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# APPRAISING THE FISCAL SUSTAINABILITY IN A WELFARE STATE: EVIDENCE FROM TURKEY

**Cansın Kemal CAN***

## Abstract

According to Tanzi and Schuknecht (1997), the welfare states are characterized by large and ever-mounting fiscal deficits and public debt. Due to their shallow fiscal spaces, the developing countries jeopardize their fiscal stability once they opt for running welfare state policies. This study gauges the degree of fiscal vulnerability in Turkey from a welfare state perspective and aims to appraise the posture of fiscal stability under welfare state policies by means of fiscal fragility index and causality analyses. Overall, the results indicate that despite exhibiting welfare state characteristics, Turkey's fiscal stance does not reveal high levels of fragility. The analysis of the fiscal fragility index indicates that the level of fiscal vulnerability is time-varying and during the 90s surges in the social expenditures coexist with rising fiscal vulnerability, whereas during 2000s, the despite considerable upward movements in social spending, the index value does not imply a deterioration in fiscal fragility apparently thanks to prudential policies during the period. Also, causality test results reveal that there is unidirectional causality from required primary balance to real primary balance indicating that the primary balance is used actively to restore fiscal stability. Nevertheless, in recent years, the index value exhibits a rising trend signalling a worsening fiscal posture which might entail an overhaul for the welfare state policies.

**Keywords:** *Fiscal Sustainability, The Welfare State, Toda -Yamamoto Test, Fiscal Fragility Index*

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# SOSYAL DEVLETTE MALİ SÜRDÜRÜLEBİLİRLİĞE DAİR BİR DEĞERLENDİRME: TÜRKİYE ÖRNEĞİ


## Öz

Tanzi ve Schuknecht'e (1997) göre refah devletlerinin karakteristik özellikleri arasında büyük ve sürekli artan mali açıklar ve kamu borcu yer alır ancak bu ülkeler sınırlı mali alanları nedeniyle refah devleti politikaları yürüttüklerinde bir yandan da mali istikrarlarını tehlikeye atarlar ve mali kırılganlıkla karşılaşırlar. Bu çalışma, refah devleti perspektifinden Türkiye'de mali kırılganlığın derecesini ölçmekte ve mali kırılganlık endeksi ve nedensellik analizleri yoluyla refah devleti politikaları çerçevesinde mali istikrarın durumunu değerlendirmeyi amaçlamaktadır. Genel olarak, sonuçlar refah devleti özellikleri sergilemesine rağmen Türkiye'nin mali duruşunun yüksek düzeyde kırılganlık göstermediğini göstermektedir. Mali kırılganlık endeksinin analizi, mali kırılganlık seviyesinin zamana göre değiştiğini ve 90'lı yıllarda sosyal harcamalardaki artışların artan mali kırılganlık ile birlikte var olduğunu, 2000'li yıllarda ise sosyal harcamalardaki önemli artış hareketlerine rağmen endeks değerinin arttığını göstermektedir bu da söz konusu dönemde ihtiyatlı politikalar sayesinde mali kırılganlıkta bir bozulma gerçekleşmediği anlamına gelmektedir. Ayrıca nedensellik testi sonuçları, faiz dışı dengenin mali istikrarı sağlamak için aktif olarak kullanıldığını ve borcu stabilize eden faiz dışı dengeden reel faiz dışı dengeye doğru tek yönlü bir nedensellik olduğunu ortaya koymaktadır. Bu da hükümetin gerektiğinde faiz dışı fazlayı bir dengeleyici enstrüman olarak kullandığını göstermektedir. Bununla birlikte, son yıllarda, mali kırılganlık endeksi değeri, refah devleti politikalarının revizyonunu gerektirebilecek kötüleşen bir mali durum sinyali veren bir yükseliş eğilimi sergilemektedir.



**Anahtar Kelimeler:** *Mali Sürdürülebilirlik, Refah Devleti, Yamamoto Testi, Mali Kırılganlık Endeksi*

## Introduction

In their seminal work, Tanzi and Schuknecht (1997) state that the welfare states are characterized by high fiscal deficits and public debt since in those countries, a large portion of the fiscal space is mostly devoted to the promotion of social welfare through social expenditures. Those countries incur large fiscal costs due to heightened welfare promoting expenditures. At this point, the sturdiness of the fiscal posture is quite important since the cost of those expenditures oftentimes dwarfs the budgetary capacity of the government. According to Alesina et al. (2008), in developing countries, the households demand more government expenditures and transfer payments when the economy is in an expansion due to political mistrust. In those countries, society mostly does not have confidence in the way the public funds will be spent since prudential policies are not common in those countries. The prevalence of profligacy and corruption in those countries lead to the public opinion that the generated funds will be spent ineffectively and imprudently if they are not used for social expenditures and transfers. Nevertheless, when these two conditions occur simultaneously, the fiscal vulnerability turns out to be a concern since the fiscal space is already shallow in those countries. In other words, when a developing country acts as a welfare state, the fiscal risks get higher since heightened social expenditures bring about an additional fiscal burden on the budget which already lacks sufficient capacity for the existing defrayals.

Based on these arguments, in this study, we strive to find out if the characteristics of the welfare state coexist with fiscal vulnerability risks in Turkey following the methodology described in Stoian (2012). In this study, the authors calculate the correlation coefficient among fiscal variables, such as total expenditure, total revenue, budget deficit, primary surplus and find out if the country exhibits the characteristics of a welfare state. Then, they calculate a fiscal fragility index to evaluate the level of fiscal riskiness and reaches a verdict about the fiscal stance of the economy.

To accomplish this objective of adopting Stoian (2012) approach to Turkish economy, we calculate the fiscal fragility index based on IMF data and also use the same data source to elaborate on the characteristics of the Turkish economy from a welfare state perspective. In addition, as an auxiliary analysis, we ran a Toda-Yamamoto causality test to assess the extent to which the fiscal policy is responsive to the fluctuations in the level of vulnerability in Turkey to support the arguments of the index-based analysis.

