Macroeconomics of *Twin-Targeting* in Turkey: A General Equilibrium Analysis*

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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 prevalent fragilities in the financial and commodity markets. We further utilize the model to study viable policy alternatives to the current Program over the medium run, spanning 2006-2010.

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, together with its virtual collapse to provide any social services to the citizens; a lopsided and volatile growth trajectory amidst rising unemployment, declining real wages, and deepened social exclusion and increased poverty. 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]

Under the deepening fragility, what triggered the crisis came from a controversial paper by Stanley Fischer[2], the then Deputy Director of the Fund. Mr. Fischer had argued, based on the experiences of the Turkish November 2000 and the Argentinean 2001 crises, that the currency regimes based on soft-pegs (as had been the case for Turkey under the IMF program) were not

[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).

[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.

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, created havoc and torpedoed 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 budget[3] 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.*

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 late 2005 the CBRT has announced that it will start full-fledged inflation targeting in January 1, 2006.

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[3] *I.,e.,* balance on non-interest expenditures andaggergate public revenues. The primary surplus target of the *central government budget* was set 5% to the GNP.

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 viable policy alternatives to the *twin-targeters* (the primary surplus targeting fiscal authority and the inflation targeting central bank). In so doing, we investigate, in particular, the (slippery) sources of the (speculative-led) growth, and also highlight the main indicators of culminating fiscal and financial fragility. To this end we construct a macroeconomic general equilibrium model and study the analytics of an alternative growth and employment oriented macroeconomic adjustment program.

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 macro aggregates are essential steps to understand the impact of the current austerity program on the evolution of output, fiscal 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. 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), Karadag and Westaway (1999), De Santis (2000), Voyvoda and Yeldan (2005), and Agenor *et. al.* (2005). Those of Lewis (1992), Yeldan (1998), and Agénor *et. al.* (2005) include a financial sector, whereas the others are "real" models focusing on tax and trade policy issues.

The current model captures relevant linkages between the fiscal policy decisions, private sector choices 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 external disequilibria interact with the domestic economy. We pay particular attention to fiscal issues such as a high degree of debt overhang and fiscal dominance; the link between public and private investments, 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/medium-run macroeconomic conditions of Turkey. 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 stagnated in 1998 with 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 by 8.9% and 7.4%, in 2004 and 2005, respectively, in real terms. 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 8.2% 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, and export revenues have reached $76.6 billions over 2005. Nevertheless, with the rapid rise of the import bill over the same period, the deficit in the current account reached $22.8 billion (or about 6.2% of GDP in 2005). The current account deficit continued to widen in 2006 and reached 6.6% as a ratio to the GNP by the first quarter. Table 1 documents the main macro indicators of the post-1998 Turkish economy under close IMF supervision.

Table 1. Basic Characteristics of the Turkish Economy, 1998-2005

	1998	1999	2000	2001	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
Consumption Expenditures								
Private	0.6	-2.6	6.2	-9.2	2.0	6.6	10.1	8.8
Public	7.8	6.5	7.1	-8.6	5.4	-2.4	0.5	2.4
Investment Expenditures	-3.9	-15.7	16.9	-31.5	-0.8	10.0	32.4	24.0
Private	-8.3	-17.8	16.0	-34.9	-7.2	20.3	45.5	23.6
Public	13.9	-8.7	19.6	-22.0	14.5	-11.5	-4.7	25.9
Exports	12.0	-7.1	19.2	7.4	11.0	16.0	12.5	8.5
Imports	2.3	-3.7	25.4	-24.8	15.7	27.1	24.7	11.5
Macroeconomic Balances (As Ratio to the GNP, %)								
Aggregate Domestic Savings	22.7	21.2	18.2	17.5	19.2	19.3	20.2	19.5
Aggregate Fixed Investments	24.3	22.1	22.8	19.0	17.3	16.1	18.4	20.3
Budget Balance	-7.0	-11.6	-10.9	-16.2	-14.3	-11.2	-7.1	-2.0
Public Sector Borrowing Requirement	9.2	15.1	12.5	16.4	12.6	9.4	4.7	0.9
Current Account Balance	1.0	-0.7	-4.8	2.4	-0.8	-3.4	-5.2	-6.2
Stock of Foreign Debt	55.4	71.0	63.4	92.7	77.5	57.1	50.4	46.9
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
Inflation (WPI)	71.8	53.1	51.4	61.6	50.1	25.6	11.1	5.9
Inflation (CPI)	84.6	64.8	54.9	54.4	44.9	25.3	10.6	8.2
Real Interest Rate on GDIs	29.5	36.8	4.5	31.8	9.1	15.4	13.1	10.4
Real Wage Growth Rates								
Private Sector	0.8	4.9	2.1	-20.1	1.1	5.1	3.9	3.0
Public Sector	4.6	22.5	17.2	-21.0	6.9	-1.1	2.9	1.3

Sources: SPO *Main Economic Indicators* ; Undersecreteriat of Treasury, *Main Economic Indicators;*

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 6.6%, 10.1%, and 8.8% over 2003, 2004 and 2005, respectively. 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 2.0% by 2005. Consequently, the public sector borrowing requirement (PSBR) as a ratio to the GNP fell from 16.1% to less than 1% over the same period.

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. As of end-2005, the rate of inflation stands at 5.9% for producer prices, and 8.2% for consumer prices. The CBRT has indicated its plans for following 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.

