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The Relationship Between Current Deficit and Economic Growth: An Empirical Study on Turkey

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Abstract

This study aims to examine the relationship between the current account deficit and economic growth in Turkey. For this purpose, Granger causality and VAR analyses were performed on the variables by using their quarter data for 1999:01 - 2014:02. Granger causality test revealed a unidirectional correlation from growth rate to current account deficit. As shown by the impulse-response functions obtained through VAR analysis, a shock of one standard deviation on the growth rate variable results in effect on the current account deficit variable. Furthermore, in the variance decomposition analysis, growth rate accounts for 53.25% of the prediction error variance for current account deficit during the tenth period, while the current account deficit variable itself accounts for the remaining 46.75% of the prediction error variance.

Keywords: Granger causality, VAR analysis, current account deficit, economic growth

1. Introduction

Many of the developing countries are faced with current account deficit since they use a high level of import input in production; or to put it differently, their growth is import-oriented growth. Nevertheless, this correlation between growth rate and current account deficit is not always necessarily true. Particularly in countries where
economic growth occurs with foreign trade surplus, increases in real national income may lead to improvement in current account deficit (Telatar, 2007: 14).

When export rate increases with a decline in production costs and decreasing costs in a growing national economy, this will result in a positive impact on current account deficit. However, the direction of the impact of economic growth on current account deficit depends on the amount saved and spent from a country’s income increase. If the amount spent is higher than the amount saved, then the current account deficit will increase. Economic growth which depends on import since imported goods are used as raw materials, semi-finished products or capital goods to produce export goods on one hand and which therefore brings about a production increase on the other hand will inevitably increase imports and eventually current account deficit (Coskun, 2010: 21-22).

Numerous studies in the literature examine the relationship between economic growth and current account deficit. Debelle and Faruqee (1996) demonstrated that countries with rapid economic growth tend to have a high rate of current account deficit, while Calderon, Chong, and Loayza (2000) found in their research on forty four developing countries that an increase in GDP growth rate led to an increase in current account deficit. In a study on the United States, Kandil and Greene (2002) showed that current account deficit correlates with the increases in real GDP in the long run and that this correlation is reverse and significant.

Discussing the subject within the context of Turkish economy, Kasman, Turgutlu and Konyali (2005) found out that there is long-term constant correlation between current account deficit, real exchange rate, and economic growth in Turkey and that overvalued Turkish Lira has a higher negative impact on current account deficit than that of economic growth. In a study trying to determine the presence of a causality relationship between current account deficit, and economic growth and exchange rate, Erbaykal(2007) carried out a causality test using Toda and Yamamoto analysis, in which he identified causality both from economic growth and from exchange rate to current account deficit. In another study, Telatar and Terzi (2009) examined the relationship between current account deficit and economic growth in Turkey using VAR analysis and found that on the basis of impulse-response functions, current account deficit immediately responds to a shock of one standard deviation in growth rate and there is a statistically significant relationship with a negative sign. Yilmaz and Akinci (2011), on the other hand, investigated the relations between GDP and current account deficit in Turkey drawing upon Granger causality and Johansen cointegration tests. In this study, a long-term relationship was identified between GDP and current account deficit, while in their Granger causality test, the researchers found unidirectional causality from GDP to current account deficit. Kostakoglou and Dibo (2011) tested the relationship between current account deficit and growth rate in Turkey using the VAR method and by drawing upon impulse-response functions, they concluded that one unit of shock in GDP results in a negative impact on the current account balance/GDP ratio, meaning that economic growth caused an increase in current account deficit.

The present study aims to explain the relationship between the current account deficit and economic growth in Turkey. For this purpose, we used the quarter data for 1999:01 - 2014:02 for the variables.

The study consists of four sections. The second section following the introduction evaluates the relations between the current account deficit and economic growth in Turkey within the scope of the period under study. The third section examines the relationship between the current account deficit and economic growth in Turkey with the help of Granger causality test and VAR analysis. And the conclusion involves the interpretation of the analysis results and presents some suggestions.