In the view of this framework, the rest of the paper is designed as follows:

The next section is devoted to the analysis of the theoretical background of the index which is used to evaluate the fiscal performance of Turkey. The underlying algebra behind the calculation of the index will be presented in this section. The second section will explore the literature on the analysis of fiscal stability. Reviewing the current literature highlights the academic contribution of our paper. The third section introduces the data and the methodology used for the analysis along with the interpretation of the estimation results and makes a verdict about the status of the welfare state and fiscal fragility in Turkey. The final part concludes.

## Theoretical Background

The theory behind the tools used for the evaluation of the fiscal fragility in this paper is based on the standard intertemporal budget constraint. In this section, we will briefly consider the underlying algebra of solvency and obtain an operational condition for fiscal sustainability.[1]

In the modern economy, solvency is crucial for the stability of the financial system since in the absence of solvency, debt contracts are not honoured in time which is an important source of fragility for the entire economy. Since the government is the largest borrower in the economy, its solvency directly affects the stability of the overall economy. Hence, the sustainability of fiscal balances hinges to a large extent on the credibility and capacity to pay ratings of the sovereign. In theory, the government budget constraint always binds at least in an ex-post manner but what determines the level of credibility of the government is the time it takes for the government to meet the intertemporal budget constraint and the quality of the means it employs. Thus, from the perspective of fiscal fragility and sustainability, the question is not whether the government will fulfil the constraint, but whether the preferred strategies are feasible and credible or not. A credible fiscal policy to keep public debt under control entails the generation of a sufficient amount of primary balance on a continuous basis. For this reason, the government should fulfil the intertemporal budget constraint by generating primary balance instead of other methods such as inflation tax or Ponzi financing so as to stay on the sustainable path in terms of public finances.

Our analysis in this paper is based on this argument and we test the performance of Turkish public finances in systematic primary balance generation. Fulfilling the intertemporal solvency condition does not imply sustainability and it is only a necessary condition. Fiscal sustainability can only be formed by means of regular primary balance generation.

To carry out this analysis which is based on primary balance performance, we need to go over the arithmetic behind the budget constraint. Government spending is comprised of several types of expenditures which also include interest payments. The interest payments occur as a result of previous debt.

Formally, government spending can be articulated as:

$G_t + (1+r_t)\, D_{t-1}$ where $G_t$ denotes the non-interest government expenditures.

Also, the government revenues are made up of tax revenues and issuance of new debt for simplicity. Formally;

$T_t + D_t$

[1] The fomal derivations in this section are compiled from the analysis in Chapter 9 of *"Financial Programming and Policies Training Material Volume I"* by IMF Institute for Capacity Development.

If the budget constraint binds, these two expressions must be equal to each other.

$$G_t + (1+r_t)\, D_{t-1} = T_t + D_t \qquad (1)$$

Slightly manipulating the equation, we get;

$$D_t = (1 + r_t)\, D_{t-1} - (T_t - G_t)$$

The last term on the right-hand side denotes the difference between total revenues and non-interest government expenditures which is defined as primary balance. As we mentioned earlier, primary balance generation performance is the core of our analysis.

Hence alternatively the equation can be written as follows:

$$D_t = (1 + r_t)\, D_{t-1} - (PB_t)$$

From a debt sustainability perspective what matters is not the amount of public debt but its relative value against the capacity to pay which is represented by GDP or formally, $Y_t$.

Scaling both sides of the equation with $Y_t$ we get;

$$\frac{D_t}{Y_t} = (1 + r_t)\left(\frac{D_{t-1}}{Y_{t-1}}\right)\left(\frac{Y_{t-1}}{Y_t}\right) - \frac{PB_t}{Y_t}$$

Since the growth rate of the GDP can be formulated as $g_t = (Y_t - Y_{t-1}) / Y_t$ and the real interest rate is $r_t = \left(\frac{1+i_t}{1+\pi_t}\right) - 1$ where $i_t$ is the nominal interest rate and the $\pi_t$ is the inflation rate, the whole equation can be rewritten as:

$$d_t = \left(\frac{1+r_t}{1+g_t}\right) d_{t-1} - pb_t \qquad (2)$$

or in differential terms;

$$\Delta d_t = d_t - d_{t-1} = \left(\frac{r_t - g_t}{1+g_t}\right) d_{t-1} - pb_t$$

The equation above is the core of our analysis. It represents the change in public debt and its determinants. According to that, the public debt in a particular period grows as a product of real interest rate, growth rate, previous debt level, and the primary balance. Using this equation, we can calculate the level of primary balance required to keep public debt constant. Setting $\Delta d_t = 0$ we get;

$$\left(\frac{r_t - g_t}{1+g_t}\right) d_{t-1} - pb_t = 0 \text{ and } pb_t^* = \left(\frac{r_t - g_t}{1+g_t}\right) d_{t-1}. \qquad (3)$$

The last equation implies that the primary balance required to keep the public debt stable can be calculated by using the previous public debt, real interest rate, and the growth rate. A positive real interest rate increases the interest bill of the government, therefore, it increases the required primary balance and the growth rate enhances the capacity to pay therefore it reduces the debt stabilising primary balance. Also, if the previous public debt level is higher, then, more amount of the primary balance will be needed next term to trim the excessive part thereof.

Also, it is clear from the above articulation that the government needs to respond to upward movements in the public debt by increasing the level primary balance to preserve the balance in the equation (2). This condition implies that the direction of causality needs to be from required balance to real primary balance which indicates that the government is using the primary balance as a fiscal tool when required which facilitates the occurrence of fiscal sustainability in the economy through an active fiscal policy.

## Literature Review

Now that we have gone over the underlying theory and algebra behind the intertemporal budget constraint along with the calculation of debt stabilising primary balance, in this section, we will introduce the selected contributions to the literature on fiscal fragility to reconcile our contribution to the existing literature.

Stoian A. (2011) assesses the fiscal vulnerability for European countries based on an index that is calculated by using the debt stabilising primary balance. Calculating the required primary balance for each year and comparing this value with the actual values of primary balance, they evaluate the fiscal performance of each European country in terms of fiscal vulnerability. According to their findings, the European countries are mostly vulnerable to fiscal shocks since they suffer from mismanagement on certain occasions.