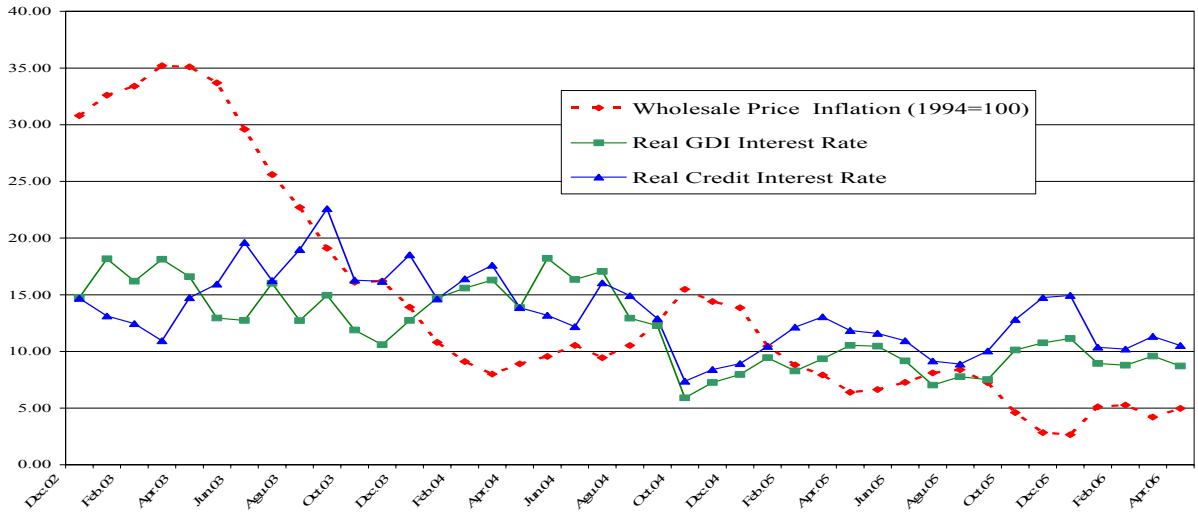
The Bank has announced that it will continue to use the overnight interest rates as its main policy tool to reach its target. It is stated explicitly that the "sole objective of the CBRT is to provide price stability", and that all other possible objectives are out of its policy realm.[4]

Despite the positive achievements on the dis-inflation front, rates of interest remained slow to adjust. The real rate of interest remained above 10% over mid-2006, 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 responsible in attracting heavy flows of short term speculative finance capital over 2003 and 2005. This pattern continued into 2006 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, is stagnant at the rate 16% despite the deceleration of price inflation. Consequent to the fall in the rate o inflation, the inertia of credit interest rates translates into increasing real costs of credit. (See Figure 1).

[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 (WPI, 1994=100) and Real Interest Rates



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).

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$ 170.1 billion by the end of 2005, as a ratio to the GNP it has created an illusionary tendency to fall when measured in the overvalued *Lira* units. The path of the real value of the Turkish Lira against the US$ is portrayed in Figure 2 below.

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

It can be argued that 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 2004 reaching a record-breaking magnitude of $15.4 billion, or 5.3% as a ratio to the aggregate GDP. The latest data indicate that by the end of 2005, the cumulative current account deficit has already reached $22.8 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 2% of 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 Consolidated Budget (In Fixed 1987 Prices)

	1998	1999	2000	2001	2002	2003	2004	2005
Total Budget Revenues	**37,138.6**	**40,427.0**	**42,193.3**	**50,912.3**	**39,163.9**	**38,836.4**	**41,205.5**	**40,660.5**
Total Tax Revenues	29,278.1	31,814.5	33,638.0	39,408.9	30,920.5	32,670.7	34,403.0	34,272.3
Total Non-Tax Revenues	3,875.4	4,048.1	4,424.9	7,357.3	5,638.4	3,967.8	5,585.5	5,541.3
Total Expenditures	**49,496.1**	**60,382.4**	**59,613.9**	**80,507.1**	**60,784.5**	**54,411.6**	**51,524.7**	**46,469.8**
Current Expenditures	16,413.1	19,686.7	17,247.9	20,232.1	15,852.3	14,883.2	15,187.3	
Personnel Exp.	12,281.0	14,855.8	12,664.9	15,086.7	11,972.4	11,699.6	12,414.1	10,240.1
Investment Expenditures	3,179.4	3,369.7	3,512.3	4,758.7	4,373.2	2,775.7	2,563.6	3,112.8
Interest Expenditures	19,595.5	23,042.2	25,941.9	40,724.3	26,896.3	22,704.9	19,260.2	14,683.8
On Domestic Debt	17,859.9	19,955.4	23,850.3	37,185.7	24,270.7	20,423.1	17,130.2	
On Foreign Debt	1,735.6	1,926.2	2,091.6	3,538.6	2,625.6	2,281.9	2,130.0	
Transfers to SEEs	507.5	895.8	1,124.4	1,098.0	1,125.2	728.7	452.6	
Transfers to Soc Sec Institutions	4,441.6	5,910.6	4,094.0	5,069.9	5,810.1	6,168.1	6,581.4	7,071.6
Budget Balance	**-12,357.5**	**-19,955.4**	**-17,420.7**	**-29,594.8**	**-21,620.6**	**-15,575.2**	**-10,319.2**	**-5,809.3**
Share in Total Expenditures (%):								
Current Expenditures	33.2	32.6	28.9	25.1	26.1	27.4	29.5	
Personnel Exp.	24.8	24.6	21.2	18.7	19.7	21.5	24.1	22.0
Investment Expenditures	6.4	5.6	5.9	5.9	7.2	5.1	5.0	6.7
Total Interest Payments	39.6	38.2	43.5	50.6	44.2	41.7	37.4	31.6
Transfers to SEEs	1.0	1.5	1.9	1.4	1.9	1.3	0.9	
Transfers to Soc Sec Institutions	9.0	9.8	6.9	6.3	9.6	11.3	12.8	15.2
Memo:								
Budget Balance / GNP (%)	-7.0	-11.6	-10.9	-16.2	-14.3	-11.2	-7.1	-2.0
Interest Payments on Dom Debt / Total Tax Revenues (%)	61.0	62.7	70.9	94.4	78.5	62.5	49.8	42.8
Interest Payments on Dom Debt / Investment Expenditures (%)	561.7	592.2	679.1	781.4	555.0	735.8	668.2	471.7

a. Fixed 1987 prices, Thousand YTL. Deflated by the WPI (1987=100)..

