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Current Account Deficit Problem in Turkish Economy: An Application with Selected Macroeconomic Variables[1]

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Abstract

The main goal of the countries that want to increase the prosperity of their citizens is economic growth. As a result of worldwide economic and prosperity growth, consumption and energy usage increased significantly. Insufficiency of the local resources lead the countries to international trade. Growth of international trade and increase of financial transactions made the current account deficit (CAD) problem very important for the countries. Therefore, countries develop policies in order to understand the causes of the CAD and resolve them. Some of the factors that cause the CAD are excessive appreciation of the country's currency, fast economic growth and increase in the imported oil prices. Increase of the CAD as a share of GDP lead economies to currency and/or financial crises by increasing their fragility. Thus, CAD preserves its actuality and significance as a problem for economies. In the last decades, the CAD issue became one of the chronical problems of Turkish economy. In this context, it is seen that Turkish economy adopted the growth with CAD strategy in last 20 years and always have CAD in this period except 1998 and 2001. In this study, the causality relation and long-term relationship of Turkey's current account balance (CAB), GDP, brent type oil prices, and real exchange rate are determined by using data of 2000: Q1-2016: Q2. According to results, there is a bidirectional causality between CAD and GDP and one-way causality from oil prices to both GDP and CAD. In addition to causality relation, according the cointegration analysis, oil prices and GDP increase the CAD in the long run.

Keywords: Current Account Deficit, Current Account Balance, Economic Growth, Turkish Economy, Oil prices

Türkiye Ekonomisinde Cari Açık Problemi: Seçili Makroekonomik Değişkenlerle Bir Uygulama

Özet

Vatandaşlarının refahını artırmak isteyen ülkelerin temel amacı ekonomik büyümeyi sağlamaktır. Dünyadaki ekonomik büyüme ve refah artışının bir sonucu olarak, tüketim ve enerji kullanımı önemli ölçüde artmıştır. Yerel kaynakların yetersizliği, ülkeleri uluslararası ticarete yönlendirmiştir. Uluslararası ticaretin büyümesi ve finansal işlemlerin artması ülkeleri, cari işlemler bilançosu (CİB) açığı sorununu ile karşı karşıya bırakmıştır. Bu nedenle, ülkeler CİB açıklarının nedenlerini anlamak ve bunları çözmek için politikalar geliştirmektedirler. CİB açıklarına neden olan faktörlerden bazıları, ülkenin para biriminin aşırı değerlenmesi, hızlı ekonomik büyüme ve ithal edilen petrol fiyatlarındaki artıştır. CİB açıklarının GSYH içindeki payının artması, ekonomilerin kırılganlıklarını artırarak parasal ve / veya finansal krizlere neden olmaktadır. Dolayısıyla, CİB açıkları ekonomiler için önemli bir sorundur. Son yıllarda, CİB açıkları sorunu Türkiye ekonomisinin kronik sorunlarından biri haline gelmiştir. Bu bağlamda, Türkiye ekonomisinin son 20 yılda CİB açığı stratejisiyle büyümeyi benimsediği ve bu süreçte, 1998 ve 2001 yılları haricinde daimi olarak CİB'in açık verdiği görülmektedir. Bu çalışmada, Türkiye'nin cari işlemler bilançosu (CİB), GSYH, brent tipi petrol fiyatları ve reel döviz kuru arasındaki nedensellik ve uzun dönem ilişkisi, 2000: Q1-2016: Q2 verileri kullanılarak incelenmiştir. Elde edilen sonuçlara göre, CİB ve GSYH arasında çift yönlü nedensellik bulunurken, petrol fiyatlarından hem GSYH'ye hem de CİB'e tek yönlü bir nedensellik ilişkisi bulunmaktadır. Nedensellik ilişkisine ek olarak uygulanan eşbütünleşme analizine göre, uzun dönemde petrol fiyatları ve GSYH'de meydana gelecek artışlar CİB açıklarının artmasına neden olmaktadır.