Baldacci et al. (2011) create two fiscal stress indices to evaluate fiscal stability. Their findings indicate that for all developed and developing countries the index values rose after the currency crisis in 2009 indicating an overall rise in fiscal vulnerability.

Stoian (2012)a tests the fiscal vulnerability for selected European countries. They conclude that all countries in the experiment except Bulgaria and Estonia suffer from fiscal vulnerability. Later, Stoian et al. (2015) develop another index called V-L-D to investigate the short-term fiscal fragility in EU member countries. They classify the vulnerability in four categories depending on their severity from lowest to hardest. Their findings are suggestive that there are 310 vulnerability periods for the sample they used for estimation. In 2018, they enhance their study and figure out that Greece, Portugal, Romania, the United Kingdom, Ireland, Spain, and Slovenia are the most fragile countries in Europe.

Stoian (2012)b, tests the fiscal fragility in european countries with welfare state characteristics. They used fiscal fragility index and social spending data along with other fiscal variables to evaluate the fiscal fragility from a welfare state perspective. According to their findings, Nordic welfare states are less vulnerable to fiscal risks compared to Conservative countries.

Ferrari-Filho (et al). (2010) generate a financial fragility index for Brazil and conclude that Brazilian public finances were speculative during their observation years. This result indicates that the fiscal space was shrinking in Brazil leaving less room for manoeuvrability regarding social expenditures. Terra & Ferrari-Filho (2020) revisits the Brazilian fiscal stability and their results indicate that Brazilian fiscal policy has turned out to be a Ponzi game since budgeting was not possible without new borrowing in the country.

Similar results for Greece were obtained by Nikolaidi (2014). They estimate the same index for Greece and conclude that the country is suffering from ultra-Ponzi financing which is by no means sustainable. Argitis & Nikolaidi (2014) augments the argument in this paper by focusing on public sector cash inflows and outflows and based on their findings they critique the ineffectiveness of the government in fulfilling loan commitments to secure fiscal sustainability. They concur that the Greek public finances are under ultra-Ponzi dictation.

Rodriguez (2014), implements Granger causality test and fiscal fragility index to evaluate the likelihood of the crises. His findings indicate that higher levels of fiscal fragility index emit a signal for a potential crisis and there is a causal relationship between required primary balance and real primary balance in the economy.

Afonso and Jalles (2016) is another study which is based on Granger causality test to evaluate the fiscal sustainability. Their findings are suggestive that the direction of causality is from public debt to primary balance which suggests the existence of Ricardian regimes in selected European countries. The overall results in this study imply absence of sustainability for most European economies.

Karlsson (2020) analyses the time-dependent causality among fiscal variables via Granger causality test using wavelet decomposition. His findings suggest that in China there is a bidirectional causal relationship between fiscal components which corresponds to fiscal synchronisation.

Herrera and Prats (2020) extends the causality framework to a panel data setting. In their analysis, they investigate the existence of fiscal sustainability in selected European countries. They run a Dumitrescu and Hurlin extension to causality testing and their findings are indicative of a bidirectional causal relationship among fiscal variables.

Shevcuk and Kopych (2018) carries out an investigation on the fiscal sustainability in Ukraine. Their primary conclusion is that fiscal sustainability does not exist in Ukraine as evidenced by two-way Granger causality test results.

Zarei (2018) empirically tests the fiscal sustainability in Iran. For this purpose, he runs a causality test among fiscal sustainability indicators. It is evidenced by his findings that excluding the oil revenues the fiscal posture in Iran is not sustainable. Only if the oil revenues are included the fiscal balances turn sustainable in the country.

In the literature, there are numerous other contributions that seek an answer to the question of fiscal fragility for different countries with different data sets however due to space limitations we included only a few of them in this section. The main takeaway from this brief review is that fiscal fragility is a common problem for developed and developing countries regardless of their economic status.

## Appraising the Fiscal Vulnerability in Turkey

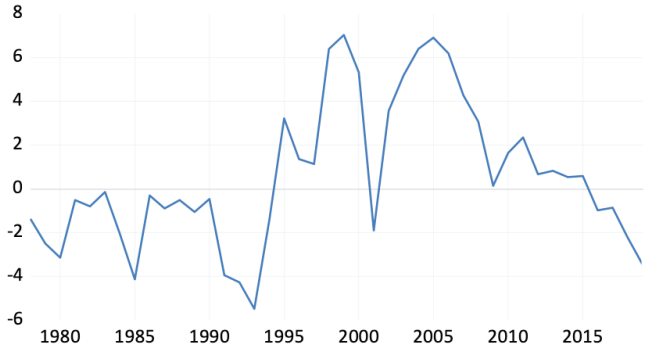
In the final section, we appraise the fiscal vulnerability in Turkey using the methodology described in the first section. The data we used for the analysis were retrieved from the Public Finances in Modern History, Fiscal Monitor and Financial Monitor databases of the IMF. The dataset covers the 1978-2019 period and is comprised of growth rate, deposit rate, inflation rate, public debt/GDP, and primary balance/GDP, total revenue/GDP, total expenditure/GDP, total social spending/GDP series. In the subsection below we summarize the main trends in the data.

*Salient Features of the Data*

The figure below illustrates the primary balance/GDP ratio for the sample period. It is clear that the late 70s and entire 80s were characterized by negative levels of primary balance, in other words, primary deficits. From a fiscal stability point of view, this trend is not suitable for public debt sustainability since primary deficits lead to explosive debt patterns rather than stabilized fiscal postures. This trend prevails in the economy until the mid-90s but comes to a halt thereafter. As a result of the IMF backed recovery programs, the primary balance hits positive values to restore public debt sustainability. However, during the economic downturn in 2001, the primary balance plunged dramatically but recovered swiftly during the first years of single-party government.