Sources: SPO *Main Economic Indicators* ; Undersecretariat of Treasury, *Treasury Statistics, 1980-2005.*

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—disclose the structural constraints over the Turkish fiscal policy openly: Interest expenditures as a ratio of tax revenues reached 103.3% in 2001, and 77.1% 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 2004, it was anticipated that the target of interest expenditures would be lowered to 59% of the tax revenue targets.

Thus, even though interest costs continued to claim an increasing portion of tax revenues over the 1990's, none of the governments showed the political will to tackle the problem of debt re-consolidation directly. Under conditions of maintaining the debt turnover via only primary surpluses, the fiscal authority has been deprived of any viable 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 22 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 2005.

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.

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 and it increased to 10.3% in 2002. The unemployment rate remained at that plateau despite the rapid surges in GDP and exports. Open unemployment is a severe problem, in particular, among the young urban labor force reaching 26%. Table 3 tabulates pertinent data on the Turkish labor market.

Table 3. Developments in the Turkish Labor Market (1,000 persons)

	2000	2001	2002	2003	2004	2005
15+ Age Population	46211	47158	48,041	48,912	49,906	50,826
Labor force participation rate (%)	49.9	49.8	49.6	48.3	48.7	48.3
Civilian Labor Force	23,078	23,491	23,818	23,640	24,289	24,565
Civilian Employment	21,581	21,524	21,354	21,147	21,791	22,046
Unemployed	1497	1967	2,464	2,493	2,498	2,520
Unemployment Ratio (%)	6.5	8.4	10.3	10.5	10.3	10.3
Underemployed	1,592.4	1,409.5	1,297	1,143	997	892
Underemployment Ratio (%)	6.9	6.0	5.4	4.8	4.1	3.8
Civilian Employment by Sectors						
Agriculture	7,103	8,089	7,458	7,385	7,400	6,493
Industry	3,738	3,774	3,954	3,821	3,988	4,281
Services	9,738	9,661	9,942	10,080	10,403	11,272

Source: Turkish Statistics Institute, Household Labor Force Surveys.

The civilian labor force (ages 15+) is observed to reach 50.1 millions people as of 2005. 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 the size of the discouraged workers who had lost their hopes for finding jobs. If we add the SIS data on the *underemployed* people, the excess labor supply (unemployed + underemployed) is observed to reach 13.1% of the labor force.

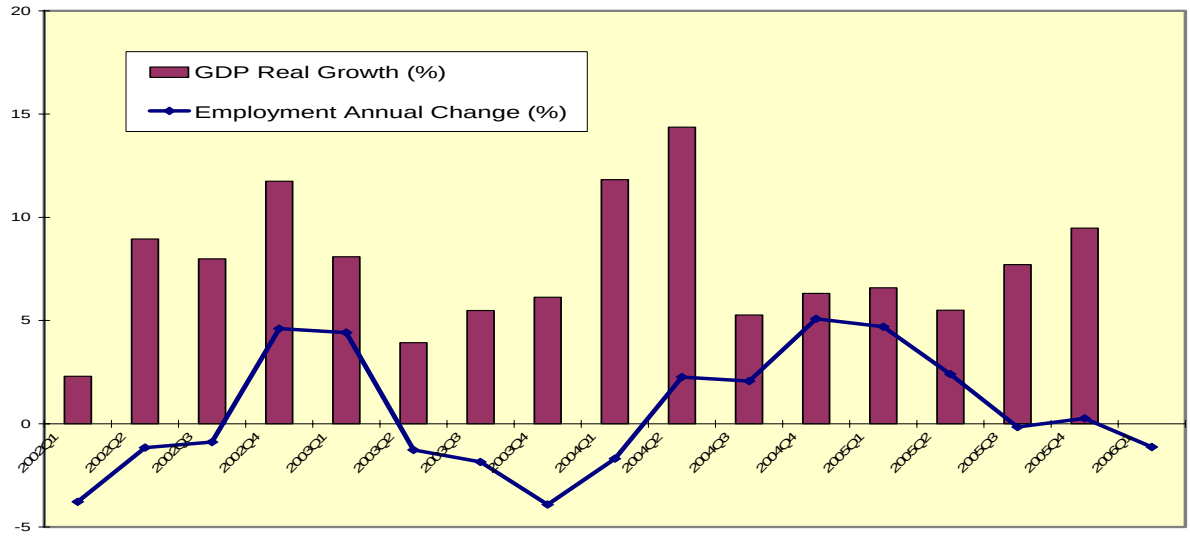
Yet the most striking observation on the Turkish labor markets over the post-2001 crisis era is the sluggishly slow performance of employment generation capacity of the economy. Despite the very rapid growth performance across industry and services, employment growth was minimal. This observation, which actually is attributed to many developing economies as well,[5] is characterized by the phrase *jobless-growth* in the literature. In Turkey this problem manifests itself in meager employment generation despite the very rapid growth conjuncture especially after 2002.

In Figure 3, we plot the quarterly growth rates in real gross domestic product and contrast the *y-o-y* annualized rates of change in labor employment. In order to make comparisons

[5] See, e.g., UNCTAD, *Trade and Development Repor*t, (2002 and 2003).

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



The figure discloses that between 2002.I and 2005.IV the average rate of growth in real GDP was 7.5%. In contrast the rate of change of employment averaged *minus 0.1%* over the same period. Over the sixteen quarters portrayed in the figure, GDP growth was positive in all periods. Yet, labor employment growth was *negative* in 9 of those 16 quarters.

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 if the current account deficit financing dries up? What will be the likely adjustment mechanisms and the role of the Central Bank in maintaining macro equilibrium? (2) Given our assessments of fragility conditions currently prevailing in Turkey, what could the elements of an alternative macroeconomic program be? How would such an alternative program fare against the current

IMF-led Staff Monitoring Program 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

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

Given the overview of the recent macroeconomic developments, fiscal policy and debt management and labor markets under the current macroeconomic prices, we develop a computable general equilibrium (CGE) model for Turkey. The CGE model presented in this study is a real CGE model disaggregated into nine production sectors, a labor market that is divided into formal and informal components and a fairly detailed account of the public sector. The model is built around a multi-sectoral social accounting matrix (SAM) of the Turkish economy based on a nine sector –agriculture, mining, consumer manufacturing, intermediates manufacturing, capital goods, energy, construction, private services, public services- input-output core of 2003.

