

Debt Sustainability and the Exchange Rate: The Case of Turkey

Abstract

The report attempts to estimate the primary surplus requirement for debt sustainability in Turkey, taking into consideration not only the operational deficit and seigniorage factors but also the exchange rate factor. In estimations, a modified version of the approach suggested by the World Bank (2000:16-18; 121-124) is used. The analysis is carried out in two steps. First the real interest rate is estimated and then the results are plugged into the primary surplus equation. The exchange rate factor is taken up during the estimation of the real interest rate in TL, on FX-related debt. The debt sustainability issue is evaluated by comparing the estimated primary surplus-to-GNP ratios required for debt sustainability, with the targeted primary surplus ratio, taking into consideration the real interest rate and composition of the existing debt stock.

Debt Sustainability and the Exchange Rate: The Case of Turkey

Introduction

External debt sustainability, as stated in the World Bank and IMF document, can be attained by “...bringing down the net present value of external debt down to about 150 percent of a country’s exports” (2001:4). Similarly, in general, the ratio of the net present value of external debt to GDP of 50%, is regarded as sustainable over the long run.

However, when fiscal sustainability is discussed, the aggregate public sector debt, both domestic and external, should be considered. An economy is said to have achieved fiscal sustainability “...when the ratio of public debt to GDP is stationary, and consistent with the overall demand -both domestic and foreign- for government securities” (Edwards 2002:3). A concept closely related to the debt sustainability issue is the “primary balance”, which is expected to be compatible with a stable debt-to-GNP ratio. Primary balance is obtained by deducting government expenditures (excluding interest payments) from government revenues. Also highly significant is the concept of operational deficit, which is obtained by adding the real interest burden of the government on to the primary balance.

In this report we attempt to modify the formula used by the World Bank (2000:16-8; 121-4) to estimate the primary surplus ratio, so as to take account of exchange rate movements. The “non-maturing debt plus borrowing” is divided into two parts: the FX-linked part and the TL denominated part. The real interest rate for the two categories are estimated separately (r_{FX} and r_{TL}); and in the formula used, they are weighted by the FX-linked and the TL-linked debt expressed as percentage of GNP (b_{FX} and b_{TL}), respectively.

The rest of the report is organized as follows: In section one, as background information, the variables/indicators relevant to debt sustainability are discussed. In section two, the formula used to estimate the primary surplus ratio is presented. Section three gives the estimation of the real interest rate, first that on FX-related borrowing plus non-maturing debt, and then on

TL-denominated borrowing plus non-maturing debt. In section four, using Turkish data, the primary surplus ratio requirement for the year 2004 to keep the debt ratio stable at its end-2003 level is estimated under different scenarios. The results are evaluated in Section five. The last section is reserved for conclusion.

1. Background Information on Variables/Indicators Relevant to Debt Sustainability

1.1 Composition of the Public Debt Stock

The figures announced for the outstanding central government debt stock for December 2003, are as follows (Undersecretariat of Treasury 2004): The total was \$148.5 billion, of which \$91.7 billion was domestic and \$56.8 billion was external. Hence, in 2003, external debt made up 38% and the domestic debt made up 62% of the total central government debt stock. 48% (\$27.4 billion) of the \$56.8 billion external debt was to international agencies, (\$13.9 billion to the IMF, \$6.8 billion to foreign government agencies and \$6.7 billion to international institutions); 52% (29.4 billion) was to foreign markets (\$6.2 billion to commercial banks and \$23.1 billion to the bond market).

Looking at the composition of the \$148.5 billion central government total debt stock by lenders, we see that 29% is 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.

Considering domestic debt stock alone, we see that 52.8% represents the Treasury's indebtedness toward other public institutions and 47.2% represents the 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, also the interest payments among the public institutions are netted out when the public sector balance sheet is

consolidated. Hence, in discussing the debt sustainability issue, the major concern is actually the public sector debt stock toward the market.

