

Macroeconomics of *Twin-Targeting* in Turkey: Analytics of a Financial CGE Model*

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After a long history of failed stabilization attempts, Turkey signed a Staff Monitoring Program with the International Monetary Fund (IMF). The Program currently sets the macroeconomic policy agenda in Turkey and relies mainly on fiscal austerity with specific primary budget targets and a contractionary monetary policy implemented within an inflation targeting central bank regime. The post-1998 Turkish macroeconomic adjustments reveal speculative-led growth patterns with limited employment creation and a widening foreign deficit together with increased foreign indebtedness.

The paper provides an overview of the post-1998 Turkish economy and constructs a macroeconomic general equilibrium model to illustrate the real and financial sectoral adjustments of the Turkish economy under the conditionalities of the “twin targets”: on primary surplus to GNP ratio and on the inflation rate. We further utilize the model to study three sets of issues: (i) the critical role of the expanded foreign capital inflows in resolving the macroeconomic impasse between the disinflation motives of the CBRT and imperatives of debt sustainability and fiscal credibility of the ministry of finance; (ii) reduction of the central bank’s interest rates, and (iii) a labor market reform of reducing payroll taxes. Our simulation results suggest that the current monetary strategy, which involves a heavy reliance on foreign capital inflows along with a relatively high real rate of interest, is effective in bringing inflation down; yet it suffers from increased cost of interest burden to the public sector, and strains fiscal credibility. In contrast, given the ex ante constraints of the domestic economy in the short run, an alternative heterodox policy of reduction of the central bank interest rate and lowering of the payroll tax burden in labor markets indicate strong employment and growth effects along with strengthened fiscal credibility.

I. Introduction: Macroeconomics of *Twin-Targeting* in Turkey

Turkish macroeconomics into the 21st century is in disarray. The economy currently suffers from premature and unprepared deregulation of the financial markets; increased indebtedness both externally and domestically by the public sector; a lopsided and volatile growth trajectory amidst rising unemployment, declining real wages, and deepened social exclusion. These observations pertain despite the thematic continuity of the ambitious structural adjustment reforms initiated as early as 1980 and a new window of opportunity heralded by the initiation of the accession negotiations towards full membership to the European Union (EU).

After a decade of failed reforms and deteriorated macroeconomic performance, Turkey entered the millennium under a *Staff Monitoring Program* signed with the International

Monetary Fund (IMF) in 1998, and put into effect in December 1999. The IMF was involved with both the design and supervision of the Program, and has provided financial assistance totaling \$20.6 billion *net*, between 1999 and 2002. The Program currently sets the macroeconomic policy agenda in Turkey and relies mainly on fiscal austerity with specific *primary budget targets* and a contractionary monetary policy implemented within an *inflation targeting* central bank regime —hence the terms in the title: *macroeconomics under twin-targeting*.

In November 2000, however, one year after introducing the program, the country experienced a very severe financial crisis. More than six billion USD of short-term capital fled the country, creating a severe liquidity shortage and sky-rocketing interest rates. In early 2001 the government requested access to the Supplemental Reserve Facility of the IMF. Only then could continued implementation of the program be secured, as the markets seemed to have calmed down. However, on February 19, 2001, shortly after this arrangement with the IMF, Turkey suffered from a full-fledged financial crisis and the Central Bank declared the surrender of the pegged exchange rate system on February 22, 2001, thereby letting the exchange rates free float.

The Turkish crisis, which came in the aftermath of an exchange rate-based disinflation attempt, followed all the well-documented empirical regularities of such programs: a demand-based expansion accompanied by rising and usually unsustainable trade and current deficits followed by a contractionary phase – in the form of a liquidity squeeze, sky-rocketing interest rates, and negative growth (see e.g. Amadeo, 1996; Calvo and Vegh, 1999). The main weakness of the 2000 disinflation program was its exclusive reliance on speculative short-term capital inflows as the source of the liquidity generation mechanism. Overlooking the existing structural indicators of financial fragility and resting the liquidity generation mechanism on speculative in- and out-flows of short term foreign capital, the program has left the economy defenseless against speculative runs and a “sudden stop.”¹

¹ The underlying elements of the disinflation program and the succeeding crises are discussed in detail in Boratav and Yeldan (2006); Akyüz and Boratav (2003); Yeldan (2002); Ertugrul and Selçuk (2001); Eichengreen (2001) Alper, (2001); Yeldan (2001); Ersel (2000); Uygur (2000) and Özatay (1999).

Under the deepening fragility, what triggered the crisis came from a controversial paper by Stanley Fischer², the then Deputy Director of the Fund. Mr. Fischer had argued, based on the experiences of the Turkish November 2000 and the (culminating) Argentinean 2001 crises, that the currency regimes based on soft-pegs (as had been the case for Turkey under the IMF program) were not sustainable. Thus he called for either full-flexibility or full-dollarization. This critique to the theoretical basis of the IMF-led austerity program, coming from the inner-circles itself, resulted in a sudden and significant loss of credibility and further strained the deeply fragile macro balances.

With the collapse of the program in February 2001, a new round of stand by is initiated under the direct management of Mr. Kemal Dervis, who resigned from his post at the World Bank as Vice Chair and joined the then three-party coalition cabinet. Finally, in the November 2002 elections the Justice and Development Party (AKP) has come to power with absolute majority in the parliament and, despite its otherwise election rhetoric, embarked in a new and intensified adjustment program with the IMF staff.

The current IMF program in Turkey relies mainly on two pillars: (1) fiscal austerity that targets a 6.5 percent surplus for the public sector in its primary budget³ as a ratio to the gross domestic product; and (2) a contractionary monetary policy (through an *independent* central bank) that exclusively aims at price stability (via inflation targeting);. Thus, in a nutshell the Turkish government is charged to maintain *dual* targets: a *primary surplus* target in fiscal balances (at 6.5% to the GDP); and an *inflation-targeting* central bank whose sole mandate is to maintain price stability and is divorced from all other concerns of macroeconomic aggregates.

According to the logic of the program, successful achievement of the fiscal and monetary targets would enhance “credibility” of the Turkish government ensuring reduction in the country risk perception. This would enable reductions in the rate of interest that would then stimulate private consumption and fixed investments, paving the way to sustained growth. Thus, it is alleged that what is being implemented is actually an *expansionary* program of *fiscal contraction*.

² Stanley Fischer, “Exchange Rate Regimes: Is the Bipolar View Correct?,” International Monetary Fund at: <<http://www.IMF.org>>, January, 2001. A revised version of the paper later appeared as “Distinguished Lecture on Economics in Government,” *Journal of Economic Perspectives*, Vol.15, No.2 (Spring, 2001), pp.3-24.

³ *i.e.* balance on non-interest expenditures and aggregate public revenues. The primary surplus target of the *central government budget* was set 5% to the GNP.

On the monetary policy front, the Central Bank of Turkey (CBRT) was granted its *independence* from political authority in October 2001. What follows, the central bank announced that its sole mandate is to restore and maintain price stability in the domestic markets and that it will follow a disguised inflation targeting until conditions are ready for full targeting. Thus, over 2002 and 2003 the CBRT targeted net domestic asset position of the central bank as a prelude to full inflation targeting. Finally in January 1, 2006 the CBRT has announced that it will adopt full-fledged inflation targeting.

The purpose of this paper is to provide an assessment of the key macroeconomic developments in Turkey over the post-2001 crisis period and to provide a general equilibrium analysis of the macroeconomic policy alternatives under the *twin-targeters* (the primary surplus targeting fiscal authority and the inflation targeting central bank). We focus on three sets of issues: first we study the macroeconomics of the expanded foreign capital inflows in resolving (temporarily) the macroeconomic impasse between the *disinflation* motives of the CBRT and imperatives of *debt sustainability* and *fiscal credibility* of the ministry of finance. Secondly, we study the reduction of the central bank's interest rates, and then at the third step we implement a labor market reform and study the implications of reducing/eliminating payroll taxes (paid by the employers). To these ends we construct a macroeconomic general equilibrium model with a full fledged financial sector in tandem with a real sector. Across all policy simulations we exclusively focus on both the fiscal and financial adjustments and study the possible dilemmas of gains in efficiency in the labor markets *versus* the loss of fiscal revenues to the state.

Our finding is that the current monetary strategy followed by the CBRT that involves a heavy reliance on foreign capital inflows along with a relatively high real rate of interest, is effective in bringing inflation down, yet it suffers from increased cost of interest burden to the public sector and strains fiscal credibility. In contrast our simulation results suggest that, given the *ex ante* constraints of the domestic economy in the short run, an alternative heterodox policy of reduction of the central bank interest rate and lowering of the payroll tax burden in labor markets may have strong employment and growth effects. The policy also achieves significant gains in fiscal credibility in the short run. Yet it suffers from increased inflationary pressures in the commodity and the financial markets. Even though observed to prevail at a modest scale in our simulation experiments, the *ex ante* constraints of maintaining inflationary expectations may lead to intolerance of the CBRT and render the policy ineffective. Thus, maintaining an

integrated and coherent policy framework between the monetary and fiscal authorities is seen as a key issue of prime importance for the success of the policy formulation at the macro scale.

Our premise in this paper is that a proper modeling of the general equilibrium linkages between the production-income generation and -aggregate demand components across individual sectors as well as responses of the real macro aggregates to financial decisions are essential steps to understand the impact of the current austerity program on the evolution of output, fiscal, financial, and external balances, and on employment. Accordingly, we develop a dynamic computable general equilibrium (CGE) model with a relatively aggregated productive sector, a segmented labor market, and a full-blown public sector with a detailed treatment of fiscal balances and financial flows. By itself, this endeavor is not new; over the years, a number of CGE models have been developed for Turkey. These include Dervis, *et. al.* (1982), Celasun (1986), Lewis (1992), Yeldan (1997, 1998), Diao, Roe and Yeldan (1998), Mercenier and Yeldan (1997), Karadag and Westaway (1999), De Santis (2000), Voyvoda and Yeldan (2005), and Agenor *et. al.* (2006). Those of Lewis (1992), Yeldan (1998), and Agénor *et. al.* (2006) include a financial sector, whereas the others are “real” models focusing on tax and trade policy issues.

The current model shares many of the analytical structure of the Agenor *et.al* (2006) design in the dynamics of financial transactions, especially with respect to formation of expectations and fragility. It is explicitly designed to capture the relevant linkages between the fiscal policy decisions, financialization constraints and external balances that we believe are essential to analyze the impact of disinflation and fiscal reforms on labor market adjustment and public debt sustainability. First among these is the proper analysis of linkages between the fiscal austerity targets and the real sectoral activity; second, pertains to the structure of the labor market; and third focuses on the channels through which domestic and external disequilibria interact with the financial economy. We pay particular attention to fiscal issues such as a high degree of debt overhang and fiscal dominance; the link between real and financial sector interactions, and interactions between external (current account) deficits, private saving-investment deficits, and the public (primary balance) surpluses.

We organize the paper under four sections. First, we provide a broad overview of the recent macroeconomic developments in Turkey in section II. Here we study, exclusively, the evolution of the key macroeconomic prices such as the exchange rate, the interest rate, and price inflation.

Here we also comment on the external balances, the dynamics of external debt, fiscal policy issues and the labor market. In section three, we introduce and implement our computable general equilibrium modeling analysis of the alternative policy scenarios to depict the short-run macroeconomic adjustments of the Turkish economy under the conditionalities of the IMF program targets on *primary surplus to GDP ratio* and on *inflation rate*. Finally, we provide a brief summary with concluding comments in section four.

II. Macroeconomic Developments under IMF's Staff Monitoring

The growth path of the Turkish economy over the post-1998 period had been erratic and volatile, mostly subject to the flows of hot money. Following the *contagion* effects of the Asian, Russian and the Brazilian turmoil, the economy first decelerated in 1998 with a growth rate of 3.1%, and then contracted in 1999 at the rate of -5.0%. The boom of 2000 was followed by the 2001 crisis. The recovery was sharp as the economy has grown at an average rate of 7.1% over the 2002-2006 period. Price movements were also brought under control through the year and the 12-month average inflation rate in consumer prices has receded from 45% in 2002 to 7.7% in 2005, and from 50.1% to 5.9% in producer prices.

The post-2003 period has also meant a period of acceleration of exports, where export revenues reached \$91.7 billions in 2006. Nevertheless, with the rapid rise of the import bill over the same period, the deficit in the current account reached \$31.7 billion (or about 7.9% of the GNP in 2006). The current account deficit continued to widen in 2007 and reached \$34 billion over 12 months cumulative period in the first quarter. Table 1 documents the main macro indicators of the post-1998 Turkish economy under close IMF supervision.