Anahtar Kelimeler: Cari İşlemler Açığı, Cari İşlemler Dengesi, Ekonomik Büyüme, Türkiye Ekonomisi, Petrol Fiyatları

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Introduction

The liberalization of international trade and the abolition of financial restrictions have increased the trade of goods and services and financial transactions between countries. The goods, services trade and capital movements of one country to other countries are monitored in the balance of payments. The increase in international transactions has led countries to have the external deficit and external surplus situation. Nowadays, these current account imbalances are used as country's economic evaluation criteria. The global shocks affect the macroeconomic factors, especially the CAD, and increase the cost of economic crisis for all countries. The CAD is not only a problem of the developing countries but also a problem of the developed countries as well. However, developed and developing countries differ in terms of the responses of the current account deficit to the change in internal and external conditions (Calderon et al., 2000: 5). For example, the USA, which is obviously a developed country, has the highest current account deficit in recent years, but it has a comparative advantage because it differs in terms of technology and capital-intensive goods from developing countries. With the help of these advantages, the US was able to decrease its current account deficit by $ 20.2 billion in the second quarter of 2018 to $ 101.5 billion[5]. As a developing country Turkey has a CAD problem, even this problem is regarded as a chronic problem of the Turkish economy. In the last two decades, Turkey's current account balance was positive only in after crisis periods (1997 East Asian crisis and 2001 Turkish economic crisis), 1998 and 2001. One of the reasons of this is the decline in imports that is the result of the drop in purchasing power due to the impact of crises. Another reason is the increased export revenues due to the effects of shuttle trade.

1. Current Account Deficit Problem

Balance of payments account gives a summary of the economic relations of the home country with other countries in a certain period. The current account balance, which is one of the main accounts of the balance of payments, shows the amounts of exported and imported goods and services of the country and consists of goods trade, services trade, income balance and current transfers. Deficit or surplus of the current account closely affects the macroeconomic variables and economic decisions of decision makers (Öztürk, 2011:450).

The most important part of the current account is the balance of goods and services payments which show the difference between import and export value in a certain period. Balance of goods trade, also called foreign trade balance, is frequently used as a benchmark in reports on the economy. Foreign trade balance shows the difference between export values and import values in a certain period (Krugman and Wells, 2011:494-496). Therefore, if the country imports more than its exports, it will have a deficit in foreign trade and so on current account balance. There are three sources of CAD:

[5] Bureau of Economic Analysis, https://www.bea.gov/data/intl-trade-investment/international-transactions, date of access: 18.12.2018.

balance on savings and investments, foreign trade balance, and the reflection of foreign assets (decrease in net foreign assets) (MD, 2013). If the CAD has a continuous upward trend, the economy may be dragged into the foreign exchange bottleneck and become unable to fulfill its debts or other commitments to foreign countries (Eğilmez and Kumcu, 2004:302). High and unsustainable CAD can make the country vulnerable to global developments and fragile to financial crises. According to Dornbusch, if the CAD continues to increase for more than two or three years and this deficit exceeds 4% of GNP, the situation in the economy is perceived as a crisis signal (Dornbusch, 2001: 3).

In the literature, many studies have been conducted for different countries and country groups in different periods in order to determine the causes of the CAD. Banday and Aneja (2015) examined the relation between current account balance and budget balance in India for the period 1990-2013 by vector error correction model and co-integration test. According to the results of the study, they found two-way causality between current account balance and budget balance in the long run. Alam and Taib (2013), analyzed the relation between external public debt with budget deficit, current account deficit, and exchange rate depreciation of the six debt-trap countries (India, Indonesia, Nepal, Pakistan, Sri Lanka, and Thailand) and eight non-debt trap countries (Bangladesh, Fiji, Korea, Malaysia, Myanmar, Papua New Guinea, Philippines, and Singapore) of the Asian Pacific Developing Countries (APDC) in the period of 1971-2000 by using panel data. Findings show that there is a positive relationship of external public debt with budget deficit, current account deficit, and exchange rate depreciation. However, the strength of the relations varies in both country groups. Das (2012) used panel GMM to determine the causes of CAD for large sample of developed, emerging and developing countries during 1980–2011. Results of the study shows that current account balance is positively correlated with net foreign assets, trade openness and exchange rate stability and negatively associated with commodity price, real GDP growth and real effective exchange rate for the developed countries. In the emerging countries, While, among emerging countries, commodity price, real GDP growth, trade openness and de jure capital openness are positively correlated with net foreign asset, exchange rate stability index is negatively related to current account balance. Das showed that the current account determinants explain different characteristics of different country groups.