At the end of July 2004, the total public debt stock has increased to \$185.4 billion, 32% of which is external, and 68% domestic. 50.3% of the public debt is TL denominated and 49.7% FX linked. 35% of the total debt stock is to the Domestic Market, 29% to the Public Sector, 17% to Foreign Markets, 7% to International Institutions and 12% to the IMF. Looking at the domestic debt stock alone, of the \$126 billion, 48.1% of the debt is to the public sector and 51.9% is to the market.

1.2 Debt-to-GNP Ratio

The debt-to-GNP ratio, which was 29% in 1990 and 57% in 2000, climbed up to 92% in 2001, and was back to 79.4% in 2003. The reasons behind the debt explosion experienced in 2001 can be summarized as follows:

- Weak fiscal performance: Over the period between 1990-94, the primary deficit-to GNP ratio averaged 4.5%, while the operational deficit was on average 8.3% of GNP.
- High real interest rates: The primary deficit of the first half of the 1990s turned into a primary surplus (0.1% of GNP on average) over the 1995-2000 period. Yet, due to high real interest payments, the country's operational deficit was still high (5.8% of GNP on average). This contributed to the surge of the debt ratio.
- Weak banking sector and "duty losses": The debt explosion experienced in 2001 was the outcome of the hidden Treasury debt, the so called duty losses, coming into the open and the rehabilitation costs of the ill-managed private banks that were turned over to the Saving Deposit Insurance Fund (SDIF). "Duty losses", which accumulated in public banks, originated from uncompensated credit subsidies and payments for agricultural sector and small and

medium sized companies. In 2001, the Treasury injected close to \$40 billion for the rehabilitation and restructuring of these state and private banks.

1.3 Primary Surplus-to-GNP Ratio

The primary surplus-to-GNP ratio realized in 2003 was 3.9%, which fell behind the 6.5 target. In terms of actual size, the primary surplus realized at TL9.881 quadrillion levels was below the TL16.715 quadrillion target set for the year. Even if the primary surplus target had been realized, when divided by the TL 273 quadrillion realized GNP, it would have corresponded to 6.1%, instead of the targeted 6.5% primary surplus ratio. When the actual GNP (ex-post) turns out to be much higher than the revised estimate, the primary surplus ratio falls behind the target. Despite the shortfall in the primary surplus ratio, the debt-to-GNP ratio declined from 92% in 2001 to 79% in 2002. The favorable effects created on the debt ratio by growth and real appreciation of the TL, are the responsible factors behind this drastic fall.

Hence, in the case of a country where 58% of the public debt stock is FX-linked, the effect of exchange rate movements should not be ignored in the debt sustainability discussions.

1.4 Exchange Rate

Starting May 2004, TL strengthened against foreign exchange. Appreciation was more pronounced against the US Dollar (USD) than against Euro. TL's appreciation against the Euro was not so drastic in May 2004, however starting in July, TL started gaining further strength against both the dollar and Euro, due to increased FX supply, which generally is encountered during the summer months due to increased tourism revenues.

Central Bank's direct interventions to prevent excess volatility as well as currency overvaluation were futile in reversing the overvaluation. The Central Bank's FX buying auctions resumed in May, 2004 Central Bank's FX buying auctions plus its 5 direct interventions resulted in total dollar purchases equivalent to \$6 billion by September, 2004.

There is a widespread belief that the TL is highly overvalued. If this were true, one would expect a significant deterioration in Turkey's trade balance. However, the export and import performance over the first six months of the year when compared to the same period of 2003 (32% growth in exports and 34.4% growth in imports) does not reveal such an adverse effect yet. The negative effect on exports created by the real appreciation of the TL, might have been partially offset by the improvements in the unit labor costs. A study conducted by the State Planning Organisation estimates the productivity growth in the manufacturing sector as 18% over the 1999-2002 period; this, along with declining real wages in the sector, is claimed to have resulted in reduced unit labor costs. The surge in imports also can not be explained only by the strengthened TL. Only 10% of imports comprise consumption goods, the rest are investment (15%) and intermediary goods (75%). Hence, the strong demand for investment and intermediary good imports may be a signal of high growth in 2004.