One of the clear characteristics of the period is the fall in aggregate domestic savings and fixed investment expenditures as a ratio to the GNP. The decline in saving performance is also revealed in the rapid acceleration of private consumption expenditures especially after the 2001 crisis. Private consumption expenditures have risen by an annual average rate of 7.9% over 2002 through 2006. On the public sector front one witnesses a very strong fiscal discipline effort. The ratio of central government budget deficit to the GNP was reduced from its peak of 16.2% in 2001, to 0.8% by 2006. Consequently, the public sector borrowing requirement (PSBR) as a ratio to the GNP fell from 16.1% to *negative* 3%, indicating a surplus, in 2006.

Table 1 . Basic Characteristics of the Turkish Economy Under the IMF Surveillance, 1998-2006

	Staff Monitoring Program Initiated	Contagion of Emerging Market Financial Crises	IMF-Directed Dis-inflation Programme	Financial Crisis	IMF-Directed Post-Crisis Adjustments				
					Under the three-party Coalition Government	Under the Pragmatic and Western-friendly Islamism of the AKP			
						2002	2003	2004	2005
Real Rate of Growth									
GDP	3.1	-5.0	7.4	-7.4	7.6	5.8	8.9	7.4	6.1
Consumption Expenditures									
Private	0.6	-2.6	6.2	-9.2	2.0	6.6	10.1	8.8	5.2
Public	7.8	6.5	7.1	-8.6	5.4	-2.4	0.5	2.4	9.6
Investment Expenditures									
Private	-8.3	-17.8	16.0	-34.9	-7.2	20.3	45.5	23.6	17.4
Public	13.9	-8.7	19.6	-22.0	14.5	-11.5	-4.7	25.9	-0.2
Exports	12.0	-7.1	19.2	7.4	11.0	16.0	12.5	8.5	8.5
Imports	2.3	-3.7	25.4	-24.8	15.7	27.1	24.7	11.5	7.1
Macroeconomic Balances (As Ratio to the GNP, %)									
Aggregate Domestic Savings	22.7	21.2	18.2	17.5	19.2	19.3	20.2	17.1	16.6
Aggregate Fixed Investments	24.3	22.1	22.8	19.0	17.3	16.1	18.4	20.3	23.1
Budget Balance	-7.0	-11.6	-10.9	-16.2	-14.3	-11.2	-7.1	-2.0	-0.8
Public Sector Borrowing Requirement	9.3	15.5	11.8	16.4	12.7	9.3	4.7	-0.4	-3.0
Current Account Balance	1.0	-0.7	-4.8	2.4	-0.8	-3.4	-5.2	-6.2	-7.9
Stock of Foreign Debt	55.4	71.0	63.4	92.7	77.5	57.1	50.4	46.9	50.4
Macroeconomic Prices									
Rate of Change of the Nominal Exchange Rate (TL/\$)	71.7	60.6	28.6	114.2	23.0	-0.6	-4.9	-5.7	6.9
Inflation (PPI)	71.8	53.1	51.4	61.6	50.1	25.6	14.6	5.9	9.4
Inflation (CPI)	84.6	64.8	54.9	54.4	44.9	25.3	10.6	7.7	9.6
Real Interest Rate on GDIs ^a	29.5	36.8	4.5	31.8	9.1	15.4	13.1	10.4	7.9
Real Wage Growth Rates ^b									
Private Sector	-0.9	8.6	-2.6	-14.4	-5.0	0.5	4.8	1.6	1.9
Public Sector	5.5	18.3	15.6	-11.5	0.5	-5.3	4.7	7.9	-3.0
Sources: SPO Main Economic Indicators ; Undersecretariat of Treasury, Main Economic Indicators; TR Central Bank data dissemination system.									
a. Deflated by the Producer Price Index									
b. Based on real wage indexes (1997=100) in manufacturing per hour employed, Turkstat data.									

II-1. Macroeconomic Prices and the Monetary Policy

The most successful aspect of the post-2001 crisis adjustment efforts clearly lied on the dis-inflation front. Inflation rate, both in consumer and producer prices, has been brought under control by 2004. In 2005, the rate of inflation fell to 5.9% for producer prices, and to 7.7% for consumer prices. After a series of external shocks, the rate of inflation seems to have stabilized around the plateau of 9 – 10% despite the (official) target of 4% set for 2007 and 2008.

The CBRT initiated an open inflation targeting framework starting 1 January 2006. The Bank's current mandate is to set a "point" target of 5 percent inflation of the consumer prices. Given internal and external shocks, the Bank has recognized an internal (of 1 percent) and an external (of 2 percent) "uncertainty" band around the point target. Thus, the Bank will try to keep the inflation rate at its point target; however, recognizing a band of maximum 2 percentage

points below or above the 5% target rate. The Bank has announced that it will continue to use the overnight interest rates as its main policy tool to reach its target. It is stated explicitly that the “sole objective of the CBRT is to provide price stability”, and that all other possible objectives are out of its policy realm.⁴

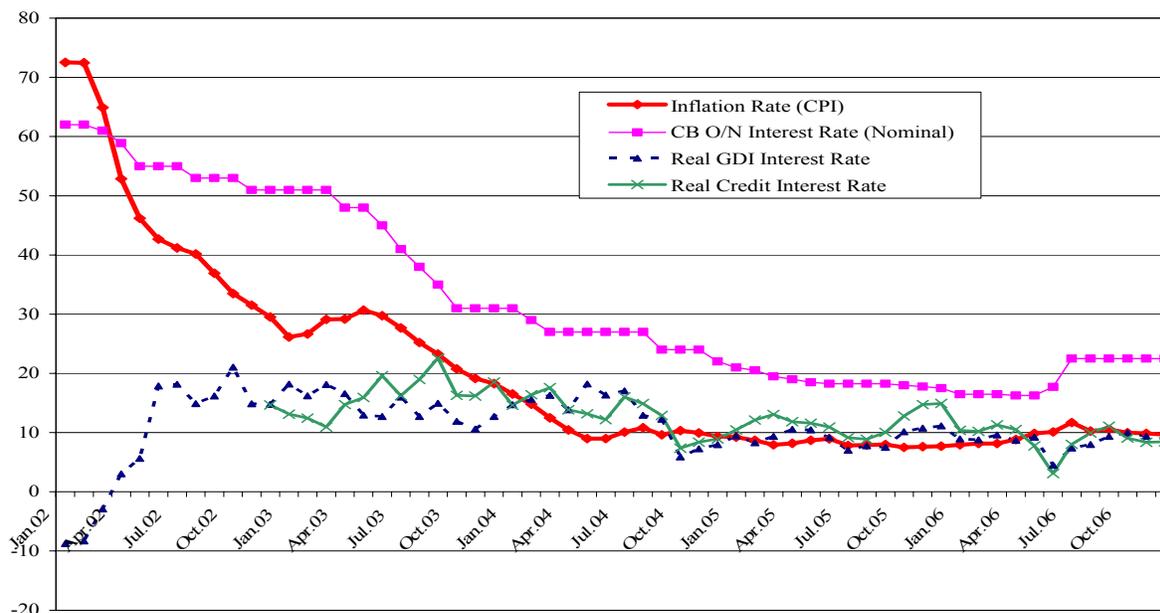
Despite the positive achievements on the dis-inflation front, rates of interest remained slow to adjust. The real rate of interest remained above 10% much of the post-2001 crisis era, and generated heavy pressures against the fiscal authority in meeting its debt obligations. The persistence of the real interest rates, on the other hand, had also been conducive in attracting heavy flows of short term speculative finance capital over 2003 and 2006. This pattern continued into 2007 at an even stronger rate.

Inertia of the real rate of interest is enigmatic from the successful macro economic performance achieved thus far on the fiscal front. Even though one traces a decline in the general plateau of the real interest rates, the Turkish interest charges are observed to remain significantly higher than those prevailing in most emerging market economies. The credit interest rate, in particular, had been constrained by a lower bound of 16% despite the deceleration of price inflation. Consequent to the fall in the rate of inflation, the inertia of credit interest rates translates into increasing real costs of credit. (See Figure 1).

Figure 1 below portrays the paths of inflation (CPI) and the central bank’s overnight interest rate as its monetary policy tool. The paths of the *real* interest costs on government debt instruments (GDIs) and on credit clearly depict a persistent inertia despite the falling rate of inflation.

⁴ Further institutional details of the Central Bank’s inflation targeting framework can be found at the December 2005 document, “*General Framework of Inflation Targeting Regime and Monetary and Exchange Rate Policy for 2006*”, available on line at <http://www.tcmb.gov.tr/yeni/announce/2005/ANO2005-45.pdf>

Figure 1. Inflation and Interest Rates under Inflation Targeting

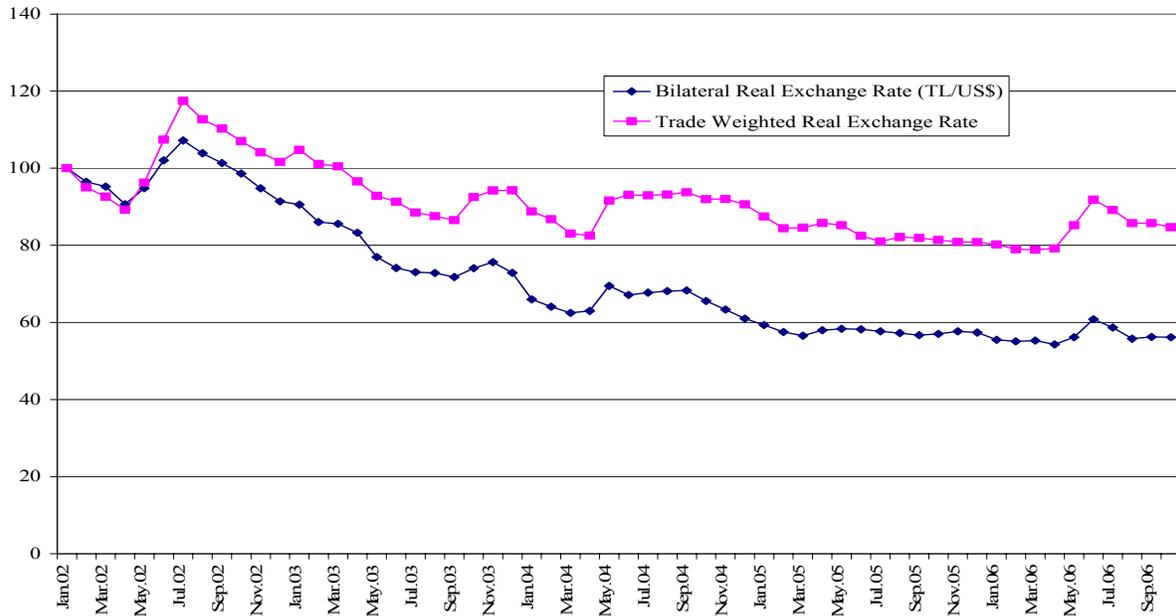


Source: TR Central Bank

High rates of interest were conducive in generating a high inflow of hot money finance to the Turkish financial markets. The most direct effect of the surge in foreign finance capital over this period was felt in the foreign exchange market. The over-abundance of foreign exchange supplied by the foreign financial arbiters seeking positive yields led significant pressures for the Turkish Lira to appreciate. As the Turkish Central Bank has restricted its monetary policies only to the control of price inflation, and left the value of the domestic currency to be determined by the speculative decisions of the market forces, the *Lira* appreciated by as much as 40% in real terms against the US\$ and by 25% against Euro (in producer price parity conditions, over 2002 - 2006).

The overvaluation of the *Lira* was the most important contributor in reducing the burden of an ever-expanding foreign indebtedness. While the aggregate foreign debt stock has increased from US\$ 113.6 billion in 2001 to US\$ 206.5 billion by the end of 2006, as a ratio to the GNP it has created an illusory tendency to fall when measured in the overvalued *Lira* units. The paths of the real value of the Turkish Lira against both as a *trade-weighted* and also as a *bilateral* exchange rate (TL/US\$) are portrayed in Figure 2 below.

Figure 2. Index of the Real Exchange Rate (TL/\$)



Source: TR Central Bank

One key aspect of this tendency towards appreciation of the Lira is due to the un-regulated, excessively open regime of the Turkish capital account. After the 1989 decision to de-regulate the capital account and to fully liberalize the financial markets, Turkey opened its domestic markets to the speculation of international finance capital. In this structure the Central Bank has lost its control over the money markets. The exchange rate and the interest rate actually became a “single” exogenous variable, totally dependent on the decisions of international arbiters. This financial structure has trapped the Turkish economy in a policy of overvalued exchange rates and very high real interest rates, as argued above.

