

CURRENT ACCOUNT IMBALANCE AND FOREIGN CAPITAL INFLOWS IN TURKEY: WHAT CAUSES WHAT?

Dr. Özge BARIŞ TÜZEMEN * 

Dr. Samet TÜZEMEN * 

ABSTRACT

The Turkish economy has the chronic current account deficit problem for many years due to insufficient savings and dependency on energy and intermediate goods import. In order to close the deficit, developing countries need foreign capital. This is also the case for the Turkish economy. In the pre-financial liberalization period, the direction of the causality would be expected from the current account to the capital inflows. After the liberalization on the other hand, the direction of the causality has become an intensively debated issue. This paper's aim is to reveal the course of the possible causal nexus between the financial account and the current account (CA) balance using the Toda-Yamamoto causality and the Hatemi-J asymmetric causality tests. The data cover the period of 2002:01-2017:12. Evidence from the test of the asymmetric causality shows that the negative shocks of the portfolio investment Granger causes both the negative and the positive shocks of the current account balance in Turkey.

Keywords: ADF unit roots, Toda-Yamamoto approach, Asymmetric causality, Foreign capital inflows, Financial liberalization

JEL Codes: F21, F32, F62

TÜRKİYE'DE CARİ AÇIK VE YABANCI SERMAYE ARASINDAKİ NEDENSELLİK İLİŐKİSİ

ÖZET

Türkiye ekonomisi yetersiz iç tasarruflar ve enerji ve ara malı ithalatına olan bağımlılığı nedeniyle uzun yıllar boyunca kronik cari açık sorunuyla karşı karşıya kalmıştır. Çoğu gelişmekte olan ülkede olduğu gibi Türkiye'de de cari açığın finansmanı için yabancı sermayeye ihtiyaç duyulmaktadır. Finansal serbestleşme öncesi dönemde iki deęişken arasındaki nedenselliğin yönünün cari dengeden

* Karadeniz Technical University, Faculty of Economics and Administrative Science, Department of Economics, Trabzon/Turkey, e-mail: ozgebariss@gmail.com

* Ardahan University, Faculty of Economics and Administrative Science, Department of Economics, Ardahan/Turkey, e-mail: samettuzemen@ardahan.edu.tr

yabancı sermayeye doğru olması beklenebilirdi. Ancak, finansal serbestleşme sonrasında sözü edilen nedenselliğin yönü çokça tartışılan bir konu haline gelmiştir. Bu çalışmanın amacı cari işlemler hesabı ile alt kalemler bazında finans hesabı arasındaki olası nedensellik ilişkisini Toda-Yamamoto nedensellik ve Hatemi-J asimetrik nedensellik testleri ile incelemektir. Bunun için aylık olarak derlenen veri seti Ocak 2002 ile Aralık 2017 dönemini kapsamaktadır. Asimetrik nedensellik testinden elde edilen sonuçlara göre finans hesabı içerisinde yer alan portföy yatırımlarının negatif şokları cari dengenin hem negatif hem de pozitif şoklarının Granger nedeni olmuştur.

Anahtar Sözcükler: ADF birim kök testi, Toda-Yamamoto yaklaşımı, Asimetrik nedensellik, Yabancı sermaye girişi, Finansal serbestleşme

JEL Classification: F21, F32, F62

1. INTRODUCTION

The balance of payments is defined as all transactions of the entities in a state and the rest of the world over a time period. The current account is one of the components of the balance of payments. It keeps track of all transactions except financial transactions that comprise economic values and occurs between residents and nonresidents of a country. The current account balance is divided into its components such as trade in goods, trade in service, income, and current transfers. A country's current account balance may have surplus or have a deficit. A surplus indicates that the country is a net creditor. On the other hand a deficit indicates that it is a net debtor. In other words, if a country's current account balance is negative then it means that investments are exceeding savings. The deficit is financed by the financial account in the balance of payments.

With the beginning of the financial liberalization era, the restrictions on the capital flows are removed gradually. Thus, the foreign capital could easily flow into any developing countries' financial markets. It was expected that this liberalization would end up with the efficient resource allocation. Besides, the developing countries would have more capital to finance their investments with the liberalization. However financial liberalization caused the link between real investments and financial markets weakened and ended up with a dual structure in the economy. In addition, the volume and the kind of the capital inflow to the developing countries have been changed over time. For instance, foreign capital was incoming mostly as aids and loans before liberalization. After the liberalization on the contrary, it is shifted to speculative investments where the main propose is to gain arbitrage profits. Hence the macroeconomic balance of the recipient country is spoiled more and more over time, contrary to the expectations.