We define sectoral capital and labor aggregates as primary factors of production. Gross output in each sector in turn, is produced by a representative firm employing intermediates and composites of primary inputs. The capital input is further disaggregated into its private and public components, which enter into the production process at different stages so as to reflect their relatively differentiated positions in the production of value added. Public capital is assumed to be fixed and sector specific (which is later updated by the sectoral allocation of aggregate public investments). Private capital is mobile across sectors and the movement is directed by the difference in the differentiated private profit rates among the production sectors. Labor input is also disaggregated into organized wage-labor and informal/marginalized labor categories. Nominal wage rate of the formal labor is assumed to be fixed and organized labor market clears through quantity adjustments on labor. Thus, unemployment variable in the model is defined to be the “unemployed” wage-labor which is mobile between the formal and informal categories.

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:

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

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=Agriculture, Mining, Consumer Manufacturing, Intermediates, Producer Manufacturing, Energy, Private Services, and Public Services*.

The value-added in each sector is generated by combining both formal and informal labor, as well as public and private physical capital.[6] At the last stage of this multi-level production lies:

$$V_i = A_{Vi} J_i^{\alpha_i} KG_i^{1-\alpha_i} \qquad (2)$$

where sector specific public capital KG_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_i and composite labor aggregate C_i through a constant elasticity of substitution (CES) type of production function, with a relatively low level of substitution:

$$J_i = \overline{A}_{Ji}[\beta_{Ji} C_i^{-\rho_{Ji}} + (1-\beta_{Ji}) KP_i^{-\rho_{Ji}}]^{-1/\rho J_i} \quad (3)$$

Finally, at the bottom of this multi-level specification lies the formation of the composite labor input with a relatively higher degree of substation in a CES type function:

$$C_i = \overline{A}_{Ci}[\beta_{Ci} LF_i^{-\rho_{Ci}} + (1-\beta_{Ci}) LI_i^{-\rho_{Ci}}]^{-1/\rho_{Ci}} \qquad (4)$$

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

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 formal unemployment level:

$$UNEMP_F = \overline{L}_F^S - \sum_i L_{F,i}^D \qquad (5)$$

which is defined to be the "mobile" labor force between formal and informal labor groups. Thus,

$$\sum_i L_{I,i}^D = \overline{L}_I^S + UNEMP_F \qquad (6)$$

The primary sources of income for the private household then compose of returns to both types of labor inputs, the wages, and returns to capital, the distributed profits. Private household's total income, on the other hand, consists of both primary income and secondary income categories:

$$totYHH = (1 - sstax).\overline{W}_F \cdot \sum_i LF_i^D + W_I \sum_i LI_i^D + EtrHH + GtrHH + SSItrHH + \varepsilon \cdot ROWtrHH \qquad (7)$$

In Equation 7, *GtrHH* and *SSItrHH* are government transfers to households and transfers from social security institutions. *ROWtrHH* represents the remittances.

With $\overline{W}_F$ and W_I representing the nominal wage rate of formal and informal labor types, the first two terms correspond to aggregate labor income of the private household. *EtrHH* is the net profit transfer of the enterprise income to private household and is defined by:

$$EtrHH = (1 - t_K)\sum_i RP_i - rttrrow\sum_i (1 - tk)RP_i + GtrEE + r^D DomDebt^G - r_E^F \varepsilon ForDebt^E + \varepsilon ForBOR^E \qquad (8)$$

Here, the first term is the enterprise profits left over after paying for both types of labor and profits to government. A constant portion, *rttrrow*, of the total profit income is distributed to rest of the world to represent net factor income of the foreigners in Turkey. *GtrEE* is the net transfer payment of the government to private enterprises, $r^D DomDebt^G$ is the interest payments of the

enterprise sector out of government domestic debt and $r^F ForDebt^G$ is the interest payments of the private enterprises for their already accumulated foreign debt. As ε represents the exchange rate variable, $ForBOR^E$ is the new foreign borrowing in foreign exchange terms of the private sector.

Private households save a constant fraction, s^p of their income. The residual aggregate private consumption then is distributed into sectoral components through exogenous (and calibrated) shares:

$$CD_i = cles_i . \frac{PRIVCON}{PC_i} \qquad (9)$$

where PC_i is the composite price of product i which consists of the unit prices of domestic and foreign commodities, united under the imperfect substitution assumption through an *Armingtonian* specification.

Likewise, aggregate public consumption is distributed into sectoral production commodities in fixed proportions:

$$GD_i = gles_i . \frac{GOVCON}{PC_i} \qquad (10)$$

Nonetheless, as the emphasis of the public fiscal policy is the budget surplus net of interest payments, the aggregate public consumption is specified to be a constant fraction of aggregate public income, net of interest payments on both the domestic and foreign public debt stocks:

$$GOVCON = gcr \cdot (\text{GREV} - \text{r}_{\text{F}}^{\text{F}} \varepsilon ForDebt^G - r^D \varepsilon DomDebt^G) \quad (11)$$

where *GREV* represents public revenues. *GREV* composes of direct taxes on wage and profit incomes and profit income from state economic enterprises. The income flow of the public sector is further augmented by indirect taxes on domestic output and foreign trade (net of subsidies) and sales taxes:

$$GREV = \sum_i tn_i . PX_i . XS_i + \sum_i tm_i \varepsilon P_i^w M_i + \sum_i te_i \varepsilon P_i^W E_i + \sum_i tva_i . PQ_i CC_i + ty \cdot totYHH + t_K \sum_i RP_i + \sum_i RG_i$$
(12)

In order to characterize and represent the current fiscal policy of primary surplus targeting, the government's fiscal balances are centered around the pre-determined level of the primary surplus variable, *PRIMBAL*:

$$PRIMBAL = GREV - GOVCON - GINV - GtrHH - GtrEE - GtrSSI \qquad (13)$$

Here, primary balance is defined to be the difference between government revenues and non-interest expenditures, namely government consumption (*GOVCON*), government investment (*GINV*) and all types of government transfers (*GtrHH* + *GtrEE* + *GtrSSI*).

