

A note on the debt sustainability issue in Turkey*

Nur Keyder *

Middle East Technical University, Department of Economics, 06531 Ankara.

Abstract

The purpose of the paper is to shed light on the composition of the public sector debt stock and, by using the year-end 2002 *net public debt stock-to-GNP ratio* as the starting point, estimate the primary surplus-to-GNP ratio that will be necessary for the sustainability of the debt stock, using a modified version of the approach suggested by the World Bank (World Bank (2000), "Turkey—Country Economic Memorandum—Structural Reforms for Sustainable Growth, Vol. I and II," Report No. 20657-TU, Washington, DC, pp. 16-18 and 121-124). The relevant tables for the primary surplus-to-GNP ratio requirements are constructed under different scenarios with respect to the real interest rate, growth rate and the rate of inflation. The second stage consists of estimating the weighted average real interest rate on the current central government debt stock. The debt sustainability issue is then evaluated by comparing the estimated primary surplus-to-GNP ratios required by the targeted primary surplus ratio, taking into consideration the real interest rate on the existing stock.

1. Introduction

Over the implementation of the Exchange Rate Based Stabilization Program (ERBSP), adopted in December 1999 (Erçel, 1999), the exchange rate was used as the nominal anchor. Up until the last quarter of 2000 all was going well. The inflation rate as well as the real interest rate was down, the primary surplus-to-GNP ratio needed for the sustainability of the debt stock was at low and easily attainable levels (Keyder, 2001). However, there were delays in coming up with the necessary structural

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adjustments and the banking sector was too weak to support this *quasi currency board* regime. The end result was an overvalued Turkish Lira (TL), a huge current account deficit and enlarged open positions in foreign exchange (FX), which rendered the financial system highly vulnerable to external shocks. The ERBSP ended following the November 2000 and the February 2001 crises. The TL was allowed to float and the Strengthened Stabilization Program (Derviş, 2001) was adopted in May 2001. The new program carried the structural elements of the previous program but it was to be implemented under a floating rate regime. Economic indicators point to the success of the program so far. One of the most significant issues remaining concerns debt sustainability. Hence, in the present paper this topic is given special attention against the background of the debt stock composition.

2. Debt Stock

The figures announced for the outstanding central government debt stock¹ for December 2002, are as follows (Undersecretariat of the Treasury, 2003): the total was \$148.5 billion, of which \$91.7 billion was domestic and \$56.8 billion was external². Hence, in 2002, external debt constituted 38% and domestic debt 62% of the total central government debt stock; 48% (\$27.4 billion) of the \$56.8 billion external debt was owed to international agencies, (\$13.9 billion to the IMF, \$6.8 billion to foreign government agencies, and \$6.7 billion to international institutions); and 52% (29.4 billion) was owed to foreign markets (\$6.2 billion to commercial banks and \$23.1 billion to the bond market). The stock figures mentioned are *gross* figures and do not include the debt of the Turkish Central Bank (CBRT) or Treasury-guaranteed debt.

Looking at the composition of the \$148.5 billion *central government total debt stock* by lenders, we see that 29% is owed to the market and 29% to the public sector; 20% is owed to the foreign markets against money collected via bond issue (16%) or other means (4%); 9% of the debt is owed to international institutions and the remaining 13% (\$19.9 billion) is owed to the IMF (see Table 1).

¹ This is the consolidated budget-based debt stock involving general and annexed budget administrations only. This part of the debt stock indicates direct indebtedness of the Treasury. The SEE's and Central Bank's debts are excluded. As of the end of 2002, the Central Bank was not in a net-debtor position; and if SEEs are assumed to be able to pay their debts out of their earnings, the *central government net debt stock* is the part of the total debt stock that should be considered in connection to the debt sustainability issue.

² At the time the exchange rate was, TL 1.635 million per dollar.