Like many of the developing countries, production in the Turkish economy is mostly based on the imports of intermediate goods. Thus, several deteriorations occur in the country's current account balance due to the high proportion of imported input materials in their domestic production process. The

Turkish economy has also faced with the problem of large current account deficit for many years. Therefore, the kind and the function of the capital flows towards Turkey have become more of an issue. Turkey has been integrated into the global economy at the end of the 1980s. Thereby, like most developing countries, the volume of foreign capital inflows to Turkey have surged as from 1990. Considering the total amount of capital movements to the Turkish economy; the rate of the foreign direct investments remain low when it compared with the indirect capital inflows. The insufficient domestic resources to finance domestic investments create a need of using external sources.

An increase in the volume of capital inflows might worsen the current account imbalance in many different ways. For instance, more available and cheaper foreign currency cause an increase in import and an overvaluation of the real exchange rate that leads a decrease in exports over time. Hence, the deficit becomes greater and eventually, dependency to foreign capital becomes unavoidable. One may say, foreign capital could lead to certain deteriorations on macroeconomic equilibrium notably on the current account balance. For example, the 1994 and 2001 financial crises of Turkey are seen as the results of a spike in the speculative capital inflows after the financial liberalization.

Before financial liberalization, the direction of causal relationship could be expected from the current account balance to the financial account. However, after the liberalization, the direction of the causality would depend on the financial development level and current policies of the subject country. In line with these, the aim of the study is to reveal the causal nexus between the current account balance and the financial account in the Turkish Economy within the framework of Toda-Yamamoto and Hatemi-J approaches. The data cover the period between 2002:01 and 2017:12. This period is chosen intentionally in order to investigate the relationship after the 2001 crisis of Turkish economy. Because, after the economic crisis, Turkey has experienced high deficit in current account balance and high foreign inflows simultaneously.

The organization of the study is as follows. Second section gives the theoretical background and empirical studies on the relationship of the current account with the capital inflows. Third section shows the dataset and the descriptive statistics are introduced. The econometric methodology that carried out is explained in the following section. In the fifth section, the empirical findings are tabled. The final words including the policy recommendations are discussed in the last section.

2. THEORETICAL AND EMPIRICAL BACKGROUND

There is a significant number of research exists about the current account deficit and the foreign capital inflows relationship. In these studies, various causality testing approaches are applied for several countries and time periods. They have found different results regarding the direction of the relationship. Calvo et al. (1994) investigated the connection between the current account deficit and the foreign inflows within the Fisher-type intertemporal model of saving and consumption. This model suggests an open economy with capital mobility. According to the model, for debtor countries, a decrease in the

world interest rates will increase income. It also increases the substitution effects which leads to a “consumption boom” and a negative expansion in the current account balance. An increase in the consumption affects the investment decision between tradable and non-tradable sectors. Since the non-tradable goods are limited in supply, an increase in demand will result in a rise in the prices of the non-tradable goods. Moreover, a surge in the capital inflows puts an increasing pressure on the imports with the appreciation of the real exchange rate. Ghosh and Ostry (1995) adopted a different approach namely the consumption-smoothing theory to investigate the relationship between the capital inflows and the current account deficit. One can predict the behavior of the capital flows if decision makers act in parallel with the permanent income theory. According to the Ghosh and Ostry’s (1995) argument, current account should have a deficit when the capital inflow is expected to rise in time. On the other hand, it will have surplus if the expectation of incoming cash becomes negative. Ghosh and Ostry (1995) also claimed that the intertemporal current account model provides a standard to evaluate the capital inflows’ movement, when a specific shock affects an economy. In their study, Ghosh and Ostry (1995) calculated ideal current account levels using data of 45 emerging countries. They applied vector autoregression (hereafter VAR) analysis and found that effective current account balance leads to consumption smoothing or high capital mobility.

According to Obstfeld and Rogoff (1996), the intertemporal balance model of the current account provides a perspective to the optimization behavior of an individual via an intertemporal decision. Hence, a current account imbalance shows that the individuals take the advantage of tapping international financial markets to smooth their consumption out in order to achieve intertemporal optimization. Fry et al. (1995) investigated the causal relationship with a yearly data spanning between 1970 and 1992 for some emerging states. They revealed that the capital account is the Granger cause of the current account for 17 states while the current account is the Granger cause of the capital account for 12 states. There is also no causal relationship for 21 countries according to their results. Wong and Carranza (1999) studied annual data spanning from the 1970s to 1990s for 4 developing countries. To test the causal nexus between the capital account and the current account, they estimated a bivariate VAR model. The evidence show that the high capital mobility could be the major cause of the current account instability.

Lane and Milesi-Ferretti (2002), investigated the long run behavior of the net foreign asset using data for 1970-1998 in 66 developing and advanced countries. They run a panel fixed effect regression and the results show that there is a nexus between the trade balance and net foreign asset position in both developing and advanced countries. The net foreign asset positions are negatively correlated with the trade balance. This relationship is stronger in the advanced countries than in the developing countries. Sarisoy Guerin (2004) examined the dependence between the current account balance and the volatility of net capital inflow by a panel regression model. She used a yearly data between 1970 and 2000 for several emerging and developed countries. The evidence for the developed countries show that

the volatility in the inflows doesn't affect the current account volatility significantly. For the developing countries, on the other hand, the results of the regressions reveals the nexus between the inflows and the current account volatility. If the volatility in the net inflows increases by one, then the volatility in the current account balance increases by 0.35 unit.