Özçalık and Tezsürücü (2012) used the Granger causality test to determine whether there is a causal relationship between the current account balance / GDP ratio of the Turkish economy and oil barrel prices for the period 1998: Q1- 2011: Q3. Bidirectional causality was found between the variables as a result of the analysis. Üzümcü and Başar (2011) studied the effect of economic growth and energy imports on current account deficits of Turkey in 2003-2010 period with quarterly data. Results of the study show there is a negative relationship between current account deficits with economic growth and energy import. Kostakoğlu and Dibo (2011) investigated the CAD-growth relationship in Turkey with VAR analysis by using the CAD / GDP ratio and the percent changes in GDP, for the period 1991-2010. According to the results of the study, positive changes in the GDP trigger the CADs. In the

empirical study conducted by Herrmann and Jochem (2005), panel data analysis was conducted using CAD, GDP, fiscal balance, investments ratio and real effective exchange rate of eight central and eastern European countries that joined the Union in May 2004. Germany was selected as the reference country for relative per capita income. According to results of the analysis, the CAD depends on the level of development of the economy and the per capita GDP has a positive effect on the current account. The results also confirmed the twin-deficit hypothesis, so, the further integration of the financial sector would increase the CAD.

Bayar et al. (2014) examined the relationship between current account balance and economic growth, inflation, real effective exchange rate, foreign direct investment inflows, crude oil prices, portfolio investments, total government gross debt stock, rate of exports meeting imports and Borsa Istanbul 100 index in Turkey during the period 2000:Q4–2013:Q3 by using Granger causality test, impulse-response and variance decomposition analyses. According to the findings, the public gross total debt stock, real effective exchange rate, portfolio investments, export import coverage ratio and BİST 100 index are the Granger causes of the current account balance. And also, it was determined that 78.6% of the variations in current account balance was explained by foreign direct investment inflows, portfolio investments, crude oil prices and total government gross debt stock. Demir (2013), by using Cointegration Test, Error Correction Model and Granger Causality has examined quality and direction of relation among industrial production, current deficit and energy import in the period 1987-2012. As a result of the study, he has identified the existence of one-way causality towards the current deficit from the industrial production index and energy imports. Erdoğan and Bozkurt (2009) investigated the determinants of current deficit of Turkey with monthly data of 1990-2008 using MGARCH method. It was determined that oil prices, M2, export / import coverage ratio, inflation, inflation uncertainty, exchange rate, exchange rate uncertainty, FDI/GDP are the determinants of the CAD. According to results, the highest correlation valued variable is export / import coverage ratio.

As seen in these studies, the most common factors affecting the current account are budget balance, per capita income and energy imports. The economic growth of the countries increases the welfare of the people, and people with increasing levels of welfare need more energy. So, people become more dependent to the energy. Increase in dependence on energy leads to increase in imports and foreign trade deficits, i.e. budget deficits. Among the economists, it is generally believed that these factors affect the current account deficit. Countries try to achieve economic growth by using imported energy at high rates. The increase in imported energy dependency has been one of the main reasons for the increase in the CAD/GDP ratio in the countries. So, as the energy dependency increase, the fluctuations of energy prices become much more important.