If government transfer items to the households, to the enterprises and to the social security system are taken as fixed proportions of government revenues net of interest payments, then, under a pre-determined primary surplus/GDP ratio, public investment demand is settled as a residual variable out of the public fiscal accounts.[7]

The PSBR then, defined by

$$PSBR = GREV - GCON - GINV - r_P^G \square ForDebt^G - r^D DomDebt^G - GtrHH - GtrEE - GtrSSI \qquad (14)$$

and is either financed by domestic borrowing, $\Delta DomDebt^G$ or by foreign borrowing $\Delta \square ForDebt^G$.

In the last stage of the model definition, we state the market equilibrium conditions for each commodity *i*:

$$CC_i = CD_i + GD_i + IDP_i + IDG_i + INT_i \qquad (15)$$

[7] The fixed public investment, as a ratio to GDP has been decreasing steadily under the constraints of the current program. The ratio was 5.6% in 2001, which has gradually dropped down to 5.33% in 2002, 4.17% in 2003 and 3.63% in 2004.

that each commodity is demanded either for private or public consumption purposes, private or public investment purposes or as an intermediate good.

The model's closure rule for the savings-investment balance is to be defined by:

$$PSAV + GSAV + \square\ CAdef = PINV + GINV \quad (16)$$

The *CADef* in the equation above determines the current account balance in foreign exchange terms and equals to the export revenues, the remittances and private and public foreign borrowing on the revenue side and the import bill, profit transfers abroad and interest payments on the accumulated private and public debt stocks on the expenditures side:

$$\begin{aligned} CAdef &= \sum P_i^W E_i + ROWtrHH + ForBor^{E} + ForBor^{G} \\ &\quad - \left[\sum P_i^W M_i + trrow \sum (1 - tk) RP_i + r_E^F ForDebt^{E} + r_P^F ForDebt^{G}\right] \end{aligned} \quad (17)$$

The private and public components of the external capital inflows are fixed in their foreign exchange terms. The additional endogenous variable of the system to close is the private investments, *PINV*.

We assume such a real specification unreservedly models a central bank which is *passive* on exchange rate determination and on real interest rate determination. Hence, the CB is envisaged as *inflation targeting alone*. In the model we specify this trait of the monetary authority by fixing the aggregate price level of the modeled economy, and allowing the real exchange rate to adjust freely given foreign exchange flows. The real interest rate on the other hand, is hypothesized to be set at the external markets with, again, no role set for the monetary authority.

III-2. General Equilibrium Analysis of Alternative Policy Environments

III-2-1. The "Base Path, 2003-2010"

Now we turn to the applications of the CGE apparatus. Our first task is to characterize the realized growth path of the Turkish economy over 2003-2005. To this end we make the following stylized assumptions:

- The external flows are assumed constant over 2005-2010. The increase in foreign inflows throughout 2003-2005 is exogenously imposed to the model.
- Assume that the real interest rate is given via the external markets. Likewise, the fall in real interest rate during 2003-2005 is exogenously replicated.
- The real exchange rate is determined endogenously under flexible conditions.
- Wages of the formal/organized labor are kept constant in real terms.
- The rate of total productivity growth (of the industrial sectors) is set at 0.08 for 2004 and 0.02 for 2005. No further *significant* TFP growth is assumed over 2006-2010.
- The non-interest, primary, budget balance is constrained to 6.5% of GDP (IMF program assumption).
- Labor supply grows at a 2 percent rate per annum.
- Government capital investments are allocated at their historical paths, private capital flows are endogenously determined according to sectoral profit rate signals

Under these assumptions, the model is run over 2003-2010. The model-path for 2003-2005 is then contrasted with the historically realized values as observed in 2003-3005. The outcome of this validation exercise displays the models tracking ability of the historical path directly. We report over the following macro aggregates (see Table 4 for the model results on the base-path and validation):

Current account deficit

The model tracks the current account deficit as a ratio to the GDP quite closely. Given the exogeneity of the external flows, this task was relatively easy to accomplish. With the influence of relatively consistent growth rates of real GDP, the current deficit on the base path gradually recedes to 5.5% of GDP by 2010.

Unemployment rate

The rate of unemployment is one of the persistent problems of the Turkish growth path since 2003. The recent path of the Turkish economy is characterized with both a fall in real wage costs, as well as a rise in the productivity growth. Under these conditions the persistence of unemployment is a real puzzle, suggesting either an inconsistency in the official statistics, or a conjectural bottleneck that we cannot foresee at the time being.

Thus, the enigma of this "jobless growth" is one of the hardest aspects to model. Nevertheless, given the models flexibility in allowing adjustments of the exogenous flows, we could have generated the historical conditions to the extent possible. The unemployment path is depicted below in Table 4. As seen, given assumptions of the historical path, the extended base path generates an unemployment rate of approximately 8% by 2010. This is probably quite an optimistic scenario compared with the official estimates. For an evaluation, Table 5 below illustrates a set of selected variables from the "Medium-Term Program" of the State Planning Organization (SPO). As observed from the table, the estimates of the unemployment rate stay quite high even under much higher projections of the real GDP growth rate.

Public sector borrowing requirement and domestic debt

Given the strict application of the primary budget balance targets, the public sector borrowing requirement (PSBR) is observed to fall sharply and turn negative by 2006. This is rather in line with the projections of the SPO (See Table 5). Therefore under this contractionary environment the debt to GDP ratio falls secularly to reach 78% by 2007 and 64.5% in 2010. Likewise, interest payments on the accumulated stock of public debt gradually falls down to 5.9% in 2007 and 4.9% by 2010.