Yet, the Turkish financial markets are too shallow to absorb the excesses of the hot money inflows and such speculative attacks hold the necessary adjustments in the Lira at bay. The structural overvaluation of the TL, not surprisingly, manifests itself in an ever-expanding deficits on the commodity trade and current account balances. As traditional Turkish exports lose their competitiveness, new export lines emerge. These are mostly import-dependent, assembled-part industries, such as automotive parts and consumer durables. They use the advantage of cheap

import materials, get assembled in Turkey at low value added and then are re-directed for export. Thus, being mostly import-dependent, they have a low capacity to generate value added and employment. As traditional exports dwindle, the newly emerging export industries are not vigorous enough to close the trade gap.

Consequently, starting in 2003 Turkey has witnessed expanding current account deficits, with the figure in 2006 reaching a record-breaking magnitude of \$31.7 billion, or 7.9% as a ratio to the aggregate GNP. The latest data indicate that by the first quarter of 2007, the cumulative current account deficit has already reached \$34 billion. Thus, the strong pressures towards deterioration of the current account balance seem to persist at the time of writing of these pages.

II-2. Fiscal Policy and Debt Management

The current fiscal policy stance in Turkey relies primarily on fiscal restraint. The fiscal authority has a clear mandate to generate a primary budget surplus (not counting the interest expenditures) of 6.5 percent for the public sector as a ratio to the gross national product (GNP). Spanning over a planning horizon 2001 to 2007, the primary surplus target is regarded necessary by the fiscal authorities to reduce the massive debt burden and the fragilities it imposes on the financial and the real commodity markets. Needless to assert, the current fiscal policy administration has important implications on both the macroeconomic environment and the microeconomic mechanisms of resource allocation, employment, and tax incidence.

We tabulate the selected components of the consolidated budget in Table 2. On the revenue side one witnesses a significant effort in raising tax revenues, both in real terms and also as a ratio to the GNP. Much of this effort can be explained by the rise in the share of taxes on goods and services, while the contribution of direct income taxes to the budgetary revenues are observed to fall especially after 2000. We observe that as a ratio to GNP, taxes on goods and services and on foreign trade yield about 70% of total tax revenues. Taxes on foreign trade are around 3.5% of total GNP.

Data reveal a secular rise in the budget deficit through the 1990s. The peak is reached in the aftermath of the 2001 crisis with a ratio of 16.9% to the aggregate GNP. Under the post-crisis administration, the deficit is now reduced to less than 1% to the GNP. As discussed above, much of the aggregate budget expenditures is explained by the high costs of debt servicing. Interest

costs on consolidated budget debt were openly 20% of total expenditures in early 1990s. Their share rose continuously to reach 50.6% of total budgetary expenditures in 2001.

Table 2. Selected Indicators on the Central Administration Budget (*) ()**

	1998	1999	2000	2001	2002	2003	2004	2005	2006
<i>Ratios to the GNP (%)</i>									
Total Budget Revenues	21.9	24.2	26.6	29.2	27.5	28.1	25.8	27.7	35.2
Direct Taxes	7.9	8.4	8.4	8.9	7.0	7.2	6.2	6.2	7.0
Indirect Taxes	8.8	10.5	12.7	13.6	14.7	16.4	14.8	15.8	21.2
Total Non-Tax Revenues	5.2	5.3	5.5	6.7	5.8	4.5	4.8	5.7	7.0
Total Expenditures	29.1	35.9	37.2	45.7	42.1	39.4	32.9	29.7	36.0
Interest Expenditures	11.5	13.7	16.3	23.3	18.9	16.4	13.2	9.4	9.4
Non-Interest Expenditures	17.6	22.2	20.9	22.4	23.2	22.9	19.7	20.3	26.6
Personnel	7.2	8.8	7.9	8.6	8.4	8.5	6.7	6.5	6.6
Investment	1.8	2.0	2.0	2.4	2.5	2.0	1.9	2.0	2.1
Transfers (exc. interest exp)	6.1	8.5	8.1	8.4	9.4	10.2	7.0	7.6	9.2
Other current exp.	2.1	2.8	2.8	2.8	2.7	2.1	3.0	2.9	3.2
Budget Balance	-7.2	-11.7	-10.6	-16.5	-14.6	-11.3	-7.1	-2.0	-0.8
<i>Memo:</i>									
Interest Exp. / Total Tax Revenues (%)	68.9	72.5	77.3	103.6	87.1	69.5	62.9	42.7	33.3
Interest Exp / Investment Expenditures (%)	638.9	685.0	815.0	970.8	756.0	820.0	694.7	470.0	447.6
(*) Refers to the Consolidated Budget for 1998-2004.									
(**) Coding for the budget definitions have been changed after 2004.									
<i>Sources:</i> Ministry of Finance and Undersecretariat of Treasury.									

Interest burden necessarily claims a big share of the budget revenues. In fact, a comparison of the interest costs as a ratio of aggregate tax revenues –targeted and realized—discloses the structural constraints over the Turkish fiscal policy openly: Interest expenditures as a ratio of tax revenues reached 103.6% in 2001, and 87.1% in 2002. Under the crisis management targets, interest expenditures were fixed as 88.1% of the tax revenues in 2000, and 109% in 2001. In 2007, it was anticipated that the target of interest expenditures would be lowered to 30% of the tax revenue targets.

Thus, as the interest costs continued to claim an increasing portion of tax revenues over the 1990's, the main logic of the austerity program rested on maintaining the debt turnover via only primary surpluses. This led the fiscal authority to be deprived off the necessary funds to sustain public services on health, education, protection of the environment, and provision of social infrastructure.

As a result, the boundaries of the public space are severely restricted, and all fiscal policies are directed to securing debt servicing at the cost of extraordinary cuts in public consumption and investments. We see these trends clearly from Table 2 above. If one focuses on non-interest

expenditures, it can be understood that such expenditures have increased as a ratio to the GNP from 13.4 percent in 1990 to 23 percent in 2003. Much of this increase, however, has been due to the unprecedented rise in the financing requirement of the social security institutions. As a ratio to the GNP, transfers to the social security institutions were marginal until 1999, at less than 1 percent. After then the deficits of the social security institutions rose rapidly and reached 5.2 percent to the GNP in 2006.

All of these meant a heavy toll on the needed public investments on health, education and public infrastructure. Within total expenditures, public investments' share has fallen from 12.9 percent in 1990, to 5.1 percent in 2003. As a ratio to the GNP, public investments stand at less than 2 percent currently. From Table 2 we calculate that in 2003 interest expenditures reached 7.4-folds of public investments. The burden of interest costs on public funds is immense and needs acute attention.

All of these painful adjustments on the fiscal front can be contrasted against the "gains" on the indebtedness front. In Table 3 we document the relevant data on the debt position of the public sector over the "IMF era". Data reveal that, as a ratio to the GNP, gross public debt of the aggregate public sector has fallen from 68.1% in 2000, to 63.1% by the end of 2006. Thus the achieved fall in the public sector debt burden despite the very rapid raise in the rate of growth of GNP (7.2% per annum over the whole period), and the very strict fiscal austerity measures of primary surplus targets (of 6.5% to the GNP for 2002 and beyond), has been only 5 percentage points to the aggregate GNP. Furthermore much of this decline has come only after 2005, and *all of it* is due to the decline in the ratio of *foreign debt* to the GNP. As a ratio to the GNP, public external debt has declined from 25.2% in 2000 to 16.9% in 2006; while the *domestic debt* burden has *increased* from 43.1% to 46.2% over the same period. It is a clear fact that the illusion of falling foreign indebtedness is a direct outcome of the real appreciation of the Turkish Lira. As the increased external indebtedness of the public sector from \$47.6 billion in 2000 to \$69.6 billion in 2006, its ratio to the GNP had the effect of a fall when denominated in appreciated Liras.

Table 3. Public Sector Net Debt Position (As Ratios to the GNP, %)

	2000	2001	2002	2003	2004	2005	2006
As % Ratio of the GNP:							
(1) Total Public Sector Debt (Gross)	68.1	107.3	93.4	83.2	77.3	71.6	63.1
Domestic Debt	43.1	71.1	56.3	56.4	54.5	52.9	46.2
Consolidated Budget	41	69.3	56.3	54.5	52.3	50.3	43.7
Foreign Debt	25.2	36.2	37.4	26.8	22.8	18.7	16.9
Consolidated Budget	21.7	31.6	33.8	24.8	21.5	17.8	16.3
(2) Net Public Assets of the Public Sector	11.1	16.8	14.9	12.9	13.4	16.3	18.2
Central Bank Net Assets	8.8	12.9	9.2	6.9	6.5	6.3	7.9
Public Sector Deposits	2	2.7	3.9	3.5	3.8	6.3	6.2
Unemployment Insurance Fund	0.3	1.2	1.8	2.5	3.1	3.7	4.1
Net Public Sector Debt (1) - (2)	57.0	90.5	78.5	70.3	63.9	55.3	44.9

Source: Undersecretariat of Treasury (www.hazine.gov.tr)

The appreciation of TL disguises much of the fragility associated with both the level and the external debt induced financing of the current account deficits. A simple purchasing power parity “correction” of the real exchange rate, for instance, would increase the burden of external debt to 76.8% as a ratio to the GNP in 2005.⁵ This would bring the debt burden ratio to the 2001 pre-crisis level. Under conditions of the floating foreign exchange regime, this observation reveals a persistent fragility for the Turkish external markets, as a possible depreciation of the Lira in the days to come may severely worsen the current account financing possibilities. This persistent external fragility is actually one of the main reasons why Turkey had been hit the hardest among the emerging market economies in the May-June 2006 turbulence (IMF, 2006).

II-3. Persistent Unemployment and Jobless Growth

Another key characteristic of the post-2001 Turkish growth path has been its “jobless” nature. The rate of open unemployment was 6.5% in 2000; increased to 10.3% in 2002, and remained at that plateau despite the rapid surges in GNP and exports. Open unemployment is a severe problem, in particular, among the young urban labor force reaching 26%. Table 4 tabulates pertinent data on the Turkish labor market.

⁵ Measured in 2002 producer prices. If the PPP-correction is calculated in 2000 prices, the revised debt to GNP ratio reaches to 82.3%.

Table 4. Developments in the Turkish Labor Market (1,000 persons)

	2000	2001	2002	2003	2004	2005	2006
15+ Age Population	46,209	47,158	48,041	48,912	49,906	50,826	51,668
Civilian Labor Force	23,078	23,491	23,818	23,640	24,289	24,565	24,776
Civilian Employment	21,581	21,524	21,354	21,147	21,791	22,046	22,330
Unemployed (Open)	1,497	1,958	2,473	2,497	2,479	2,520	2,446
Open Unemployment Ratio (%)	6.5	8.4	10.4	10.5	10.3	10.2	9.9
Disguised Unemployment ^a	1,139	1,060	1,020	945	1,223	1,714	2,087
Total Unemployment Ratio ^b (%)	10.9	12.3	14.1	14.0	14.5	16.1	16.9
<i>Civilian Employment by Sectors</i>							
Agriculture	7,103	8,089	7,458	7,385	7,400	6,661	6,809
Industry	3,738	3,774	3,954	3,821	3,988	4,360	4,429
Services	9,738	9,661	9,942	10,080	10,403	11,545	12,041
Source: Turkish Statistical Institute (TURKSTAT), Household Labor Force Surveys.							
a. Persons not looking for a job yet ready to work if offered a job: (i) Seeking employment and ready to work within 15 days, and yet did not use any of the job search channels in the last 3 months; plus (ii) discouraged workers.							
b. Total (open + disguised) unemployment accounting for the persons "not in labor force".							

The civilian labor force (ages 15+) is observed to reach 51.7 millions people as of 2006. On the other hand, the participation rate fluctuates around 48% to 50%, due mostly to the seasonal effects. It is known, in general that, the participation rate is less than the EU averages. This low rate is principally due to women choosing to remain outside the labor force, a common feature of Islamic societies, but its recent debacle depends as much on the size of the discouraged workers who had lost their hopes for finding jobs. If we add the TURKSTAT data on the *underemployed* people, the excess labor supply (unemployed + underemployed) is observed to reach 16.9% of the labor force by the end of 2006.