Table 1
Consolidated Budget Total Debt Stock

	End-2002		March 2003	
	Total (\$ Billion)	(%)	Total (\$Billion)	%
Debt by Lender	148.5	100	152.3	100
Domestic Market	43.3	29	46.4	30
Public Sector	42.5	29	43.0	28
Foreign Market	29.4	20	29.8	20
<i>Bond Issue</i>	23.1	16	23.7	16
<i>Other</i>	6.3	4	6.1	4
International Institutions	13.5	9	13.4	9
IMF Credit	19.9	13	19.7	13

Source: The Treasury.

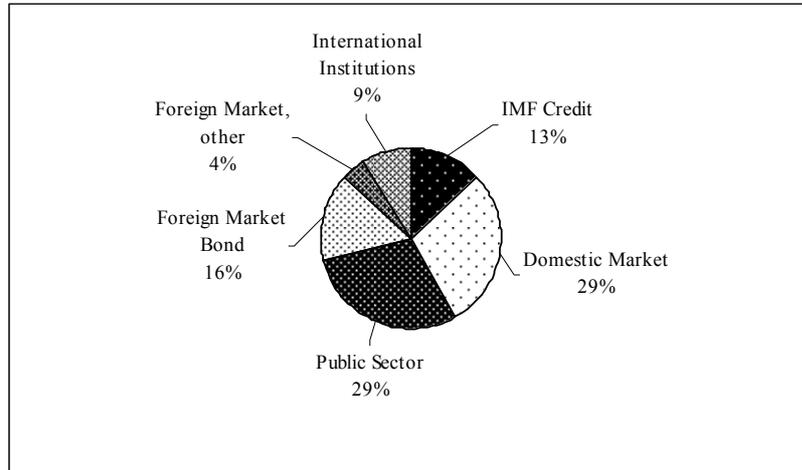
Looking at the domestic debt stock alone, we see that 52.8% represents Treasury's indebtedness toward other public institutions (18.8% to CBRT, 16.2% to State Banks, 7.4% to SDIF and 10.5% to other public institutions) and 47.2% represents Treasury's indebtedness toward the market. The Treasury's debt to other public institutions can be restructured or consolidated with interest rates in favor of the debtor; the interest payments among the public institutions are also netted out when the public sector balance sheet is consolidated. Hence, in discussing the debt sustainability issue, actually, the public sector debt stock toward the market is the major concern.

In 2002, 32% of the domestic debt stock was FX-related³. This corresponds to 20% of the total stock. Hence 58%(=38%+20%) of the total stock is FX-related. The other components of the domestic debt stock by instruments are; 25% fixed, and 43% Floating Rate Notes (FRNs).

As of the end of March 2003, the composition of the consolidated budget debt stock has not changed much. The total public debt stock increased to \$152.3 billion, 37.6% of which is external and 62.4% domestic. 57% of the total public debt stock is FX-linked (The Undersecretariat of Treasury, 2003a). 30% of the total debt stock is to the domestic market, 28% to the public sector, 20% to foreign markets, 9% to international institutions and 13% to IMF (see Table 1).

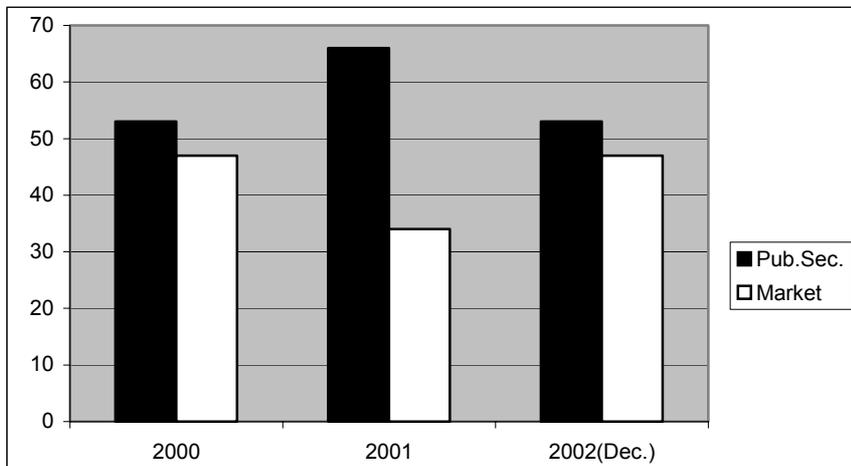
³ Either FX-denominated (11% of the domestic debt stock) or FX-indexed (12% of domestic the debt stock – IMF credit; Swap and other).