Yan and Yang (2008) investigated a quarterly data for the period between 1974:Q1 and 2005:Q4 for 5 developing and 5 advanced countries. In order to examine the nexus between the current account and the capital account, they used both net and gross capital inflows and employed a VAR model to examine the possible Granger causality. The empirical results show that the foreign capital inflows are the Granger cause of the current account balance in the developing countries. However, there is not any causal relationship in the advanced countries. Akbas et al. (2014) analyzed whether there exists a causal nexus between capital inflows and current account deficit for 20 developing states using the data cover the period of 1990-2011. According to the findings of the panel causality approach, there is a unilateral causality from short-term capital inflows to current account deficit.

By the year of 1990 when the capital account was liberalized in Turkey. The liberalization experience was not as successful as expected. In other words, when capital inflows increases, irresponsible risk taking actions with "when it pours" type approaches become the norm rather than the exception. Turkey has the lowest savings rate among the emerging market economies and does not have an outstanding investment performance. Therefore, Turkey became one of the most capital inflows dependent countries (Ozatay, 2014: 4-6). The gap between the investment and the savings determines the current account balance and it should be filled by the foreign capital inflows. Thus, it is a much debated issue in Turkey. Some of these studies are reviewed below.

Erden and Cagatay (2011) used a monthly dataset (1992-2009) for Turkey and according to the findings there is a unilateral causal link exists between the capital account and the current account. In addition, they carried out the Granger causality test to the capital account that is decomposed into its components such as the hot money and the other financial investments. They found that there is not any link between the current account and the other financial investments. On the other hand, they also found that the changes in the hot money Granger cause the movements in the current account imbalance. To find out the most effective tool in financing the current account deficit in Turkey, Zafir and Sezgin (2012), used the co-integration and the vector error correction methods for the period of 1992Q1-2011Q3. The evidence show that the foreign direct investment and the portfolio investments are significant factors in financing the current account deficit in both long and short-term. According to the causality test results, there is a bidirectional causal link between the CA and the FDI, as well as the PI and the public debts variables.

Kırıkkaleli et al (2015) used the data for the period of 1994:Q1-2009:Q4. The foreign bank penetration, the foreign direct investment and the portfolio investment are used as variables of their

study. Kırıkkaleli et al (2015) applied a multivariate VAR and block exogeneity Wald tests to investigate the short run dynamic relations between the relevant variables. The findings of the block exogeneity Wald test indicate that there is a unidirectional causality from the portfolio investment to the foreign bank penetration. Also, another causality is determined from the foreign bank penetration to the foreign direct investment. Finally, the evidence from variance decomposition suggest that the influence of the foreign bank penetration to the variability of the foreign direct investment is more than that of the portfolio investment in Turkey. Kandil and Trabelsi (2015), carried out the effects of the foreign capital on macroeconomic variables in Turkey. Kandil and Trabelsi (2015) used quarterly data covering the period 1989:01-2009:03 within the frame of VAR analysis. The results show that the capital inflows have different effects on the Turkish economy with respect to the date. Particularly, during the post-crisis period, they found traces of sterilization policy which has helped cleaning excess liquidity and suppressing inflationary pressures.

Kesgingoz and Karatas (2016) examined the causal relationship and the direction of this causality between the foreign capital and the current account balance in Turkey. They split the data into two sub-periods in order to observe the relationship before and after the economic crisis separately. While the data of the first sub-period cover the years between 1992 and 2001, the second sub-period cover the years between 2002 and 2015. For both first and second sub-periods, they observed that the CA is the Granger cause of the capital account in Turkey. Varlık and Berument (2016) used a monthly data for the period between 1992:01 and 2013:05. According to results of the VAR impulse and response analysis, the capital inflows without control of credits increase the imports. However, controlling the growth of the credit decreases the effects of the capital inflows on the imports and the industrial production. Turan and Karakas (2016) studied causality relationship between the current account balance and the components of financial account namely the foreign direct investment, the portfolio investment and the other investment. The data cover the period of 1998:01-2014:04. Turan and Karakas (2016) analyzed the asymmetric causal relationship as well as the symmetric causality. They employed Toda-Yamamoto test for the symmetric causality and implemented Hatemi-J approaches for the asymmetric causality. The results of both Hatemi-J and Toda-Yamamoto tests show that there is a unilateral causality from the financial account to the current account.