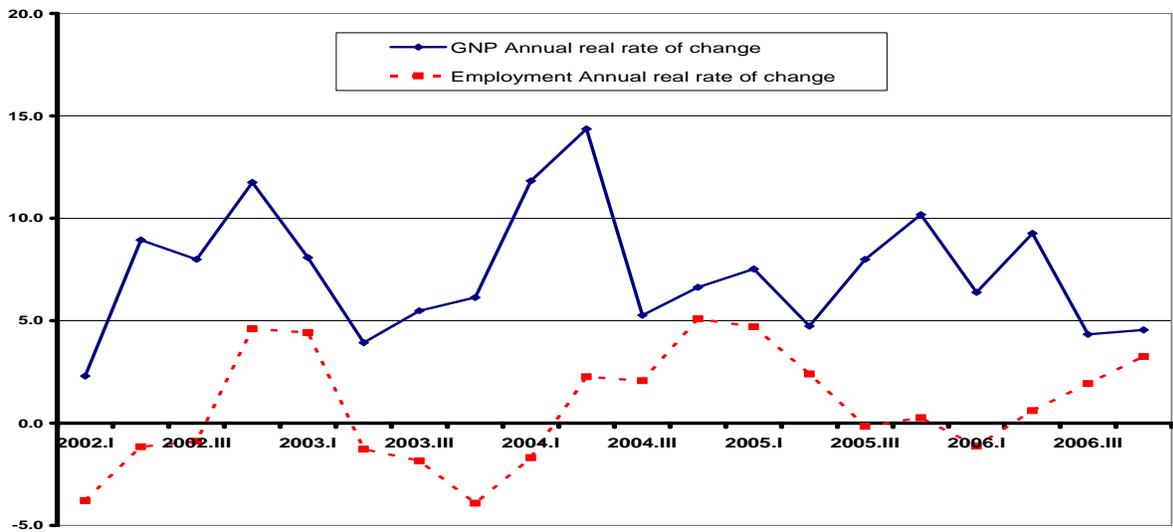
Yet the most striking observation on the Turkish labor markets over the post-2001 crisis era is the sluggishly slow performance of employment generation capacity of the economy. Despite the very rapid growth performance across industry and services, employment growth has been meager. This observation, which actually is attributed to many developing economies as well,⁶ is characterized by the phrase *jobless-growth* in the literature. In Turkey this problem

⁶ See, e.g., UNCTAD, *Trade and Development Report*, (2002 and 2003).

manifests itself in insufficient employment generation despite the very rapid growth conjuncture especially after 2002.

To make this assessment clearer, we plot the quarterly growth rates in real gross domestic product in Figure 4, and contrast the *y-o-y* annualized rates of change in labor employment. In order to make comparisons meaningful, the changes in labor employment is calculated relative to the same quarter of the previous year.

Figure 3. Annual Rate of Change in GDP and Aggregate Employment



Source: Turkish Statistical Institute (TURKSTAT), Household Labor Force Surveys.

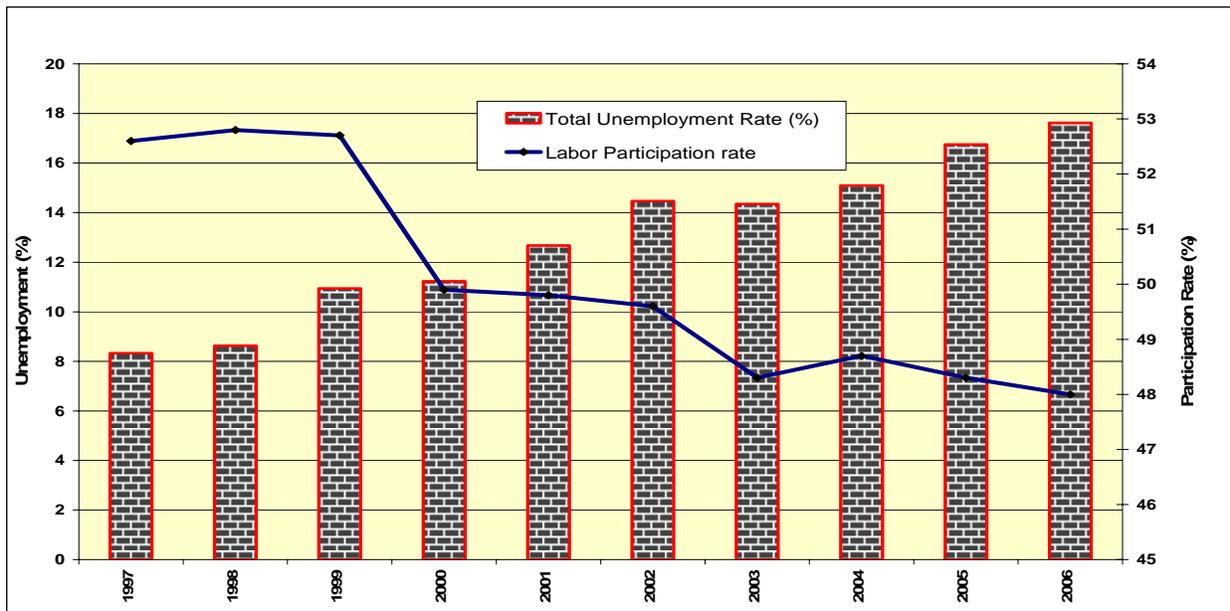
The figure discloses that between 2002.Q1 and 2006.Q4 the average rate of growth in real GDP was 7.2%. In contrast the rate of change of employment averaged *only* 0.8% over the same period. Over the twenty quarters portrayed in the figure, GDP growth was positive in all periods. Yet, labor employment growth was *negative* in 9 of those 20 quarters.

The sectoral breakdown of the post-crisis employment patterns reveals a massive depopulation in the rural economy. Agricultural employment has been reduced by 1,289 thousand workers since 2001. Against this fall, there had been a total increase of employment in the services sectors by 2,380 thousand, and by 655 thousand in industry. Simultaneous to this was

the overall expansion of the aggregate labor supply from 47.158 million in 2001 to 51.770 million in 2006, adding to the acuteness of the joblessness problem.

A further detrimental impact of the speculative-led, jobless growth era had been the overall decline in the labor participation rates. Even though lower than the comparable member countries of the European Union, labor participation rates were nevertheless above 50% during most of the 1990s. The participation rate declined to less than the 50% threshold first during the implementation of the 2000 exchange rate-based dis-inflation programme. It continued its secular decline over the rest of the decade and its trend is depicted in Figure 4.

Figure 4. Labor Participation Rate and Total Unemployment



Source: Turkish Statistical Institute (TURKSTAT), Household Labor Force Surveys.

Thus, two important characteristics of the post-crisis adjustment path stand out: first is that the post-2001 expansion is observed to be concomitant with a deteriorating external disequilibrium, which in turn is the end result of excessive inflows of speculative finance capital. Secondly, the output growth contrasts with persistent unemployment, warranting the term “*jobless growth*”.

The foregoing facts bring the following tasks to our agenda: (1) What are the viable policy choices in combating unemployment in the short run, and under the conditionalities of the “twin targets”? (2) Given our assessments of fragility conditions currently prevailing in Turkey, what are the short run effects of a reduction in the interest cost of the central bank credit in terms of output, employment, foreign indebtedness and other macro aggregates?

We now turn to the analytics of general equilibrium with the aid of our CGE model to study these questions.

III. Computable General Equilibrium Modeling Analysis

Given the overview of the recent macroeconomic developments, we now develop a real-financial computable general equilibrium (CGE) model for Turkey. Mainly based on the requirements of debt servicing, it has been argued by various observers that Turkey needs to continue running sizable primary surpluses over the medium to long term to lower its public debt burden, meet its (dis)inflation targets and “convince” markets that the debt is sustainable, for the risk premium embedded in interest rates on domestic debt to fall. Mostly based on this impetus, many researchers and financial rating agencies conducted a series of programming exercises to monitor the Turkish fiscal sustainability and its debt burden in the short-to-medium run.⁷ However, such exercises are often restricted to a partial adjustment framework, and do not go beyond an accounting check between the real rate of growth of the GNP, the interest rate, and the debt to GNP ratio. In fact, what is perhaps most notably lacking in these exercises is a general equilibrium framework where all macroeconomic variables are resolved in a consistent (Walrasian) system of flow equations describing production, expenditures on consumption and investment both by the private and the public sectors, savings and asset accumulation, the foreign economic relations, and the fiscal balances together with debt dynamics.

⁷ In one such study, Agénor (2001) reports that with an output growth rate of 5 percent, a real interest rate of 12 percent, and an inflation rate of 5 percent, a primary surplus of 3.5 percent of GNP would be needed to stabilize the Turkish debt-to-GNP ratio at 60 percent. More recently, Keyder (2003) carried out a similar exercise and, using detailed fiscal data, concluded that Turkey’s debt would come out to be sustainable on the condition that the real interest rate be reduced to 15 percent or less. Noting that at the time of her writing (March, 2003), the weighted-average real interest rate was around 25 percent, Keyder recommended strict continuation of the austerity policies programmed. In addition, various financial institutions and rating agencies carried out similar exercises almost on a monthly basis in their close monitoring of the Turkish fiscal stance. In those exercises, various combinations of low and high rates of growth and real interest rates are contrasted to a “plausible” benchmark scenario, and the resultant debt-to-GNP ratio is reported. See also IMF (2000), and World Bank (2000).

Our current model captures a number of features that we believe are essential to analyze the impact of disinflation and fiscal reforms on labor market adjustment and public debt sustainability. First, it provides a proper account of linkages between the financial and the real sectors. Next, the labor market is subject to a high degree of tax burden. Furthermore, there is a comparatively detailed financial system and credit market. We pay particular attention to the central bank's current inflation (targeting) policy with the effects on fiscal environment, production and labor markets and give emphasis to the financial sector issues such as high degree of exchange rate flexibility, external risk premium in the banking sector, dollarization of loans and bank deposits, the link between market interest rates and official policy rates, and interactions between credibility, default risk on government debt, and inflation expectations.

III-1. The Algebraic Structure of the Model and Adjustment Mechanisms

This section reviews various building blocks of the model. We consider, in turn, the production side, the labor market, income formation, saving and investment, the financial sector and asset allocation decisions, and the links between default risk, credibility, and inflation expectations.

Production

The model is fairly aggregate over its microeconomic structure but accommodates a relatively detailed treatment of the labor market, and of real-financial sector linkages. There are four production sectors as agriculture, industry, private services and public services. There is a financial sector with a full-fledged banking segment, a central bank, enterprises, government and household portfolio instruments.

The multi-level treatment of the production technology defines at the very top level a Leontieff specification over the value added and intermediate inputs to produce the gross output in each production sector:

$$X_i^S = \min \left[\frac{V_i}{b_{0i}}, \frac{a_{1i} X_i^S}{b_{1i}}, \frac{a_{2i} X_i^S}{b_{2i}}, \frac{a_{3i} X_i^S}{b_{3i}}, \dots \right] \quad (1)$$

where V_i is the value-added and a_{ij} 's are the input-output coefficients measuring sales from sector i to sector j . We have $i=j=\text{Agriculture, Industry, Private Services, and Public Services}$.

The value-added in each sector is generated by combining labor, as well as public and private physical capital.⁸ At the last stage of this multi-level production lies:

$$V_i = A_{Vi} J_i^{\alpha_i} K G_i^{1-\alpha_i} \quad (2)$$

where sector specific public capital $K G_i$ combines with the composite input J_i , under a Cobb-Douglas specification.

