published by the Statistical Institute of Turkey show that, after the crisis in 2001, the gap between export and import was only 10 billion U.S. dollars, whereas it was almost 106 billion U.S. dollars in 2011. It grew tenfold in ten years.

As before, the context of economic program applied to the Turkish economy caused government expenditures to increase. According to the data obtained from the Ministry of Finance, government expenditure was only 46.7 billion Turkish Lira and it reached 230 billion Turkish Lira in ten years. If Figure 1 is considered, the ratio of government expenditures to GDP has also increased over the years. Increasing government expenditures and higher current account deficit indicate possible relationship between them.

In the light of these explanations, the main aim of this study is to determine causation linkage between government expenditures and trade deficit in the Turkish economy between years 1987 and 2014. Figure 1 indicates a possible reverse causality between variables and that situation brings up the following question: is there a divergence among the variables?

Figure 1 Movement of Ratio of Government Expenditures and Trade Deficit to GDP



Source: Own Calculation via Eviews

The contribution of this study is twofold. First of all, by exploring the relationship between government expenditures and trade deficit, we will be able to understand the role of government in the current account deficit problem and we will investigate the validity of twin divergence hypothesis suggested by Kim and Roubini (2008). The results might give important policy implications in employing expenditure instruments of the fiscal policymakers.

Another contribution of the study is about the econometric methods employed in the study. While conventional causality analyses do not give information about the term of causality or the existence of causality in the case of positive and/or negative shocks, Roca and Hatemi-J causality test permits to analyze effects of positive and negative shocks separately. This might yield important results due to stickiness in economic variables. This will result in a positive shock when an economic variable affects another one or a negative shock if the former variable does not affect the latter. By doing so, it will be possible to test the validity of twin divergence hypothesis by employing causality analysis methods. On the other hand, frequency domain causality analysis permits to find causality in different time periods and it might be useful for investigating relations between economic variables. Rolling windows causality analysis also provides exact dates when the causation linkage occurs.

In the next section, the theoretical framework on the relations between government expenditures and trade deficit will be described. In the third section econometrical methodology is given. Empirical results are presented in the fourth section. In the conclusion section, empirical results are interpreted and policy implications are presented.

2. Theoretical Background

Theoretically economists explain the relation between budget deficits and trade deficits via different ways. First of them is Elwell's (2008) well-known saving – investment identity approach, which indicates that the difference between export and import equals to the difference between savings and investments plus difference between taxes and government spending. An increase in government spending would induce an increase in trade deficit. On the other hand, the absorption approach identifies the trade balance as the difference between the national income and domestic expenditures. The domestic expenditures are made by private sector and also government. According to the Mundell–Fleming model and IS – LM model, in an open economy, an increase in government expenditures would affect aggregate demand positively and induce a shift in IS-curve. The shift triggers an increase in equilibrium interest rate level. High interest rate would cause net capital inflow from abroad and result in appreciation of the nominal exchange in the context of Mundell–Fleming model. Appreciated nominal exchange rate would adversely affect net exports due to overvalued domestic currency by cheapening import goods and

making expensive export goods. While the volume of import increases, the export volume moves in the opposite direction and decreases, so the trade deficit occurs (Kayhan et al., 2013).

There is a different point of view indicated by Blanchard and Perotti (2002). According to Blanchard and Perotti (2002), a temporary increase in government spending depreciates the nominal exchange rate, appreciates the terms of trade and increases net exports. The results show that there is a causation linkage between government expenditures and trade deficit running from government expenditures to trade deficit, but in the case of worsening budget deficit, trade balance would increase. This is different from conventional relationship between the public's role in the economy and trade balance, explained in the context of twin deficit hypothesis. Kim and Roubini (2008) call the situation in the U.S. economy as 'twin divergence' instead of 'twin deficit'. This is because they could not find any positive correlation between deficits and they explain the relation via endogenous movements of budget deficit and current account. According to them, during the recession, output falls and fiscal balance worsens. At the same time, the current account would improve when the fall in output leads to a fall in investment that is sharper than the fall in national savings. Therefore, the current account can improve as the fiscal balance worsens (Kim, Roubini, 2008).