Rate of growth of GDP

The model results suggest a steady path with a 4.8% growth rate on average between 2006 and 2009 as opposed to the official estimate of 6.8% over the same period. This path in the model is the end result of significant import pressures and the overvaluation of the exchange rate under the generous external flows. Yet this path roughly follows the historical growth rates recorded for 2004, and to a lesser extend for 2005.

Table 4. Model Results: Historical Path and Scenarios

	Real GDP Growth Rate			
	Realization	**Base-Path**	**Scenario 1**	**Scenario 2**
2003	0.059			
2004	0.090	0.0834	0.0830	0.0889
2005	0.055	0.0595	0.0597	0.0563
2006		0.0462	0.0330	0.0605
2007		0.0469	-0.0033	0.0620
2008		0.0480	-0.0111	0.0621
2009		0.0482	-0.0234	0.0628
2010		0.0494	-0.0399	0.0489

	Real Interest Rate			
	Realization	**Base-Path**	**Scenario 1**	**Scenario 2**
2003	0.230	0.2819	0.2819	0.2819
2004	0.180	0.2255	0.2255	0.2255
2005	0.100	0.0902	0.0902	0.0902
2006		0.0812	0.2706	0.0812
2007		0.0812	0.2706	0.0812
2008		0.0812	0.2706	0.0812
2009		0.0812	0.2706	0.0812
2010		0.0812	0.2706	0.0812

	Current Account Deficit / GDP			
	Realization	**Base-Path**	**Scenario 1**	**Scenario 2**
2003	0.035	0.0404	0.0404	0.0404
2004	0.052	0.0483	0.0483	0.0480
2005	0.066	0.0684	0.0684	0.0682
2006		0.0656	0.0135	0.0646
2007		0.0629	0.0135	0.0610
2008		0.0602	0.0136	0.0576
2009		0.0576	0.0138	0.0544
2010		0.0550	0.0143	0.0520

	PSBR / GDP			
	Realization	**Base-Path**	**Scenario 1**	**Scenario 2**
2003	0.095	0.0961	0.0961	0.0961
2004	0.059	0.0755	0.0759	0.1101
2005	0.020	0.0006	0.0006	0.0386
2006		-0.0074	0.1062	0.0320
2007		-0.0107	0.1355	0.0306
2008		-0.0140	0.1749	0.0291
2009		-0.0176	0.2291	0.0276
2010		-0.0213	0.3060	0.0268

	Public External Debt / GDP			
	Realization	**Base-Path**	**Scenario 1**	**Scenario 2**
2003	0.276	0.2839	0.2839	0.2839
2004	0.229	0.2614	0.2621	0.2607
2005	0.178	0.2467	0.2474	0.2468
2006		0.2367	0.2395	0.2327
2007		0.2268	0.2403	0.2191
2008		0.2170	0.2430	0.2063
2009		0.2076	0.2488	0.1941
2010		0.1983	0.2591	0.1851

	Public Domestic Debt / GDP			
	Realization	**Base-Path**	**Scenario 1**	**Scenario 2**
2003	0.564	0.5258	0.5258	0.5258
2004	0.545	0.5725	0.5742	0.5711
2005	0.548	0.6116	0.6135	0.6449
2006		0.5875	0.5947	0.6445
2007		0.5558	0.7032	0.6370
2008		0.5217	0.8481	0.6285
2009		0.4856	1.0475	0.6187
2010		0.4471	1.3297	0.6162

	Unemployment Rate			
	Realization	**Base-Path**	**Scenario 1**	**Scenario 2**
2003	0.105	0.1055	0.1055	0.1055
2004	0.103	0.0951	0.0965	0.0931
2005	0.100	0.0976	0.0977	0.0995
2006		0.0965	0.0860	0.0930
2007		0.0924	0.1194	0.0846
2008		0.0890	0.1571	0.0780
2009		0.0843	0.1979	0.0708
2010		0.0778	0.2425	0.0696

	Domestic Interest Payments / GDP			
	Realization	**Base-Path**	**Scenario 1**	**Scenario 2**
2003	0.148	0.1482	0.1482	0.1482
2004	0.117	0.1291	0.1295	0.1288
2005	0.075	0.0552	0.0553	0.0582
2006		0.0477	0.1609	0.0523
2007		0.0451	0.1903	0.0517
2008		0.0424	0.2295	0.0510
2009		0.0394	0.2835	0.0502
2010		0.0363	0.3598	0.0500

Table 5. Selected Variables from the Medium-Term Program of the SPO

	2006*	2007	2008	2009
Real GDP Growth (%)	6.0	7.0	7.0	7.1
TFP Growth Rate (%)	1.5	2.1	2.2	2.3
Unemployment Rate (%)	10.4	10.5	10.6	10.4
PSBR / GDP (%)	-0.3	0.3	0.1	-0.7
Interest Payments on Public Debt / GDP (%)	8.2	6.7	5.6	4.5
Inflation (%)	5.0	4.0	4.0	-
Exchange Rate (TRY/$)	1.4502	1.4705	1.4806	1.4780
Current Account Deficit (billions $)	27.8	33.4	34.3	34.4
Current Account Balance / GDP (%)	-7.3	-7.9	-7.3	-6.6

** From the Proposal of the 9th Plan.*

The source of growth of the 2004 and 2005 gross domestic product in Turkey is yet another puzzle. Given the persistent unemployment and the significant pressure of imports, the source of current growth performance is one of the biggest challenges of any quantitative assessment of the Turkish economy. In this regard, given the algebraically stable characterizations of the production activities set in the model, the base-path to some extent falls short of tracking the historically realized path.

III-2-2. Scenario 1: Darkening External Environment

First we depict the fragility of the Turkish macroeconomic environment to external conditions, especially the sources of short term foreign finance. It is a warning shared by many economists that the 2006 is likely to witness a slow down in the growth of external finance available to the emerging markets and that the speculative bubble has likely reached its limits. Given this observation, Turkey may witness a fall in the availability of foreign finance in 2006 and beyond.

