

**IS ECONOMIC GROWTH A PROBLEM IN TERMS OF CURRENT  
ACCOUNT DEFICIT?  
AN EMPIRICAL APPROACH TO VICIOUS CIRCLE: CASE OF TURKEY**

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**ABSTRACT**

Developing countries with insufficient national savings have to have a current account deficit in order to grow. The decision makers in these countries, which are fragile due to the current account deficit, are on the knife edge and often cannot develop an economic growth model that will not produce a current account deficit. In this study conducted to question if there is a relationship between economic growth and current account deficit forming a vicious cycle in developing countries, the relationship between variables were searched taking the numbers of Turkey's Gross Domestic Product (GDP) (with fixed prices, USD) between 1974-2018 and the current account deficit (million USD) from IMF. Engle-Granger and Johansen Cointegration Tests were applied to the data to determine long term relationship. As a result of the determination of long-term cointegration of the series, the Granger Causality Test was applied through VECM to test the short-term causality and direction. As a result of analysis; it was determined that the economic growth and the current account deficit were cointegrated in the long term, and in the short term it was determined that economic growth was the cause of the current account deficit.

**Keywords:** Economic Growth, Current Account Deficit, Cointegration, Johansen Cointegration, Granger Causality.

**CARİ AÇIK AÇISINDAN İKTİSADİ BÜYÜME BİR SORUN MUDUR?  
KISIR DÖNGÜYE AMPİRİK BİR BAKIŞ: TÜRKİYE ÖRNEĞİ**

**ÖZET**

Ulusal tasarruf oranları yetersiz olan Gelişmekte Olan Ülkeler, büyüebilmek için cari açık vermek zorundadırlar. Verilen cari açık nedeni ile kırılğan bir yapıya sahip olan bu ülkelerdeki karar vericiler, iki keskin bıçak arasında kalmaktadırlar ve çoğu zaman cari açık vermeyecek bir iktisadi büyüme modeli geliştirememektedirler. Gelişmekte Olan Ülkeler açısından bir kısır döngü oluşturan iktisadi büyüme ve cari işlemler açığı arasında bir ilişkinin var olup olmadığının sınanması amacı ile gerçekleştirilen bu çalışmada IMF'den Türkiye'nin 1974 - 2018 dönemine ilişkin yıllık Gayri Safi Yurtiçi Hasıla (GSYİH)(Sabit Fiyatlarla, USD) ve cari işlemler açığı (milyon Dolar) rakamları alınarak değişkenler arasındaki ilişki araştırılmıştır. Verilere uzun dönem ilişkisini tespit üzere Engle Granger ve Johansen Eşbütünleşme Testleri uygulanmıştır. Serilerin uzun dönemde eşbütünleşik olmalarının tespiti sonucunda kısa dönem nedenselliğin ve yönünün sınanması için de VECM üzerinden Granger Nedensellik Testi uygulanmıştır. Analizler sonucunda; iktisadi büyüme ile cari işlemler açığının uzun dönemde eşbütünleşik olduğu tespit edilmiştir, kısa dönemde de iktisadi büyümenin cari işlemler açığının nedeni olduğu saptanmıştır.

**Anahtar Kelimeler:** İktisadi Büyüme, Cari Açık, Eşbütünleşme, Johansen Eşbütünleşme, Granger Nedensellik.

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## INTRODUCTION

The crises after 1980 drew all the attention to the current account deficit and the sustainability of the current account deficit. It is emphasized by researchers that the ratio of current account deficits, which shows the performance of the national economies, to gross domestic product (GDP), should be closely monitored as it is an important crisis indicator.

Developing countries (DC) with insufficient savings have a current account deficit to finance their development. Along with current account deficit due to the import-based growth model, these economies become dependent on external savings and become vulnerable to external shocks. The economies trapped between these two important phenomena and on the knife edge cannot succeed in growth without having the current account deficit at a dangerous level. The fact that the current account deficit exceeds certain threshold values poses an infectious crisis threat in globalizing markets.