However, during the second half of the decade, a gradual fall in the primary balance to GDP ratio is clearly visible. This decline continued until the global economic crisis during which the primary balance to GDP ratio hit level zero after a long period. After the global downturn, the ratio seems to recover but through the end of the 2010s, it starts to fall once again and currently is in the negative territory for the last couple of years. Several factors can be listed for the sharp decline in the primary balance but the most prominent ones include the war in Syria, failed coup attempt, etc. Regardless of the underlying reasons, the current trend in primary balance generation performance is seemingly weak compared to the outstanding performance of the last decade which raises concerns about the fiscal vulnerability since positive primary balance is an important indicator of fiscal stability.

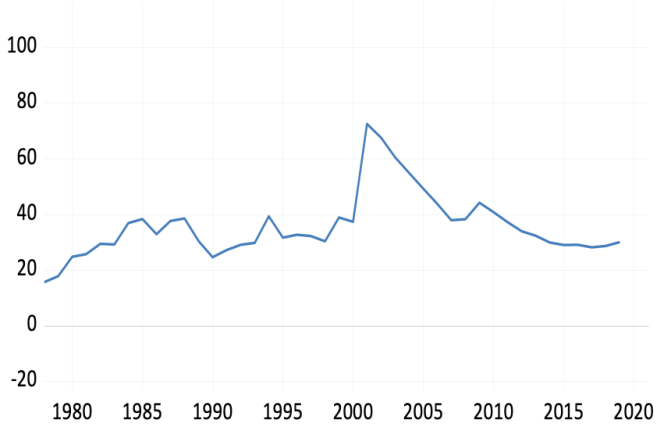
*Figure 1. Primary Balance to GDP Ratio*




Source: IMF Fiscal Monitor and Public Finances in Modern History Databases

Figure 2 plots the public debt/GDP ratio over the sample period. The upward trend is visible during the 80s which not surprisingly corresponds to a declining primary balance trajectory in the same period. As we mentioned earlier, consecutive realizations of primary surpluses are needed to preserve the stability of public debt which did not exist during this period. Also, the outcome of the IMF backed policies is also visible from the early 90s onward evidenced by the seemingly stable debt profile. However, the public debt ratio tops out in 2001 during the economic crisis and in the rest of the sample, it falls gradually except for the global crisis in 2009. During the sample period, the public debt/GDP ratio mostly remains under the 60 % threshold level of Maastricht criteria which is a remarkable sign for stability.

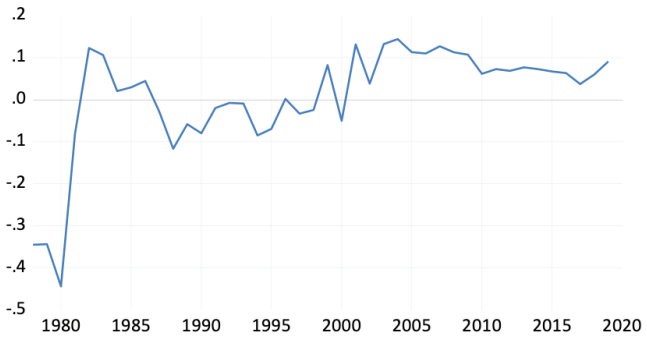
*Figure 2. Public Debt/GDP*




Source: IMF Fiscal Monitor and Public Finances in Modern History Databases

The figure below depicts the real interest rate for the sample period. It can be observed that, unlike the 80s, the economic recovery policy of the late 90s and 2000s is based on the positive interest rate to attract international funds to the country. Nevertheless, despite its beneficial aspects such as facilitating the influx of foreign capital, a positive real interest rate has some impairing effects as well. The higher the real interest rate, the higher the cost of borrowing for the government. Thus, keeping an optimal level of real interest rate is crucial for sustainability. Besides, according to equation two introduced in the theoretical section, the net compounding effect of the real interest rate occurs when we scale the real interest rate by the growth rate. Thus, keeping the growth rate positive and in terms of magnitude higher than the real interest rate is also important for avoiding vulnerability. Otherwise, when the real interest rate is higher than the growth rate, the compounding coefficient in equation 2 becomes larger than one which leads to a snowball effect in public debt generation and restoring sustainability entails even higher levels of primary surplus.

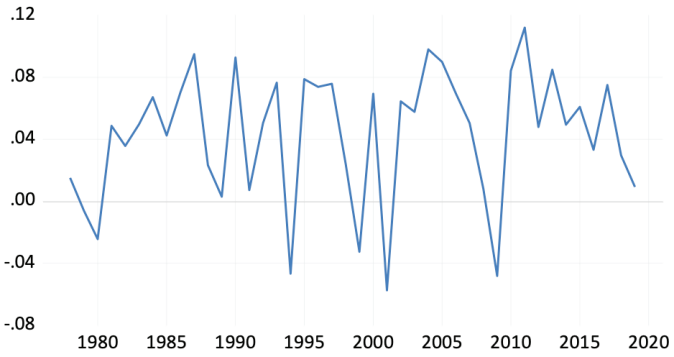
*Figure 3. Real Interest Rate*




Source: Author's own calculations using IMF data

The figure below shows the growth rate for the sample. Except for the occasional crises periods, the growth rate was mostly positive for the sample which is a good sign for sustainability. However, the volatility in the growth rate dominates the economy which generates an unstable environment for public debt management. In recent years, despite remaining in the positive territory, the growth rate is gradually falling which emits a signal for deteriorating conditions for stability.

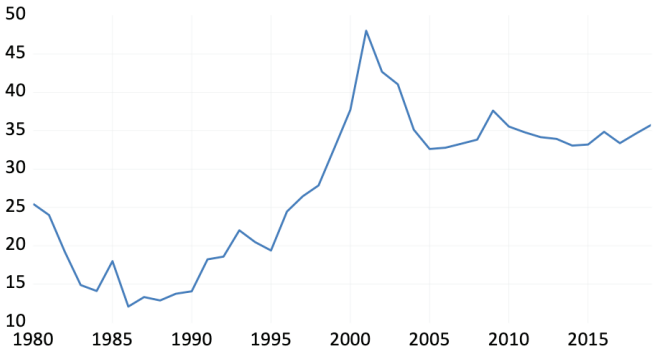
*Figure 4. Growth Rate*




Source: IMF Financial Statistics Database

The figure below displays the government expenditure levels with respect to the GDP over the sample period. The plot of the series is dominated by an upward trend and in 2001 there is an obvious summit which apparently occurred by the abrupt fall in GDP which is the denominator of the indicator. Another point to note on the graph is that the share of the economy in the 2000s is almost twofold higher than in the 80s which indicates that the government has seemingly higher involvement in the profile of the economy.