The composite primary input J_i , is defined to be a combination of private capital $K P_i$ and labor aggregate L_i through a constant elasticity of substitution (CES) type of production function:

$$C_i = \bar{A}_{Ci} [\beta_{Ci} L_i^{-\rho_{Ci}} + (1 - \beta_{Ci}) K P_i^{-\rho_{Ci}}]^{-1/\rho_{Ci}} \quad (3)$$

Under such specification of the production technology, the first order conditions of profit maximization derive the input demand functions for primary inputs of production. The quantity adjustment in the labor market defines the unemployment level:

$$UNEMP = \bar{L}^S - \sum_i L_i^D \quad (4)$$

Income Generation

For the household, the basic sources of income are returns to labor input, the wages, and returns to capital, distributed profits. The enterprise profits amounts to what is left over after paying wages and factor transfers, $R G$, to the government:

$$R P_i = P V A V_i - R G_i - (1 + pyr\text{ltax}_i) \bar{W}_i L_i^D \quad (5)$$

Profits from commercial bank activities, on the other hand are defined as the difference between the revenues from loans to firms (for investment financing in domestic currency) and households, income from holdings of government debt and interest payments on their

⁸ The public services sector is the exception since it employs only formal labor and public capital in the production of value added.

borrowings from the central bank and interest payments on both household deposits and foreign loans:

$$PROF^B = \text{int}LD(DomDebt_{-1}^E + DomDebt_{-1}^H) + \text{int}BGDI_{-1} - \text{int}RDomDebt_{-1}^E - \text{int}DDomDebt_{-1}^H - \text{int}DF\varepsilon_{-1}FDDom_{-1}^H - \text{int}FW\varepsilon_{-1}ForDebt_{-1}^B - \text{int}PFI^{ROW} \quad (6)$$

In Equation 6, $\text{int}LD$ represents the domestic bank lending rate and is defined as a premium over the marginal cost of funds in the banking sector. $\text{int}B$ is the return on government bonds; $\text{int}R$ is the cost of funds provided by the central bank to the domestic banking sector, $\text{int}D$ is the interest on domestic-currency denominated deposits whereas $\text{int}DF$ denotes the interest on foreign-currency denominated deposits. $\text{int}FW$ on the other hand, is the country-risk premium inclusive foreign interest rate.

Therefore household total income composes of returns to productive labor, YHW_{net} , retained earnings from private production activities, net of funds allocated to investment, $(1-shpinv)YEnet$, retained earnings from commercial bank activities, $PROF^B$, interest receipts on holdings of financial assets, $\text{int}DDD^H$, $\text{int}DFFDom^H$, $\text{int}FW^{RF}PFI^H$ and $\text{int}BGDI^H$, and government transfers including the transfers from the social security institutions, $GtrHH$, $SSltrHH$:

$$\begin{aligned} totYHH = & YHW_{net} + (1-shpinv)YEnet + GtrHH + SSltrHH + \varepsilon_{-1}ROWtrHH + PROF^B \\ & + \text{int}DDD_{-1}^H + \text{int}DF\varepsilon_{-1}FDDom_{-1}^H + \text{int}FW^{RF}PFI^H + \text{int}BGDI_{-1}^H \end{aligned} \quad (7)$$

Households save a fraction $0 < s^P < 1$ of their disposable income. The saving rate is considered to be a positive function of the expected real interest rate in domestic currency denominated deposits:

$$s^P = s_0^P \left(\frac{1 + \text{int}D}{1 + E[Inf]} \right)^{\sigma_{SAV}^H} \quad (8)$$

with $E[Inf]$, the expected inflation rate and with s_0^P , the scaling parameter. The portion of income that is not saved is allocated to consumption and that total flow of savings of the household is

channeled to the accumulation of household financial wealth, which also counts for the valuation effects on the stock of foreign-currency denominated deposits.⁹

Investment Behavior

As “fiscal prudence” is one of the most emphasized parts of the program as sketched in Introduction, government investment no longer treated to be policy variable of choice under the circumstances of the current Turkish economy. Therefore, in most of the policy settings, government investment is in a sense the “residual” variable, determined in consistency with the fiscal policy dominated by the primary surplus targets. Otherwise, it is taken as exogenous.

The private capital investment is assumed to depend on a number of factors: The first is the growth rate of real GDP, which captures the regular accelerator effect. This effect is positive. The next one is the negative effect of the expected real cost of borrowing from the domestic banks. Specifically, private investment demand is represented by:

$$\frac{PK \cdot P^{INV}}{NomGDP} = \left(1 + \frac{\Delta RealGDP_{-1}}{\Delta RealGDP_{-1}} \right)^{\sigma_{ACC}} \left(\frac{1 + \text{int } LD}{1 + E[INF]} \right)^{-\sigma_{INTL}} \quad (9)$$

where *NomGDP* and *RealGDP* are the nominal and real values of the gross domestic product, respectively, valued at market prices.

Financial Markets, Asset Allocation and Risk Premia

Household’s financial wealth is typically allocated to five different categories of assets: domestic money, H^D , domestic-currency denominated bank deposits held at home, DD^H , foreign-currency denominated deposits held domestically¹⁰, $FDDom^H$, holdings of government bonds, GDI^H , and portfolio investments abroad¹¹, PFI^H .

⁹ Note that accounting for the valuation effects on the stock of foreign-currency denominated deposits is associated with the changes in the nominal exchange rate, which turns out to be one of the crucial variables in the model.

¹⁰ By allowing households to hold foreign-currency denominated deposits in the domestic banking system, we try to represent the high level of dollarized liabilities in the Turkish financial system (See Table 1)

¹¹ Both residents’ portfolio investments abroad, PFI^H and non-residents’ portfolio investments at home, PFI^{ROW} are incorporated in the model in order to capture any real-economy effects of these “speculative” means, which we believe are important in understanding the growth pattern of the Turkish economy in the last decade.

Given the liabilities of the household, $DomDebt^H$, financial wealth of the household is defined as:

$$WT^H = H^D + \varepsilon FDDom^H + DD^H + GDI^H + PFI^H - DomDebt^H \quad (10)$$

where the accumulation of financial wealth should behave according to:

$$WT^H = WT^H_{-1} + PSAV + \Delta \varepsilon FDDom^H_{-1} \quad (11)$$

with $PSAV$ denoting private saving and with the term $\Delta \varepsilon FDDom^H_{-1}$, accounting for the re-valuation effects of the accumulated foreign-currency denominated stock of assets.

The household demand function for currency is positively related to consumption and negatively related to expected inflation and interest on domestic-currency denominated deposits, $intD$. It also depends negatively on the interest on foreign currency denominated deposits, $intDF$, adjusted for the expected rate of depreciation, $(1 + \Delta \varepsilon^{exp})$:

$$H^D = \frac{H^0 PRIVCON^{\theta_{CON}^H} (1 + E[Inf])^{-\theta_{inf}^H} (1 + intD)^{-\theta_{DD}^H}}{\left[(1 + \Delta \varepsilon^{exp})(1 + intDF) \right]^{\theta_{DF}^H}} \quad (12)$$

Household allocation on domestic vs. foreign-currency deposits is a function of the interest rate on domestic-currency denominated deposits as a ratio to the rate of return on foreign-currency denominated deposits held at home:

$$\frac{DD^H}{\varepsilon FDDom^H} = \mu_{DD}^H \left[\frac{(1 + intD)}{(1 + \Delta \varepsilon^{exp})(1 + intDF)} \right]^{\theta_{DD}^H} \quad (13)$$

If the accumulated portfolio investments of households abroad is taken to be a fixed fraction of total household financial wealth, then it becomes possible to express the demand for government bonds by households as a ratio to the interest-bearing wealth, as follows:

$$\left[\frac{GDI^H}{WT^H - (H^D + PFI^H)} \right] = \mu_{GDI}^H \frac{(1 + E[\text{int } B])^{\theta_{GDI}^H} (1 + \text{int } D)^{-\theta_{DD}^H}}{[(1 + \Delta \varepsilon^{\text{exp}})(1 + \text{int } DF)]^{\theta_{fd}^H}} \quad (14)$$

Apart from the portion of retained earnings of the enterprises allocated to investment, $YENetInv$, firms borrow both domestically and abroad to finance their investment plans:

$$PK P^{INV} = YENetInv + \Delta DomDebt^E + \Delta \varepsilon ForDebt^E - \Delta GDI^E \quad (15)$$

Equation 15 necessitates a decision on the allocation on the part of the firms, between funds to private investment and funds to government bonds, which, on one hand, depends on the average profit rate expected from production activities, and on the other, expected returns on government debt instruments. Such a specification should correspond to a version of a financial crowding-out effect as referred in the macro economic literature:

$$\frac{PK \cdot P^{INV}}{\Delta GDI^E} = \mu_{GDI}^E \left[\frac{(1 + E[\text{int } B])}{(1 + \text{avgRPR}_{-1})} \right]^{-\sigma_{GDI}^E} \quad (16)$$

Equation 16 also calls for defining a composition of demand for loans, which may be assumed to depend on the lending rates on each category of loans, domestic and foreign:

$$\frac{\varepsilon ForBor^E}{DomBor^E} = \phi_{DomBor}^E \left[\frac{(1 + \text{int } LD)}{(1 + \text{int } LF)(1 + \Delta \varepsilon^{\text{exp}})} \right]^{\theta_{DomBor}^E} \quad (17)$$

With $\text{int } LF$, the interest paid on foreign debt. The expression $\text{int } LF$ is equated to the country-risk premium inclusive foreign interest rate, $\text{int } FW$. To take into account the functioning of the commercial banking system as closely as possible, we assume that commercial banks in the model provide loans, both to households, $DomDebt^H$ and to firms, $DomDebt^E$; hold government bonds, GDI^E , and hold required reserves of the central bank, $ResReq$ on the asset side of their balance sheet. The domestic and foreign-currency denominated deposits, DD^H and

$FDDom^H$, borrowings from the central bank, $DomDebt^B$, borrowing from abroad, $ForDebt^B$ and portfolio investments from abroad, PFI^{ROW} constitute the asset side of the banks' balance sheet:

$$\begin{aligned} & DomDebt^H + Domdebt^E + GDI^E + ResReq - NW^B \\ & = DD^H + \varepsilon FDDom^H + \varepsilon ForDebt^B + DomDebt^B + \varepsilon PFI^{ROW} \end{aligned} \quad (18)$$

Among these financial instruments, the demand of commercial banks for government bonds as a ratio to net worth, for instance, is assumed to be positively related to the expected return on these bonds, $E[intB]$, and negatively related to the opportunity cost, which is the domestic lending rate, $intLD$:

$$\frac{GDI^B}{NW^B} = \phi_{GDI}^B \left(\frac{1 + E[intB]}{1 + intLD} \right)^{\theta_{GDI}^B} \quad (19)$$

The demand for foreign loans by commercial banks, then again, depends on the cost of borrowing from domestic households or central bank, in addition to the (premium-inclusive) cost of borrowing from abroad. The demand function then, can be specified as a function of the official interest rate, $intR$, and the foreign interest rate, $intFW$, adjusted for expected rate of depreciation¹²:

$$\frac{\varepsilon ForDebt^B}{NW^B} = \phi_{FD}^B \left[\frac{1 + intR}{(1 + intFW)(1 + \Delta\varepsilon^{exp})} \right]^{\theta_{FD}^B} \quad (20)$$

Banks set both deposit and lending interest rates. The deposit rate on domestic currency denominated deposits, $intD$, is set equal to the borrowing rate from the central bank, $intR$:

$$(1 + intD) = (1 + intR) \quad (21)$$

¹² The equation implies that if domestic and foreign borrowing are perfect substitutes, then the central bank's refinancing rate cannot deviate from the premium-inclusive, and expectations-adjusted, world interest rate, that is $(1 + intR) = (1 + intFW)(1 + \Delta\varepsilon^{exp})$.

The deposit rate on foreign-currency deposits at home, on the other hand, is set on the basis of the (premium inclusive) marginal cost of borrowing on world capital markets:

$$(1 + intDF) = (1 + intFW) \quad (22)$$

Following Agénor *et.al* (2006), the risk-premium inclusive foreign interest rate is formulated as a function of the (risk-free) world interest rate, $intFW^{RF}$, and an external risk premium:

$$(1 + intFW) = (1 + intFW^{RF})(1 + riskpr) \quad (23)$$

in which the risk premium is assumed to be a function of total foreign debt to exports ratio:

$$riskpr = contag + \frac{\kappa}{2} \left(\frac{\sum ForDebt}{\sum E_i} \right)^2 \quad (24)$$

In Equation (24), *contag* captures the characteristic changes in the “sentiments” in world capital markets. Domestic risk premium, *dompr*, is another factor that affects the bank lending rate over loans to households and firms. It is assumed to depend positively on the ratio of assets to liabilities of private firms. Therefore, the risk premium charged by the banks reflects the “perceived” risk of default on their loans to domestic firms in the model. The bank lending rate, *intLD*, in the last analysis is defined as a weighted average of the cost of borrowing from the central bank and the cost of borrowing from foreign capital markets. It also takes into account the (implicit) cost of holding required reserves:

$$(1 + intLD) = \frac{\left\{ (1 + intR)^{\kappa_{LD}^B} \left[(1 + intFW)(1 + \Delta\varepsilon^{exp}) \right]^{1 - \kappa_{LD}^B} \right\} (1 + dompr)}{1 - resreq} \quad (25)$$

Public Sector, Credibility and Expectations

Since the government debt instruments constitute a relatively significant share of the assets in the domestic financial markets in Turkey, modeling the interactions between the public sector and the central bank (the so called *fiscal dominance*) is one of the crucial concerns of this study.