3. DATA AND DESCRIPTIVE STATISTICS

We analyzed the causal nexus between the current account (CA) and the financial account, which decomposed into its constituents namely the portfolio investments (PI), the foreign direct investment (FDI), and the other investments (OI). All the data are gathered from the database of the Turkish Central Bank (CBTR) and available from 2002:01 to 2017:12. This period is chosen intentionally in order to investigate the relationship after the 2001 crisis of the Turkish economy. Because, after the crisis, Turkey has experienced high current account deficit with high foreign capital inflows simultaneously. The data

denominated in the Turkish Lira. All the variables are deflated by consumer price index to make real and the X-13 ARIMA method applied to the variables for seasonal adjustment.

The descriptive statistics of the current account (CA), the portfolio investments (PI), the foreign direct investment (FDI), and the other investments (OI) variables are shown in Table 1. As seen in the table OI is more volatile than CA, FDI, and PI. The current account balance experienced its maximum value in March 2002 and the minimum value in March 2011. The current account deficit has reached 9.6% of GDP in 2011. This is the highest rate for the period between 1975 and 2017 in Turkey. The portfolio investment took its minimum value soon after the global financial turmoil in October 2008. The foreign direct investment took its minimum value in December 2004 while it was taking the maximum value in May 2006. The regulation regarding on the implementation of the foreign direct investment (Foreign Direct Investment Law No. 4875 in June 2003) and the limitation of paper works in establishment process of a company enhanced the quantity of newly founded investment. One another attempt is to privatization in order to accelerate foreign capital inflows. As a result, capital flows toward Turkey showed an increase and the highest capital inflows took place in 2006. On the other hand, all the variables except the foreign direct investment have a normal distribution.

Table 1. Descriptive Statistics

	CA	PI	FDI	OI
Mean	-27.50493	9.458677	9.976285	15.81033
Maximum	8.357285	62.65356	75.60324	76.67745
Minimum	-71.89522	-44.69814	-2.693836	-34.41251
Std. Dev.	15.80615	17.22410	9.414437	19.49262
Skewness	-0.239096	0.178515	3.491856	0.092027
Kurtosis	2.804800	3.466582	22.29145	3.748017
Observations	192	192	192	192

4. ECONOMETRIC METHODOLOGY

In our paper, we employed the Toda-Yamamoto's approach to testing the symmetric causal relationship between CA-PI, CA-FDI, and CA-OI pairs. Toda and Yamamoto prevent several issues by applying a standard VAR in the levels of the variables (Chowdhury and Mavratos, 2006: 6). Hence, they minimize the possible risks related with wrongly identified integration orders of the series or the presence of co-integration. They also minimize the distortion of the tests' sizes as a result of pretesting (Giles 1996: 6).

Following Wolde-Rufael (2004) we use a bivariate VAR (p+d_{max}) model, which is a composition of current account and financial account:

$$Y_t = \alpha_0 + \sum_{i=1}^p \delta_{1i} Y_{t-i} + \sum_{j=p+1}^{d_{\max}} \delta_{2j} Y_{t-j} + \sum_{i=1}^p \lambda_{1i} X_t + \sum_{j=p+1}^{d_{\max}} \lambda_{2j} X_{t-j} + u_t \quad (1)$$

$$X_t = \beta_0 + \sum_{i=1}^p \theta_{1i} X_{t-i} + \sum_{j=p+1}^{d_{\max}} \theta_{2j} X_{t-j} + \sum_{i=1}^p \gamma_{1i} Y_{t-i} + \sum_{j=p+1}^{d_{\max}} \gamma_{2j} Y_{t-j} + v_t \quad (2)$$

Where Y is the CA, and X is the financial account (namely the PI, the FDI, and the OI). In addition, α_0 and β_0 are the constant terms, δ_{1i} , δ_{2j} , λ_{1i} , λ_{2j} , θ_{1i} , θ_{2j} , γ_{1i} , and γ_{2j} are the parameters, and u_t and v_t are the residuals of the model. In (1), X_t Granger causes Y_t if $\lambda_{1i} \neq 0 \forall i$; similarly in (2) Y_t Granger causes X_t if $\gamma_{1i} \neq 0 \forall i$. It is a two steps procedure. The first step is the determination of the lag length (p) and the second step is the choosing of the maximum integration order (d_{max}) for the variables. We used the Schwarz Information Criteria (SIC) to select the optimum lag order of the VAR. The model is estimated by using Seemingly Unrelated Regression (SUR) model.