It is important to research the causal relationships and the direction of causality between economic growth and the current account deficit, which constitute important macro-economic phenomena within this vicious circle of developing countries. This study was conducted for this purpose; it consists of 3 chapters. In the first chapter, empirical studies studying the relationship and direction between these variables were reviewed. In the second chapter, the journey of Turkey's growth and the current account deficit were investigated. In the third chapter, there are econometric method and data set for the analysis in which causality and direction among variables are tested. The conclusion part contains predictions and suggestions based on the findings.

## 1.LITERATURE

Several empirical studies have been conducted to question the relationship and direction between economic growth and the current account deficit. However, as a result of these studies, no consensus was reached on the causality and direction of the relationship between variables.

**Table 1. Literature**

| Growth Increases Current Account Deficit |  |   |
|--|--|---|
| Researcher                               | Term / Country                                   | Method  |
| Khan and Knight (1983)                   | 1973 - 1980<br>Thirty - two Developing Countries | Horizontal Section and OLS (Least Squares Method) |
| Debelle and Faruquee (1996)              | 1971 - 1993<br>Twenty-one Developed Countries    | Horizontal Section and OLS                        |
| Bagnai and Manzochi (1998)               | 1965 - 1994<br>Forty - nine Developing Countries | Panel Data Analysis                               |
| Milesi-Ferretti and Razin (1998)         | 1971 - 1992<br>Eighty - six low and middle -     | Panel Data Analysis                               |

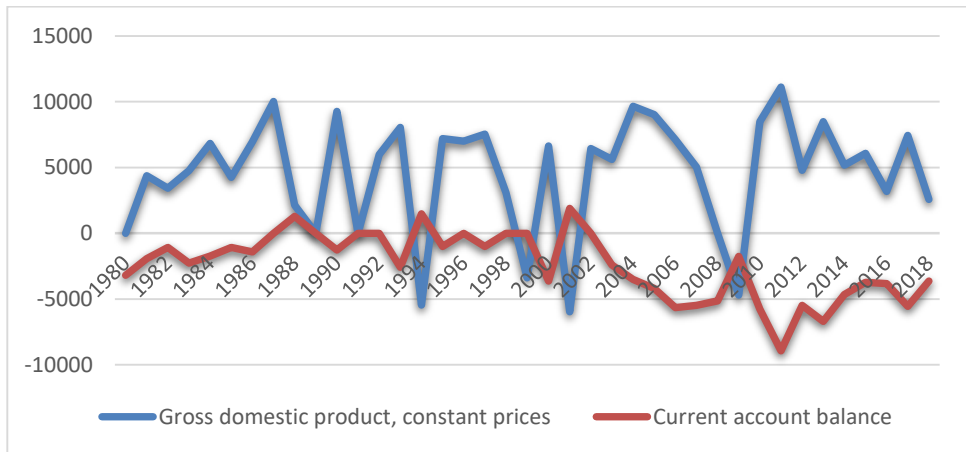
|  |  |  |
|--|--|--|
|  | income countries   |  |
| Moreno-Brid (1999)   | 1950 - 1996<br>Mexico  | Panel OLS  |
| Calderon, Chong and Loayza (2000)                          | 1966 - 1995<br>Forty - four Developing Countries                         | Panel Data Analysis  |
| Kandil and Greene (2002)                                   | 1960 - 2000<br>America   | Cointegration - ECM Analysis   |
| Parikh and Stirbu (2004)                                   | 1970 - 1999<br>Forty - two countries                                     | Panel Data Analysis  |
| Kasman, Turgutlu and Konyalı (2005)                        | 1984 - 2004<br>Turkey  | Bounds Test  |
| Tarı and Kumcu (2005)                                      | 1983 - 2003<br>Turkey  | Causality Analysis   |
| Hermann and Jochem (2005)                                  | 1994 Q1 – 2004 Q4<br>the eight central and east European countries       | Panel Data Analysis  |
| Erbaykal (2007)  | 1987 Q1 – 2006 Q3<br>Turkey  | VAR and SUR Analysis   |
| Bitzis et al. (2008)                                       | 1995 - 2006<br>Greece  | Cointegration and VEC  |
| Lebe et al. (2008)   | 1997 - 2007<br>Turkey and Romania  | SVAR Analysis  |
| Telatar and Terzi (2009)                                   | 1991 - 2005<br>Turkey  | VAR Analysis   |
| Yılmaz and Akıncı (2011)                                   | 1980 - 2010<br>Turkey  | Cointegration and Granger Causality  |
| Sekmen and Çalışır (2011)                                  | 1998 - 2009<br>Turkey  | ARDL Test  |
| Bayraktutan and Demirtaş (2011)                            | 1980 - 2006<br>Nine-teen developing countries                            | Panel Data Analysis  |
| Yurdakul and Uçar (2015)                                   | 1999 Q1 – 2014 Q2 quarterly<br>Turkey                                    | Granger causality and VAR analyses   |
| Mercan (2015)  | 1991 Q4 - 2013 Q1<br>Turkey  | ARDL Bounds Test, Toda-Yamamoto Causality Analysis   |
| <b>Current Account Deficit Increases Economic Growth</b>   |  |  |
| Freund and Warnock (2005)                                  | 1980 - 2003<br>Twenty-six Developed Countries                            | Panel Data Analysis  |
| Akçay and Erataş (2012)                                    | 1993 - 2011<br>BRICT countries (Brazil, Russia, India, China and Turkey) | Panel Data Analysis, Delta Test, CADF Test, Westurlund ECM Cointegration Test, Dumitrescu - Hurlin Panel Causality Test                |
| Sönmez and Sağlam (2018)                                   | 1993 – 2015<br>Visegrad Four (Poland, Czech Republic, Hungary, Slovakia) | Panel Data Analysis Delta and CDIm tests, Durbin-H test, Dumetrescu-Hurlin (2012) causality test.                                      |
| <b>Current Account Deficit Affects Economic Growth (-)</b> |  |  |
| De Mello et al. (2011)                                     | 1971 – 2007<br>One hundred and thirteen countries                        | “a unit root test that allows for endogenous structural breaks in the levels and trends”   |
| Aydın and Esen (2016)                                      | 1999 : Q2 – 2014 : Q2<br>Turkey  | “the threshold value was found to be 4%. Based on this, the current account deficit that exceeds this threshold harms economic Growth” |
| <b>Economic Growth Reduces Current Account Deficit</b>     |  |  |
| Aristovnik (2007)  | 1971 - 2005<br>Seventeen Middle East and                                 | Panel Data Analysis  |