The balance sheet of the central bank, on the asset side, consists of loans to commercial banks, $DomDebt^B$, foreign reserves (treated exogenously), FF , and government bonds held, GDI^{CB} . On the liabilities side, we have the monetary base, consisting of domestic supply of money and required reserves:

$$DomDebt^B + \varepsilon FF - NW^{CB} = H^S + ReqRes \quad (26)$$

The monetary base, then evolves according to:

$$H^S = H^S_{-1} + DomBor^B + \varepsilon \Delta FF + \Delta GDI^{CB} - PROF^{CB} \quad (27)$$

$PROF^{CB}$ above represents the net profits of the central bank and is given as the sum of interest receipts on loans to commercial banks, and interest receipts on its holdings of foreign assets and of the government debt. The *net worth* of the central bank is given by the following identity:

$$NW^{CB} = NW^{CB}_{-1} + PROF^{CB} + \varepsilon \Delta FF_{-1} \quad (28)$$

where the last term represents the valuation effects.

In order to rigorously characterize the main instruments of the current austerity program, the government's fiscal policy is basically centered around the primary balance:

$$PRIMBAL = GREV - GCON - GINV - GtrHH - GtrEE - GtrSSI \quad (29)$$

where $GREV$ denotes government revenues from taxes and net factor income, $GCON$ indicates public expenditures on consumption of goods and services, $GINV$ symbolizes government

investment and the last three terms stand for different types of transfer payments undertaken by the government.

The primary surplus policy of public revenues over public expenditures, together with the interest costs on the outstanding public debt stock defines the public sector borrowing requirement, *PSBR*:

$$PSBR = -[GREV - GCON - intFW^G \varepsilon ForDebt^G - intBDomdebt^G - GtrHH - GtrEE - GtrSSI] \quad (30)$$

which is financed by either an increase in foreign loans or by issuing bonds:

$$PSBR = \varepsilon \Delta ForDebt^G + \Delta DomDebt^G \quad (31)$$

therefore, making it able for us to trace the path of public domestic and foreign debt stocks.

However, one of the crucial variables in the model, as reflected in the current conditions of the Turkish economy is the interest rate on government bonds. The expected rate of return on this instrument is defined as:

$$E[intB] = (1 - PR^{default})intB \quad (32)$$

where $PR^{default}$ denotes the “subjective” probability of default on the current stock of public debt as perceived by the “markets”. This variable is set to depend on, among various alternative measures, the current debt stock to tax revenues ratio with a one-period lag:

$$PR^{default} = 1 - e^{-\gamma_0 \frac{(DomDebt^G + ForDebt^G)}{GTaxRev}} \quad (33)$$

The probability of default, $PR^{default}$, has also a further effect on inflation expectations in such a way that the less the probability of default that is perceived, the higher the chances for the “declared” inflation target to materialize. Following Agenor *et.al.* (2006) the expected inflation

rate is formulated as a function of the government’s “credibility indicator”, that is the inverse of the probability of default, $PR^{default}$, and the targeted rate of inflation in the previous period:

$$E[Inf] = (1 - PR^{default})Inf^{tgt} + PR^{default}Inf_{-1} \quad (34)$$

Note that, under such a setting, the demand for government bonds is affected by the probability of default. Private investors assign a non-zero probability of default in the current period. The expected rate of return will reflect the probability and will demand compensation in the form of higher nominal interest rates on government bonds. On the other hand, the larger the stock of debt, the higher the probability of default, and the higher the interest rate.

For a given probability of default, a continued increase in the supply of bonds will require an increase in interest rates to evoke investors’ demand. Next, an increase in the stock of debt will lead to a rise in the probability of default, which will also rise the prevailing interest rate on government bonds. Such a mechanism in the model tries to capture the structure of government trying to provide a signal of confidence to the markets under the current measures of the program.

III-2. General Equilibrium Analysis of Alternative Policy Environments

Now we utilize our CGE apparatus to provide a general equilibrium analysis of the macroeconomic policy alternatives under the *twin-targeters* (the primary surplus targeting fiscal authority and the inflation targeting central bank). As outlined in section II above, the post-2001 Turkish economy is characterized by a host of structural features: *first* is the severe decline of the employment elasticities and persistence of high unemployment. Despite rapid growth, labor employment has been meager at best and unemployment could not be reduced to the pre-crisis levels. This “jobless” characteristic of recent growth is in part due to the “speculative externalization” of the domestic economy, in particular the balance of payments-constrained production patterns in manufacturing. With increased import dependence and intensified (imported) capital substitution against labor, employment generation capacity of the domestic economy seems to have declined. Furthermore, labor markets also suffer from a relatively high tax burden on employment. Total tax burden on employers (payroll taxes plus social security

premiums and other surcharges) stands well above, for instance, the European Union averages and is also above most of the existing tax rates at comparable “emerging market” economies.

A *second* issue of concern is the high debt servicing burden of the public sector. Public debt, even though is measured to be on a declining trend as a ratio to the GDP, remains to be a critical concern for two reasons: (i) the relatively high interest costs on its servicing and (ii) the short term maturity of the debt stock. Furthermore, about a third of the existing debt stock is denominated in foreign monies, revealing a threat of liability dollarization (in the event of a possible “corrective” depreciation of the *Lira*). All of these are cast in an inflationary environment with entrenched expectations for more than three decades of *inertial* inflation. Under such conditions, the CBRT often found itself trapped in an “expectations game”, with an *ex ante* commitment to high real interest rates under the threat of capital flight.

Finally, the economy had become “addicted” to operate with a significant inflow of foreign liquidity emanating from the surge in the global financial markets. Availability of foreign finance capital with a significant risk appetite had been conducive in maintaining a steady supply of foreign exchange at relatively appreciating terms, thereby alleviating inflationary pressures. Yet, this came with the cost of increased foreign indebtedness and severed external fragility.

In what follows, we will focus on three sets of issues to depict three alternative policy environments: first we highlight the important role of the expanded foreign capital inflows in resolving (temporarily) the macroeconomic impasse between the *disinflation* motives of the CBRT and imperatives of *debt sustainability* and *fiscal credibility* of the ministry of finance. Secondly, we implement a “fiscally benign” monetary policy of reducing the interest rate charged by the CBRT. Third, we complement the interest rate reduction policy with a labor market reform and study the implications of reducing/eliminating payroll taxes (paid by the employers). In all of the policy simulations we exclusively focus on both the fiscal and financial adjustments, and study the possible dilemmas of gains in efficiency in the labor markets *versus* the loss of fiscal revenues to the state. Our simulation experiments are implemented as one-shot, comparative-static exercises. The results are tabulated in table 5 below. As valid for all types of modeling exercises of the current genre, the simulation results should not be taken as “forecast” of the future, but rather ought to be regarded as quantitative insights on the relevant macro economic outcomes of alternative policy environments.

Table 5. Experiment Results

	Base Year ("2003") data	EXP1: Effects of Increased Foreign Capital Inflows	EXP2A: Reduce CB Interest Rate	EXP2B: Reduce CB Interest Rate and Reduce Payroll Taxes
Macroeconomic Aggregates				
Real GDP (Bill 2003 TL)	369.700	369.765	370.283	375.631
Real Private Consumption (Bill 2003 TL)	255.022	263.259	250.255	256.549
Real Private Investment (Bill 2003 TL)	66.212	75.138	72.931	74.535
Merchandise Imports (Bill US\$)	69.378	76.307	70.240	70.910
Merchandise Exports (Bill US\$)	47.215	43.475	47.866	48.354
Current Account Balance (Bill US\$)	-9.201	-22.491	-9.234	-9.511
Unemployment Rate (%)	10.55	10.35	10.69	7.63
Average Profit Rate (%)	16.15	16.20	16.20	16.80
As Ratios to the GDP				
Private Consumption	68.98	71.10	67.60	68.80
Private Investment	17.91	20.30	19.70	20.00
Imports	28.06	29.70	28.39	28.35
Exports	19.09	16.92	19.34	19.33
Current Account Balance	-3.72	-8.75	-3.73	-3.80
Financial Rates and Prices				
Inflation Rate (CPI)	25.30	18.72	27.72	28.23
Expected Inflation Rate	17.65	18.83	16.58	16.79
Expected Depreciation Rate	41.66	41.78	41.56	41.58
Realized Depreciation Rate	-1.01	-9.52	0.98	0.97
CB Interest Rate (intR)	40.27	40.27	20.00	20.00
Interest Rate on Domestic Deposits (intD)	40.27	40.27	20.00	20.00
Interest Rate on Private Domestic Debt (intLD)	46.50	47.16	37.65	37.65
Interest Rate on Government Bonds (intB)	36.56	60.37	5.49	5.92
Expected Interest Rate on Gov Bonds (E[intB])	18.28	25.63	3.13	3.29
Risk Premium Incl. Foreign Int Rate (intFW)	3.41	4.09	3.24	3.23
Fragility Indicators				
Ratio of Gov Dom Debt to Tax Revenues	156.98	196.26	122.34	127.76
Government's Fiscal Credibility Index	0.50	0.42	0.57	0.56
Percieved Probability of Default on Gov Debt	0.50	0.58	0.43	0.44
Ratio of Foreign Debt to CB Foreign Reserves	235.87	264.88	223.08	223.77
Ratio of Foreign Debt to GDP	48.93	52.89	46.25	45.92
Risk Premium on Private Foreign Borrowing	1.39	2.10	1.20	1.20
Currency Substitution (FX deposits / Tot Deposits)	90.86	90.99	93.85	93.85
Monetary Aggregates (As Ratio to the GDP)				
Money Demand by HH	2.64	2.75	2.68	2.68
Domestic Deposits of HH	21.27	20.76	20.75	20.60
FX Deposits of HH	19.32	18.89	19.47	19.33
CB Foreign Reserves	0.21	0.20	0.21	0.21
Fiscal Results (As Ratios to the GDP)				
Government Aggregate Revenues	39.13	39.44	38.76	37.03
Government Tax Revenues	33.35	33.79	33.15	31.48
Government Consumption Exp	11.95	12.05	11.84	11.31
Government Investment Exp	4.36	4.53	4.16	3.20
Government Interest Exp.	16.60	42.40	3.99	4.13
PSBR	14.28	28.01	1.00	1.09
Primary Balance	6.50	6.50	6.50	6.50

EXP-1: Macroeconomics of Foreign Capital Inflows

The post-2001 Turkish economy has benefited from the recent surge of financial flows quite extensively. The increased buoyancy in the global financial markets led both to a fall in the rates of interest in the global markets and also served for provision of expanded liquidity, propelling consumption and investment expenditures. Mostly driven by the private portfolio flows, the net annual inflow of finance capital into the “new emerging market economies” totaled \$456 billion in 2005, before receding to \$406 billion in 2006.¹³ These magnitudes exceeded the previous peaks hit in the global financial markets before the eruption of the 1997 Asian crisis.

As outlined in section II above, Turkey too, had been one of the major beneficiaries of this financial glut. Balance of payments data indicate that *finance account* has depicted a net surplus of 103.3 billion over the “AKP period”, 2003 through 2006. About half of this sum (\$151.2 billion) was due to credit financing of the banking sector and the non-bank enterprises, while a third (\$32.8 billion) originated from *non-residents’ portfolio investments* in Turkey. *Residents* have exported financial capital at the magnitude of \$5.4 billion, and if one interprets the *net errors and omissions* term of the BOP accounts as an indicator of *domestic hot money flows* (see e.g. Boratav and Akyuz, 2004; Boratav and Yeldan, 2005), the total sum of *net speculative finance capital inflows* is calculated to reach \$36.2 billion over a period of three years. It is also observed that 64% of this total sum (net financial flows plus errors and omissions) was used for financing the current account deficit which had totaled \$71.8 billion over the same period; while 36% had been used for reserve accumulation of the CBRT.

The inflows of foreign finance had been conducive in supplementing the meager domestic savings through the recovery from the 2001 crisis. It also led to currency appreciation and enabled a general fall in the cost of living via availability of cheap imports. Thus, expanded inflows of foreign finance eventually lent strong support both to the CBRT and the ministry of finance in their attempts to disinflate and achieve fiscal solvency and credibility.