We employed the asymmetric causality test to investigate the expected link between positive and negative shocks of the variables. Previously published papers on causality tests assumed that the impact of the positive shock is the same as the impact of the negative shock. According to Hatemi-J (2012), this assumption is too restrictive since the economic agents' responses are different to a positive shock and a negative shock with the same size in the financial markets. Besides, the investors give more reaction to a negative news than a positive one that occurs in a market. In addition to these, the asymmetric structure should be taken into account due to the asymmetric information in markets. To allow the asymmetry in the causality, Hatemi-J (2012) argues that the test should be performed by using cumulative sums of both the positive and the negative constituents of the variables. The test that applied to investigate the causal relations between two variables such as x_{1t} and x_{2t} is defined as below:

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

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

Where x_{1t} and x_{2t} are initial values. The aforementioned shocks can be formulized as following: $\varepsilon_{1i}^+ = \max(\varepsilon_{1i}, 0)$, $\varepsilon_{1i}^- = \min(\varepsilon_{1i}, 0)$, $\varepsilon_{2i}^+ = \max(\varepsilon_{2i}, 0)$ and $\varepsilon_{2i}^- = \min(\varepsilon_{2i}, 0)$. Thus, it is appropriate to express $\varepsilon_{1i} = \varepsilon_{1i}^+ + \varepsilon_{1i}^-$ and $\varepsilon_{2i} = \varepsilon_{2i}^+ + \varepsilon_{2i}^-$. In the light of this information, the equalities from (3) and (4) can be expressed as follows:

$$x_{1t} = x_{1t-1} + \varepsilon_{1t} = x_{1,0} + \sum_{i=1}^t \varepsilon_{1i}^+ + \sum_{i=1}^t \varepsilon_{1i}^- \quad (5)$$

$$x_{2t} = x_{2t-1} + \varepsilon_{2t} = x_{2,0} + \sum_{i=1}^t \varepsilon_{2i}^+ + \sum_{i=1}^t \varepsilon_{2i}^- \quad (6)$$

Both of the shocks of each variables can be shown in the cumulative form as $x_{1t}^+ = \sum_{i=1}^t \varepsilon_{1i}^+$ and $x_{1t}^- = \sum_{i=1}^t \varepsilon_{1i}^-$; $x_{2t}^+ = \sum_{i=1}^t \varepsilon_{2i}^+$ and $x_{2t}^- = \sum_{i=1}^t \varepsilon_{2i}^-$. Next, the test for casual relationship in-between positive cumulative shocks is introduced:

$$x_t^+ = \alpha + A_1 x_{t-1}^+ + \dots + A_p x_{t-p}^+ + u_t^+ \quad (7)$$

Where x_t^+ is the 2x1 vector of the variables, α is the 2x1 vector of intercepts and u_t^+ is a 2x1 vector of error terms. The critical value is calculated using a bootstrap algorithm with leverage corrections. The bootstrap critical values are applied by using GAUSS code generated by Hatemi-J (2012). In Hatemi-J asymmetric causality approach, information criterion is taken in consideration which suggested by Hatemi-J (2003) to find the optimum lags.

Toda-Yamamoto (1995) causality analysis is practicable independently from the integration order of the variables. However, to determine the additional lags in the VAR model of the Toda-Yamamoto test, it is essential to find the maximum order of integration of the series. In our study, we employed Augmented Dickey-Fuller (ADF) test to determine the maximum order of integration. Optimum lags are determined by SIC.

5. EMPIRICAL FINDINGS

In the study, first ADF test is applied to the original data and the maximum order of integration is identified. The results of ADF test are introduced in Table 2. As it is seen, CA and FDI variables are found to be I (1), while PI, OI variables are found to be I (0). Thus, 1 is chosen as the maximum order of integration for the original data. Second, ADF unit root test is carried out to the positive and the negative cumulative sums. The evidence of ADF test is presented in Table 3. The results indicate that we cannot reject the null hypothesis of the existence of the unit roots for each variables in level. On the other hand, the null hypothesis could be rejected when the ADF test employed to the I(1) levels of the both cumulative positive and cumulative negative sums of each variables. In other words, the maximum order of integration is 1 for all combination.

Table 2. ADF Unit Root Test Results for the Original Data

Vars	I(0)		I(1)		Order of Integration
	Constant	Constant+Trend	Constant	Constant+Trend	
CA	-2.028	-2.613	-15.518***	-15.476***	I (1)

PI	9.229***	-9.342***	-	-	I (0)
FDI	2.893**	2.946	14.405***	-14.373***	I (1)
OI	4.919***	4.931***	-	-	I (0)

Note: Lag length was selected by using SIC. The Maximum lag length was set to 14. *** and **, indicate significance at 1% and 5%. Vars is for variables. I(0) & I(1) denote level and first difference respectively.

Table 3. ADF Unit Root Test Results for the Positive and Negative Shocks

Vars	I(0)		I(1)		Integration Order
	Constant	Constant&Trend	Constant	Constant&Trend	
CA⁺	3.159	1.294	-16.929***	-17.758***	I (1)
CA⁻	3.364	0.148	-17.734***	-18.554***	I (1)
PI⁺	1.164	-2.760	-17.319***	-17.412***	I (1)
PI⁻	1.108	-2.887	-12.789***	-12.875***	I (1)
FDI⁺	-1.101	-1.714	-3.658**	-3.717**	I (1)
FDI⁻	-0.874	-2.580	-4.002**	-4.027**	I (1)
OI⁺	1.318	-2.170	-17.611***	-17.730***	I (1)
OI⁻	0.811	-2.948	-16.616***	-16.650***	I (1)

Note: Lag length was selected by using SIC. The Maximum lag length was set to 14. *** and **, indicate significance at 1% and 5%. Vars is for variables. I(0) & I(1) denote level and first difference respectively.

