The External Debt in the Context of Economic Growth: The Sample of Turkey
Aysen Edirneligil, Mehmet Mucuk

Abstract—In developing countries, one of the most important restrictions about the economic growth is the lack of national savings which are supposed to finance the investments. In order to overcome this restriction and achieve the higher rate of economic growth by increasing the level of output, countries choose the external borrowing. However, there is a dispute in the literature over the correlation between external debt and economic growth. The aim of this study is to examine the effects of external debt on Turkish economic growth by using VAR analysis with the quarterly data over the period of 2002-01-2014:04. In this respect, Johansen Cointegration Test, Impulse-Response Function and Variance Decomposition Tests will be used for analyses. Empirical findings show that there is no cointegration in the long run.

Keywords—Economic growth, external debt, time series analysis, Turkish economy.

I. INTRODUCTION

Political and social development and increasing national income are two of the most important aims of the nations. To reach these aims, financing the related institutions has a significant role. At this point, especially developing countries use external debt for financing high budget institutionalizing enterprise which is necessary to ensure growth and development.

External debt which means that the money borrowed by a country (institutions or individuals) from foreign lenders, can be used to eliminate foreign trade gap and budget deficit, defense expenditures and other extraordinary expenditures. For this reason, external debt not only used by developing countries, but also used by developed countries.

On the other hand, nonpayment debts bring extra drain for the economics and can cause debt crises. This problem makes the countries’ economy more fragile to the external shocks. Thereby, today external debt restricts become one of the most debated issues. In this study, the relationship between external debt and economic growth will be examined for Turkey. In this concept, in the first part of the study, the theoretical framework will be explained and in the second part the variables of Turkish economy will be analyzed.

II. THEORETICAL FRAMEWORK

There are different approaches about the effect of external debt on economic growth. According to classical growth model, the source of the economic growth is investments.

Investments increase the efficiency of both labor force and the land and as a result production increases. The determinant of the investments is the rate of profit. According to classical economists, increase in population decrease the rate of profit and also decrease the investments [1].

A. Smith, D. Ricardo T. R Malthus, N. W. Senior and J. B. Say and the other members of Classical School of Economics defend the thought that the minimum government interference provides that the economic problems are solved by the market [2]. And also government expenditures must be minimum level and the taxes and related instruments must finance these expenditures. Ricardo is against the external debt for two reasons. 1. External debt hides the truth and people save less. 2. To pay the interest of the debt, governments increase the taxes and it can cause outflow of the capital [3].

According to Harrod-Domar model which is one of the most important modern growth models, the primary element of the economic growth is also investments. For this model, increase the amount of saving, which means the investments, means the increase the growth rate, so low saving coefficient is an obstacle for the growth. External debts in this situation increase the savings and also increase the growth rate. If the marginal saving propensity is bigger than the average saving propensity, the increase in national income increases the domestic investable resources. As a result, increase in domestic savings provides the financing of the external debt [4].

Neoclassical Models express that the only factor determine the growth rate is the capital growth rate and the only factor increases the capital growth is savings [5]. For this model, in the long run, payment of the interest rate of external debts causes the increase in taxes. As a result of this, individuals decrease their consumption and also savings which means that less capital stock is lefted to the next generation [6].

Today, it is accepted that the external debt at reasonable levels for developing countries have positive effect on growth rate because, developing countries have limited capital stock. However, increase in debt can cause crowding out effect on domestic and foreign investments and can affect the economic growth negatively [7].

Negative effect of high level debt stock on economic growth is explained by the debt overhang theories. According to this theory, if there is a probability that, in the future, debt will be larger than the country's repayment ability, expected debt-service costs will discourage further domestic and foreign investment and this situation harm growth. Potential investors will fear that the more a country produces, the more it will be taxed by creditors to service the external debt. For that reason...
they will be less willing to incur costs today, for the sake of increased output in the future. This argument is represented in the debt "Laffer curve" (Fig. 1), which assumes that larger debt stocks tend to be associated with lower probabilities of debt repayment [8].

![Fig. 1 Debt Laffer Curve](image)

III. LITERATURE REVIEW

A number of empirical studies on the relationship between external debt and economic growth have been carried out using different estimation approaches. Table VII summarizes the various studies in this field.