In this first policy experiment we first study the macroeconomic adjustment mechanisms against this continued inflow of finance capital into the Turkish economy. At the outset, it can be argued that there is nothing wrong with a strategy of tight monetary policy aimed at enhanced

¹³ See, e.g., Institute for International Economics, <http://www.iie.com>.

inflows of foreign capital. Our point here, however, is to document within a general equilibrium framework how risky and fragile the ongoing macro adjustments might be, with onerous consequences. To this end, we exogenously increase the total inflow of portfolio investments from abroad, PFI^{ROW} , by a factor of \$30 billion (roughly the realized net cumulative flow over 2003-2006). No change in the CBRT's current monetary policy stance is envisaged with respect to the level of interest rates and/or exchange rate administration.¹⁴ The exchange rate was left to full float to be determined by the free play of foreign exchange market transactors. Our results are tabulated under the column EXP-1 in Table 5.

The immediate effects of the increased inflow of foreign capital are felt in the currency markets. The exchange rate appreciates by 9.5% and cost savings on the import side lead to a fall in the inflation rate to 18.7%, from 25.3%. Appreciation of the exchange rate leads to rise in imports and the current account deficit widens to increase by about four-folds to reach \$22.5 billion in 2003 prices. As a ratio to the GDP, it increases to 8.7% from its base value of 3.7%. the domestic counterpart of the widening current account deficits is the expansion of private investment (by 2.4 percentage points as a ratio to GDP) and of private consumption (by 2.1 percentage points as a ratio to GDP). The monetary base expands by 20% and serves for the liquidity requirements of this expansion.

The aforementioned expansion of economy is limited, however, only to the private sector. Given the fiscal constraint on the primary surplus target, government's room for maneuver is limited on the expenditure side. This constraint becomes even more binding as the domestic economy continues to operate with a significantly high *real* interest burden. It has to be remembered that a critical feature of the simulated policy environment is that the CB continues to maintain its interest rate at the already high level. As the economy disinflates, however, the *real* cost of credit increases even further. The interest cost on government's debt instruments, in particular, expands to 60% from 36.3%. Government's interest expenditures as a ratio to the GDP rises to 25% and that of the public sector borrowing requirement (PSBR) increases to 28%. Increased interest expenditures lead to a widening of the fiscal deficit. Consequently there is a worsening of the fiscal credibility of the government. Credibility index

¹⁴ It has to be noted as a reminder, that the current rate of interest set by the CBRT is already significantly high in real terms. Maintaining high real rates of interest was, but one of the discretionary measures of the CBRT in an attempt to reduce inflation by curtailing domestic demand expansion, as well as to sustain the inflow of foreign capital to cover the widening current account deficit.

falls to 0.43 from its value of 0.50. The loss in fiscal credibility leads to a rise in the subjective probability of default as perceived by the private markets.

Thus, the main result of the scenario unveils an important dilemma for the post-2001 Turkish economy: a policy of maintaining high real rates of interest along with heavy reliance on foreign finance proves to be disinflationary, and it also has expansionary effects on the private sector. The net result is that the CBRT achieves relative success in controlling inflationary pressures. In the meantime, however, the increased debt burden strains the already fragile fiscal balances and results in further loss of fiscal credibility. The predicament of controlling price inflation via high real interest rates and enhanced foreign capital inflows on the one hand, and the imperatives of debt turn-over and fiscal credibility on the other, remains unresolved. This impasse is further accentuated with the rise of foreign indebtedness and consequent *external* fragility. As the results of EXP-1 suggest, stock of external debt increases both as a ratio to the GDP (from 48.9% to 52.9%) and to the foreign reserves of the central bank (from 235% to 264%). As a result of these adverse developments on external fragility, risk premium on the Turkish liabilities in the world markets increase by 6 percentage points. Clearly, the realized quandary is not to be resolved by reliance on foreign capital and tight macro management alone, and postponing the necessary adjustments on the domestic front simply lead to culminated pressures on the fiscal side as well as on the external balances.

EXP-2 Reduce the CB Interest Rate

Given the rather high costs of disinflation in terms of high fiscal and external fragility in the previous experiment, the natural policy question is to study the effects of a reduction in the interest rate charged by the CB. In general, the burden of the interest rates has a significant contractionary effect on the Turkish financial sector. As discussed in section 2 above, along with the ongoing appreciation of the domestic currency, the cost of CB liquidity is held responsible by many scholars for the external debt cycle and intensified inflows of speculative short term finance into the Turkish economy. There is a general call for reduction of the CB's rate of interest to escape the trap of speculative inflows of finance leading to appreciation and more inflows, with the consequent widening of the current account deficit and the rise of external indebtedness. Thus, in this experiment we reduce the CB interest rate by half. Again, as above,

no further change is envisaged, when experimenting with this simulation, in the policy instruments or in the parametrization of the exogenously set variables.

Note that via equation (21), the CB interest rate has a direct effect on the determination of the deposit interest rate of the domestic banks. Thus, *intD* is reduced by the same magnitude (50%) immediately. With declining rates of interest on deposits the banks find it possible to lower their credit interest rate charged to the enterprises. (*intLD* falls by 8 percentage points). Private investment expenditures increase by 1.9 percentage points as a ratio to the GDP.

The distinguishing adjustment mechanism at work is the *expenditure switching* of private consumption with investment. As private consumption expenditures are reduced by 2 percentage points as a ratio to the GDP, domestic savings could be generated to sustain the expansion in investments; thus, the net effect on the external balances remains modest. In other words, with a given level of domestic disposable income, an expanded level of investment demand could have been sustained. Thus, the current account balance is affected only marginally and the (nominal) adjustments in the exchange rate are revealed to be modest as well, with a realized depreciation of less than 1%.

What brings forth this adjustment in the private expenditure patterns is the inflation tax. Price inflation accelerates by 2.7 percentage points, and causes a downward shift of aggregate private consumption. The acceleration of inflation further strengthens the decline of the *real* interest cost for all agents of the economy, private and public. In fact, the relative buoyancy of the economy, along with the decline of the public interest expenditures, leads to an improvement in the fiscal balances. Of particular interest is the decline in the PSBR to less than 1% of the GDP, and the increase of the credibility index by 7 percentage points.

It is not clear, however, whether the CB would be willing to tolerate the resultant increase of the inflation rate, which turns out to be the crucial adjusting variable to bring forth the warranted adjustments in the real economy. Yet, a further issue is that even though the fiscal results of the policy are observed to be benign, the employment gains remain quite meager. Unemployment rate persists at above the 10.5% level, and it is to this problem we aim to tackle in the next experiment.

EXP-3: Complement CB Interest Rate Reduction with Labor Tax Reform

In this experiment we continue on the policy environment of the previous experiment and complement the CB's interest reduction strategy with a labor tax reform. Keeping the CB's interest rate at its reduced level (at half of the base run value), we now implement a further reduction on taxes paid by employers of labor.

Turkey has one of the highest tax burden on the labor markets. Employer-paid social security contributions averaged about 36% of total labor costs during 1996-2000; it has been argued that these high social security taxes create strong disincentives to job creation. More generally, many observers have called for a thorough overhaul of Turkey's social insurance system. Ercan and Tansel (2006) too, state that both the red tape and non-wage labor costs are higher in Turkey relative to, for instance, OECD averages. The authors consider the high tax burden on employment and high social security contributions among the institutional factors that contribute to the high level of unemployment and high level of undeclared work. Tunali (2003) indicates that employee contribution to social security system can be as high as 15% while employer in typical risk occupation contributes as much as 22.5%.

Thus in this experiment we study the implications of lowering the payroll tax paid by the employers on employment, production and fiscal balances. Maintaining the CB rate of interest at half of its base run value, we reduce the payroll tax by half, from its base rate of 19%. The lower tax revenues are not compensated by any other taxes. The results of the experiment are depicted under column EXP-3 in Table 5.

Clearly, the most important variable of this experiment is its effects on unemployment rate and the fiscal balances. Unemployment rate falls by around 3 percentage points, and the real GDP expands by 1.7% upon impact. We find, however, that the main adjustment falls on public investments and then on the price inflation. The first outcome is the direct result of the fiscal administration under the current austerity program. The logic of the fiscal balances is that, given the tax revenues and interest costs, the public sector is to maintain a primary surplus (of 6.5%) as a ratio to the GDP. Once this constraint is met the rest of the public expenditures are calculated. Thus, within the context of our experiment, as tax revenues are curtailed, the government finds it necessary to adjust public investments downwards. As % of GDP, public investments are observed to fall to 3.2% from its base value of 4.4% (a significantly low rate itself).

The effect on fiscal accounts is also emphasized in the ratio of government tax revenues against public debt stock. The aggregate tax revenues fall by almost 2 percentage points; yet, given the cost savings on the interest expenditures, the overall solvency of the public sector remain improved. Thus, the lower interest rate policy is enacted here as an important component of the labor tax reform policy. With a reduced interest burden over the public sector, the CBRT facilitates the fiscal authority to alleviate pressures on the fiscal balances that would have emerged as a result of reduced labor tax revenues. With accelerated growth in GDP and lower interest costs, the fiscal balances improve, with consequent gains in fiscal credibility.¹⁵

At the outset, the trade-offs as suggested by the simulation exercise under EXP-3 seem modest and not severely binding: at a loss of 2.9 percentage point increase of the inflation rate (from 25.3% to 28.2%), the gains in fiscal credibility and employment are found to be relatively robust. Given that under the macroeconomic adjustments of the experiment the external balances were not strained any further, equilibrium in the foreign exchange market seems to be maintained, as well.

IV. Concluding Comments and Policy Discussion

In this paper, we reported on the current state of the macroeconomic policy environment in the Turkish economy over the 2000s and studied the general equilibrium effects of two widely discussed policy changes in the current context: reduce payroll taxes and reduce the central bank interest rate. The current IMF-led austerity program operates with a dual targeting regime: a *primary surplus* target in fiscal balances (at 6.5% to the GDP); and an *inflation-targeting* central bank whose sole mandate is to maintain price stability. Accordingly both policy questions are analyzed within the constraints of the aforementioned dual targets set as outer conditionalities of Turkish macroeconomic decision making.

Our policy experiments reveal that the current monetary strategy followed by the CBRT that involves heavy reliance on foreign capital inflows along with a relatively high real rate of interest, is effective in bringing inflation down, yet it suffers from increased cost of interest burden to the public sector and strains fiscal credibility. It also leads to excessive foreign

¹⁵ Note, however, that this comparison is valid against the base run. One witnesses a slight loss in fiscal credibility relative to EXP-2.

indebtedness with increased external fragility. In the medium-long run, the increased fiscal and external fragilities along with a persistent and high unemployment manifest a severe impasse, whose resolution will likely to lead to onerous adjustments in the labor markets and the real sector. Against this background, we utilized the CGE model to search for applicable alternative policy regimes starting from the immediate short-run. Our results indicate that a *heterodox policy* of (i) reducing the central bank's interest rates; along with (ii) lowering the (payroll) tax burden in the labor markets offers a viable environment in the short run, with accelerated growth and improved employment outcomes. The first arm of the policy, *viz*, reduction of the CBRT interest rate, is important to facilitate the improvement in fiscal balance (and fiscal credibility) at a time when tax monies from labor taxes are expected to be reduced. The second critical element is lowering of the tax burden on employers. With lower payroll taxes levied on employment in production, the employers are led to increase employment demand (and also most probably be more willing to employ "formal" labor, and reduce the unrecorded activities along with informalization of the labor markets; issues that our model is not well-equipped to address).

With increased credibility of the public sector and lower rates of unemployment, the returns to the heterodox policy reform agenda are quite benign. However, all these come at visible opportunity costs; in particular on the inflation side. As lower interest rates boost domestic investment expenditures and the domestic economic activity is revived due to expanded employment, inflationary pressures accumulate in the commodity and financial markets. It is not so clear at the outset, how tolerant would the CBRT be to the acceleration in inflation. Even though our results are quite modest on the pace of both realized and expected rates of inflation, it is clearly an important constraint that merits to be observed closely in the Turkish macroeconomic environment. It is, in fact, mainly for this reason that we maintain some of the key features of the current austerity program with respect to expectations management *in the short run*. Of particular importance among these is the signaling effect of the primary surplus target. The policy environment of EXP-3 sets the fiscal balances with the programmed target of 6.5% primary surplus ratio to the GNP, rather than proposing a drastic break away from it. In fact, with a proper emphasis on dynamics, a direct case can clearly be proposed to stimulate domestic investment expenditures with a policy of lower interest rates, and advocating a fiscal policy of high public investments toward enhancing human capital formation and social infrastructure. Rather than cutting public investments on health, education and social

infrastructure, a case can be forwarded to *disregard* the rising PSBR to GDP ratio *in the short run*, and implement a fiscal policy to maintain a level of household income capable of addressing to the tasks of accumulating human capital. Yet, given the short run framework of our current modeling framework, we choose to abstain from making *ad hoc* statements regarding the *dynamic* consequences of such a policy environment, an issue that had been dealt elsewhere more effectively (see, e.g. Gibson, 2005; Voyvoda, 2004; Voyvoda and Yeldan, 2004 and 2005, ISSA, 2005 and 2006).