The empirical findings of the Granger causality approach based on Toda-Yamamoto (1995) methodology that is run via modified Wald (MWALD) are shown in the Table 4. The null hypothesis of no causality cannot be rejected any conventional significance level neither from the financial account to current account nor from the current account to financial account. Thereby, there is no relationship between the current account imbalance and the financial account in Turkey for the period between 2002:01 and 2017:12.

Table 4. Toda-Yamamoto Causality Test Results

The Null Hypothesis	Optimum Lag length	Wald Test Statistics	Decision
PI \nrightarrow CA	$p = 3$ $d_{max} = 1$	6.217919 (0.10)	Not rejected
CA \nrightarrow PI	$p = 3$ $d_{max} = 1$	0.614366 (0.89)	Not rejected

FDI \nrightarrow CA	$p = 3$ $d_{max} = 1$	3.533994 (0.31)	Not rejected
CA \nrightarrow FDI	$p = 3$ $d_{max} = 1$	3.556600 (0.31)	Not rejected
OI \nrightarrow CA	$p = 3$ $d_{max} = 1$	3.284088 (0.35)	Not rejected
CA \nrightarrow OI	$p = 3$ $d_{max} = 1$	2.537708 (0.46)	Not rejected

Note: The figures enclose in parenthesis indicate the probability values of Granger non-causality. p denotes optimum lag order of VAR model. To test VAR (p+d_{max}) a fixed one lag augmentation used, because the maximum order of integration one for CA series.

The results of Hatemi-J asymmetric test of causality are reported in Table 5. According to the standard causality test results, there is no causal nexus between the portfolio investments and the current account balance. There is also no causality between the FDI and the CA. Finally, the null hypothesis of no causality of the other financial investments on the current account cannot be rejected. The findings consistent with the results of Toda-Yamamoto causality test results.

On the other hand, when the interaction between the cumulative positive and negative sums of each variable is examined, the negative shocks of the portfolio investments are found to be Granger cause of the negative shocks of the current account balance at 5% significance level. In addition, a causality is observed at 5% significance for the nexus between the negative shocks of the portfolio investments and the positive shocks of the current account balance. This result is expected since the portfolio investments and the short term inflows have been the most extensively encountered forms of the foreign capital in Turkey, like most of the developing countries especially after the financial liberalization.

Table 5. Hatemi-J Asymmetric Causality Test Results

H ₀	TV	p	Bootstrap CV at 1%	Bootstrap CV at 5%	Bootstrap CV at 01%
P \nrightarrow CA	5.920	3	11.322	7.950	6.402
CA \nrightarrow P	0.585	3	11.500	7.981	6.376
P ⁺ \nrightarrow CA ⁺	1.181	2	10.067	6.294	4.776
CA ⁺ \nrightarrow P ⁺	1.399	2	9.725	6.116	4.762
P⁻\nrightarrowCA⁻	11.458**	3	12.268	8.076	6.342
CA ⁻ \nrightarrow P ⁻	1.561	3	12.148	8.004	6.328

$P^+ \nrightarrow CA^-$	0.608	2	10.332	6.512	4.955
$CA^- \nrightarrow P^+$	1.045	2	9.863	6.140	4.642
$P^- \nrightarrow CA^+$	9.018**	2	9.812	6.280	4.829
$CA^+ \nrightarrow P^-$	0.431	2	9.935	6.332	4.695
$FDI \nrightarrow CA$	7.025	5	16.720	11.835	9.603
$CA \nrightarrow FDI$	6.521	5	16.088	11.603	9.578
$FDI^+ \nrightarrow CA^+$	2.703	2	11.364	6.365	4.690
$CA^+ \nrightarrow FDI^+$	3.347	2	11.663	6.542	4.637
$FDI^- \nrightarrow CA^-$	2.507	2	11.210	6.404	4.628
$CA^- \nrightarrow FDI^-$	5.454*	2	11.711	6.614	4.753
$FDI^+ \nrightarrow CA^-$	0.397	2	11.785	6.468	4.729
$CA^- \nrightarrow FDI^+$	1.335	2	11.446	6.252	4.530
$FDI^- \nrightarrow CA^+$	0.373	1	7.892	3.808	2.554
$CA^+ \nrightarrow FDI^-$	0.568	1	7.976	3.762	2.519
$OI^+ \nrightarrow CA^+$	0.249	2	10.063	6.243	4.755
$OI \nrightarrow CA$	3.114	2	9.481	6.018	4.576
$CA \nrightarrow OI$	1.404	2	9.371	6.181	4.706
$CA^+ \nrightarrow OI^+$	1.976	2	10.115	6.177	4.686
$OI^- \nrightarrow CA^-$	1.255	2	10.745	6.325	4.774
$CA^- \nrightarrow OI^-$	2.379	2	10.407	6.221	4.744
$OI^+ \nrightarrow CA^-$	1.594	2	9.581	6.238	4.731
$CA^- \nrightarrow OI^+$	0.745	2	9.723	6.070	4.665
$OI^- \nrightarrow CA^+$	1.396	2	10.657	6.327	4.761
$CA^+ \nrightarrow OI^-$	0.146	2	10.471	6.254	4.767
Note: The symbol \nrightarrow represents Granger non-causality, CV represents critical value, "+" and "-" refer the cumulative positive and negative sums respectively. ** and * indicate rejection of null hypothesis 5% and 10% significance level respectively. p denotes optimum lag order of VAR model. To test VAR (p+d _{max}) a constant one additional lag used, because the maximum order of integration one for CA series. Number of bootstrap replication 10000. TV denotes test value. H ₀ denotes the null hypothesis.					