|  |   |                                |
|--|---|--------------------------------|
|  | African countries                                     |                                |
| Peker and Hotunluoğlu (2009)   | 1992 – 2007<br>Turkey                                 | VAR Analysis                   |
| Malik et al. (2010)  | 1969 – 2007<br>Pakistan                               | Cointegration and VEC Analysis |
| <b>No Relationship Between Economic Growth and Current Account Deficit</b> |   |                                |
| Morsy (2009)   | 1970 – 2006<br>Twenty - eight oil exporting countries | Panel Data Analysis            |

As can be seen from Table 1, different empirical methods were used and different results were obtained by considering different countries, different data and different periods. In the analysis results about Turkey, although the findings that the growth increases current account deficit are dominant, there are also results that the current deficit is a reason for the growth. In this study, the relationship between economic growth and current account deficit will be re-questioned with the inclusion of current data.

## 2.ECONOMIC GROWTH AND CURRENT ACCOUNT DEFICIT IN TURKEY

Turkey’s balance of economic growth and the current account balance for the period 1980 - 2018 will be examined in this chapter. There is a strong relationship between these two macroeconomics. Based on annual data, Figure 1 clearly shows the inverse correlation between GDP and current account balance at fixed prices.



**Figure 1.** *Economic Growth and Current Account Deficit, Turkey (1980-2018)*

*Source:* Created by author.

The 1990s indicate the years of fluctuating growth due to the increase in capital inflows and outflows (Kazgan, 2013: 314), the fluctuation in growth rates caused to undulate the current account balance in that period. The current account deficit, which increased after 2001, turned into a current surplus only four times in the 1980-2018 period. It displayed same tendency by rising to 1.275% in 1988, zero in 1991 - 1992, 1.468% in 1994, zero in 1996 - 1998 - 1999 and 1.877% in 2001, -

1,762% in 2009. These dates coincide with sharp declines in GDP. There were crises in 1991, 1994, 1998-1999 (Kazgan, 2013: 130) and 2001 in Turkey, in addition, the first global financial crisis was experienced in 2008. Devaluations in times of crisis led to a surplus in current account balance (Telatar ve Terzi, 2009: 122). The reflections of the global recession on domestic and external demand became more evident as of the last quarter of 2008. However, the current account balance was clearly deteriorated in the years of rapid economic growth.