A strong TL, while easing debt sustainability, and creating a favorable impact on the inflation rate, may also create an adverse effect on the current account. High current account deficit may cause increased demand for foreign currency and hence contribute to correction of the overvaluation of the TL.

2. Formula Used to Estimate the Primary Surplus Ratio

The World Bank estimates the primary surplus needed to keep the debt ratio stable using a formula that takes growth, real interest rate and seigniorage factors into consideration (World Bank, 2000: 16-8, 121-124). At this point, we propose modifying the formula, by adding a third term to capture the effect of the exchange rate movements on debt and hence the primary surplus requirement. Actually, the exchange rate factor is handled during the process of the estimation of real interest rate on FX debt in TL (r_{FX}), which later is plugged into Equation (1). The formula used is as follows (all terms are at (t) except the primary surplus ratio (s), which is at $(t+1)$):

$$s(t+1) = [(r_{TL} - g)/(1 + g)]b_{TL} + [(r_{FX} - g)/(1 + g)]b_{FX} - [(p + g + p \times g) / (1 + p + g + p \times g)] m(1)$$

where;

s = long-term primary surplus-to-GNP ratio that is required for debt sustainability at (t+1)

bTL = “public sector debt stock denominated in TLs-to-GNP ratio” at the beginning of the period

bFX = “public sector debt stock denominated in FX-to-GNP ratio” at the beginning of the period

e = revaluation rate of FX (FX Basket = 0.5\$+0.5Euro) (TL/FX)

rTL = real interest rate on TL-denominated debt and borrowing

rFX = real interest rate on FX-linked debt and borrowing in TL terms
 $= \{[(1+ifx)(1+e)]/(1+p)\} - 1$

g = growth rate

p = domestic inflation rate

m = reserve money-to-GNP ratio, which takes different values under different “real interest rate-inflation rate” combinations.

ifx = nominal interest rate on FX-denominated debt in FX.

The term,

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

gives the seigniorage amount expressed as percent of GNP. The first two terms of Equation (1), on the other hand, give the effect of growth and real interest rate on the primary surplus requirement. This part of the equation implies that the closer the real interest rate is to the growth rate, the more sustainable is the debt.

3. The Real Interest Rate

Real interest rate (r) is generated from two sources: FX-linked debt (comprising 58% of consolidated budget debt stock as of end-2003) and the TL-denominated debt (comprising 42% of the consolidated budget debt stock as of end-2003).

The real interest rate on FX-linked debt expressed in TL terms (rFX) can largely be affected by real appreciation/depreciation of the TL. Hence, the real interest rate on FX-linked non-maturing debt plus borrowing in terms of TL, is estimated under scenarios that account for exchange rate variability. The procedure used to arrive at the real interest rate on FX-linked debt plus borrowing in terms of TL (rFX) is as follows:

First, the interest rate in FX is converted into nominal interest rate in TL using Equation (2).

$$i_{FX}^* = [(1+i_{FX})(1+e)] - 1 \quad (2)$$

where,

i_{FX}^* = average interest rate on FX-linked debt plus borrowing in TL (nominal)

i_{FX} = average interest rate on FX-linked debt plus borrowing in FX (nominal)

e = revaluation rate of FX over the year

Then, the nominal interest rate in TL terms (i_{FX}^*) is converted into real interest rate in TL terms (rFX) on FX-linked debt, using Equation (3).

$$r_{FX} = [(1+i_{FX}^*) / (1+p)] - 1 \quad (3)$$

3.1 Real Interest Rate on FX-Linked Debt in TL Terms

As mentioned above, using Equation (2), first the FX-denominated interest rate was converted into TL-denominated nominal interest rate; and then, using Equation (3) the nominal rate was converted into real interest rate on FX-linked debt, in terms of TL. It is at this stage, when the exchange rate factor enters the picture. Table 2 gives the real rates on FX-denominated debt in TL, under different scenarios, representing alternative “FX revaluation rate-inflation rate-FX interest rate” combinations. For example, in reference to Table 2, if the inflation rate were 25%, the revaluation rate of FX were 15% and the interest rate of FX debt were 13%, then the real interest rate on the non-maturing FX debt plus borrowing would be 4%.