IV. DATA AND METHODOLOGY

For analysis in this study it is used quarterly data for the period 1998 to 2014, coming from the Central Bank of the Republic of Turkey (CBRT). The data and resources are shown at Table I.

![Table I: The Data Set](image)

The following techniques are used for data analysis and evaluation:
1. Unit Root Test
2. Johansen Cointegration Test
3. Variance Decomposition

V. EMPIRICAL FINDINGS

Unit root tests are used to identify the stationary property of a time series data. For this purpose, Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and NG Perron tests are applied in the study. The results of ADF and PP unit root tests are presented in Tables II and III. Also NG Perron Test findings are shown in Table VIII.

According to the results of these tests, each variable is no stationary in levels. Therefore it is taken first differencing of series and then it is seen that the series are stationary [I (1)]. This could mean that series move together in the long run.

At second stage, the VAR model is estimated to determine the short run and long run relationships between budget deficit and current account deficit. For this, firstly, optimal lag length is determined using information criteria. This table IV shows the optimal lag length by different criteria.

![Table II: Results of ADF Unit Root Test](image)

![Table III: Results of PP Unit Root Test](image)

According to Schwarz and Hannan-Quinn information criteria the optimal lag length is 1. In this context, the VAR model is estimated with one lag. Stationarity of the estimated model is tested by using inverse roots of AR characteristic polynomial. Fig. 2 shows the stationarity of the VAR model.

As shown in Fig. 2, all roots lie inside the unit circle. This implies that the VAR model satisfies the stability condition. After estimating VAR model, Johansen cointegration test is applied to examine the relationship between budget deficit and current account deficit in the long run. Table V shows the results of cointegration tests.

The results of cointegration test show that there is no relationship between these variables in the long run.
Inve
r
se Roots of AR Cha
r
acti
stic Polynomial

Table V: Results of Johansen Cointegration Tests

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Trace Test Trace Statistic 0.05 Max-Eigen Value Statistic 0.05</th>
<th>Maximum Eigenvalue Statistic</th>
<th>Critical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0.166097</td>
<td>12.03329</td>
<td>15.49471</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.003484</td>
<td>0.226833</td>
<td>3.841466</td>
</tr>
</tbody>
</table>

Trace test indicates no cointegration at the 0.05 level, Max-Eigen value test indicates any cointegration at the 0.05 level.

Finally, variance decomposition is used to analyze how important the change in one variable is due to change in another variable. The variance decomposition of the VAR was presented in Table VI.

According to variance decomposition, around 8 percent variation in GDP is explained by external debt in the 10th term. On the other hand, 68 percent variation in external debt is explained by GDP.

Table VI: The Results of Variance Decomposition for ED and GDP

<table>
<thead>
<tr>
<th>Variance Decomposition of GDP: Period</th>
<th>Variance Decomposition of ED: Period</th>
</tr>
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<tbody>
<tr>
<td>GDP</td>
<td>ED</td>
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</table>

Table VII: Overview of Previous Studies

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Methodology</th>
<th>Period</th>
<th>Country</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eretaş and Başçınur (2013), [10]</td>
<td>Panel Data Analysis</td>
<td>1980-2007</td>
<td>Turkey</td>
<td>There is unidirectional causality that runs from external debt to economic growth.</td>
</tr>
<tr>
<td>Bilginoğlu and Aysu (2008), [16]</td>
<td>Regression Analysis</td>
<td>1968-2005</td>
<td>Turkey</td>
<td>Foreign debts in Turkey negatively affect economic growth and therefore Turkey is facing the problem of overhang, that is, excessive debts.</td>
</tr>
</tbody>
</table>
In developing countries, one of the most important instruments of development is external debt. Most of the approaches assume that external debt is a driving force of economic growth. However, it is not possible to definite conclude about this relationship. In this study it is examined the effects of external debt on Turkish economic growth by using VAR analysis with the quarterly data over the period of 1998:01-2014:03. In this respect, Johansen Cointegration Test and Variance Decomposition Tests are used for analyses. Empirical findings show that there is no cointegration in the long run between external debt and economic growth for Turkish economy. It means that external debt is not used in productive areas in Turkey.

VI. CONCLUSION

REFERENCES