Figure 1
 Outstanding Total Debt of Central Government Debt by Lenders
 December 2002, (%)



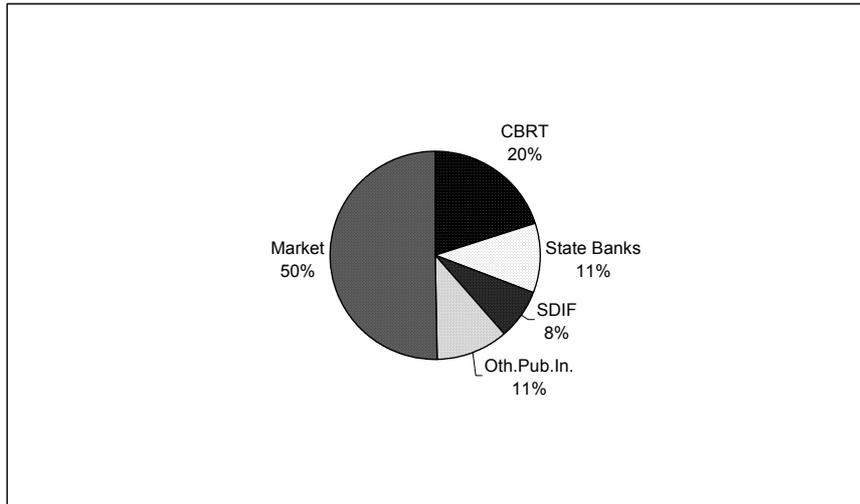
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Figure 2
 Disribution of Domestic Debt Stock by Lenders (%)



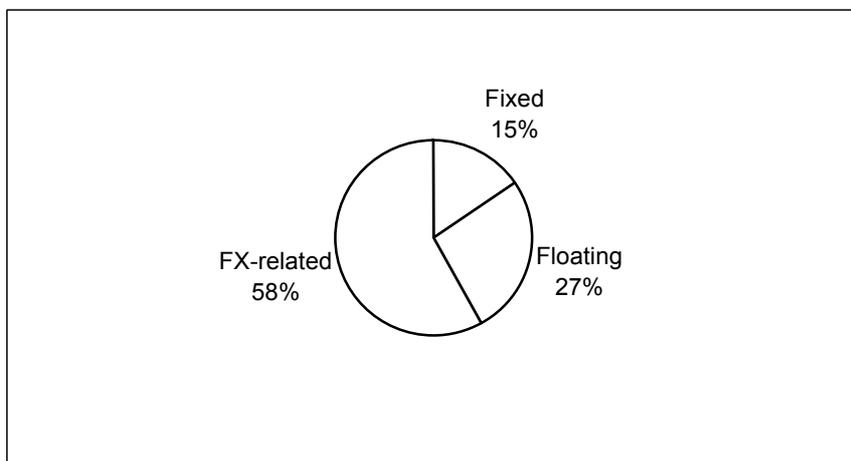
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Figure 3
 Composition of Domestic Debt Stock by Lenders,
 December 2002 (%)



Source: www.hazine.gov.tr/stat/ıç borç istatistikleri

Figure 4
 Composition of Total Debt Stock of Central Government by Instruments,
 December 2002 (%)



Source: Calculated by the author using data from www.treasury.gov.tr/stat

3. Real interest rate on the central government debt stock

On the average, the real interest rate on the FX-denominated debt stock is assumed to be 7% in TL terms⁴ (this is a highly conservative assumption and it does not take real appreciation of the TL over the period under consideration). As of the end of 2002, the average real interest rate on the TL-denominated part of the debt stock was around 25%. Knowing that 43% of government domestic debt stock consists of floating rate notes (FRNs), and if the risk premium should go down in time, the real interest rate on these issues will automatically decline, in line with the yield set at the 3-month reference auctions. Hence, as of December 2002, the weighted average real interest rate on the total public debt stock under conservative assumptions can be estimated as follows:

7% (real interest rate of FX-related debt stock) x 58% (share of FX-related debt in total debt stock) + 25% (real interest rate of TL-denominated debt stock) x 42% (share of TL-denominated debt in total debt stock) = 14.6%.