Table 2- Real Interest Rate on FX Debt Expressed in TL Terms

Inflation Rate												
20						25						
ifx						ifx						
e	0,05	0,07	0,09	0,1	0,11	0,13	0,05	0,07	0,09	0,1	0,11	0,13
0,15	0,006	0,025	0,045	0,054	0,064	0,083	0,034	0,016	0,003	0,012	0,021	0,040
0,2	0,050	0,070	0,090	0,100	0,110	0,130	0,008	0,027	0,046	0,056	0,066	0,085
0,25	0,094	0,115	0,135	0,146	0,156	0,177	0,050	0,070	0,090	0,100	0,110	0,130
0,3	0,138	0,159	0,181	0,192	0,203	0,224	0,092	0,113	0,134	0,144	0,154	0,175

3.2 Average Real Interest Rate on TL-Denominated Debt (new borrowing+non-maturing debt)

As of end-March 2004 (like in end-2003), 43% of the domestic debt stock was in the form of FRNs, paying interest on a quarterly basis. The FRNs sold to the market bear a 2-year term and those in the hands of the public institutions bear 3-7 year terms.

The average interest rate on the Treasury auctions held over the first 4 months of 2004, was around 53%, which implied a real rate above 25%. The Central Bank reduced its overnight lending rate by 3 percentage points on April 2004, another 3 percentage points on June 2004, and another 3 percentage points on August 2004. Because of this and the gradually increasing confidence, which reduces the risk premium, the interest rates have been following a declining trend.

4. Estimation of the Primary Surplus Ratio Required to Keep the Debt Ratio Stable

Real interest rates on FX-linked debt plus borrowing in TL terms (r_{FX}) given in Table 2 was plugged in the second term of Equation (1), along with the growth rate assumption (ranging from 3 to 7%) of the different scenarios. The weight (FX-linked debt-to-GNP ratio) (b_{FX}) used was 0.4582 [(=0.79 (public debt-to-GNP ratio in 2002) x 0.58 (share of FX-linked debt in total public debt)]. The weights used are those of end-2003. The result gave the primary surplus requirement originating from FX-linked non-maturing debt plus borrowing.

Similarly, under different “real interest rate (on TL denominated debt)-inflation rate-growth rate” scenarios, using the first term of Equation (1), the primary surplus requirement originating from TL-denominated debt was estimated. Here the weight (TL-denominated debt-to GNP ratio) (b_{TL}) used was 0.3318 [(=0.79 (public debt-to-GNP ratio in 2002) x 0.42 (share of TL-denominated debt in total public debt)]. Then the primary surplus requirements in connection to the FX-linked debt and the TL-denominated debt were summed up. The final primary surplus-to-GNP ratio (s) was obtained by adding the seigniorage term’s contribution (which has a negative sign in the formula) to this total. The results are reported in Table 3 in Appendix A, which is constructed under the assumption of 9 % nominal FX rate. The estimations in the table should be interpreted as follows: To keep the public debt-to-GNP ratio of end-2003 level, the primary surplus-to-GNP ratio in end-2004 should be X% (here, X = the primary surplus-to-GNP ratio (s) mentioned in the table for different scenarios).

5. Evaluation of the Results

At the higher inflation rate (25% instead of 20%), the favorable effect of seigniorage on the debt stock ratio is higher. The same is true for the growth rate. Similarly when the revaluation rate is below the inflation rate, it implies real appreciation of the TL over the period, leading to a lower real interest rate on the FX-linked debt in terms of the TL. This too eases debt sustainability. The real interest rate on the TL-denominated debt, on the other hand, has an adverse effect on debt sustainability. The shaded areas on Table 3 given in Appendix A, point to the scenarios where debt sustainability becomes questionable, since in these cases the

primary surplus requirement is above the targeted 6.5%. If we generalize; these specific scenarios implying unsustainability, display a high rate of revaluation of FX (25-30%), combined with high a real interest rate on the TL denominated debt (20-25%), which is highly improbable. The situation gets worse as the growth rate declines. However, even when the rTL is high, appreciation of the TL and/or a high growth rate, may lead to a primary surplus requirement below the 6.5% target.