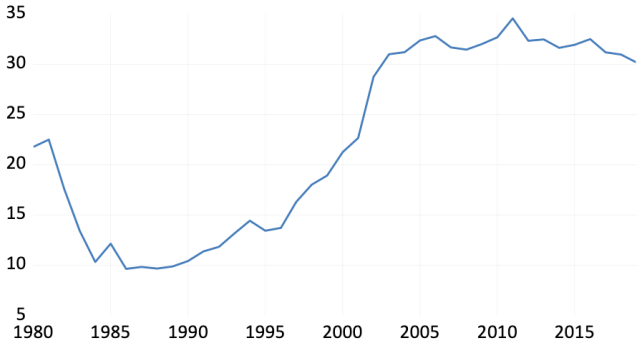
*Figure 5. Government Expenditures*




Source: IMF Fiscal Monitor and Public Finances in Modern History Databases

The graph below shows the total revenue of the government with respect to GDP over the sample period. It is clear from the figure that the level of revenues is remarkably higher during the 2000s compared to the 80s and 90s. Unlike the first half of the sample, during the 2000s, the series exhibit a more stable pattern which indicates a more profound revenue policy by the fiscal authorities.

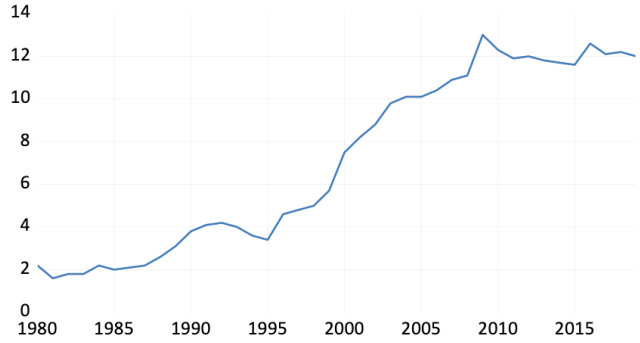
*Figure 6. Government Revenues*




Source: IMF Fiscal Monitor and Public Finances in Modern History Databases

Figure seven plots the government social spending whose correlation with other fiscal variables gives a hint about the welfare state properties of the country according to Stoian (2012)b. As in the case of other variables, the upward trend is also visible for the social spending which points out that the government liberated the reined in social spending in the post-mid 90s portion of the series. It is possible to argue that the government gained welfare state traits during this period.

*Figure 7. Social Spending*




Source: OECD

*Methodology and Findings*

Numerical Analysis of Welfare State Traits

In this section, we attempt to find out if the Turkish economy exhibits welfare state traits. For this purpose, we use the data introduced in the previous section. According to Stoian (2012)b, the extent to which the social spending measures up against total expenditures and revenues gives a hint about the status of the welfare state in the economy. The figures below display the ratio of social spending to the total revenue and expenditure for the Turkish economy. According to these figures, the share of social spending permanently increases with respect to both revenue and expenditure which indicates that the country is expanding its welfare state coverage over years. Especially, from the early 2000s onwards, the country appears to implement welfare state policies on a continuous basis.

*Figure 8. Social Spending / Total Expenditure*

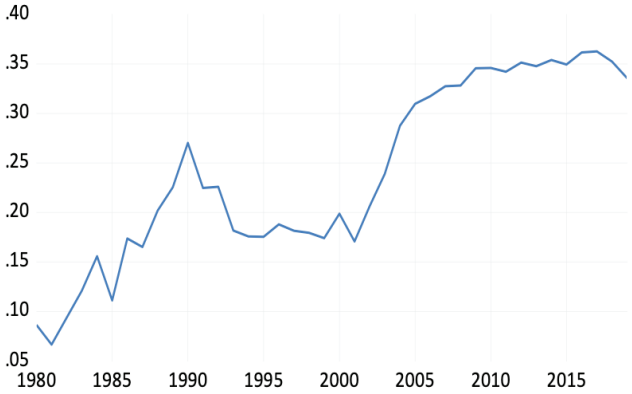
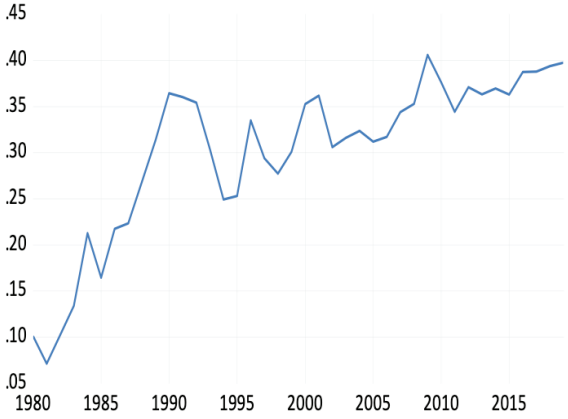


*Figure 9. Social Spending / Total Revenue*




According to Stoian (2012)b, along with the ratio of social spending to revenue and expenditure, its correlation with the fiscal variables also constitutes an indicator of the welfare state for the countries. The table below summarizes the coefficients of the correlation between social spending and other variables.

*Table 1. Correlation Matrix*

| | **Revenue** | **Expenditure** | **Debt** | **Primary Balance** |
|---|---|---|---|---|
| **Social Exp.** | 0,9237 | 0,8236 | 0,2606 | 0,3247 |

According to the findings in the table above, social spending is positively and highly correlated with government revenues and expenditures which indicates that Turkey is running welfare state policies. Also, its correlation with public debt and primary balance is also positive which implies that the government is running procyclical fiscal policies to enlarge the scope of the welfare state. In other words, whenever new funding is available in any form, the government increases the social spending which is common in developing countries according to Alesina et al. (2008). Nevertheless, this type of fiscal behaviour poses a great deal of risk on fiscal stability since the new financial sources are not spent prudently. Especially in developing countries, mounting social spending jeopardizes fiscal stability since households demand more transfer payments and government expenditures when new funding is available since they believe that otherwise the funds will be wasted by unproductive projects or lobbying. Therefore, being a developing country, the results are in line with the arguments in Alesina et al. (2008).

