AN EVALUATION ON FISCAL SUSTAINABILITY OF MUNICIPALITIES IN TURKEY

Umut AKDUĞAN¹*, Bilge Hakan AGUN²

¹ Assis. Prof. Dr., Trakya University, TURKEY, umutakdugan@trakya.edu.tr
² Assis. Prof. Dr., Trakya University, TURKEY, bhakanagun@trakya.edu.tr

*Corresponding author

Abstract

Fiscal sustainability is analyzed by different techniques on the basis of government budget constraint. The method developed for fiscal sustainability by Hamilton and Flavin (1986) is based on determining whether the budget deficit or debt stock of the current term can be met with the budget surpluses in the future terms. Therefore, lifetime budget constraints are regarded as a sign of fiscal sustainability. In this study, the approach relating to sustainability of central government budget deficit is adapted to municipalities, and fiscal sustainability of municipalities in Turkey is examined on the basis of primary budget balance of the integrated municipalities. To analyze the fiscal sustainability of the municipalities, the stationarity of the primary budget balance variable, which expresses the difference between the municipal revenues and expenditures excluding interest payments, has been tested. In this context, quarterly data of the period of 2007-2017 is used, the series is made real with the real GDP index based on the year of 2010, and finally the natural logarithm of the series is used in the model. In the methodological framework of the study, ADF, PP and Ng-Perron Unit Root Tests were used to analyze the stationarity of the primary budget balance series. The results of the analysis indicate that the primary budget balance series of the municipalities is stationary during this period. These findings reveals that the municipalities in Turkey ensure the fiscal sustainability criteria.

Keywords: Municipalities, fiscal sustainability, unit root test.

1. INTRODUCTION

In the studies performed within the scope of fiscal sustainability, central government's ability to meet its debt obligations is usually taken into consideration and sustainability of fiscal policies or budget
deficits is examined. At this point, fiscal sustainability is analyzed with different techniques on the basis of the government's budget constraint. The method developed in relation to fiscal sustainability, which is also called as lifetime budget constraint or borrowing constraint in the literature, is based on determining whether the budget deficit or debt stock in the current period can be met with budget surplus in the future periods. Therefore, lifetime budget constraints are regarded as a sign of fiscal sustainability.

In the first section of this study, fiscal rule practices, which are implemented in Turkey to ensure the fiscal discipline in municipal budgets, will be discussed. In the second section, the theoretical framework of the subject and the empirical studies in the literature will be cited. In the third part of the study, the approach relating to sustainability of central government budget deficit will be adapted to municipalities and sustainability of primary budget balance of the integrated municipalities in Turkey will be examined. In this context, fiscal sustainability of the municipalities in Turkey will be discussed on the basis of the study of Hamilton and Flavin (1986) and in the framework of borrowing constraint approach. For this purpose, the stationarity of the primary budget balance series of the municipalities for the period of 2007-2017 will be tested by various unit root tests. In the fourth section, findings will be handled and the study will be concluded with the fifth section in which a general evaluation of the results will be made.

2. FISCAL SUSTAINABILITY: FISCAL RULE IMPLEMENTATION (FISCAL POLICIES BASED ON RULES)

Public expenditures have increased due to Keynesian policies that began to be implemented worldwide after the great economic crisis of 1929 and tasks imposed on the state for the realization of economic development after the World War II. However, the failure to achieve the desired increase in public revenues has put countries into debt crises. In this context, especially since 1980, some countries have implemented stabilization programs to ensure fiscal sustainability. These stability programs eventually left their place to fiscal rules. In this period, the logic of fiscal rule implementations within the scope of central government is that public revenues do not increase in response to the increase in public expenditures. In addition, local governments' overspending and inability to raise their revenues at the same level resulted in fiscal imbalances. These crises at the level of local government also caused the failure to achieve balance at the macro level. Therefore, fiscal rules at the local level are implemented (i) to improve the political coordination between the administrations, (ii) to limit the borrowing of local governments, (iii) to discipline the expenditures of local governments, (iv) to achieve economic stability (Gündüz and Agun, 2011: 120) and (v) to ensure fiscal discipline through the constitution or legal arrangements.