The most likely realizations anticipated for the year 2004 are:

Inflation Rate (p) = 20;

Average real interest rate on the TL-denominated debt (rTL) = 15 or 20%;

Revaluation rate of foreign currency (basket comprising 0.5\$+0.5Euro) (e)= 15, 20 or 25%;

Growth rate (g) = 4, 5 or 6%;

Average interest rate on FX borrowing and non-maturing debt (iFX)= 9%.

Under these circumstances, debt sustainability does not seem to be a problem and in all cases public debt ratio is likely to decline since the primary surplus requirement is below the 6.5% target level. Now let us estimate the debt-to-GNP ratio in end-2004, under the specific scenarios that are most likely to be realized: (all expressed in %; estimations are based on the information given in Table 3 in Appendix A)

$g= 5, e=20, p=20, rTL=20, iFX=9; s=4.75, s(target)=6.5; b(2003)=79-(6.5-4.75)=77.25$

$g= 5, e=20, p=25, rTL=20, iFX=9; s=2.66, s(target)=6.5; b(2003)=79-(6.5-2.66)=75.16$

$g= 5, e=15, p=20, rTL=20, iFX=9; s=2.85, s(target)=6.5; b(2003)=79-(6.5-2.85)=75.35$

$g= 5, e=20, p=25, rTL=15, iFX=9; s=1.01, s(target)=6.5; b(2003)=79-(6.5-1.01)=73.5$

$g= 6, e=15, p=20, rTL=20, iFX=9; s=1.93, s(target)=6.5; b(2003)=79-(6.5-1.93)=74.43$

$g= 6, e=20, p=25, rTL=15, iFX=9; s=0.21, s(target)=6.5; b(2003)=79-(6.5-0.21)=72.71$

The results indicate that small changes in the assumptions for variables such as growth, the real TL interest rate, the revaluation/devaluation rate and the inflation rate, yield widely

different primary surplus requirements for the debt to be sustainable. However, under fairly conservative, but realistic assumptions about the variables mentioned above, the model used points to a relatively stable debt-to-GNP ratio, displaying a downward trend. The fall in the real TL interest rate and the real exchange rate remaining strong, can improve the debt profile even behind expectations.

6. Conclusion

In Turkey, the Strengthened Stabilization Program (The Undersecretariat of Treasury 2001), adopted in May 2001, covering the period between 2001-2004, which is technically and financially supported by the IMF and the World Bank, started to give its fruits. The stability is gradually being achieved; along with it confidence is being restored and spreads are declining.

Growth and inflation prospects are favorable and the PSBR is on the decline. Trade balance, however may close the year 2004 with an enlarged deficit due to the appreciation of the TL and better than expected growth.

As the risky country image is being transformed into a low-risk country image, the real interest rates on the TL-denominated borrowing as well as spreads on foreign borrowing are expected to fall and foreign direct investment is expected to increase.

The Central Bank of the Republic of Turkey (CBRT) resumed its FX buying auctions on May, 2004, its primary aim being enhancing its FX reserves. Daily limit on the purchases was set as \$20 million, which was raised gradually to \$75 million (\$25 million of it being option buying) between May and September 2004. However from time to time in the event of excess volatility in both directions, CBRT directly intervenes in FX market. Between May - September 2004, CBRT purchased \$6 billion through daily FX buying auctions and five direct interventions conducted. The Central Bank's purchase of FX was expected to slow down TL's appreciation, while enhancing the official reserves. However it did not exert the anticipated effect on the exchange rate. The appreciation of the TL may be cut back as a result of the increased demand for FX resulting from enlarged current account deficit in 2004. TL's

appreciation is the outcome of mainly the reversal in currency substitution; but it is also affected by high real interest rates on the TL-denominated assets. The excessive volatility in the exchange rates seen especially since the end of April 2004 was also the result of excessive FX selling because of the need for TL liquidity for tax payments. The CBRT continues its TL deposit buying auctions with a standard of 4-week maturity, which was initiated in April 2002. The aim of this tool is to enhance the effectiveness of efforts to sterilize excess TL liquidity in the system. The maximum amount at each auction is limited to TL200 trillion. Hence while the TL injection results as CBRT purchases FX, the TL deposit buying auctions may sterilize part of this TL expansion. In the years ahead, under the floating rate regime, the exchange rate may be expected to move parallel to the purchasing power parity, displaying much less volatility.