Exceeding various thresholds such as 4–5–6 % determined by the researchers is considered as an important signal for foreign exchange and financial crisis (Çiğdem, 2017: 257). While this rate was -3,633% in 2000, it was seen that this ratio frequently exceeded these thresholds and became fragile with -5.659% in 2006, -5.156% in 2008, -8.938 in 2011, -5.490% in 2012, -6.697% in 2013, and -5.560% in 2017. The structure, which walks tightrope, experienced the bottom with -5.962 in 2001 for economic growth and -8.938% in 2011 for current account deficit.

### 3.ECONOMETRIC METHODOLOGY AND DATA SET

In order to determine the relationship between economic growth and current account deficit (CAD) in Turkey, annual GDP (at fixed prices, USD) and current account balance figures (million USD) for the 1974-2018 period were taken from IMF (International Monetary Fund) (from the WEO- World Economic Outlook database) and Engel – Granger, Johansen Cointegration, Granger Causality Analysis and Granger Causality through VECM (Vector Error Correction Model) was applied. The analyses were performed with E-views 11.0 package program. First, an empirical model was created and functionally expressed below.

$$CAD = f(GDP)$$

*CAD* : Current Account Deficit (million Dollar)

*GDP* : Gross Domestic Product (Constant Prices, USD)

In the study, first of all, the stationarity and degree of integration of the data were tested with unit root analyzes. Since the series were static in the same degrees ( $I_1$ ), the existence of a long-term relationship among the series was investigated by Engle- Granger and Johansen Cointegration Test. Granger Causality Analysis was used through VECM (Vector Error Correction Model) to determine the short term relationship and direction in the series.

#### 3.1.Unit Root Analyses

Before testing the relationship between economic growth and the current account deficit, the stationary characteristics of the variables, which is the first and necessary step, were examined; PP (Phillips-Perron) developed by Phillips and Perron (1988) and ADF (Augmented Dickey-Fuller) developed by Dickey and Fuller (1981) were used as unit root analyzes. First of all, it is important to examine

the timely properties of the series, a model established without this analysis may cause false regressions, that is, non-existent relationships may appear to exist. Therefore, it is important to first test the stationary and stationary levels of the variables and this is possible with ADF (Augmented Dickey-Fuller) unit root analysis developed by Dickey-Fuller (1979, 1989). Thus, the problem of false regression can be eliminated to ensure that the analysis results are more reliable (Mac Kinnon, 1991: 266-267).

According to the  $H_0$  hypothesis of ADF Unit Root Analysis, the series are not stationary, while the  $H_1$  hypothesis of, the series are stationary. Equation 1 is a functional representation of the Fixed ADF Test (Asteriou ve Hall, 2007: 297);

$$\Delta y_t = \beta + \delta y_{t-1} + \sum_{i=1} \phi_i \Delta y_{t-1} + \varepsilon_t \quad (1)$$

if the  $H_0$  hypothesis can be rejected, that is, if it is Test Statistics < Critical values, y variable is stationary at the level. Otherwise, it is not stationary, the unit is rooted (Yamak and Küçükkale, 1997: 6). In this case, it is necessary to take the difference of the series, and Equation 1 is repeated for the first difference (Kennedy, 2006: 356).

By comparing Test Statistics and Critical Values, this process is maintained until the series becomes stable. PP Unit Root Analysis which is complementary to ADF Unit Root Analysis and has more flexible assumptions is shown by Equation 2 and Equation 3 (Enders, 1995: 237). In these equations; the number of observation was formulated with T, the distribution of error terms, with  $\varepsilon_t$ , the test series, with  $y_t$  and the trend variable, with  $\alpha$ ,  $\beta$  and t;

$$y_t = \beta_0 + \delta_1 y_{t-1} + \varepsilon_t \quad (2)$$

$$y_t = \beta_0 + \delta_1 y_{t-1} + \delta_2 (t-T/2) + \varepsilon_t \quad (3)$$

ADF and PP Unit Root Test results are given in Table 2.