3. Literature Review

In initial studies, the imbalance in current account was explained via budget deficits implying that increasing budget deficit induces trade deficits in an open economy. Darrat (1988), Bahmani-Oskooee and Payesteh (1994), Abell (1990), Rosenweigh and Tallman (1993), Vamvoukas (1997), Fidrmuc (2003), Pattichis (2004), Saleh et al. (2005), Baharumshah and Lau (2007) and Bagheri et al. (2012) support the twin deficit hypothesis in the international literature.

In latter studies, Mankiw (2006) and Elwell (2008) explain the relation between government expenditures and trade deficit by using a well-known saving – investment identity approach. On the other hand, Müller (2008) claims that an increase in government expenditures would appreciate the terms of trade and trade balance as indicated before by Blanchard and Perotti (2002) and Kim and Roubini (2008).

There are few studies investigating existence of twin deficit hypothesis in the Turkish economy. A significant number of the studies support the conventional view implying the relationship running from budget deficits to trade deficits. These studies employ mainly VAR-based methods such as Granger causality and/or impulse – response functions as well as co-integration methods. None of them employs a method which takes asymmetric causation linkage into account.

Akbostanci and Tunc (2002), Acaravci and Ozturk (2008) support the hypothesis in the long run while Gok and Altay (2007) and Yaprakli (2010) find that the causality is valid in the short run. Furthermore, Gunaydin (2004), Unsal (2006), Sever and Demir (2007), Celik et al. (2008) and Erdinc (2008) report similar findings for the Turkish economy. On the other hand, there are a few studies implying Ricardian equivalence hypothesis. Bilgili and Bilgili (1998), Kustepeli (2001) and Arican (2005) support Ricardian equivalence hypothesis for the Turkish economy.

There are also a few studies finding bi-directional causality between budget deficits and trade deficits in the Turkish economy. Ata and Yucel (2003), Ay et al. (2004), Utkulu (2003) and Barisik and Kesikoglu (2006) conclude that the feedback hypothesis is valid in the economy. Finally, Yay and Tastan (2007) support this view.

As can be seen, there is no consensus among studies about the relationship between deficits in the literature examining the Turkish economy. Results vary among the studies due to methodology, time span, frequency of analysis and data sources. Although the results obtained from studies examining the relationship between government expenditures and trade deficits imply uni-directional causality running from government expenditures to trade deficits in the international literature, the causality has not been examined for the Turkish economy yet.

4. Methodology

4.1 Hatemi J (2012) - Hatemi J and Roca (2014) Asymmetric Causality

Asymmetric causality test separates the potential causal impact of the positive shock from the negative ones. This is an important issue to take into account because the reaction of economic variables to positive shocks is different from negative ones. In

order to describe the asymmetric causality test in a simple way, Hatemi-J and Roca (2014) concentrate on a bivariate case.

Consider that P_{1t} and P_{2t} are two co-integrated variables (Hatemi-J, Roca, 2014)

$$P_{1t} = P_{1t-1} + \varepsilon_{1t} = P_{1,0} + \sum_{i=1}^{t} \varepsilon_{1i} \quad (1)$$

and

$$P_{2t} = P_{2t-1} + \varepsilon_{2t} = P_{2,0} + \sum_{i=1}^{t} \varepsilon_{2i} \quad (2)$$