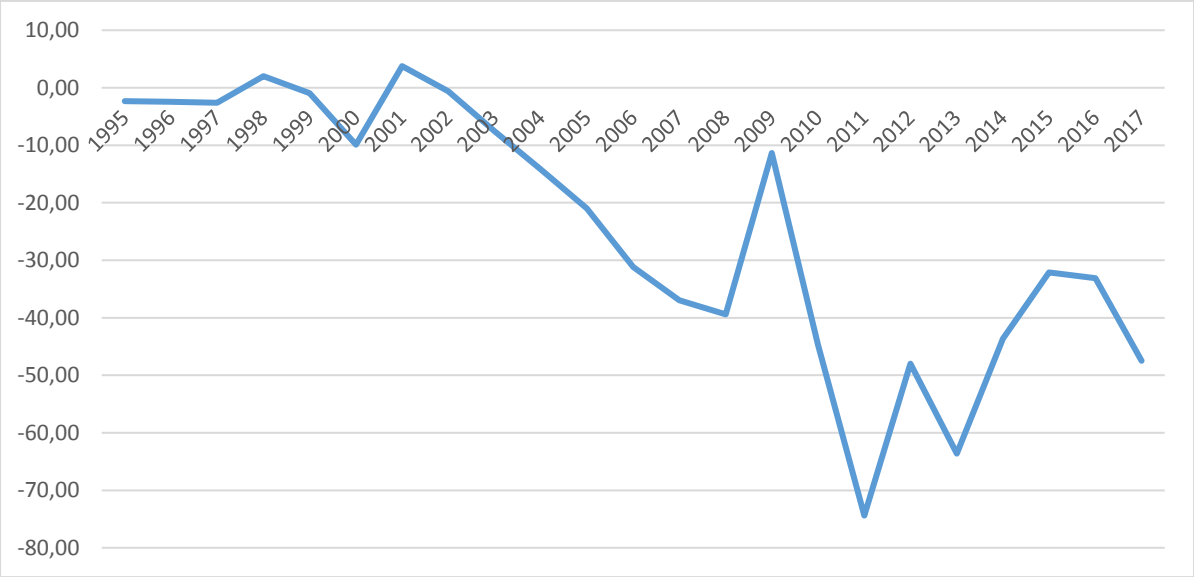
3. Evolution of Current Account Deficit in Turkey

In developing countries like Turkey, CAD is an important problem that cannot be solved. The inadequacy in private sector savings, the dependence of exports on imports and the high imports of energy are the main factors of the CAD problem. As a result of economic development, consumption and therefore energy demand increases. Increased demand is met through imports due to inadequate local resources. This causes an increase in the external debt and thus increases the CAD. The fact that international capital flows were liberated in Turkey after 1980 made the external balance in the economy more important. As the rapid growth in foreign trade was mostly in imports, the foreign trade deficit gradually increased. This growth model, which is connected to capital inflow from abroad, ensured high real interest rate and low exchange rate (Subaşat, 2010:31).

Following the liberalization of foreign capital, domestic and external indebtedness increased in Turkey in the 1990s. The indebtedness of the state with short-term and high interest rates led the private sector to have risk-free and high-yield public bonds instead of production. As a result of this, capital inflows to the country accelerated and the CAD increased. Although real interest rates decreased with the measures taken after the 2001 crisis, domestic demand increased, and private sector increased the demand for investment, but the savings to cover them were insufficient. The fact that savings are lower than investment is among the main reasons that increase the current deficit (Türkay, 2013:254-255).

The CAD has always been one of the important problems of the Turkish economy and played an important role in the economic crises. As a result of liberalization of capital movements and foreign trade, the economy has always had a CAD in the two decades, except for 1998 and 2001.

Figure 1. Current Account Balance (million USD)



Source: CBRT

Figure 1 shows the current account balance of Turkey in 1995-2017 period. Turkey's current account deficit has become a chronic problem and it has increased the influence after 2000. In this period, the abundance of liquidity in global markets has increased capital flows to emerging economies. As an emerging economy, Turkey's exposure to very large capital inflows has led to appreciation in the Turkish Lira. On the other hand, despite the appreciation of the country's currency, exports increased during this period. One of the reasons for Turkey's ability to increase exports, in spite of adversities, is the increase of foreign trade with regional and developing countries (Subaşat, 2010). However, the loss of performance in exports in 2010 led to an increase in imports, resulting an increase in foreign trade deficit and thus CAD. With the contraction of the external conjuncture, the CAD, which has risen due to the global crisis, has reached the highest level of its history with 74,402 million USD in 2011 despite the policies aimed to decrease the current deficit after 2010. However, it has shown a downward trend after 2013. As seen in Table 1, the current account deficit/GDP ratio of Turkey increased from -0.73 in 1998 to 6.6 in 2013. During 2015-2016, the decreased share of the global market for raw materials and energy prices has reduced the share of energy in Turkey's imports (Table 1) and thus lead the CAD to decrease as well.