2. The relations between current account deficit and growth rate in Turkey

During crisis periods in Turkey, the ratio of current account deficit to national income has reached around 3.5% to 4%, which led to the assumption that current account deficit causes a crisis in case it exceeds a certain threshold value (Erbaykal, 2007: 82). Therefore, changes in current account are perceived as signals for economic trends and are also known to play a decisive role in shaping economic decisions and expectations (Erdogan and Bozkurt, 2009: 137).

Figure 1 shows the yearly current account deficit values in Turkey.
As seen in Figure 1, there has been a gradual increase in current account deficit, particularly from 2003 onwards. Shrinking domestic demand as a result of the 2001 crisis led to a surplus in current account deficit, which was 3.7 billion dollars in 2001. The current account deficit started to climb up during the years following 2001 and the magnitude of these deficits gradually increased until 2009. The repercussions of global recession in on domestic and foreign demand became evident from the last quarter of 2008, while current account deficit experienced a rapid decline in 2009, falling down to -12.1 billion dollars. However, current account deficit started to rise again after 2009. Throughout 2010, foreign demand was in a weak trend, while the recovery in domestic demand was decisive in the widening of current account deficit, which rose to -75.1 billion dollars in 2011. As a result of CBT’s monetary policy introduced in late 2010, domestic demand slowed down with the macroeconomic measures taken in 2011, which slowed down the growth rate in 2012 and thus led to a decline in imports and was a determining factor in the shrinking of the current account deficit in 2012. The main reasons underlying the increase in the current account deficit in 2013 were growing imports and net gold import trends above historical averages.

Figure 2 shows the relationship between growth rate and current account deficit.
As is clear from Figure 2, there is a strong relationship between growth rate and current account deficit. This is mainly caused by the low domestic savings-investments coverage ratio in Turkey. When domestic investments exceed domestic savings, the difference is covered by foreign savings, which is translated into current account deficit in economic indicators. Particularly in the 2001-2007 period, macroeconomic stability was largely achieved, inflation rate as well as real interest rates declined, which led to an increase in consumption and investment demand higher than national income, with increasing demand being covered by foreign savings (CBT Bulletin, 2009: 4).

Another reason behind the strong relationship observed between the growth rate and current account deficit as in Figure 2 is the structural characteristics of the economy which require the import of intermediate goods in order to meet the increasing total demand. In this context, as a country which meets most of its energy needs (chiefly oil and gas) from abroad, Turkey’s current account deficit is highly influenced by energy prices and increasing energy prices has a widening effect on current account deficit (CBT Bulletin, 2009: 4).

3. Empirical study

The study aims to examine the relationship between current account deficit and economic growth in Turkey. The dataset consists of quarterly data encompassing the 1999:01 - 2014:02 period. All data were obtained from the Electronic Data Distribution System (EDDS) of the Central Bank of Turkey. Below is the constructed model:

\[ CO = \beta_0 + \beta_1 BO + \epsilon_t \]

CO: Current account deficit (Current account deficit/GDP ratio) (%)
BO: Economic growth rate (%)

Seasonal effects were removed from the BO and CO variables. Current account deficit widens with increasing growth rate, while a current account surplus or a lower current account deficit is observed at times with low growth rates.

The analysis started with a unit root test. The unit root test (Augmented Dickey-Fuller (ADF)) was applied to determine the stationarity of the series and the results of the unit root test are given in Table 1.

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF test statistics</th>
<th>Critical values at a significance level of 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOSM</td>
<td>-3.92557 (1)</td>
<td>-3.171541</td>
</tr>
<tr>
<td>COSM</td>
<td>-5.671165 (4)</td>
<td>-3.173943</td>
</tr>
</tbody>
</table>

Note: The values in parentheses are lag lengths identified according to minimum SIC information criteria. \( H_0: \delta = 0 \) The series is non-stationary.
The series is stationary.