(Note: The Treasury announced that the real interest rate on the public sector domestic debt stock alone is 11%, as of May 2003)

4. Net public debt-to-GNP ratio

Even though the stock figures given above are gross, the analysis of the debt stock composition may be illuminating in sustainability discussions. However, in evaluating the debt sustainability issue, the *Net Consolidated Public Debt Stock* figures should be used. To arrive at the *net consolidated public debt stock* figure, the deposits held by the Treasury at the Central Bank and CBRT's Net Foreign Assets (NFA) need to be deducted from the gross figure; adjustment should also be made for the Central Bank's external debt used by the Treasury for budget financing purposes, which is recorded under both domestic and external debt. The 'net' figure comes out to be considerably below the 'gross' figure. In Turkey, the *net consolidated public debt stock-to-GNP* ratio climbed from 57% in 2000 to 92% in 2001 due to the conversion of

⁴ This is a highly cautious assumption not only because real appreciation of the TL is ignored, but also because of the large weight of the IMF and World Bank credits in the total external debt, which will not mature for a few more years. The interest rate charged by the World Bank is Libor plus 0.75; currently Libor is 1.34, and hence the interest rate on World Bank credit is around 2.09%. The rate charged by the IMF, on the other hand, is around 4-4.5%. The credits extended by these international institutions bear 5-7 year maturities. Some other credit rates in connection to FX-related debt are as follows: in the January 28, 2003 auction, the dollar bond rate was 6.5%; and in the debt-swap operation of June 15, 2001, arranged by the Treasury with the private banks, the average yield was 15% on the FX-denominated paper carrying three- to five-year maturity.

the implicit duty losses⁵ at the state banks into Treasury debt and restructuring and recapitalization of the SDIF and state banks (see Table 2). In 2001, the Treasury had to inject 39 billion dollars (equivalent to around one-fourth of GNP in 2001) into troubled state and private banks. The *net consolidated public debt-to-GNP ratio* at the end of 2002 was down to 79%, which will be the reference point in the debt sustainability calculations given in the next section. This ratio is not high compared to some of the countries listed in Table 2 (note that percentages given for countries other than Turkey are *gross public debt-to-GDP* ratios; the net-debt ratios would have been lower), whereas in the case of Turkey, they are *net consolidated public debt-to-GNP ratios*. Hence the ratios are not directly comparable). Even though the Maastricht criteria set the limit for the gross debt ratio as 60%, some of the countries in the EU have debt-to-GNP ratios considerably higher than 60%. For example in 2002, Belgium had a 104% consolidated gross debt-to-GDP ratio; for Italy the ratio was 108% and for Greece it was 98%. In the Euro area as a whole (excluding Luxembourg, but including East Germany), the ratio was 69%. Japan too, has a debt-to-GDP ratio (121%) that is much higher than Turkey's. In these countries, however, the stock carries a much longer average maturity and the real interest rate is much lower than for Turkey. Hence it is not the size of the debt, but its maturity and the real interest rate that should call for concern (see Figure 5).

Table 2
General Government Consolidated Gross Debt (% of GDP)

	1999	2000	2001	2002
Belgium	115.0	109.3	107.5	104.3
Greece	103.8	102.8	99.7	97.8
Italy	114.5	110.6	109.4	107.8
Euro Area*	72.8	70.5	69.4	68.8
Japan**	101.7	108.8	115.4	121.3
Turkey***	61.0	57.4	93.5	81.6

*Excluding Luxembourg, including East Germany.