t is t=1,2,...,T, $P_{1,0}$ and $P_{2,0}$ constant terms, $\varepsilon_{1i}, \varepsilon_{2i} \sim iid(0, \delta^2)$. Positive and negative changes in each variables are $\varepsilon_{1i}^{+} = \max(\varepsilon_{1i}, 0)$, $\varepsilon_{2i}^{+} = \max(\varepsilon_{2i}, 0)$, $\varepsilon_{1i}^{-} = \min(\varepsilon_{1i}, 0)$ and $\varepsilon_{2i}^{-} = \min(\varepsilon_{2i}, 0)$, respectively. We estimate results as $\varepsilon_{1i} = \varepsilon_{1i}^{+} + \varepsilon_{1i}^{-}$ and $\varepsilon_{2i} = \varepsilon_{2i}^{+} + \varepsilon_{2i}^{-}$. So,

$$P_{1t} = P_{1t-1} + \varepsilon_{1t} = P_{1,0} + \sum_{i=1}^{t} \varepsilon_{1i}^{+} + \sum_{i=1}^{t} \varepsilon_{1i}^{-} \quad (3)$$

$$P_{2t} = P_{2t-1} + \varepsilon_{2t} = P_{2,0} + \sum_{i=1}^{t} \varepsilon_{2i}^{+} + \sum_{i=1}^{t} \varepsilon_{2i}^{-} \quad (4)$$

The accumulation of positive and negative shocks in each variable are $P_{1t}^{+} = \sum_{i=1}^{t} \varepsilon_{1t}^{+}$, $P_{1t}^{-} = \sum_{i=1}^{t} \varepsilon_{1t}^{-}$, $P_{2t}^{+} = \sum_{i=1}^{t} \varepsilon_{2t}^{+}$ and $P_{2t}^{-} = \sum_{i=1}^{t} \varepsilon_{2t}^{-}$, respectively (Hatemi-J, Roca, 2014). $P_t^{+} = (P_{1t}^{+}, P_{2t}^{+})$ vector is used in order to test causation linkage between positive shocks. We denote the vector as stated below with lag k in a VAR (L) model.

$$P_t^{+} = v + A_1 P_{t-1}^{+} + A_2 P_{t-2}^{+} + ... + A_L P_{t-k}^{+} + u_t^{+} \quad (5)$$

In the equation above, v is 2 x 1 vector of constant variables, u_t^{+} is 2x1 vector of error terms where positive shocks take place, A_r is 2x2 parameter matrix and r=1,2, ..., k (Hatemi-J, 2002; 451). Optimal lag length is identified by test statistics developed by Hatemi-J (2003, 2008).

$$HJC = In(\left|\hat{\Omega}_f\right|) + k2T^{-1}(m^2 InT + 2mIn(InT)) \quad (6)$$

$\left|\hat{\Omega}_f\right|$ denotes error terms co-variance matrix in the case lag length k, m denotes equivalence number in vector autoregressive (hereafter, VAR) model and T is sample size (Hatemi-J, Roca, 2014). Null hypothesis is determined as kth column and jth row of A_r matrix equals to zero. Detailed Wald statistics are available in Lütkepohl (2005). If the test statistics are bigger than critical values, the null hypothesis which implies non-causality is rejected.

4.2 Balcılar et al. (2010) Bootstrap Rolling Window Causality

Balcilar et al. (2010) apply corrected likelihood ratio (LR) causality test based on residual based bootstrap method. LR Granger causality test based on bootstrap process employs VAR (p) model with two variables and t=1,2,...,T;

$$y_t = \Phi_0 + \Phi_1 y_{t-1} + ... + \Phi_p y_{t-p} + \varepsilon_t \quad (7)$$

In equation 7, $\varepsilon_t = (\varepsilon_1, \varepsilon_2) \sim iid(0, \sigma^2)$ with nonsingular covariance matrix Σ. Optimal lag length is identified by AIC. $y_t = [y_{1t}, y_{2t}]_{2x1}$ is matrix and VAR(p) model can be identified as:

$$\begin{bmatrix} y_{1t} \\ y_{2t} \end{bmatrix} = \begin{bmatrix} \phi_{10} \\ \phi_{20} \end{bmatrix} + \begin{bmatrix} \phi_{11}(L) & \phi_{12}(L) \\ \phi_{21}(L) & \phi_{22}(L) \end{bmatrix} \begin{bmatrix} y_{1t} \\ y_{2t} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \end{bmatrix} \quad (8)$$