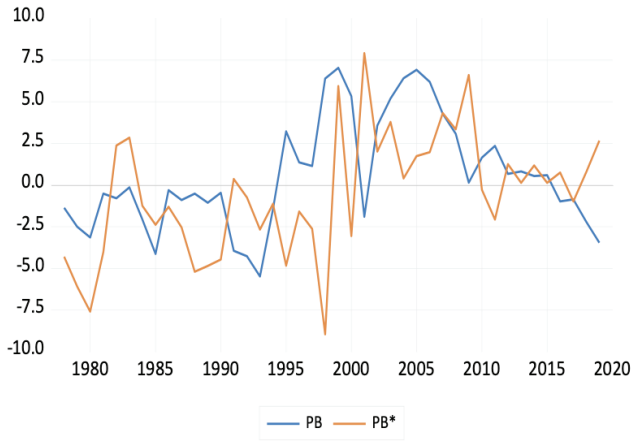
Index-Based Analysis

Now that we have found out that Turkey is implementing welfare state policies, in this section, our purpose is to detect if the welfare state policies coexist with the fiscal fragility in Turkey. In the previous section, we noted that procyclical welfare state policies jeopardize

fiscal stability therefore it is worthwhile to test the simultaneity of fiscal fragility and welfare state indicators.

The methodology we use in this subsection for assessing the fiscal stability is based on Stoian (2012)b whose algebra we put forward in the first section. The debt stabilising primary balance was defined as the hypothetical level of primary balance which is required to keep public debt under control. Using the formula described in the first section, we calculate this level of primary balance and compare it with the actual level of primary balance to evaluate the fiscal performance of Turkey. The smaller the gap between these two levels, the higher the performance of Turkey in stabilising the fiscal posture of the country. Figure 10 below illustrates the debt stabilising primary balance and actual primary balance together. The blue line represents primary balance realizations while the orange line depicts the required level of primary balance to preserve fiscal stability.

*Figure 10. Actual vs Required Primary Balance*

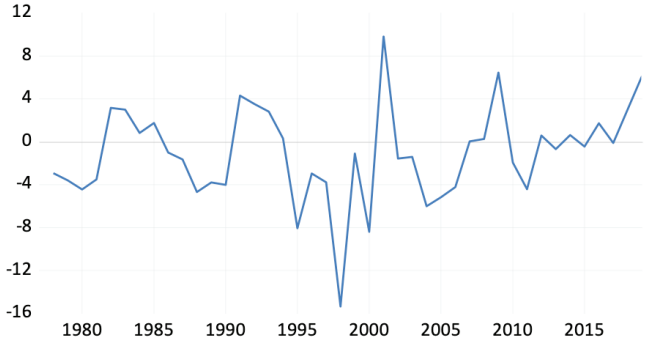



Source: IMF Financial Statistics and own calculations

It is evident from the figure above that the blue line is above the orange line whenever a stabilisation programme agreement with the IMF was signed in history. These periods include the late 80s, late 90s and early 2000s. The fiscal policies during these periods were to large extent designed by IMF agreements which impelled the government to run primary surpluses for restoring stability. Outside these years, the orange line is mostly above the blue line indicating an inappropriate environment for fiscal stability. The gap between the actual and the required primary balance is the highest during the 2001 and 2009 crises implying that the government could not generate sufficient primary balances during these years. However, during the early 2000s, the actual primary balance is remarkably higher than the required primary balance as an outcome of the IMF programme which corresponded to a 6,5 % primary surplus for each year of the agreement. This strategy not surprisingly coincides with the abruptly falling debt ratio in Figure 2 above (from 70 % to 40 %). Strong adherence to the IMF programme resulted in a falling debt ratio thanks to high primary balance performance. Nevertheless, in recent years, the gap between required primary balance and actual primary balance is once again negative similar to crises periods of 2001 and 2009 which raises concerns about the future course of fiscal balances.

The difference between these two levels can also be considered as an index for evaluating fiscal vulnerability and can be plotted on a graph. Figure 11 below serves this purpose. On this graph, the blue line represents the vertical distance between the blue and orange lines in figure 10. This difference indicates the degree of fiscal risk for each year. By definition, negative values stand for stable while positive values stand for non-stable fiscal postures. The graph clearly shows that the crises periods are characterized by positive values of the index while the years during which the fiscal policies were supervised by IMF programmes the index gets negative values which correspond to a stabilisation in the fiscal balances. Not surprisingly, the index value tops out in 2001 with an outstanding positive level, and thereafter either stays in the negative territory or very close to zero except for 2009 which indicates that the fiscal stability was established throughout the 2000s. In 2009, the cumulative index once again made an upward movement but this movement was not persistent and it was restored in a short period.

*Figure 11. Fiscal Vulnerability Index (PB*- PB)*




Source: Own calculations

Nevertheless, in recent years the index value has hit once again positive levels which exhibits an alarming condition for a potentially looming fiscal instability in the near future. If the current trend is not shifted through policy alterations, all the outcomes of good performance in the last 18 years will be lost promptly. A full-fledged tax reform, proper scrutiny of expenditures, restructuring the contingent liabilities are among the major policy alternatives available to the government for this purpose.

Toda-Yamamoto Causality Analysis

According to equation 3 in section 1, the primary balance generated by the government needs to respond to debt stabilising required primary balance to preserve fiscal stability. In the preceding subsection, we calculated the debt stabilising primary balance using equation 3, namely $\left(\frac{r_t - g_t}{1+g_t}\right)d_{t-1} - pb_t = 0.$ For a stable fiscal posture, the primary balance needs to respond to a movement in the required primary balance which proves that primary balance is actively used as a tool for stabilising the fiscal posture of the economy. To test the causality of this sort, we carry out a Toda-Yamamoto type causality test to determine the direction of causality between primary balance realizations and required primary balance levels.