6. CONCLUSION

In this study, we have examined the causal link between the current account balance and the financial account in Turkey during the period of 2002:01-2017:12. The financial account is decomposed into its component namely the portfolio investments, the foreign direct investment, and the other investments. Both of the portfolio and the other investment series found to be stationary while the current account and the foreign direct investment series have unit roots. Two unique methodologies have been carried out to test the Granger causality. These are the Toda-Yamamoto (1995) approach to test the symmetric relations and the Hatemi-J (2012) test for asymmetric causality interaction.

The results of the Toda-Yamamoto causality test shows that the current account doesn't cause both the PI, the FDI and the OI. In addition, the financial account variables are not the cause of the current account either. These findings are not parallel with the results of several studies about Turkey. For instance, Erden and Cagatay (2011) have found evidences of a unilateral causal link between the capital account and the CA while Kesgingöz and Karatas (2016) suggest vice versa in their study. On the other hand the results of Zafir and Sezgin (2012) show that there is unilateral causality from the current account balance to both the foreign direct investments and the portfolio investments. Finally our results are also in contradiction with the Turan and Karakas's (2016) Toda-Yamamoto test results where they have found evidence of unilateral causal relationship from the PI to the CA.

The evidence from the Hatemi-J (2012) asymmetric causality test show that there is not any nexus between the current account balance and FDI and OI. On the contrary, a relationship is observed between the negative shocks of the portfolio investment and the negative shocks of the current account balance. The direction of the causality is from the negative shocks of the portfolio investment to the negative shocks of the current account balance. In addition, the negative shocks of the portfolio investments also Granger causes the positive shocks of the current account. On the contrary, Turan and Karakas (2016) have found evidence of a unilateral causality from the positive shocks of the portfolio investments to the positive shocks of the current account balance in their study.

The current account imbalance is one of the main macroeconomic issues of Turkey. Low saving rates and high import dependency for the domestic and export markets, especially on energy imports, are the major reasons for the current account imbalance in Turkey. On the other hand, the current account imbalance is led by lower saving rates. The substantially decreasing saving rates have dropped to the level as low as 13 percent in 2009. This ratio was 26% in 1988, when is the last year before the financial liberalization begins in Turkey. After 2001, appreciation of the domestic currency, the high proportion of imported inputs and increasing consumption lead to a foreign trade deficit. As a result of this cycle, the increased trade deficit increases the current account deficit. In addition, post-2001 rapid economic growth caused a rise in current account imbalance due to the increased imports. In this sense, because of the domestic saving rates were not enough to finance the domestic investment, an unavoidable need

to external sources arose. During the 2000s, short-term speculative capital inflows are encouraged by the higher interest rate policies. The effect of the FDI on the current account deficit is weak when compared to the portfolio investments. Since the beginning of the 2000s the Turkish economy has experienced both higher capital inflows and current account deficit simultaneously. Thus, the current account imbalance problem created a risk for the economy and the economy has become much more vulnerable.

The main problem of the Turkish economy is related to its structure of production. Increasing dependency on import is also stimulated the current account imbalance. Policies should take measures in order to enhance the competitiveness in the exporting sectors and to reduce dependency on the imports of the intermediate goods. On the other hand, alternative energy sources might be considered, in order to reduce dependency on oil, which takes very high proportion in total imports. In addition, instead of short-term capital inflows, long-term capital inflows like foreign direct investments might be preferred to finance the current account imbalances. Finally, the policies should be implemented to promote domestic saving rates.