In equation 8, $\phi_{ij}(L) = \sum_{k=1}^{p} \phi_{ij,k} L^k$ and i,j=1,2. Also we identify lag operator as $L^k x_t = x_{t-k}$. The null hypothesis of the test is y_{2t} does not Granger cause of y_{1t} while $\phi_{12,i} = 0$. Balcılar et al. (2010) use rolling window Granger causality based on modified bootstrap process developed by Koutris et al. (2008) and Shukur and Mantalos (2000) in order to solve problems because of sample size and possible structural changes in variables. In this case;:

$Y := (y_1, y_2, ..., y_T)$	2xT
$B := (\Phi_0, \Phi_1, ..., \Phi_T)$	(2x(2p+1))
$Z_T := (1, y_t, y_{t-1}, ..., y_{t-p+1})$	((2p+1) x 1)
$Z := (Z_0, Z_1, ..., Z_{T-1})$	((2p+1) x T)
$\eta := (\varepsilon_1, \varepsilon_2, ..., \varepsilon_T)$	(2xT)

Φ_0 is constant term and t is t=1,2,...,T. We estimate VAR (p) model by estimating B in $Y = BZ + \eta$ model using least squares estimation. By using error terms η_U of the unconstrained model and error terms η_R of the constrained model, cross products are $S_U = \eta_U' \eta_U$ and $S_R = \eta_R' \eta_R$. The test statistics are

$$LR = (T-k)\text{In}(\frac{\det S_R}{\det S_U}) \quad (9)$$

T denotes the number of observation, k=2x(2p+1)+p denotes the correction term in small samples and p denotes lag length of VAR model. After the calculation of test statistics, we obtain $Y^* = BZ^* + \eta^*$ regressions by employing OLS error terms $(\eta_R - \bar{\eta}_R)$. The number of calculated LR* probability value is N_b. In the last phase, in addition to applying to the full sample, we repeat the above steps for the rolling sub-sample $t = \tau - l + 1, \tau - l, ..., l$, $\tau = l, l+1, ..., T$ where l is the size of the Rolling window.

5. Data

In this study, we employ the ratio of trade deficit to GDP in order to measure real change in trade deficit (hereafter, TD) and government expenditures to GDP (hereafter, GE) to see real change in government expenditures. We employ trade deficit data and government expenditures in order to measure real effect of public spending as used by Müller (2008), Mankiw (2006) and Elwell (2008).

We employ the gap between import and export data in order to measure trade deficit and government expenses in budget of central government data in order to measure expenditures of government. While trade deficit is standard data, the definition of government expenditures covers different expense items. So we employ the largest definition covering all government expenditures relating to existing literature. Although application of export-led growth model has started by the beginning of 1980s and trade deficit problem has occurred in the beginning of 1980s, absence of data until 1987 shortened the time period we analyzed. So the analysis contains quarterly data for the period 1987 to 2014. We obtained the data from the statistical database of the International Monetary Fund, namely the International Financial Statistics database.

6. Empirical Results

In this section, we summarize the statistical investigation results. According to descriptive statistics presented in Table 1, volatility value in TD is higher than others. Also the skewness parameter showing asymmetry in distribution of possibility indicates that GE is skewed to the left and TD is skewed to the right. According to Kurtosis coefficient, GE is steep and TD is flattened. Jarque – Bera (JB) test also indicates that GE is not distributed normally and TD is distributed normally.

Table 1 Descriptive Statistics of Variables

Variables	Mean	Maximum	Minimum	Standard Deviation	Skewness	Kurtosis	Jarque-Bera
GE	0.121	0.154	0.070	0.019	-0.750	3.510	11.531 (0.003)
TD	-0.059	0.005	-0.119	0.025	0.100	2.784	0.397 (0.819)

Note: Numbers in parenthesis indicate probability value.