**Table 2. Unit Root Results**

|            | Variable     | Test Statistics | Critical Values |           |           |
|------------|--------------|-----------------|-----------------|-----------|-----------|
|            |              |                 | % 1             | % 5       | % 10      |
| <b>ADF</b> | GDP, level   | 0.691529        | -4.180911       | -3.515523 | -3.188259 |
|            | GDP, level 1 | -6.089212       | -4.186481       | -3.518090 | -3.189732 |
|            | CAD, level   | -3.066614       | -4.180911       | -3.515523 | -3.188259 |
|            | CAD, level 1 | -6.834934       | -4.192337       | -3.520787 | -3.191277 |
| <b>PP</b>  | GDP, level   | 1.357142        | -4.180911       | -3.515523 | -3.188259 |
|            | GDP, level 1 | -6.077529       | -4.186481       | -3.518090 | -3.189732 |
|            | CAD, level   | -2.986205       | -4.180911       | -3.515523 | -3.188259 |
|            | CAD, level 1 | -8.890326       | -4.186481       | -3.518090 | -3.189732 |

Note. “\*\*\*” represents a significance level of 1 %. The number of delays in the ADF tests is determined according to the Schwarz criteria. The Schwarz criteria is a stronger criterion and gives better results than the others. In the PP tests, the number of delays determined according to Newey-West Bandwith is taken. As a test format, fixed and trend equation options are used for all variables at the level value. The fixed equation option is used to obtain the first difference of the variables. MacKinnon critical values are contemplated.”

### 3.2. Cointegration Tests

Cointegration tests were developed to test the existence of long-term relationships between concurrent integrated time series. The prerequisite for searching cointegration is that they are stationary when the first differences of the series are taken. In this study, Engle - Granger and Johansen Cointegration Tests were applied to the series to test the existence of long - term relationship between economic growth and current account deficit. In the first stage of the Engle - Granger method, the error term is estimated by Least Squares (OLS) method, and in the next stage, unit root search is performed. In case the result is stationary, the existence of cointegration can be mentioned. In this respect, firstly, the regression equation seen in Equation 4 and then the residues ( $\varepsilon_t$ ) were established and it was investigated whether the unit has a rooted structure. The results of Engle-Granger Causality Test are given in Table 3. As the statistical value is smaller than the critical values, it is concluded that the series are cointegrated in the long run.

$$\Delta CAD_t = \beta + \beta_1 GDP_t + \varepsilon_t \quad (4)$$

**Table 3.** *The Results of Engle - Granger Test*

| ADF-Statistics | Mac Kinnon Critical Values |           | Prob.  |
|----------------|----------------------------|-----------|--------|
| -4.976028      | 1 %                        | -4.243644 | 0.0015 |
|                | 5 %                        | -3.544284 |        |
|                | 10 %                       | -3.204699 |        |

Engle-Granger cannot give healthy results if the number of variables increases. So, Johansen Cointegration Test is used since it gives healthy results and includes delays of the variables and is based on VAR (Vector Auto Regression). For this reason, in addition to Engle-Granger, Johansen Cointegration Test was applied to the series and it was concluded that the series were cointegrated in the long-term (Table 5).

**Table 4.** *Determination of Appropriate Lag Length*

| Lag | LogL      | LR        | FPE       | AIC       | SC        | HQ        |
|-----|-----------|-----------|-----------|-----------|-----------|-----------|
| 0   | -2201.881 | NA        | 1.30e+43  | 104.9467  | 105.0295  | 104.9771  |
| 1   | -2075.985 | 233.8081* | 3.91e+40* | 99.14214* | 99.39037* | 99.23312* |
| 2   | -2073.668 | 4.082838  | 4.24e+40  | 99.22226  | 99.63600  | 99.37391  |
| 3   | -2071.921 | 2.911240  | 4.74e+40  | 99.32956  | 99.90879  | 99.54187  |

The most important step in the Johansen Cointegration Test is to determine the appropriate lag length. When Table 4 is examined, it is found that the optimal lag length is 1 based on all information criteria.