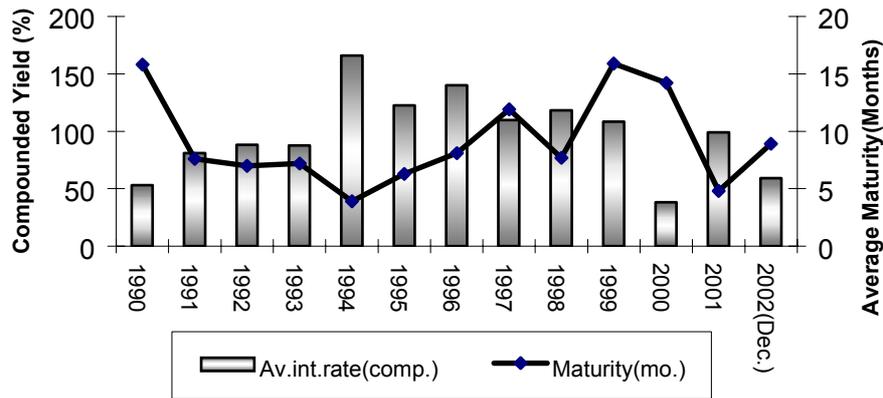
**Debt-to-GDP ratio

***Net Public Debt-to-GNP ratio.

Source: European Commission, Directorate-General for Economic and Financial Affairs (2002, Table A.4.16: 368); for Japan, European Commission, Directorate-General for Economic and Financial Affairs (2001: 350); for Turkey, IMF (2002, Table 15: 66). The 2001 figures are revised figures, while the 2002 figures are provisional estimates. The figures given by the IMF for 2001 and 2002 were 92.8 and 82.1, respectively.

⁵ *Duty losses* originated from uncompensated credit subsidies and payments for agricultural sector and small- and medium-sized companies.

Figure 5
Interest Rates (compound, annual) (%) and
Average Maturity (months) at Treasury Auctions



Note: Includes only auction and public offer sales. The figures include FRN issues. The interest rate for FRNs is calculated assuming that the initial term interest rate remains the same during the lifetime of the bond.

Source: www.hazine.gov.tr/stat.

5. Primary surplus-to-GNP ratio requirement for debt sustainability

The change in the public sector debt stock is equal to the operational deficit minus seigniorage and minus growth effects (all expressed as a percentage of GNP). Growth and inflation therefore have a reducing effect on the debt stock-to-GNP ratio, while the operational deficit has an increasing effect.

The growth effect alone can be expressed as follows:

$$[g/(1+g)]b \quad (1)$$

where, b is the public sector debt stock-to-GNP ratio at the beginning of the period and g is the growth rate. The long-term primary surplus-to-GNP ratios (s) that need to be achieved for net debt stock-to-GNP ratio sustainability are estimated under different real interest rate (r), growth rate (g), and inflation rate (p) scenarios. In estimations, a modified version of the methodology suggested by the World Bank (2000: 16-8; 121-124) is used. For derivation of the equations refer to this source.

Primary surplus-to-GNP ratio under different g - r - p combinations is calculated using the following formula⁶:

$$s = [(r - g) / (1 + g)] b - [(p + g + p^*g) / (1 + p + g + p^*g)] m \quad (2)$$

Here m denotes reserve money-to-GNP ratio, which takes different values under different real interest rate and inflation rate combinations. 'm' can be estimated using the following regression equation⁷:

$\ln(m) = f(r + p) = f(R)$ where R is the nominal interest rate. The equation estimated is as follows:

$$\ln(m) = -2.2555 - 0.6053 R$$

(-70.1004) (-10.7901)

$$R^2 = 0.81; \quad SSR = 0.2946; \quad DW\text{-statistic} = 1.6934$$

The term,

$$[(p + g + p^*g) / (1 + p + g + p^*g)] m$$

gives the seigniorage amount expressed as percent of GNP⁷. In end-2002, the *net consolidated public debt-to-GNP ratio* was 79.4%. The primary surplus (as percent of GNP) required for sustainability of the debt ratio at this level or for lowering the ratio, is estimated using the m calculated at different nominal interest rates and the elements of the relevant scenario used, within the context of Equation 2. The results are given in Tables 3 and 4. The shaded cells point to p - r - g combinations that render debt unsustainable.

