Fiscal sustainability test: The case of Turkey

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Abstract

The main purpose of the study is to test the sustainability of fiscal policies for Turkish economy using quarterly series over the period 2000:1 to 2015:2. By considering Kremers (1989) sustainability condition we test the debt-income ratio by using Lee-Strazicich unit root test which allow structural breaks under both null and alternative hypothesis. The test results we obtained show that the series has a unit root which indicates the unsustainability of public debt.

Keywords: Fiscal policies, Fiscal Sustainability, Unit root test

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1. Introduction

The sustainability of economic policies can be evaluated as important as the implemented policies. Therefore, the investigation of the lifetime of the implemented economic policies has been one of the important topics in literature. Although there are various definitions of sustainability in terms of fiscal policy there is no clear definition. In general, fiscal sustainability is defined as the sustainability of the debt. Marks (2004) defined the fiscal sustainability as providing financial proficiency of government without making any arrangements and maintaining their current financial situation to ensure that the budget constraint. In other words fiscal deficit defined as sustainable as long as a government raises the necessary funds by borrowing Chen (2014).

Fiscal sustainability which is one of the important issues in the literature are heavily tested by using unit root and cointegration tests. According to the sustainability condition which introduced to the literature by Kremer, if the dept stock-GDP ratio stationary then the fiscal deficit is said to be sustainable. In this study by following this condition we test the fiscal sustainability for Turkey.

The studies in the literature on fiscal sustainability can be summarized as follows. Yol (2009) investigated the fiscal sustainability for Egypt, Tunisia, and Morocco for the 1972-2005 period and find as not sustainable. By using quarterly data Hepşag (2011) investigated the same issue for Turkey testing the stationarity of debt stock/GDP ratio in the 1990:1-2008:4 period allowing structural breaks and find it as not sustainable.

While, Ehrhart & Llorca (2008) conclude that fiscal deficits are sustainable for South Mediterranean countries for the 1975-1999 period using unit root tests. Joseph (2010) investigated the same issue for East Caribbean countries and found the fiscal deficits as unsustainable. Aslan (2009) test the fiscal sustainability by using unit root and cointegration tests for Turkey. His empirical findings show the fiscal deficits as sustainable when he use monthly data and unsustainable when he use yearly data.

2. Econometric Methodology and Empirical Results

The milestone study of Perron (1989) showed that in the case of existence of structural breaks in the data ignoring them can cause misleading results. Since this study several unit root tests which allow for structural breaks has been introduced to the literature (Zivot & Andrews (1992), Lumsdaine & Papell (1997) e.g.)

In this study we employ a recently introduced unit root test which allow structural breaks for both the null of unit root and the alternative. By following the Lee & Strazizch (2003) the unit root test statistic can be computed from the following regression:

\[ \Delta g_t = \delta^* \Delta Z_t + \phi \tilde{S}_{t-1} + u_t \quad t = 2, \ldots, T \]

(1)

Where \( \tilde{S}_{t-1} = g_t - \tilde{\psi} - Z_t \delta^* \). For testing the unit root by allowing the breaks in the intercept we replace the \( Z \) with \( Z_t = [1, t, D_{1t}, D_{2t}] \) to allow the breaks in the intercept and trend we use \( Z_t = [1, t, D_{1t}, D_{2t}, D_{1t}, D_{2t}] \). On the other hand we test the null unit root with structural breaks by testing \( \phi = 0 \). The structural breaks in data determined by choosing the dummy variables which minimizes this test statistic.
We obtain the quarterly data of net total public debt from the under secretariat of treasury of Republic of Turkey Prime Ministry over the period 2000:1 to 2015:2.

To make a comparison we first employ ADF and DF-GLS unit root test which do not allow structural breaks:

<table>
<thead>
<tr>
<th>Test Stat.</th>
<th>CV %1</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF Unit Root Test</td>
<td>-1.741897</td>
</tr>
<tr>
<td>DF-GLS Unit Root Test</td>
<td>-1.351298</td>
</tr>
</tbody>
</table>

The test results of two unit root tests indicate the debt series have a unit root. To analyze whether ignoring structural breaks cause the non-rejection of the null we next use LS unit root test. The following table includes the test results:

<table>
<thead>
<tr>
<th>Test Stat.</th>
<th>TB1</th>
<th>TB2</th>
<th>k</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3.6644</td>
<td>2003Q2</td>
<td>2012Q1</td>
<td>4</td>
</tr>
</tbody>
</table>

The test results show the structural breaks occurred in 2003Q1 and 2012Q1. On the other hand the comparison of the test statistic with the critical values of Lee-Strazichic indicates a unit root in the series. This result implies that fiscal sustainability of Turkey is not sustainable in the analysis period even we allow the structural breaks.

3. Conclusion

In this study we test the fiscal sustainability of Turkey by considering the Kremers (1989) sustainability conditions. For this purpose, we test the net total public debt of Turkey over the period from 2000:1 to 2015:2. By employing unit root test which allow two endogenous structural break in data. The test results we obtained show that the debt series has a unit root which indicates the unsustainability of public debt.

References