**Table 5.** *Johansen Cointegration Test Results*

| Hypothesized No. Of CE(s) | Eigenvalue | $\Lambda$ Trace | 0.05 C. V. | Prob.  | Eigenvalue | $\Lambda$ Max. V. | 0.05 C.  | Prob.  |
|---------------------------|------------|-----------------|------------|--------|------------|-------------------|----------|--------|
| None*                     | 0.324166   | 20.83773        | 12.32090   | 0.0015 | 0.324166   | 16.84775          | 11.22480 | 0.0047 |

|           |          |          |          |        |          |          |          |        |
|-----------|----------|----------|----------|--------|----------|----------|----------|--------|
| At most 1 | 0.088615 | 3.989985 | 4.129906 | 0.0543 | 0.088615 | 3.989985 | 4.129906 | 0.0543 |
|-----------|----------|----------|----------|--------|----------|----------|----------|--------|

The Engle-Granger and Johansen Cointegration Tests have demonstrated a long-term relationship between economic growth and the current account deficit, but no information about the direction of this relationship is available. Following detection of cointegration, causality is investigated using the ECM (Error Correction Model). Therefore, after determining the long-term cointegration of variables, Granger was applied to the series through VECM (Vector Error Correction Model) to determine the direction of the relationship and interaction in the short term. It is possible to see the error correction model created between two variables in equation 5;

$$\Delta y_t = \alpha + \beta \Delta X_{t-1} + \beta u_{t-1} + \varepsilon_t \quad (5)$$

$\varepsilon_t$  in equation 5 refers to the error correction term. Table 6 shows the direction of the short-term relationship and Granger Causality Test results through the VECM model applied to the series;

**Table 6.** *Granger Causality Test Results through VECM*

| Hipotesys                     | Prob     | Direction of Causality |
|-------------------------------|----------|------------------------|
| GDP is a Granger cause of CAD | 0.0545 * | GDP → CAD              |
| CAD is a Granger cause of GDP | 0.8671   |                        |

\*Note: 10 % significance level

According to the results of the analysis; there is also a short-run correlation between economic growth and the current account deficit, and the direction of interaction between the variables is from the growth to the current account deficit. In other words, economic growth is a Granger cause of the current deficit at a significance level of 10%.

## CONCLUSION

In developing countries, policy-makers fall between two important decisions; not to grow or give current account deficit. Since growth, which represents the increase in national income from one period to the next, can only be realized by giving a current account deficit, it is generally accepted as a positive phenomenon; however, economic growth may actually become a problem for the developing country economies based on the import based growth model. The current account deficit given for growth and short - term foreign savings instead of inadequate national savings make these economies vulnerable to external shocks and constitute important leading indicators against future crises. The devaluation is inevitable for the currencies of the countries giving a current account deficit to grow, which leads to an increase in cost-push inflation and a decrease in investment, production and employment, and this chain leads to a shrinkage in the national economy. In this context, economic growth can turn into “a problem” for developing countries’ economies.



The experiences brought about the questioning of the relationship between economic growth and the current account deficit, and a lot of research has been done on this issue. However, as a result of the researches, no consensus was reached. While the causality relationship is mostly determined from economic growth to the current account deficit, different results are also obtained that there is a causality relationship from the current account deficit to growth or there is no relationship between the variables.

This study was performed in order to the existence of the relationship and the direction of interaction between these variables in a setting where a recession process is discussed and used the annual data of Turkey in the period between 1974-2018. For this purpose, Engle-Granger and Johansen Cointegration Tests were used to test the long-term relationship and Granger Causality Test through VECM to test the short-term causality relationship. The results of the analysis showed that the variables were cointegrated in the long term. In the short term, a one-way causality relationship was determined in the direction from economic growth to the current account deficit.

Economic growth is crucial for developing countries. However, a stable real growth model based on employment should be developed without giving a current account deficit. The analysis of the relationship and direction of causality between these two important macro-economic variables, which have advantages and disadvantages, is a contribution since it was performed by the last data, and this study is substantial for policymakers and decision-makers, confirming the literature about obtaining similar results to some previous studies.

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