The procedure of this test is based on Toda and Yamamoto (1995). This procedure is a modified version of the standard Granger causality test which overcomes the shortcomings thereof such as stationarity requirement. The Toda-Yamamoto approach relaxes the stationarity requirement of the standard Granger causality procedure. The standard procedure involves the estimation of the following VAR:

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + ... + \alpha_p Y_{t-p} + \theta_1 X_{t-1} + ... + \theta_p X_{t-p} + \epsilon_t$$

$$X_t = \beta_0 + \beta_1 X_{t-1} + ... + \beta_p X_{t-p} + \delta_1 Y_{t-1} + ... + \delta_p Y_{t-p} + \nu_t$$

In this setting $H_0: \theta_1 = ... = \theta_p = 0$ and $H_0: \delta_1 = ... = \delta_p = 0$ hypotheses are tested for detecting the existence and direction of causality among variables. In Toda-Yamamoto taxonomy, in the case of integrated variables, as far as the order of integration of the process does not exceed the true lag length of the model $(k + d_{(Max)})$ *th* order VAR can be estimated where $d_{(Max)}$ is the maximal order of integration and k is the optimal lag length (Toda and Yamamoto 1995).

We apply this procedure to seek causality between the real primary balance and debt stabilising primary balance calculated earlier in the study. If the debt stabilising primary balance Granger causes the real primary balance and no causality in the reverse direction exists, we can conclude that the fiscal policy establishes stability when a divergence in fiscal balances occur in Turkey since it means that the government is actively using primary balance as a fiscal policy tool.

To carry out this objective we start with the determination of the level of integration and optimal lag length.

*Table 2. Lag Length Criteria*

| Lag | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|
| 0 | NA | 118,52100 | 10,45081 | 10,54060 | 10,48143 |
| 1 | 39,01830 | 42,63243 | 9,42745 | 9,696807* | 9,51931 |
| 2 | 10,94196 | 37,11335 | 9,28543 | 9,73436 | 9,43853 |
| 3 | 10,01865* | 32,65030* | 9,149667* | 9,77817 | 9,364004* |
| 4 | 4,41004 | 35,15080 | 9,20856 | 10,01663 | 9,48414 |
| 5 | 3,97690 | 38,22196 | 9,27095 | 10,25859 | 9,60776 |
| 6 | 0,66241 | 48,46202 | 9,47470 | 10,64191 | 9,87275 |
| 7 | 0,19570 | 63,68777 | 9,69969 | 11,04648 | 10,15898 |
| 8 | 5,26347 | 63,23380 | 9,62537 | 11,15173 | 10,14590 |

*Table 3. Formal Stationarity Test Results*

| | | (Level) | | | | |
|---|---|---|---|---|---|---|
| | | ADF | DF-GLS | PP | KPSS | ERSP |
| Primary Balance | | -2,68 | -2,72 | -2,68 | 0,23 | 2,28 |
| | 1% | -3,57 | -2,61 | -3,57 | 0,73 | 1,87 |
| | 5% | -2,92 | -1,94 | -2,92 | 0,46 | 2,97 |
| | 10% | -2,59 | -1,61 | -2,59 | 0,34 | 3,91 |
| Required Primary Balance | | -2,59 | -1,83 | -4,59 | 0,57 | 6,89 |
| | 1% | -3,6 | -2,62 | -3,6 | 0,73 | 1,87 |
| | 5% | -2,93 | -1,94 | -2,93 | 0,46 | 2,97 |
| | 10% | -2,6 | -1,61 | -2,6 | 0,34 | 3,91 |
| | | **(First Difference)** | | | | |
| | | ADF | DF-GLS | PP | KPSS | ERSP |
| Primary Balance | | -8,07 | -0,8 | -9,04 | 0,17 | 1,79 |
| | 1% | -3,57 | -2,61 | -3,57 | 0,73 | 1,87 |
| | 5% | -2,92 | -1,94 | -2,92 | 0,46 | 2,97 |
| | 10% | -2,59 | -1,61 | -2,59 | 0,34 | 3,91 |
| Required Primary Balance | | -4,83 | -4,89 | -16,59 | 0,19 | 1,93 |
| | 1% | -3,62 | -2,62 | -3,6 | 0,73 | 1,87 |
| | 5% | -2,94 | -1,95 | -2,93 | 0,46 | 2,97 |
| | 10% | -2,61 | -1,61 | -2,6 | 0,34 | 3,91 |

According to the test results in the tables above maximum order of integration is one and the optimal lag length is three. Table 3 clearly shows that the variables are either I(1) or I(0) but none of them is I(2). Thus, regardless of the individual test results, it is safe to conclude that the maximum order of integration required for the T-Y procedure is one. Besides, four of the five lag length criteria indicate that the optimal lag length is three therefore with the help of democracy we set the optimal lag length equal to three. As a result, $(k + d_{(Max)})$ is equal to four which is essential for the Toda-Yamamoto procedure.

Before moving on to the determination of the causality, we need to verify that the VAR is stable and does not suffer from residual and stability flaws. The tables below exhibit the diagnostic test results.