Municipalities' spending, borrowing and collecting revenue authority helps to ensuring the effectiveness and imposes tight budget constraints as they hinder the realization of fiscal targets at the national level. Thus, actually, increasing speed of fiscal localization (municipalities' authority to spend and collect revenue) and economic development of local governments has become important in providing economic stability at the national level (Gündüz and Agun, 2011: 129).

The reasons for implementing fiscal rules in municipalities are grouped under four headings (Sutherland et al., 2005: 7-12): (1) to help to ensure fiscal stability in long-term, (2) to help to ensure economic stability in short-term, (3) to ensure total effectiveness by balancing the marginal utility of public expenditures with marginal tax burden, and (4) to help to ensure effectiveness in resource allocation by providing public services in accordance with local needs. In this context, fiscal rules implemented in municipalities are complementary to those implemented at the national level (OECD, 2007: 245).

In Turkey, the need for implementing fiscal rules at the local level have emerged as a result of excessive borrowing of municipalities and their divergence from fiscal discipline (Gündüz and Agun, 2011: 136). The external financial liberalization decision which has been taken in 1989 was effective

July 9-11, 2018 Skopje-MACEDONIA
in divergence of the fiscal discipline. After this decision, the share of external debt increased within the
debt amounts of municipalities and the share of municipalities’ debt increased within the total amount
of external debt of the public sector. Especially since the 1990s, there has been an increase in the
amount of Treasury guaranteed external debt of the municipalities. As a result of municipalities’
divergence from fiscal discipline, in other words, their resorting to unrestrained borrowing, the debt
burden has remained on the Treasury and the requirement of borrowing at the national level has also
increased. Since the second half of the 1990s, several legal regulations have been introduced to ensure
fiscal discipline in the borrowing of municipalities (Önal, 2008: 197-8). In this context, firstly, some
limitations have been introduced in the budget laws. In 1997 Budget Law performance criterion have
been introduced, and some limits have been introduced for the external borrowing under the Treasury
guaranteed commercial conditions in 1998 Budget Law. By the 1999 Budget Law, an maximum limit
has been introduced on the borrowing of municipalities, their affiliates, and municipal economic
enterprises which municipalities own more than 50 percent of their capital, and local government
associations which have public entity from international commercial banks with the condition of
Treasury guarantee (Gündüz and Agun, 2011: 136).

Since 2000s, several legislative regulations have been introduced to ensure fiscal discipline by limiting
the borrowing of municipalities. Accordingly, the provisions related to the fiscal rules were enacted
with Public Finance and Regulation of Debt Administration Law No. 4749 in 2002, Municipal Law No.
5393 in 2005, and Public Fiscal Management and Control Law No. 5018 in 2006. The first purpose of
these legislative regulations is to establish a debt management in order to ensure and protect the fiscal
discipline in municipalities and to supervise and control their –especially external- borrowings (Law
No. 4749). The second purpose is to ensure the fiscal transparency and accountability of the
municipalities (Law No. 5018). The third is to design of municipalities that are not bound to central
government in terms of resources, and that loans and borrows with their own revenues. As a result,
since 2002, and especially in 2005 it has been seen that the real debt payments of municipalities
showed a downward trend (Önal, 2008: 198; Gündüz and Agun, 2011: 137-139).

3. THEORETICAL FRAMEWORK AND EMPirical LITERATURE

The concept of fiscal sustainability is generally related to ability-to-pay and explains the ability of the
central government or municipalities to fulfill their debt commitments. The approach for debt
sustainability and debt restraint developed by Hamilton and Flavin (1986) on fiscal sustainability
seeks an answer to the following question: Can current debt stock or budget deficit be covered by
future budget surpluses? Therefore, it is expressed that if the reduced value of future primary budget
surplus equals to or exceeds the debt stock or budget deficit, fiscal sustainability condition is provided.
Since it is not possible to repay current debts consistently with new debts, in the long-term the
repayment of debts depends on the value of the primary budget surplus (Hamilton and Flavin, 1986:
808-811). More precisely, the current debt stock should be met with the present value of expected
future primary budget surplus (excluding the interest payments) (Uctum and Wickens, 2000: 197).