As is clear from Table 1, the variables of growth rate (BOSM) and current account deficit (COSM) were found to be stationary in level at a significance level of 10%. Since the BOSM and COSM variables are I(0), the constructed model was estimated using the least squares estimation technique and the results of the estimation are shown below.

\[
\text{COSM} = -3.3620 - 0.2642 \text{BOSM} \quad R^2 = 0.23 \quad F = 18.84 \quad DW = 0.22
\]

According to the least squares estimation, a 1% increase in growth rate results in a 0.2642% decrease in current account deficit. The negative sign of the coefficient indicates a reverse correlation between growth rate and current account deficit. In other words, it was concluded that economic growth leads to an increase in current account deficit.

The model has a low determination coefficient. This could be because much more important variables that influence current account are not included in the model. In addition, this is corroborated by the presence of autocorrelation in the model. However, the coefficients are significant. These results demonstrate that growth rate has impact on current account deficit, but it is not sufficient on its own.

Granger causality test is applied so that one can look at and interpret the causality relationships between variables. First, a convenient lag length is identified, which was determined as \( k=1 \) according to AIC and SIC information criteria. Table 2 shows the results of the Granger causality test.

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Number of Observations</th>
<th>F-Statistics</th>
<th>Probability Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOSM does not Granger Cause COSM</td>
<td>61</td>
<td>3.65848</td>
<td>0.06073</td>
</tr>
<tr>
<td>COSM does not Granger Cause BOSM</td>
<td>61</td>
<td>1.85185</td>
<td>0.17883</td>
</tr>
</tbody>
</table>

As seen in Table 2, in the first null hypothesis, the F-statistics probability value of 0.06073 is lower than the significance level (10%), so hypothesis \( H_0 \) is rejected. The growth rate variable is the Granger cause of the current account deficit variable. Then, there is a unidirectional causality relationship from growth rate to current account deficit. However, no causality relation was detected from current account deficit to growth rate.

In the study, VAR analysis was also carried out to examine impulse-response functions and variance decompositions. In impulse-response analysis, the aim is to measure the response of a variable when a shock of one standard deviation is applied to another variable. Figure 3 shows the impulse-response functions.
As is clear in Figure 3, a shock of one standard deviation in the growth rate variable results in a negative response in the current account deficit variable throughout the period under study. This negative response remains high until the fourth period, after which its magnitude starts to decrease, getting closer to the equilibrium point.

Variance decomposition analysis was applied to reveal the numerical effects of statistical shocks on the variables. Table 3 gives the results of the variance decomposition.
A look at the variance decomposition analysis for current account deficit in Table 3 shows that during the tenth period, growth rate accounts for 53.25% of the prediction error variance for current account deficit, while current account deficit itself accounts for the remaining 46.75%.

4. Conclusion and Evaluation

In this study that examines the relationship between current account deficit and economic growth in Turkey for the period between 1999:01 and 2014:02, Granger causality and VAR analyses were carried out using economic growth rate and current account deficit/GDP as variables.

In the analyses, first, stationarity of the series was investigated and the series were found to be stationary in level. According to the results of the least squares estimation made with the variables that were found to be stationary in level, economic growth leads to an increase in current account deficit.

Granger causality test performed to identify the direction of the relationships between variables revealed a unidirectional relationship from growth rate to current account deficit. Thus, increases in economic growth rate are the cause of current account deficit. According to the impulse-response functions obtained as a result of VAR analysis, when a shock of one standard deviation is applied to the growth rate variable, the current account deficit variable responds to this shock negatively for ten periods, meaning that economic growth increases current account deficit. Furthermore, the results of the variance analysis show that during the tenth period, growth rate accounts for 53.25% of the prediction error variance for current account deficit, while current account deficit itself accounts for the remaining 46.75%. All these results suggest that increases in growth rate have an impact on current account deficit.

The impact of increases in growth rate upon current account deficit is observed in many developing countries as well as in Turkey’s economy. This relationship between economic growth rate and current account deficit results from the low domestic savings-investments coverage ratio and the import of intermediate goods. Structural reforms are needed to make this relationship more flexible. There is a need to pursue such policies that aim to reduce Turkey’s foreign dependency in energy and many other sectors and to target sustainable growth rather than a high economic growth rate. In addition to policies aiming to reduce the dependency of exports on imports, increasing domestic savings is also very important.

References


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