Table 1. CAD, Total Imports, Energy Import Data of Turkey (1998-2016) (million$)

	Total Imports (1)	Energy Imports (Chapter 27) (2)	Current Account Balance (3)	CAB/GDP	Current Account Balance without Energy imports (3)+(2)	Share of Energy Imports in Total Import (%)
	Million $	Million $	Million $		Million $	
1998	44779	4509	2000	0.725	6509	10.07
1999	38802	5377	-925	-0.361	4452	13.86
2000	52882	9541	-9920	-3.634	-379	18.04
2001	38092	8339	3760	1.878	12099	21.89
2002	47109	9204	-626	-0.263	8578	19.54
2003	65883	11575	-7554	-2.423	4021	17.57
2004	91271	14407	-14198	-3.508	209	15.79
2005	111445	21256	-20980	-4.184	276	19.07
2006	134672	28859	-31168	-5.641	-2309	21.43
2007	162210	33883	-36949	-5.468	-3066	20.89
2008	193823	48281	-39425	-5.158	8856	24.91
2009	134494	29905	-11358	-1.762	18547	22.24
2010	177317	38497	-44616	-5.780	-6119	21.71
2011	231552	54118	-74402	-8.937	-20284	23.37
2012	227315	60117	-47962	-5.488	12155	26.45
2013	241706	55917	-63621	-6.695	-7704	23.13
2014	232523	54889	-43597	-4.672	11292	23.61
2015	200084	37843	-32118	-3.734	5725	18.91
2016	190968	27155	-32605	-3.837	-5450	14.22

Source: TURKSTAT, CBRT and WORLDBANK.

In developing countries like Turkey, two of the important reasons for the trade deficit are that energy, which is one of the essentials of development, is obtained from foreign countries and energy imports have a big share in total imports. As it is seen in Table 1, the share of Turkey's energy imports of 2016 (Chapter 27) in total imports is 14%. In the same period, while total energy imports were 27 billion dollars, CAD was 32.6 billion dollars. According to this, if there were no energy imports, CAD in this period would be about 6 billion dollars. In addition, until 2014, energy imports usually cover more than 20% of total imports. The reason of this is the increase in energy prices as well as the growth of Turkey. On the other hand, one of the reasons for the decrease of this percentage to 18% in 2015 and to 14% in 2016 can be named as the decrease in energy prices.

Dependence on foreign energy also negatively affects the dynamics within the country. This large amount of energy imports makes the economies vulnerable to shocks in the international environment. As a result, fluctuations in energy prices or exchange rates directly affect the economy. For instance, an increase in exchange rates can increase the indebtedness of the country even if the energy prices are fixed.

4. Econometric Analysis

In this study, firstly, direction of the causality relationship between Turkey's current account balance, GDP, real exchange rate and oil prices was examined with the help of Toda-Yamamato test by using quarterly data between 2000: Q1-2018: Q2. Following the causality relation, the long-term relation of the variables is determined by the ARDL model. The data used in the analysis are taken from the CBRT and TURKSTAT databases. The variables include *CAD*, Current account deficit / Current GDP (Thousand TL); *GDP*, percentage change in the GDP (fixed 1998=100) from the same period in the previous year; *OIL*, natural logarithm of Brent type crude oil prices (nominal barrel prices, $); *REER*, the real effective exchange rate. Since quarterly data is used, all variables are seasonally adjusted using Census X-13 before the analysis.

False regression is one of the main problems of econometric analysis and the non-stationary series can lead to this problem. If a series has no unit roots, it is characterized as stationary. There are various unit root tests to examine the stationarity of the series. The unit root tests which does not take into account the structural breaks can be categorized as biased. The breakpoint unit root test developed by Zivot and Andrews (2002) is valid for endogenously selected structural change. There are three types of structural changes; first one occurs with the change in the intercept, second one occurs with the change in the trend, and the third one occurs with change in both (Bouznit and Pablo-Romero, 2016:96). In this study, the stationarity of the series is examined by breakpoint unit root test. The results of the breakpoint unit root test are presented in table 2.