The mathematical analysis of fiscal sustainability is basically based on borrowing constraint. Accordingly, when the sum of primary budget balance and seignorage revenues is subtracted from
interest payments, net borrowing amount is found. Evaluation on fiscal sustainability can be made by
deriving the "lifetime budget constraint" from the single-term borrowing (budget) constraint. It is also
stated in the literature that there is a close relationship between the lifetime budget constraint and the
sustainability of implemented policies. In other words, it is stated that while the existing debts can be
paid, the ability to sustain the implemented policies indefinitely is related to fiscal sustainability
(Burnside, 2005: 11).

The “central government budget constraint” used in the theoretical approach to fiscal sustainability is
defined as (Prohl and Schneider, 2006: 3):
\[ G_t + (1 + r_t) B_t = R_t + B_{t+1} \]

(1)

In Equation (1), \( B_t \) is public debt stock, \( r_t \) is interest rate, \( R_t \) is the government revenue including the seignorage and \( G_t \) is the expenditure excluding interest payments. In the model, there are real values of all these variables. Since Equation (1) is valid for each period, when this equation is resolved forward and the expected values of the variables are taken, it can be reached to the following equation:

\[
B_t = E_t \sum_{j=0}^{\infty} \delta^{j+1} s_{t+j} + \lim_{j \to \infty} E_t \delta^{j+1} B_{t+j+1}
\]

(2)

In Equation (2), it is defined as \( s_t = R_t - G_t \) and represents the primary budget balance. \( \delta = 1/(1+r) \), \( r \) is the estimated real interest rate, and \( E_t \) is the expected value. At this stage, in order to test the fiscal sustainability, the following assumption must be made in Equation (2):

\[
\lim_{j \to \infty} E_t \delta^{j+1} B_{t+j+1} = 0
\]

(3)

If this assumption is correct, it can be stated that the lifetime budget balance or deficit is sustainable. Because, Equation (3) implies that the debt stock does not grow at a higher rate than the interest rate. If this condition is met, the lifetime budget constraint expresses the equality between the current value of the debt stock and the reduced value of the future budget surplus. So, fulfillment of this condition indicates that fiscal policies are sustainable (Prohl and Schneider, 2006: 4).

In the empirical literature on this subject, there are different methods derived from the test of Equation (3). The most important of these is the analysis of the stationarity of the primary budget balance. In their study, Hamilton and Flavin (1986) state that the test of the hypothesis expressed in Equation (3) can be done by testing the stationarity of debt stock and the primary budget balance as a univariate approach. In their study, they used the annual data of the United States for the period of 1960-1984 to test the stationarity of the variables of public debt stock (\( B_t \)) and the primary budget balance (\( s_t \)), and indicated that these variables are stationary. They also argue that the stationarity of the primary budget balance series is a sufficient condition for the sustainability of fiscal policies (Prohl and Schneider, 2006: 4-5).

Also in this study, the method used in the work of Hamilton and Flavin (1986) to analyze the fiscal sustainability of central government is adapted for municipalities in Turkey. In this context, stationarity of the primary budget balance of the integrated municipalities will be tested with different unit root tests and the fiscal sustainability of the municipalities in Turkey will be examined.

4. DATA AND METHOD

In the study, the stationarity of the primary budget balance (pd) variable, which is the difference between the municipal revenues and expenditures excluding interest payments, was examined in an attempt to investigate the fiscal sustainability of the municipalities. The quarterly data for the period of 2007Q1-2017Q4 is used for this variable and the time series is taken from T.R. Ministry of Finance Directorate General of Public Accounts website. In addition, the primary budget balance series is made real with the real GDP index based on 2010, which is taken from IMF-IFS (International Financial Statistics), and a seasonal adjustment is performed on this series using the Census X-12 method. The chart of final version of the series used in the analysis is shown below.
In the methodical framework of the study, Augmented Dickey-Fuller (ADF), Phillips-Perron (PP) and Ng-Perron Unit Root Tests are used to analyze the stationarity of the primary budget balance (pd) series of the integrated municipalities.