To study the effects of this phenomena we implement two exogenous shifts in the model:

(1) Reduce the stream of foreign flows to their pre-2003 level, i.e., to 1.3%-1.4% of the GDP.

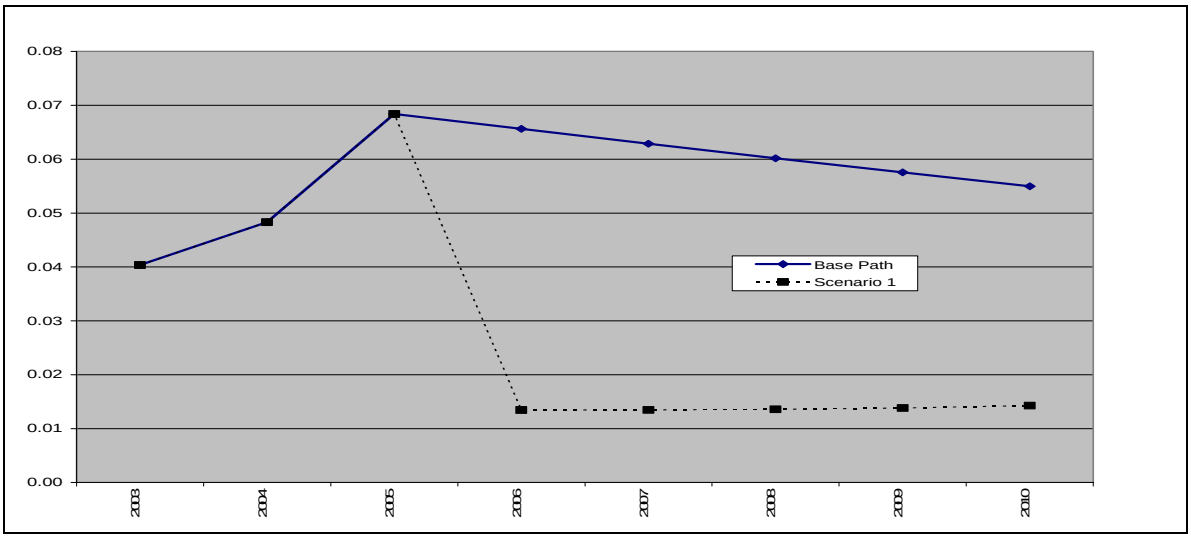
(2) Hypothesize that such a decline in external sources of finance will lead to the rise of the domestic interest rate also to its pre-2003 level, i.e. to 27%.

The model results are displayed in Table 4 above and also portrayed in a series of figures below.

The current account deficit

The fall in the availability of foreign finance leads to a significant cut in the current account deficit as a ratio to the GDP. The current account deficit falls to around 1.4% of the GDP. Observe that even though this results in a "spectacular" fall of the current account deficit, it nevertheless remains "negative", suggesting that the experiment results are still quite optimistic and does not necessarily reveal a "crisis" environment. In any event, even this modest and plausible decline in foreign inflows triggers a set of onerous adjustments as we witness below.

Figure 4. Current Account Deficit as a ratio to the GDP (Base Path and Scenario 1)

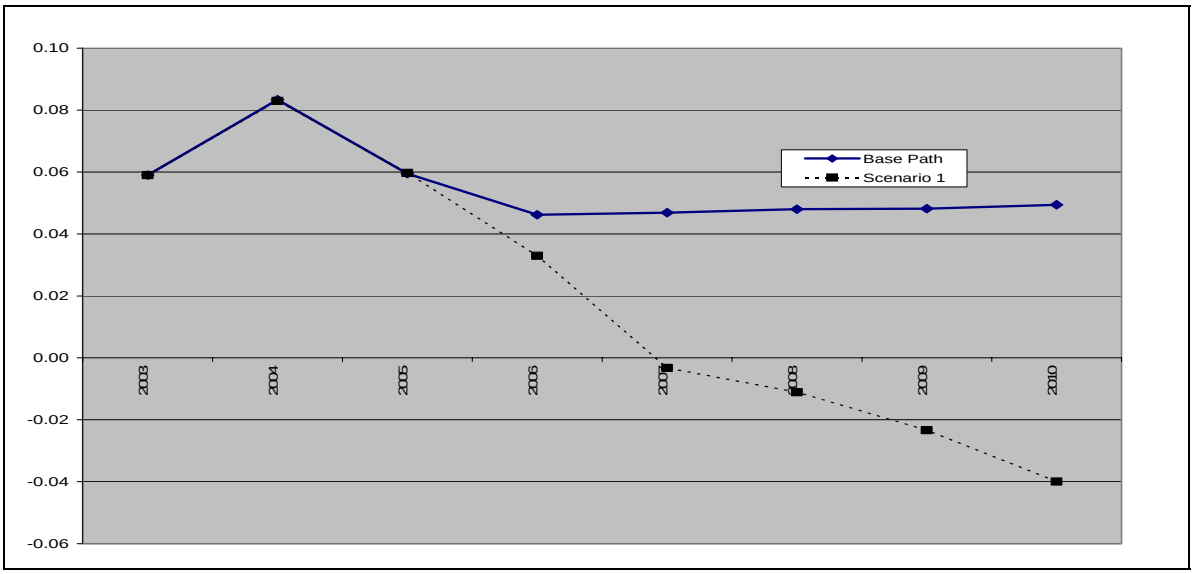


Growth of GDP

The GDP growth slows down considerably and is reduced to minus 1.1% by 2008 and minus 4% by 2010. This result is a direct outcome of both the decline in the availability of foreign exchange and the contraction of expenditures via exchange rate depreciation, and also is due to the significant rise of the real rate of interest forcing the government to reduce its expenditures even further in attempt to meet the primary budget balance target of the IMF (the 6.5% ratio to the GDP).