As the results of our analysis indicate, for Turkey the default risk is very low and there is no need for restructuring of the debt. Turkey is frequently being mentioned in the same pot with Argentina and Brazil and similar default risk is being implied for all three countries (Goldstein 2003). We believe that a high-growth country under a floating rate regime, with no significant depreciation prospect, which has a good export performance and strong reserves, where the PSBR is declining, the banking sector is strengthened should not be judged in the same category with Argentina and Brazil. In the medium run, Turkey's debt ratio is expected to follow a declining trend, reaching the 60% level within a few years.

In sum, for Turkey debt sustainability is likely to be much less of a problem in the years ahead. Low spreads, low risk premiums and hence low real interest rates along with longer maturity, will make debt rollover much easier. Actually in Turkey, the debt-to-GNP ratio is not so high when compared to such countries like Belgium, Italy, Greece and Japan, just to name a few. But in those countries maturity is much longer and real interest rates are very low. The problem with Turkey's debt stock is its short maturity and high real interest rates, which will be resolved as stability is gained and confidence is restored. Lasting stability can be achieved only if the present stabilization program is strictly enforced.

REFERENCES

Edwards, Sebastian (2002) “ Debt Relief and Fiscal Sustainability,” NBER Working Paper w8939.

Goldstein, Morris (2003) “Debt Sustainability, Brazil and The IMF,” Institute for International Economics, Working Paper, No.WP 03-1, February.

The Undersecretariat of Treasury (T.C. Hazine Mustesarligi) (2001) “ Turkiye’nin Guclu Ekonomiye Gecis Programi: Hedefler, Politikalar ve Uygulamalar” (The Strengthened Stabilization Program).

The Undersecretariat of Treasury (T.C. Hazine Mustesarligi) (2004) Kamu Borc Yonetim Raporu.

World Bank (2000) “ Turkey –Country Economic Memorandum – Structural Reforms for Sustainable Growth, Vol.I and II.” 20657-TU, Washington.

World Bank and IMF (2001) “The Challenge of Maintaining Long Term External Debt Sustainability,” April 20,2001.

APPENDIX A

Table 3- Primary Surplus Ratio Required (%) Ifx =9 %

20				25		
rTL(%)				rTL(%)		
E (%)	15	20	25	15	20	25
G=3%						
15	2,86	4,51	6,18	0,84	2,51	4,16
20	4,96	6,61	8,28	2,74	4,41	6,06
25	6,96	8,61	10,28	4,74	6,41	8,06
30	8,96	10,61	12,28	6,64	8,31	9,96
G=4%						
15	2,04	3,68	5,33	0,02	1,68	3,31
20	4,04	5,68	7,33	1,92	3,58	5,21
25	6,04	7,68	9,33	3,82	5,48	7,11
30	8,04	9,68	11,33	5,72	7,38	9,01
G=5%						
15	1,23	2,85	4,49	-0,89	0,76	2,38
20	3,13	4,75	6,39	1,01	2,66	4,28
25	5,13	6,75	8,39	2,91	4,56	6,18
30	7,13	8,75	10,39	4,81	6,46	8,08
G=6%						
15	0,32	1,93	3,56	-1,69	-0,06	1,55
20	2,32	3,93	5,56	0,21	1,84	3,45
25	4,32	5,93	7,56	2,11	3,74	5,35
30	6,22	7,89	9,46	4,01	5,64	7,25

G=7%						
15	0,48	1,12	2,73	-2,49	-0,86	0,73
20	1,52	3,12	4,73	-0,59	1,04	2,63
25	3,42	5,02	6,63	1,31	2,93	4,53
30	5,32	6,92	8,53	3,11	4,74	6,33