In ADF Unit Root Test developed by Dickey and Fuller (1979), it is shown whether the time series variables can be explained by the autoregressive (AR) process or not. In order to understand the kind of process that time series pass through, when a regression model is constructed between the values of the period t and the value of the period t-1, this model becomes first-level autoregressive model and can be expressed as (Enders, 2003: 211-221):

\[ Y_t = \rho Y_{t-1} + \epsilon_t \]  

(4)

In the model shown above, \( \epsilon_t \) is a stochastic error term. While \( Y_t \) time series is converging to \( t \to \infty \), if \( |\rho| < 1 \) then series is stationary, if \( |\rho| = 1 \) then series is not stationary and variance of \( Y_t \) is \( t \cdot \sigma^2 \). Generally, this process is called as the random-walk process and the first level differences of this random-walk process are stationary. The following regression model is estimated in the ADF unit root test:

\[ \Delta Y_t = \alpha + \beta T + \delta Y_{t-1} + \sum_{i=2}^{p} \beta_i \Delta Y_{t-j+1} + \epsilon_t \]  

(5)

In Equation (5), the lag length \( p \) is determined by information criteria such as Akaike or Schwarz. By the way model is estimated by least squares method, estimated value and standard error of \( \delta \) is found and thereby \( \tau \) test statistic is calculated. It is decided according to comparing the \( \tau \) test statistic with the critical values in Dickey and Fuller (1979). Accordingly, if the absolute value of the \( \tau \) test ( \(|\tau|\) ) is greater than the critical value, the basic hypothesis that states the series has unit root is rejected.

Equation (5) is also used in the PP unit root test. However, in the PP unit root test, attempts are made to eliminate the problem of high-level autocorrelation by adding the various variations of lagged terms to the model. Furthermore, in the PP unit root test, t-statistics is being modified (Awan, Anjum and Rahim, 2015: 386).
There are some negative aspects of unit root tests such as ADF and PP, namely, if the autoregressive roots of the equations for these unit root tests are close to one or less than one, these tests have a relatively low power; if in the implementation of these tests, the moving average roots approaches to -1, it causes to sample volume distortion and this distortion affects selected lag length (Esteve and L-Lopis, 2005: 2330). The Ng-Perron unit root tests have been developed to correct the distortion of the volume of the term (Perron and Ng, 1996: 435-463).

Ng-Perron unit root test includes four different tests, namely $MZ_\alpha$ which is the modified one of Phillips-Perron $Z_\alpha$ test, $MZ_t$ that is the modified version of Phillips-Perron $Z_t$ test, $MSB$ that is the modification of Bhargava (1986) statistic and $MPT$ which is the modification of ERS Point Optimal statistic. Formulations of these tests, also known as M-tests, are shown below (Perron and Ng, 1996: 437):

$$MZ_\alpha = Z_\alpha + (T/2)(\hat{\phi}_1 - 1)^2$$

(6)

$$MSB = \left( T^{-2} \sum_{t=1}^{T} Y^2_{t-1} \right)^{1/2} / s^2$$

(7)

$$MZ_t = Z_t + (1/2) \left( \sum_{t=1}^{T} \frac{Y^2_{t-1}}{s^2} \right)^{1/2} (\hat{\phi}_1 - 1)^2$$

(8)

$$MPT = \left[ \bar{c} T^{-2} \sum_{t=1}^{T} \tilde{y}^2_{t-1} - \bar{c} T^{-1} \tilde{y}^2_T \right] / s^2_{AR}$$

(9)

$$MPT = \left[ \bar{c} T^{-2} \sum_{t=1}^{T} \tilde{y}^2_{t-1} - (1 - \bar{c})T^{-1} \tilde{y}^2_T \right] / s^2_{AR}$$

(10)

In the above models, $\hat{\phi}_1$ represents coefficient for the autoregressive variable used in the unit root test. Basic hypothesis in $MZ_\alpha$ and $MZ_t$ tests is that the series has unit root, while basic hypothesis in $MSB$ and $MPT$ test is that the series is stationary. It is decided according to comparing the relevant test statistics with the critical values calculated by Ng-Perron (2001). Furthermore, the lag length in the Ng-Perron unit root tests is calculated by the formula of $T^{1/3}$ with the total number of observations.