Table 2. Breakpoint Unit Root Test Results

Trend Specification	Intercept only		Trend and intercept		Trend and intercept		Trend and intercept	
Break Specification	Intercept only		Intercept only		Trend and intercept		Trend only	
Variables	t-value	Probability	t-value	Probability	t-value	Probability	t-value	Probability
CAD	-3.1544	0.5944	-3.2898	0.8072	-3.5081	0.8089	-3.1205	0.6359
CAD I (1) *	**-8.3800**	**< 0.01**	**-8.3167**	**< 0.01**	**-8.3259**	**< 0.01**	**-7.6513**	**< 0.01**
GDP	-4.3017	0.0744	-4.4840	0.1361	-4.5429	0.2181	-4.2747	0.0966
GDP I (1) *	**-7.5521**	**< 0.01**	**-7.5132**	**< 0.01**	**-7.6670**	**< 0.01**	**-6.3687**	**< 0.01**
LNOIL	-3.0293	0.6693	-4.4895	0.1342	-3.6620	0.7317	-3.5049	0.4033
LNOIL **I (1) ***	**-7.9577**	**< 0.01**	**-7.7797**	**< 0.01**	**-7.8834**	**< 0.01**	**-6.6634**	**< 0.01**
REER	-3.5410	0.3648	-4.5590	0.1134	**-6.3346**	**< 0.01**	**-6.2675**	**< 0.01**

* indicates the significance at 1%.

As seen in the table, it was observed that REER variable is stationary at level while to others are stationary at first difference according to breakpoint unit root test.

4.1. Causality Test

The Granger causality test does not only examine the causal relationship between variables, but also determine the direction of the effect of each variable on the other. When the Granger causality test is applied, the false regression problem arises as a result of the some or all of the series not being stationary. This means that the Granger causality test is not applicable to dataset in this study since some of the series is stationary at first difference. Therefore, it was preferred to use the Toda-Yamamato causality test, which is developed by Toda and Yamamato (1995), instead of the Granger causality test. Toda-Yamamato causality test is the extended version of the Granger causality test and allows the investigation of the causality relationship between the non-stationary series.

Before applying Toda-Yamamato causality test, the level values of the series are taken as variable to determine the appropriate order of lags. After determining the appropriate order of lags by this test, the extra lags of the series are added to the analysis as external variables and the Granger causality test is applied.

Table 3 : Lag Order Selection Criteria

VAR Lag Order Selection Criteria						
Endogenous variables: CAD GDP LNOIL REER						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-193.0945	NA	0.031189	7.883781	8.036743	7.942030
1	-70.80041	220.1294	0.000445	3.632017	4.396826*	3.923260*
2	-52.54601	29.93722	0.000412	3.541840	4.918497	4.066079
3	-33.58215	28.06651*	0.000378*	3.423286*	5.411790	4.180520
4	-21.59144	15.82774	0.000474	3.583658	6.184009	4.573886
* indicates lag order selected by the criterion						

The lagged values of the variables must also be used in the analysis to ensure that the relationship between the variables and the forecasts are determined in a healthy and reliable way. In the VAR analysis, the appropriate order of lags for the variables is determined by the Lag Length Criteria test. As shown in table 3, the appropriate order of lags was determined as three according to the LR, final predict error (FPE) and Akaike information criterion (AIC). Since one of the variables is stationary

at level and the rest are stationary at first difference, the forth lags of all variables were added to the analysis as external variables and the causality test was applied. The results of the Toda- Yamamato causality test are given in table 4.

Table 4: Toda-Yamamato Causality Test Results

	χ^2	df	Probability
Dependent variable: CAD			
GDP**	8.672034	3	0.0340
LNOIL*	11.74545	3	0.0083
REER	1.045026	3	0.7904
Dependent variable: GDP			
CAD**	9.206233	3	0.0267
LNOIL*	24.91370	3	0.0000
REER	2.704495	3	0.4395
Dependent variable: LNOIL			
CAD	1.713960	3	0.6338
GDP	0.396688	3	0.9409
REER	2.313134	3	0.5100
Dependent variable: REER			
CAD***	7.019921	3	0.0713
GDP	2.551206	3	0.4661
LNOIL	1.250668	3	0.7409

*, **, *** indicates the significance at 1%, 5% and 10%, respectively.