*Table 4. Normality Test*

| Component | Jarque-Bera | df | Prob. |
|---|---|---|---|
| 1 | 1,64841 | 2 | 0,43858 |
| 2 | 0,06618 | 2 | 0,96745 |
| Joint | 1,71458 | 4 | 0,78807 |

*Table 5. Heteroskedasticity Test*

| Joint test: | | |
|---|---|---|
| Chi-sq | df | Prob. |
| 45,27634 | 36 | 0,13820 |

*Table 6. Serial Correlation LM Test*

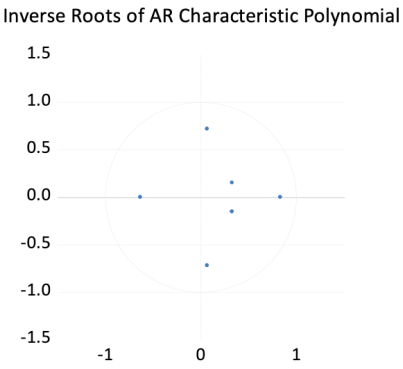
Null hypothesis: No serial correlation at lag h

| Lag | LRE* stat | df | Prob. | Rao F-stat | df | Prob. |
|---|---|---|---|---|---|---|
| 1 | 4,45565 | 4 | 0,34783 | 1,13744 | (4, 58.0) | 0,34797 |
| 2 | 1,81910 | 4 | 0,76898 | 0,45403 | (4, 58.0) | 0,76907 |
| 3 | 2,15175 | 4 | 0,70787 | 0,53858 | (4, 58.0) | 0,70794 |
| 4 | 1,98605 | 4 | 0,73832 | 0,49641 | (4, 58.0) | 0,73832 |

Null hypothesis: No serial correlation at lags 1 to h

| Lag | LRE* stat | df | Prob. | Rao F-stat | df | Prob. |
|---|---|---|---|---|---|---|
| 1 | 4,45565 | 4 | 0,34784 | 1,13744 | (4, 58.0) | 0,34797 |
| 2 | 10,85605 | 8 | 0,20999 | 1,41617 | (8, 54.0) | 0,21101 |
| 3 | 14,66790 | 12 | 0,26010 | 1,27348 | (12, 50.0) | 0,26346 |
| 4 | 15,45001 | 16 | 0,49196 | 0,97303 | (16, 46.0) | 0,49971 |

*Table 7. VAR Inverse Roots*




According to the diagnostic test results tabulated above, the model does not suffer from any residual and stability flaws therefore it is safe to conduct the Toda-Yamamoto causality test to investigate the relationship between real and the required levels of primary balance.

*Table 8. Toda-Yamamoto Causality Test Results*

| Dependent variable: PB | | | |
|---|---|---|---|
| Excluded | Chi-sq | df | Prob. |
| RPB | 10,64529 | 3 | 0,01381 |
| All | 10,64529 | 3 | 0,01381 |

| Dependent variable: RPB | | | |
|---|---|---|---|
| Excluded | Chi-sq | df | Prob. |
| PB | 4,89253 | 3 | 0,17984 |
| All | 4,89253 | 3 | 0,17984 |

Toda-Yamamoto causality test results indicate that the direction of causality is from required primary balance to real primary balance as expected by the theoretical background in the first section. From a fiscal policy perspective, this result implies that the government responds to the required level of primary balance by adjusting its primary balance and thereby uses the primary balance as an active policy tool. In other words, the fiscal policy is responsive to the requirements of fiscal stability which facilitates the establishment of long-term fiscal sustainability in Turkey.

All in all, the numerical analysis in this section reveal that Turkey performs welfare state policies but the overall fiscal posture appears to be stable which corresponds to a favourable situation overall. However, there are occasional deviations from fiscal stability and in recent years Turkey is experiencing a departure of this sort. Thus, to shun the continuum of this deviation, the procyclical welfare state policies might be needed to be reconsidered in the near future.

## Conclusion

Fiscal vulnerability is a thread for all countries regardless of their economic posture but developing countries are generally more prone to suffer from more fragile fiscal positions. Besides, the developing countries with welfare state traits confront even higher level of fiscal risks since welfare state policies entail procyclical fiscal policies which jeopardize the stability of fiscal posture in those countries. The fiscal stance in those countries is mostly characterized by high debt levels and heightened expenditures since a large portion of the budget is devoted to social spending. In view of these arguments, in this study, we analysed the status of fiscal vulnerability in Turkey for the 1978– 2019 period and also attempted to figure out if the fiscal vulnerability coexists with the welfare state characteristics. Being a developing country, procyclical fiscal policies which are carried out due to politico-economic reasons, lead the fiscal risks to be generally higher for Turkey which entails rigorous

analysis of the level of fiscal vulnerability from a historical perspective. To accomplish this objective, we initially calculated the ratio of social spending to total government revenues and expenditures to figure out how the social spending level measures up against the fiscal variables. Also, we calculated the correlation between social spending and fiscal variables to detect any co-movement between those variables to find more evidence regarding the welfare state. For the stability analysis, we calculated the debt stabilizing primary balance which can be defined as the level of primary balance needed to keep public debt stagnant, and compared this value with the actual primary balance to gauge how the required level measures up against the actual level. Subtracting the former from the latter we calculated an index denoting the margin between two variables. We also performed a Toda-Yamamoto type causality test to detect the direction of causality between required and real primary balance levels.

The correlation analysis reveals that social spending is positively and highly correlated with government revenue and expenditures. Also, the ratio of social spending to government revenue and expenditure exhibits an upward trend and currently is at its highest level which is also indicative of welfare state policies. In addition, the fiscal fragility analysis reveals that the welfare state policies coexist with fiscal fragility occasionally. The causality test results reveal that the required level causes the real primary balance level which is a clear sign for fiscal stability. According to this result, the government responds by the primary balance to the requirements of the fiscal trajectory which is a clear sign for the existence of an active fiscal policy to restore fiscal stability whenever needed. Besides, the analyses of the calculated index indicate that in general, the fiscal policy performance was sufficient to keep the index values mostly in negative territory which implies that the fiscal posture was chiefly stable during this period. However, in recent years the fiscal vulnerability risk is mounting continuously indicated by rising values of the index. It means that the country is departing from the fiscal discipline which can at least partially be attributed to the intensive welfare state policies. Despite exhibiting welfare state characteristics, lack of overall fiscal fragility indicates that the fiscal policy has been performing sufficiently during the estimation period. However, the recent upward trend in the fiscal fragility index might entail an overhaul in the welfare state policies. Hence, the ongoing trend in the fiscal policies should be reversed promptly to avoid a fiscal turmoil reminiscent of 2001. For this purpose, spending cuts, tax system reform, extended scrutiny of public expenses can be considered as alternative policy options. Also, reducing the strength of procyclical fiscal policies by trimming the welfare state characteristics of the economy is also an alternative policy for restoring stability.

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