Above all, our simulation experiments clearly underscore the importance of maintaining an integrated and coherent policy framework between the monetary and fiscal authorities. Given the acuteness of the perceived dilemmas on disinflation and fiscal credibility, the resolution of the current impasse will surely necessitate a more tolerant view over the programmed targets (on both inflation and the primary surplus ratio) as well as a coherent and a mutually supportive macro policy design. Furthermore, there is a clear case for the acute need to design viable policies to diminish the exposure of the domestic economy (in particular of the financial markets) to short term, speculative foreign capital. This, in turn, may necessitate implementation of capital management techniques to gear inflows towards longer maturities.

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Financial T-Accounts (Billions TL, 2002)		Financial T-Accounts (Billions TL, 2003)	
Households		Households	
Assets		Assets	
Cash in circulation, H ^d	6,889,360	Cash in circulation, H ^d	9,775,116
Domestic Bank Deposits in TL, DD ^h	58,003,437	Domestic Bank Deposits in TL, DD ^h	78,626,815
Domestic Bank Deposits in FX, ER*FDDom ^h	74,694,149	Deposits at Domestic Banks, in FX, ER*FDDom ^h	71,436,742
GDI's purchased by households, GDI ^h	23,387,293	GDI's purchased by households, GDI ^h	39,548,323
Portfolio Investments of hh's Abroad		Portfolio Investments of hh's Abroad (net)	
Liabilities		Liabilities	
Borrowing from banks, DomDebt ^h	6,638,109	Borrowing from banks, DomDebt ^h	12,994,916
Net Financial Wealth, WT ^h	156,336,130	Net Financial Wealth, WT ^h	186,392,080
Firms		Firms	
Assets		Assets	
Private capital stock, PK*KSup ^E	812,482,855	Private capital stock, PK*KSup ^E	878,694,906
Firms' GDI Holdings GDI ^E	9,779,884	Firms' GDI Holdings GDI ^E	17,982,411
Liabilities		Liabilities	
Domestic Debt Stock, DomDebt ^E	29,032,709	Domestic Debt Stock in TL, DomDebt ^E	41,981,166
Foreign Debt Stock, ER*ForDebt ^E	50,528,899	Foreign Debt Stock, ER*ForDebt ^E	54,943,553
NET Worth, NW ^E	742,701,131	NET Worth, NW ^E	799,752,598
Commercial Banks		Commercial Banks	
Assets		Assets	
GDI's purchased by banks, GDIB ^B	76,914,142	GDI's purchased by banks, GDIB ^B	92,592,321
Loans to firms, DomDebt ^E	29,032,709	Loans to firms, DomDebt ^E	41,981,166
Loans to households, DomDebt ^H	6,638,109	Loans to households, DomDebt ^H	12,994,916
Reserve Requirements, ResReq	9,350,316	Reserve Requirements, ResReq	9,973,767
Total Assets	121,935,276	Total Assets	157,542,170
Liabilities		Liabilities	
Domestic Deposits, DD ^h + ER*FDDom ^h	132,697,586	Deposits at Domestic Banks, DD ^h + ER*FDDom ^h	150,063,557
Foreign Debt Stock, ER*ForDebt ^B	16,451,269	Foreign Debt Stock, ER*ForDebt ^B	21,853,909
Borrowing from Central bank, DomDebt ^B	191,190	Borrowing from Central bank, DomDebt ^B	84,514
Portfolio Investments from the ROW		Portfolio Investments from the ROW	
Total Liabilities	149,340,045	Total Liabilities	172,001,980
Net Worth, NW ^B	-27,404,769	Net Worth, NW ^B	-14,459,810
Central Bank		Central Bank	
Assets		Assets	
Loans to commercial banks, DomDebt ^B	191,190	Loans to commercial banks, DomDebt ^B	84,514
Foreign Exchange Position (net), ER*FF	-3,556,500	Foreign Exchange Position (net), ER*FF	767,000
GDI's Purchased by the Central Bank	39,788,371	GDI's Purchased by the Central Bank	44,263,645
Liabilities		Liabilities	
Cash in circulation, H ^d	6,889,360	Cash in circulation, H ^d	9,775,116
Reserve Requirements, ResReq	9,350,316	Reserve Requirements, ResReq	9,973,767
Net Worth, NW^{CB}	20,183,385	Net Worth, NW^{CB}	25,366,277
Government		Government	
Assets		Assets	
Total Public Capital	249,444,229	Total Public Capital	265,555,217
Liabilities		Liabilities	
GDI's, DomDebt ^G	149,869,691	GDI's, DomDebt ^G	194,386,700
Foreign Debt Stock, ER*ForDebt ^G	95,852,087	Foreign Debt Stock, ER*ForDebt ^G	104,113,669
Net Worth, NW^G	3,722,451	Net Worth, NW^G	-32,945,152
Row		Row	
Assets		Assets	
Total Foreign Debt of residents	162,832,255	Total Foreign Debt of residents	180,911,131
Portfolio Investments from ROW	0	Portfolio Investments from ROW	0
Liabilities		Liabilities	
Portfolio Investments of Households Abroad	0	GDI's, DomDebt ^G	0
Foreign Exchange Position (net), ER*FF	-3,556,500	Foreign Exchange Position (net), ER*FF	767,000
Net Worth, NW^r	166,388,755	Net Worth, NW^r	180,144,131

Combined SAM Definitions

	Factors				Agents' Current Accounts						Agents' Capital Accounts						Financial Flows					TOTALS					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21		22	23	24	25	
	Activities	Commodities	Labor	Capital	Households	Enterprises	Government	Domestic Banks	ROW	Central Bank	Households	Enterprises	Government	Domestic Banks	ROW	Central Bank	Currency	Dom. Dep.	GDI	Foreign Dep. Home	Portfolio Inv.	Domestic Credits	Foreign Credits	Reserve Req.	Foreign reserves		
1	Activities	Intermediate							Exports																	Total Sales Revenue	
2	Commodities	Inputs			Private Consumption		Public Consumption					Private Investment	Public Investment													Domestic Absorption	
3	Labor	Gross Wages																								Labor Income	
4	Capital	Operating Surplus + Depreciation																								Capital Income	
5	Households			Net Labor Income		Distributed Profits	Transfers to HH's + Interest Payment on Dom. Debt held by HHs	Interest Earning on HH's TL and FX Deposits	Remittances+Return on Portfolio Investments																	Private Income	
6	Enterprises			Capital Income			Transfers to SEE's	Private Foreign Transfers																		Corporate Income	
7	Government	Net Indirect Taxes on Production+ Payroll Taxes	Sales Taxes + Tariffs	Social Security Taxes by Workers		Direct Taxes + Non-Tax Rev	Public Sector Factor Income + Corp. Tax + Soc.Sec. Tax by Firms?	Taxes from Banking Sector ?	Public Foreign Transfers																	Public Income	
8	Domestic Banks				Interest Payment on Loans to HH's	Interest Payment on Loans to Enterprises	Interest Payment on Dom. Debt held by Dom. Banks																			Domestic Banks Earnings	
9	ROW		Imports			Interest payments on external debt+Profit Transfers Abroad	Interest Payment on Ext. Pub. Debt	Interest Payment on Ext. Debt of Banks+return on portfolio inv. Of row																		Foreign Exchange Earnings	
10	Central Bank						Interest Payment on Dom. Debt held by CB	Interest Payment on Dom. Debt of Banks	Payment on net foreign securities held																	Central Bank Earnings	
11	Households				Private Savings																					Household Savings (NW)+Liab	
12	Enterprises					Private Sector Retained Earnings																Domestic Loans to Enterprises	Foreign Loans to Enterprises			Enterprise Profits (NW) + Liab	
13	Government				Net Taxes on Wealth (- Expropriation)	Net Cap Tra. in Privatization	PUBLIC SAVINGS	Net Cap Trans for Privatization												GDI's by the Government						PSBR (NW)+ Liab	
14	Domestic Banks							Domestic Bank Profits	Net Cap Trans for Privatization									Domestic TL Deposits by HH's		Domestic FX Deposits by HH's		Portfolio Inv. from ROW		Foreign Loans to Domestic Banks		Dom. Bank Prof (NW) + Liab	
15	ROW								Foreign Resources													Portfolio Inv. of HH's Abroad				ROW Cur Account Surpl+Liab	
16	Central Bank									Profits CB																Foreign Reserves	
17	Currency										Cash Holdings by HHs															CB Profits (NW) + Liab	
18	Dom. Dep.										Domestic TL Deposits by HH's															Currency in Circulation	
19	GDI											GDI purchases by HH's		GDI purchases by Domestic Banks													Domestic Deposits
20	Foreign Dep. Home																										Public Domestic Debt
21	Portfolio Inv.																										FX Deposits Home
22	Domestic Credits																										Portfolio Investments
23	Foreign Credits																										Domestic Credits
24	Reserve Req.																										Foreign Credits
25	Foreign reserves																										Reserve Req.
																											Foreign Assets

Combined Macro SAM, Turkey, 2003 (Billions TL)

		Factors				Agents' Current Accounts					
		1	2	3	4	5	6	7	8	9	10
		Activities	Commodities	Labor	Capital	Households	Enterprises	Government	Domestic Banks	ROW	Central Bank
1	Activities		510,187,304							98,496,338	
2	Commodities	278,878,198				245,085,448		44,192,468			
3	Labor	112,726,802									
4	Capital	169,553,793									
5	Households			104,425,155			121,570,594	65,422,805	25,910,520	1,090,079	
6	Enterprises				169,553,793			5,155,201		7,196,707	
7	Government	47,524,849	29,957,482	8,301,647		28,370,862	30,510,587				
8	Domestic Banks					3,086,721	13,500,210	28,121,947			
9	ROW		110,334,367				2,125,513	6,624,215	561,553		0
10	Central Bank							14,547,734	88,903		
11	Households					41,876,121					
12	Enterprises					38,008,460	14,198,797	-31,213,469	18,147,901	12,862,525	14,636,637
13	Government					3,867,661	428,800	-19,398,942			
14	Domestic Banks								18,147,901		
15	ROW									12,862,525	
16	Central Bank										14,636,637
	Other Changes and Revaluation Accounts					-7,952,511	-23,359,382	-21,565,122	-5,202,941	892,850	-9,453,745
17	Currency										
18	Dom. Dep.										
19	GDI										
20	FX Dep. Home										
21	Portfolio Inv.										
22	Domestic Credits										
23	Foreign Credits										
24	Reserve Req.										
25	Foreign reserves										

Combined Macro SAM, Turkey, 2003 (Billions TL) Continued

Agents' Capital Accounts						Financial Flows										
11	12	13	14	15	16		17	18	19	20	21	22	23	24	25	TOTALS
Households	Enterprises	Government	Domestic Banks	ROW	Central Bank	Other Changes and Revaluation Accounts	Currency	Dom. Dep.	GDI	Foreign Dep. Home	Portfolio Inv.	Domestic Credits	Foreign Credits	Reserve Req.	Foreign reserves	
																Total Sales Revenue
	66,212,051	16,110,988														Domestic Absorption
																Labor Income
																Capital Income
																Private Income
																Corporate Income
																Public Income
																Domestic Banks Earnings
																Foreign Exchange Earnings
																Central Bank Earnings
												6,356,807				Household Savings (NW)+Liab
												12,948,457	4,414,654			Enterprise Profits (NW) + Liab
									44,517,009				8,261,582			PSBR (NW)+ Liab
								17,365,971			0	-106,676	5,402,639			Dom. Bank Prof (NW) + Liab
											0				4,323,500	ROW Cur Account Surpl+Liab
							2,885,756							623,451		CB Profits (NW) + Liab
2,885,756																Currency In Circulation
20,623,378																Domestic Deposits
16,161,030	8,202,526		15,678,178		4,475,274											Public Domestic Debt
-3,257,407																FX Deposits Home
0				0												Portfolio Investments
			19,305,264		-106,676											Domestic Credits
				18,078,875												Foreign Credits
			623,451													Reserve Req.
					4,323,500											Foreign Assets