5. FINDINGS

Results of the Augmented Dickey-Fuller (ADF) Unit Root Test and the Phillips-Perron (PP) Unit Root Test for the stationarity of the primary budget balance ($pd$) series of integrated municipalities are shown in Table 1.
Table 1. Results of the ADF and PP Unit Root Tests

<table>
<thead>
<tr>
<th>ADF Test Statistics</th>
<th>PP Test Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF Test Statistics</td>
<td>PP Test Statistics</td>
</tr>
<tr>
<td>-2,40** (0)</td>
<td>-2,28** (1)</td>
</tr>
<tr>
<td>Critical Values</td>
<td>Critical Values</td>
</tr>
<tr>
<td>%1</td>
<td>%1</td>
</tr>
<tr>
<td>-2,61</td>
<td>-2,61</td>
</tr>
<tr>
<td>%5</td>
<td>%5</td>
</tr>
<tr>
<td>-1,94</td>
<td>-1,94</td>
</tr>
<tr>
<td>%10</td>
<td>%10</td>
</tr>
<tr>
<td>-1,61</td>
<td>-1,61</td>
</tr>
</tbody>
</table>

**Explanation:** The maximum lag length in the ADF unit root test is taken as 9 and the optimal lag length is determined according to the Akaike Information Criteria (AIC). In the PP unit root test, the optimal lags are automatically determined according to the Newey-West estimator. According to critical values indicated by the package program and indicated by MacKinnon (1996), (*) is statistically significant at 1% significance level, (**) is statistically significant at 5% significance level and (***) is statistically significant at 10% significance level in both tests. The deterministic components (constant and trend) in the model are determined with graphs of the time series.

According to the results of the ADF and PP Unit Root Tests, the \( pd \) series appears stationary at 5% significance level. Ng-Perron Unit Root Test results of the same series are presented in Table 2.

Table 2. Results of the Ng-Perron Unit Root Test

<table>
<thead>
<tr>
<th>Ng-Perron Test Statistics</th>
<th>( MZ_\alpha )</th>
<th>( MZ_t )</th>
<th>MSB</th>
<th>MPT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12,29**</td>
<td>-2,41**</td>
<td>0,196**</td>
<td>2,22**</td>
</tr>
<tr>
<td>Critical Values</td>
<td>%1</td>
<td>-13,80</td>
<td>-2,58</td>
<td>0,174</td>
</tr>
<tr>
<td></td>
<td>%5</td>
<td>-8,10</td>
<td>-1,98</td>
<td>0,233</td>
</tr>
<tr>
<td></td>
<td>%10</td>
<td>-5,70</td>
<td>-1,62</td>
<td>0,275</td>
</tr>
</tbody>
</table>

**Explanation:** Optimal lag lengths are calculated by \( T^{1/3} \) formulation and in this direction lag length is taken as 4. Critical values are taken from Ng-Perron (2001). (**) indicates that it is statistically significant at 5% significance level.

According to the results of the Ng-Perron Unit Root Test, it has been seen that the \( pd \) series is stationary at 5% significance level. The results of Ng-Perron Unit Root Test are in line with the results of ADF and PP Unit Root Test.

6. CONCLUSION

Results of the analysis show that the primary budget balance series for the municipalities is stationary. This finding reveals that municipalities in Turkey ensure fiscal sustainability condition in the period studied. Enforcement of both the numerical and procedural fiscal rule provisions since 2002 has been effective at this end. With these legal arrangements, some restrictions have been introduced for...
municipalities’ borrowings, real debt payments of municipalities have decreased and this reduction has had a positive effect in ensuring fiscal discipline.

REFERENCE LIST