According to the results of the Toda-Yamamato approach of the Granger causality test given in Table 4, there is a statistically meaningful bidirectional causality relationship between CAD and GDP, and unidirectional causality relationship from LNOIL to both CAD and GDP, and CAD to REER. The results show that while GDP and CAD are affecting each other, oil prices effects both.

4.2. Co-integration Test

In econometric analyzes, there are various co-integration tests to examine the relationship between series. Conventional OLS is used for stationary series. Engle-Granger (1987) or Johansen (1991) methods are used for the series stationary at first difference. If variables have different order of integration (i.e., not all variables are I (1)), then Engle-Granger and Johansen co-integration tests cannot be used. For the series with different order of integration, the ARDL boundary test approach which is developed by Pesaran et al. (1999) and Pesaran et al. (2001) can be applied to examine the co-integration relationship between the variables (Türkay and Demirbaş, 2012: 9-10). The advantage of the ARDL boundary test approach over other co-integration tests is that it can be applied to the series have different order of integration. That is, if some of the variables are stationary (I (0)), and the rest of them are integrated at first difference (I (1)), ARDL can be applied.

To check the cointegration relation between the series, bounds test of the ARDL approach should be examined firstly. If the long-term relation is determined by the bounds test, then long-term coefficients of the variables can be examined to determine the direction and degree of the relation.

4.2.1. Bounds Test

The F-statistic obtained from ARDL bounds test is used to determine the long-term relation of the variables. The null hypothesis of the ARDL bounds test is that there is no long-term relation. If the value of F-statistic is greater than the upper limit of the significance level, the null hypothesis (H_0) can be rejected which shows existence the long-term relation between the variables. However, H_0 cannot be rejected if the value of F-statistic is less than the lower limit. In addition to these, if the calculated F-statistic value falls between the upper and lower limit values, no definitive decision can be made in respected significance level. The result of the ARDL bounds test is given in table 5.

Table 5: ARDL Bounds Test

Null Hypothesis: No long-run relationships exist	
F-statistic	Degree of Freedom
10.27680	3
Critical Value Bounds at significance level 1%	
I (0)	I (1)
4.29	5.61

As seen in the table, the value of the F statistic is greater than the upper limit value of 1% significance level, therefore, the H_0 hypothesis can be rejected. That is to say, there is a long-term relationship between the variables at significance level of 1%. So, the long-term coefficients of ARDL can be examined to determine the direction and degree of the relation.

4.2.2. ARDL Approach and Long-Term Relationship Estimation

The lag lengths for the ARDL model are automatically determined according to the model selection criteria by the Eviews 9 software which is used to conduct the analysis. The maximum number of lags was chosen as 4 and ARDL (3, 0, 3, 4) was determined according to Akaike Info Criterion (AIC). The results of the estimated model are given in Table 6.