REFERENCES

- Akbas, Y. E., Lebe, F. ve Uluyol, O. (2014) "Analyzing The Relationship Among The GDP - Current Account Deficit and Short Term Capital Flows: The Case of Emerging Markets", *Journal of Management and Economics*, 21 (2): 293-303.
- Calvo, G. A., Leiderman, L. ve Reinhart, C. M. (1994) "Inflows of Capital to Developing Countries in the 1990s: Causes and Effects", IDB Working Paper, No. 246. Available at SSRN: <https://ssrn.com/abstract=1815929> or <http://dx.doi.org/10.2139/ssrn.1815929>.
- Chowdhury, A. ve Mavratos, G. (2006) "FDI and Growth: What Causes What?", *The World Economy*, 29 (1): 9-19.
- Dickey, D. A. ve Fuller, W. A. (1981) "Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root", *Econometrica*, 49 (4): 1057-1072.
- Erden, L. ve Cagatay, O. (2011) "The Relationship between Current and Capital Accounts in Turkey", *Hacettepe University Journal of Economics and Administrative Sciences*, 29 (2): 49-67.
- Fry, M. J., Claessens, S., Burridge, P. ve Blanchet, M. (1995) "Foreign Direct Investment, Other Capital Flows and Current Account Deficit: What Causes What?", Policy Research Working Paper, No. 1527, World Bank.
- Ghosh, A. R. ve Ostry, J. D. (1995) "The Current Account in Developing Countries: A Perspective from the Consumption-Smoothing Approach", *The World Bank Economic Review*, 9 (2): 305-333.

- Giles, D. E. A. (1996) "Causality between the Measured and Underground Economies in New Zealand", *Applied Economics Letters*, 4: 63-67.
- Granger, C. W. (1969) "Investigating Causal Relations by econometric Models and Cross-Spectral Methods", *Econometrica*, 37 (3): 424-438.
- Hatemi-J, A. (2003) "A New Method to Choose Optimal Lag Order in Stable and Unstable VAR Models", *Applied Economics Letters*, 10 (3): 135-137.
- Hatemi-J, A. (2012) "Asymmetric Generalized Impulse Response and Variance Decomposition with an Application", *Munich Personal RePEc Archive*, 31700: 1-8.
- Kandil, M. ve Trabelsi, M. (2015) "On Capital Flows and Macroeconomic Performance: Evidence Before and After the Financial Crisis in Turkey", *Borsa Istanbul Review*, 15(4): 249-258.
- Kesgingöz, H. ve Karatas, A. R. (2016) "Foreign Direct Investment and Current Account Deficit with Relations and Policy Recommendations for the Current Account Deficit", *Journal of the Human and Social Science Researches*, 5 (3): 597-610.
- Kırıkkaleli, D., Bora, I. ve Vehbi, A. (2015) "Capital Flows to Turkey: Multivariate VAR Approach", *International Journal of Economic Perspectives*, 9(3): 9-21.
- Lane, P. R. ve Milesi-Ferretti, G. M. (2002) "Long-Term Capital Movements", *National Bureau of Economic Research, Working Paper No. 8366. Available at URL: <http://www.nber.org/chapters/c11064>*.
- Obstfeld, M. ve Rogoff, K. (1996) "Foundations of International Macroeconomics", *Cambridge: The MIT Press*.
- Ozatay, F. (2014) "Turkey's Distressing Dance with Capital Flows", *Emerging Markets Finance and Trade*, 52 (2): 336-350.
- Sarisoy Guerin, S. (2004) "The Relationship between Capital Flows and Current Account: Volatility and Causality", Available at SSRN: <https://ssrn.com/abstract=2018195orhttp://dx.doi.org/10.2139/ssrn.2018195>.
- Sims, C. A. (1980) "Macroeconomics and Reality", *Econometrica*, 48 (1): 1-48.
- Toda, H. Y. ve Yamamoto, T. (1995) "Statistical Inference in Vector Autoregression with Possibly Integrated Processes", *Journal of Econometrics*, 66 (1): 225-250.
- Turan, T. ve Karakas, M. (2016) "The Relationship between Current Account Balance and Financial Account: An Empirical Study for Turkey", *Maliye Dergisi*, 170: 45-58.
- Varlık, S. ve Berument, M. H. (2016) "Credit Channel and Capital Flows: A Macroprudential Policy Tool? Evidence from Turkey", *the BE Journal of Macroeconomics*, 16(1): 145-170.

- Wolde-Rufael, Y. (2004) “Disaggregated industrial energy consumption and GDP: the case of Shanghai, 1952–1999”, *Energy Economics*, 26 (1): 69-75.
- Wong, C. ve Carranza, L. (1999) “Policy Responses to External Imbalances in Emerging Market Economies: Further Empirical Results”, *IMF Staff Papers*, 46 (2): 225-237.
- Yan, H. ve Yang, C. (2008) “Foreign Capital Inflows and the Current Account Imbalance: Which Causality Direction?”, *Journal of Economic Integration*, 23 (2): 434-461.
- Zafir, C. Z. ve Sezgin, F. H. (2012) “Analysis of the Effects of Foreign Direct Investment on the Financing of Current Account Deficits in Turkey”, *International Journal of Business and Social Science*, 3 (10): 68-78.