Actually, the large share of the FX-related debt in the total stock adds a fourth determinant to the debt sustainability issue, which must be incorporated into the analysis. If TL records a real appreciation against foreign currency (as it happened in 2002⁸) *ceteris paribus* this would

⁶ To be able to apply this formula, it was necessary that real income (y) elasticity of real reserve money (rrm) (deflated by WPI) be close to unity. The OLS estimation result given below satisfies this condition. The reason why annual data over the period 1970-1999 was used is because the crises years (2000-2001) could not be accepted as normal years.

$$\ln(rrm) = -2.1268 + 0.967 \ln(y) - 0.0057 R \quad (R \text{ is the nominal interest rate on time deposits})$$

(-3.7513) (6.3432) (-3.5370)

Adjusted R-Squared = 0.76; SSR = 0.0.2975; DW-statistics = 1.676.

⁷ The original seigniorage expression suggested by the World Bank (2000: 16-18) is as follows:

$$[(p + g) / (1 + p + g)] m$$

This may be an acceptable approximation for the seigniorage term especially in low inflation cases.

⁸ In 2002, the exchange rate movement was below that required by the purchasing power parity. This was mainly due to reversal of currency substitution during 2002. Hence TL, which was undervalued following the devaluation of February 2001, caught up and closed the year being overvalued (based on *real exchange rate series* calculated by the author, using 1999(12) as the base period; see Keyder (2003a) for more information on the real exchange rate developments in Turkey). Hence over 2002 alone, TL has appreciated in real terms against foreign exchange. This has been a favorable development for Turkey from

exert a downward pressure on the debt-to-GNP ratio. Whereas, TL's real depreciation against FX would cause the ratio to go up. The role of exchange rate movements is not considered in the present paper⁹.

Table 3
The Required Primary Surplus as a percentage of GNP

Real GNP Growth (%)	Inflation Rate (%) 20						Inflation Rate (%) 25					
	Real Interest Rate (%)						Real Interest Rate (%)					
	10	11	12	13	14	15	10	11	12	13	14	15
4	2.88	3.66	4.44	5.21	6.00	6.79	2.67	3.45	4.23	5.01	5.79	6.61
5	2.00	2.78	3.55	4.33	5.10	5.89	1.81	2.58	3.35	4.13	4.90	5.67
6	1.16	1.91	2.68	3.45	4.22	5.00	0.95	1.72	2.49	3.25	4.02	4.79
7	0.32	1.07	1.84	2.59	3.34	4.12	0.12	0.88	1.64	2.40	3.15	3.91

Source: Author's own calculations based on data from tcmb.gov.tr/evds and www.treasury.gov.tr/stat.

Table 4
The Required Primary Surplus as percentage of GNP

Real GNP Growth (%)	Inflation Rate (%) 20						Inflation Rate (%) 25					
	Real Interest Rate (%)						Real Interest Rate (%)					
	15	16	17	18	19	20	15	16	17	18	19	20
4	6.79	7.57	8.35	9.12	9.90	10.68	6.61	7.35	8.14	8.91	9.70	10.49
5	5.89	6.65	7.42	8.19	8.97	9.74	5.67	6.44	7.22	7.99	8.77	9.55
6	5.00	5.76	6.52	7.29	8.05	8.82	4.79	5.65	6.32	7.09	7.84	8.63
7	4.12	4.88	5.64	6.39	7.15	7.91	3.91	4.68	5.45	6.20	6.97	7.73

Source: Author's own calculations based on data from www.tcmb.gov.tr/evds and www.treasury.gov.tr/stat.

6. Evaluation of the results

Under the 20% inflation rate and 16% real interest rate scenario, growth rates of 6% and above ensure debt sustainability. When the real interest rate falls below 15%, any growth rate used in the analysis is sufficient for debt sustainability, since the primary surplus-to-GNP ratios required are all below the 6.5% target. Even in the case of a 17% real

debt sustainability point of view. OECD (2002: 144), describes the situation as follows: "...real appreciation is making the real interest rate on foreign currency debt negative (in TL terms). Therefore, the negative TL-adjusted interest rate on foreign borrowings is currently easing debt sustainability, even though the domestic interest rate (in both nominal and real terms) is very high."