Source: Own Calculation via Eviews

In order to obtain stationary, the estimated statistical value of series of y_t must be bigger than MacKinnon (1996) table value. According to the augmented Dickey Fuller (ADF, hereafter) (1981) and Phillips Perron (PP, hereafter) (1988) unit root test results presented in Table 2, variables are stationary in level. In VAR model, variables are employed in level value of variables. According to Zivot-Andrews (1992) unit root test which takes structural breaks into account, GE variable has structural break in 2000:Q4. The results indicate the crisis period for the Turkish economy. The financial crises in November 2000 and February 2001 had resulted in the recession of the economy and new fiscal policy applications in order to expand the economy.

Table 2 Augmented Dickey Fuller (1981) and Phillips Perron (1988) Linear Unit Root Tests and Zivot-Andrews Unit Root with Structural Break Results

		ADF	PP		ZA
Level	Variables				
Constant	**GE**	-3.382 (0) [0.013]**	-3.318 (6) [0.016]**	Model A	-6.0534 (3) 2000:Q4*
	TD	-2.268 (1) [0.183]	-2.595 (15) [0.096]***		-4.1597 (7) 1997:Q2
Constant+Trend	**GE**	-3.385 (0) [0.015]**	-3.860 (6) [0.017]**	Model C	-6.3923 (3) 2000:Q4*
	TD	-3.467 (0) [0.048]**	-3.371 (0) [0.060]***		-4.3651 (4) 1994:Q1
First Difference					
Constant	**GE**	-10.129 (0) [0.000]*	-13.048 (18) [0.000]*		
	TD	-13.498 (0) [0.000]*	-14.098 (13) [0.000]*		
Constant+Trend	**GE**	-10.083 (0) [0.000]*	-12.908 (18) [0.000]*		
	TD	-13.464 (0) [0.000]*	-14.101 (14) [0.000]*		

*Notes: *.** and *** denotes 1%, 5% and 10% significance levels of unit root, respectively. Numbers in square brackets indicate probability value. Numbers in round brackets indicate lag numbers.*

Source: Own Calculation via Eviews

*Critical values for Model A in Zivot – Andrews test is -5.34 and -4.80, respectively. For model C it is -5.57 and -5.08, respectively. For the ADF test: * shows the results of Dickey Fuller test in the case of zero lag length and lag length chosen due to SIC criteria.** For the ADF test the MacKinnon (1996) critical values for with constant -.3.485. -2.885. -2.579 at the 1%, 5% and 10% levels. The critical values for with constant and trend -4.035. -3.447 and -3.148 at the 1%, 5% and 10% levels, respectively.*

*For the PP test: *Values in the parenthesis show bandwidths obtained according to Newey-West using Bartlett Kernel criteria. ** For the PP test MacKinnon (1996) critical values for with constant -3.483. -2.884. -2.579 at the 1%, 5% and 10% levels. The critical values for with constant and trend -4.033. -3.446 and -3.148 at the 1%, 5% and 10% levels, respectively.*

To test asymmetric causality, we employ Hatemi-J (2012) and Hatemi-J and Roca (2014) asymmetric causality test. Results in Table 3 show that there is bi-directional causality between trade deficit and government expenditures. Causation linkage running from trade deficit to government expenditures is valid for both positive and negative shocks. It means that an increase in trade deficit would increase government expenditures and a decrease in trade deficit would decrease government expenditures. Although these results are both significant economically and statistically, statistical significance level is low. Another important implication is that in the case of negative shock in trade deficit the government expenditures would increase. The result is significant in 1% level. In this regard, it is possible to say that government increases the expenditures in order to stimulate the economy in the case of decreasing trade deficit. Decreasing trade deficit means the private sector is slowing down the production. Because the production type of the Turkish economy is dependent on imported raw materials, this affects investment properties. In this case government has to implement Keynesian fiscal policies by increasing government purchases.