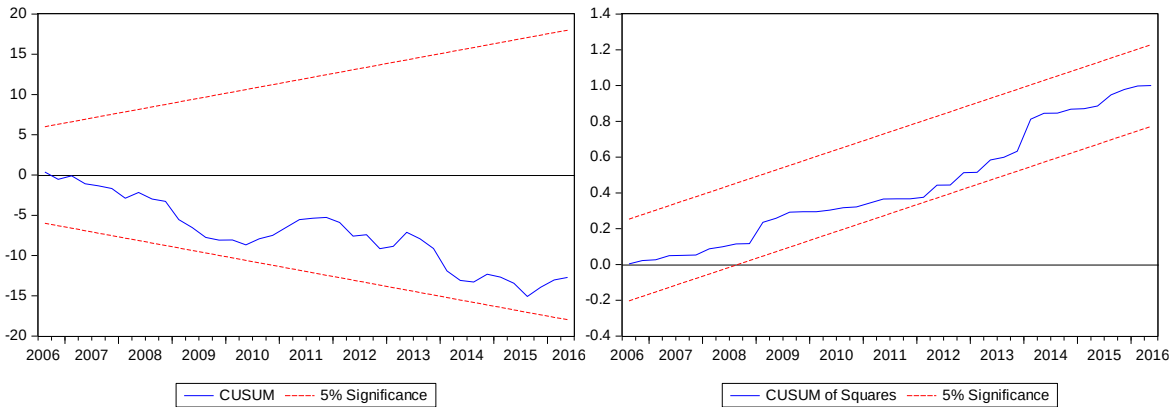
Table 6. ARDL (3, 0, 3, 4) Test Results

Dependent Variable: CAD				
Variable	Coefficient	Std. Error	t-Statistic	Probability
ECM*	-0.809335	0.148108	-5.464477	0.0000
$CAD = 0.0031GDP + 0.0337LNOIL + 0.0001REER - 0.1191 + ECM$				
Long Run Equation				
Variable	Coefficient	Std. Error	t-Statistic	Probability
GDP*	0.003071	0.000596	5.155336	0.0000
LNOIL*	0.033689	0.003512	9.592250	0.0000
REER	0.000107	0.000217	0.494627	0.6236
C	-0.119139	0.025696	-4.636414	0.0000
$R^2 = 0.870842$ $\bar{R}^2 = 0.828866$ $F = 20.74599$ [0,000]				
Breusch-Godfrey Serial Correlation LM Test				
F-statistic=0.489490 [0.6168]				
Breusch-Pagan-Godfrey Heteroscedasticity Test				
F-statistic=0.880606 [0.5786]				
Ramsey RESET Test				
	Value	df	Probability	
F-statistic	3.117909	(1, 39)	0.0853	

* indicates the significance at 1%.

According to the results of the ARDL model (table 6), the coefficient of error (ECM) was found statistically significant and negative (ECM=-0.80, p-value=0.00). This means that there exists a long-term relationship between the variables and if there is a deviation from this balance for any reason, it will return to the long-term equilibrium again in about 1 period. Test results of the model given in the table are evaluated before interpreting the long-term coefficients obtained from the analysis in order to check whether these coefficients are valid. According to test results, it is seen that there are no problems such as auto-correlation and heteroscedasticity. In addition to these, Cusum and Cusumsq test results are examined in Figure 2.

Figure 2: Cusum ve Cusumsq Test Results



As shown in Figure 2, the plot of Cusum and Cusumsq statistics stay within the critical bounds indicating stability of the model. Therefore, the long-term coefficients of ARDL obtained with the model established in the analysis are stable and can be interpreted. According to long term coefficients

in table 6, the coefficients of oil prices and CAD are both statistically significant and positive. This means that increase in oil prices and economic growth will increase the current account deficit in Turkey. According to these findings, oil imports increase as the production increases (since the production is mostly depend on the energy produced by from oil), so, the current account deficit increases along with the economic growth. Since there are various reasons for fluctuation of oil prices and importing oil is necessary for Turkey, it is clear that the CAD will be affected by oil prices for a long time. In order to prevent or mitigate the severity of this problem, it is important to reduce the oil dependence in the economy. Alternative energy sources, namely renewable energies, play a crucial role in this context. Since renewable energies produced locally, increasing its share will decrease the dependence of foreign energies and therefore energy imports. In addition to its effects on energy import, local economy would benefit from producing its own energy in an environmentally friendly way.

Conclusion

Current account balance is considered as one of the important indicators in evaluating country economies. Commercial and financial liberalization at the global level has led to a deterioration of the current account balance. In this context, it has become important for the stabilization of an economy to determine the elements causing the current deficit and to take the necessary precautions. In this study, it has shown that Turkey, whose trade was liberated after 1980, started to have CAD problem and this problem reached to a more serious level with the acceleration of economic growth after 2000. According to the results of the analysis between CAD and the main factors affecting Turkey's current account deficit (GDP, oil prices, and real exchange rate), it was determined that the rise in GDP and oil prices cause the CAD to increase. In addition to this, it has seen that changes in CAD and oil prices affect the economic growth. The reason for this is that the share of energy imports is large, and the export is highly dependent on imports. While it is nearly impossible to solve this problem in the short term, it is necessary to increase the domestic savings in the long run and make the export dependent on the domestic production. Since the domestic production mostly depends on the foreign energy, the investments should focus on renewable energies (wind, solar, hydro, geothermal and biomass energy) to decrease the demand. Using the renewable energy sources X which can be found in Turkey extensively, the energy will be obtained locally and the dependence for imported energy will decrease. Therefore, the fluctuations of the energy prices, namely oil prices, would not affect the CAD and the growth of the economy.

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