⁹ For an analysis incorporating the exchange rate factor see Keyder (2003b).

interest rate, debt is sustainable at growth rates of 6% and above (the primary surplus-to-GNP ratio requirement is 6.5% for a growth rate of 6%, and 5.6% for a 7% growth rate). In the case of a 25% inflation and 17% real interest rate scenario, at growth rates 6% or above, the primary surplus requirement is below the target. Under a 25% inflation rate and 16% real interest rate scenario, growth rates of 6% and above; and in the case of 25% inflation rate and 15% real interest rate scenario, growth rates of 5% and above ensure debt sustainability, since then, the primary surplus requirement is below 6.5%. Actually, 25% is the annual average inflation rate targeted for 2003, while 20% is the year-end target. The weighted-average real interest rate of the end-2002 debt stock of the central government is considerably below 15% (that of the domestic debt stock alone was announced as 11% by the Treasury). As the results of the analysis indicate, if the average real interest rate of the total public debt stock can be kept below 15%, then in Turkey, the public debt sustainability issue will not be a problem, and in addition, the net public debt-to-GNP ratio can be expected to go down in the years to follow, provided that growth rate is at reasonable levels. It is this declining trend that is needed to satisfy the relaxed Maastricht criteria.

7. Conclusion

Under the different scenarios examined in the article, Turkey's debt is found to be sustainable whenever the average real interest rate on the total stock is maintained at a level of 15% or less. The real interest rate, which to a great extent reflects the risk premium, is closely tied to people's confidence in the economy and in the government. All it takes, therefore, is strong determination on the part of the government to pursue the Strengthened Stabilization Program, adopted in May 2001, in order to meet the aspirations of the public at large and to rebuild confidence.

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Özet

Türkiye’de kamu borç stoğunun sürdürülebilirliği üzerine bir not

Yazının amacı, ilk etapta 2002 sonu itibarıyla kamu borç stoğunun kompozisyonunu borç verene ve enstrüman niteliğine göre irdelemektir. İkinci aşamada bu stoğun sürdürülebilirliği tartışması yer almaktadır. Büyüme hızı, reel faiz ve enflasyon bileşimleri üzerine kurulan çeşitli senaryolar çerçevesinde, ilgili formüller kullanılarak, borcun sürdürülebilmesi için gereken *faiz dışı fazla-GSMH* oranları hesaplanmış, elde edilen rakamlar hedeflenen oran ile karşılaştırılmak suretiyle borcun hangi koşullarda sürdürülebileceği ortaya konulmuştur. Döviz cinsi ve dövize endekli borcun toplam kamu borcunun %58’ini oluşturması, borcun sürdürülebilmesinde kur hareketlerini dördüncü bir unsur olarak ortaya çıkarmaktadır. Ancak, bu çalışmada kur hareketlerine yer verilmemiştir.

Analiz sonuçları, kamunun borç stoğunun ortalama reel faizi %15’in altında kaldığı sürece, borcun sürdürülebilirliği konusunda sorun yaşanmayacağına işaret etmektedir. Kamunun toplam borç stoğunun reel faiz oranı ağırlıklı ortalama olarak hesaplandığında, 2002 sonu itibarıyla %15’in oldukça altındadır. %15’in altındaki ortalama reel faiz ise hedeflenen %6.5 faiz dışı fazlanın altında bir faiz dışı fazla gereksinimine işaret etmektedir. Mayıs 2001’de başlatılan Güçlü İstikrar Programı’nın ödün verilmeden ciddi bir şekilde uygulanması reel faizlerin düşmesi için ön şarttır. Ancak bu şekilde güven ortamı tesis edilebilecek ve risk primini temsil eden reel faizlerde düşüş sağlanabilecektir.