Table 3 Hatemi-J and Roca (2014) Asymmetric Causality Test Results

The Direction of Causality	MWALD	1% Bootstrap Critical Value	5% Bootstrap Critical Value	10% Bootstrap Critical Value
$(TD)^{+} \neq> (GE)^{+}$	4.538 (0.033)**	9.348	5.639	3.917***
$(TD)^{+} \neq> (GE)^{-}$	0.699 (0.403)	10.016	5.456	3.749
$(TD)^{-} \neq> (GE)^{-}$	3.190 (0.074)***	11.984	7.260	5.342
$(TD)^{-} \neq> (GE)^{+}$	10.017 (0.002)*	11.162	7.160**	5.696***
$(GE)^{+} \neq> (TD)^{+}$	4.088 (0.043)**	10.326	5.796	4.056*
$(GE)^{+} \neq> (TD)^{-}$	4.846 (0.028)**	12.612	8.070	5.732
$(GE)^{-} \neq> (TD)^{-}$	2.143 (0.143)	10.310	5.903	3.933
$(GE)^{-} \neq> (TD)^{+}$	0.458 (0.499)	9.683	5.544	3.707

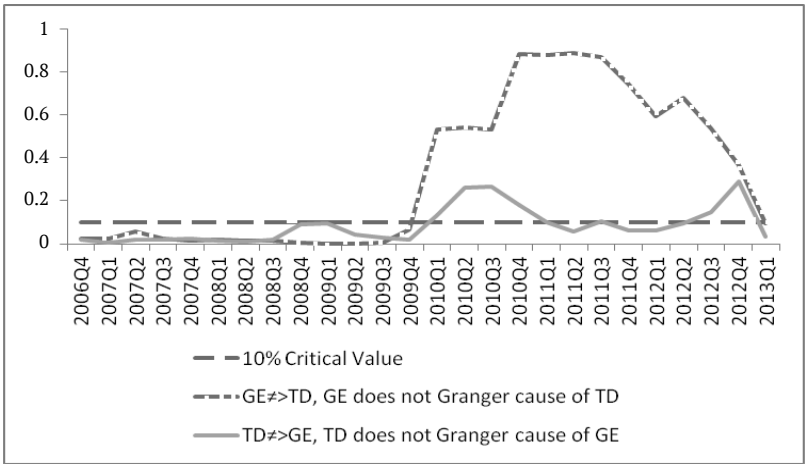
*Note: ≠> denotes that the null hypothesis which implies there is no causality. Values in parentheses indicate asymptotic probability values. *, ** and *** denote significance levels 1%, 5% and 10%, respectively. The number of bootstraps is 10.000.*

Source: Own Calculation via Eviews

On the other hand, causation linkage running from government expenditures to trade deficit is valid only in the case of positive shocks in government expenditures similar to causation linkage running from trade deficit to government expenditures. So, while an increase in government expenditures would increase trade deficit, a decrease in government expenditures would not induce a decrease in trade deficit. Another interesting result from the analysis is this: an increase in government expenditures would decrease trade deficit. This finding is in line with Müller (2008), Kim and Roubini (2007) and Blanchard and Perotti (2002). Results of asymmetric causality test support the existing literature partially. In contrast with the existing studies, analyses results indicate an asymmetric relation and therefore twin divergence may be valid in the second case.

According to Balcilar et al. (2010) rolling windows causality test, there is a bi-directional causality between variables. Results of the test are presented in Figure 2. The uni-directional causality running from government expenditures to trade deficit is valid between years 2009:Q2 and 2006:Q1. On the other hand, causation linkage from trade deficit to government expenditures is valid between years 2009:Q2 and 2010:Q2, 2011:Q4 and 2012:Q1 and in 2010:Q4. Results also support asymmetric causality and frequency domain causality analyses. Results of rolling windows causality analysis support the literature which indicates bi-directional causality between variables.

Figure 2 Balcilar et al. (2010) Bootstrap Rolling Window Causality Test Results



Source: Own Calculation via Eviews

7. Conclusion

The conventional view indicates that budget deficit is the main source of trade deficit in an economy. Despite existing literature for the Turkish economy claiming the validity of twin deficit hypothesis, trade deficit is still high, although the budget deficit remains low. The situation brings to mind questions such as 'Is there any other source of trade deficit and are government expenditures the main source of trade deficit in Turkey or not?' and 'Which hypothesis is valid in the Turkish economy: twin divergence or twin deficit hypothesis?'. In this regard, we employed recently developed causality analysis methods in order to find causality in different terms, in different shock types and to examine exact dates.

All test results support bi-directional causality between government expenditures and trade deficit between years 1987 and 2014. The rolling windows causality analysis finds that causality running from trade deficit to government expenditures is valid between years 2009:Q2 and 2010:Q2, 2011:Q4 and 2012:Q1 and in 2010:Q4. Reverse causality is valid between 2006:Q1 and 2009:Q2. The dates with unidirectional causality running from trade deficit to government expenditure confirm that, especially after the global crisis, trade deficit is the main source of increase in government expenditures. On the other hand, this might be interpreted as a government policy in order to stimulate economy.

The asymmetric causality analysis also confirms that there is a bi-directional causality between variables. Results imply that a positive shock in both variables affects the other one positively. However, a negative shock in trade deficit increases government expenditures. This result implies that a slowdown in private sector would be compensated by the government. On the other hand, an increase in government expenditures would induce a decrease in trade deficit and this is an indicator of the validity of twin divergence. So the deficit in the current account and budget in the Turkish economy would not move symmetrically when government expenditures increase. Government expenditures will depreciate the national currency and this would increase the amount of export and reduce the amount of imported goods. This might be the reason why the initial studies investigating the Turkish economy fail to find results supporting the twin deficit hypothesis.

As a result, this study shows that the government expenditure variable is more useful to explain trade deficits in the Turkish economy. Findings also imply that government expenditures might be used to stimulate the economy, especially after the global financial crisis. By doing so, we imply that the ruling Turkish government has been applying the Keynesian economy policies in the last decade. On the other hand, results give some hints about the validity of the twin divergence hypothesis in the Turkish economy. For future studies, it is possible to investigate the relation via the Markov switching regime dependent analysis methods.

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MEĐUSOBAN UTJECAJ DRŽAVNIH RASHODA I TRGOVINSKIH DEFICITA -ISKUSTVO TURSKE

Sažetak

Svrha ove studije je utvrditi međusobnu uzročnost između trgovinskih deficita i državnih rashoda u turskom gospodarstvu u različitim vremenskim horizontima i u slučaju različitih vrsta šokova za razdoblje između 1987. i 2014. godine. Na taj način namjeravamo testirati hipotezu o postojanju dvostrukoga deficita u turskom gospodarstvu, odnosno utvrditi imaju li državni rashodi sposobnost utjecati na kretanje trgovinskog deficita. U tu svrhu upotrijebili smo model asimetrične uzročne ovisnosti, koji su razvili Hatemi-J (2012) i Hatemi-J i Roca (2014), te test uzročne ovisnosti baziran na metodi pokretnih prozora, koji su razvili Balcilar i dr. (2010). Dobiveni rezultati svih testova navode na zaključak da postoji dvosmjerna uzročnost između varijabli. Za razliku od drugih analiza uzročnosti, rezultati asimetrične uzročne ovisnosti pokazuju da se trgovinski deficit smanjuje s povećanjem državnih rashoda, što je u suprotnosti s rezultatima prethodnih istraživanja. To znači da bi se mogla povrditi hipoteza o postojanju dvostruke divergencije u turskom gospodarstvu umjesto hipoteze o postojanju dvostrukog deficita.

Ključne riječi: asimetrična uzročnost, državni rashodi, trgovinski deficit, hipoteza o postojanju dvostruke divergencije