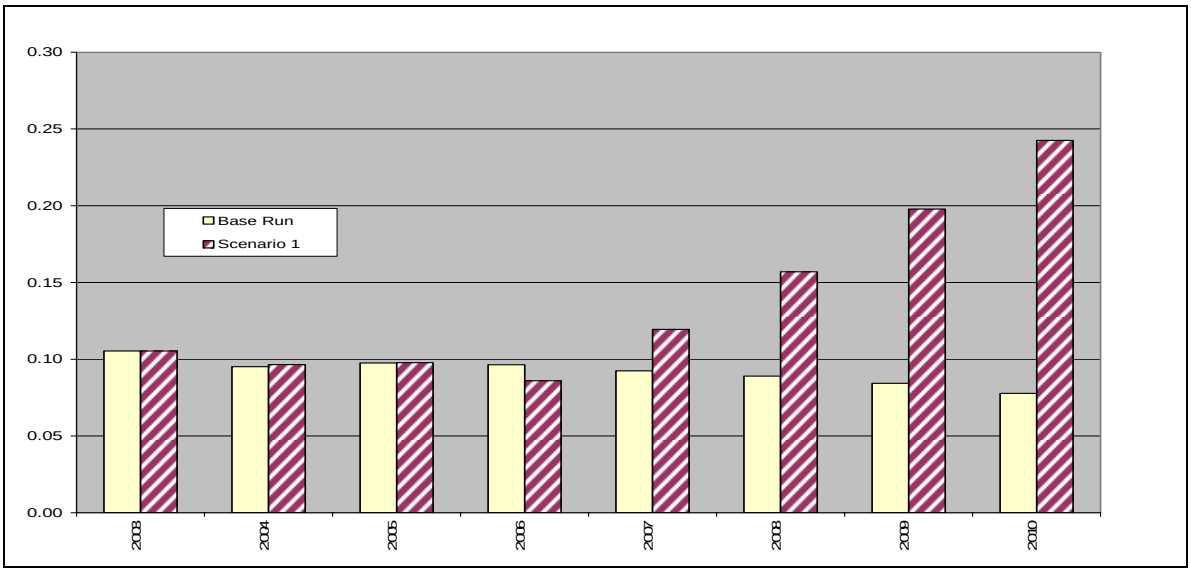
The deflationary macroeconomic environment manifests itself most feverishly with the rapid rise of the unemployment ratio. Open unemployment is observed to rise above 15% by 2008 and above 20% by 2010.[8] The deterioration of the labor employment brings a contraction in consumer demand and, through the multiplier process, leads to a downward adjustment of the aggregate expenditures further constraining production activities.

Figure 5. Real GDP Growth (Base Path and Scenario 1)



[8] The scenario maintains the base-path assumption that the real wage rate of the formal labor will be fixed throughout the modeling horizon. If the real wage rate is allowed to deteriorate, the unemployment ratio may lie below the suggested 15% and 20%marks. In both instances, however, the burden of adjustment will clearly lie on the labor markets.

Figure 6. Unemployment Rate (Base Run and Scenario 1)



Fiscal balances and public sector borrowing requirement

The rise in the real interest rate leads to acceleration of servicing costs of the public debt. In the absence of any counter-cyclical policy that could be initiated by the central bank, the money market is left to the discretion of the international arbiters with a consequent rapid rise of the interest rate. The rise of the real rate of interest has direct repercussions on public debt dynamics. Interest cost on public debt is observed to rise abruptly and reaches to more than a quarter of aggregate GDP by 2009. In contrast, interest costs were expected to be kept under control at about 5% of the GDP under the "business-as-usual" base-path.

The deterioration in the fiscal expenditures leads to a significant rise of the public sector borrowing requirement. The PSBR ratio reaches to almost 20% of the GDP by then end of 2008. Consequently the Turkish fiscal balances turn once again into a net debtor position with a debt to GDP ratio hovering around more than 100% by 2010 (see Table 4 above).

Figure 7. Public Debt Interest Costs / GDP (Base Run and Scenario 1)

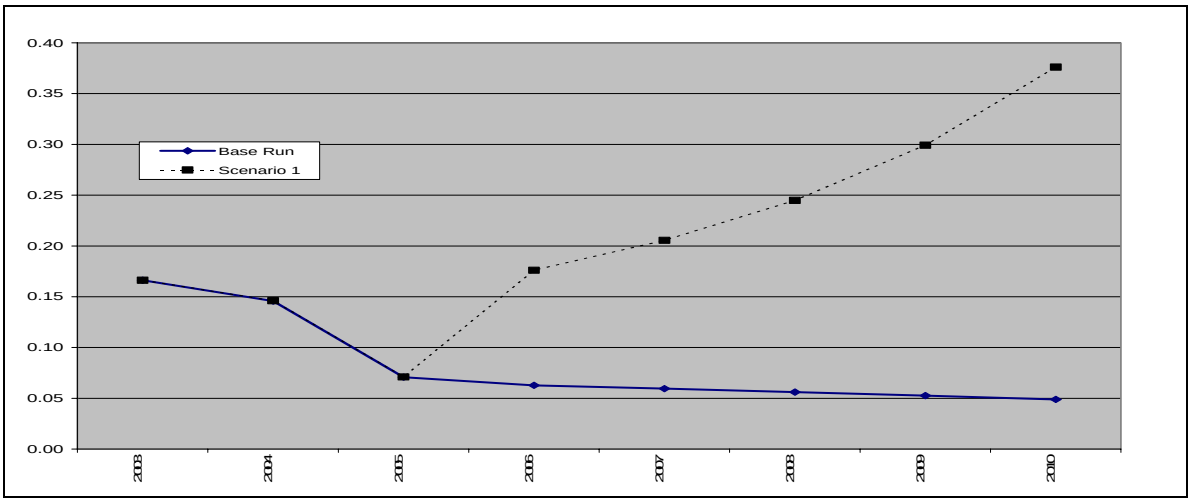
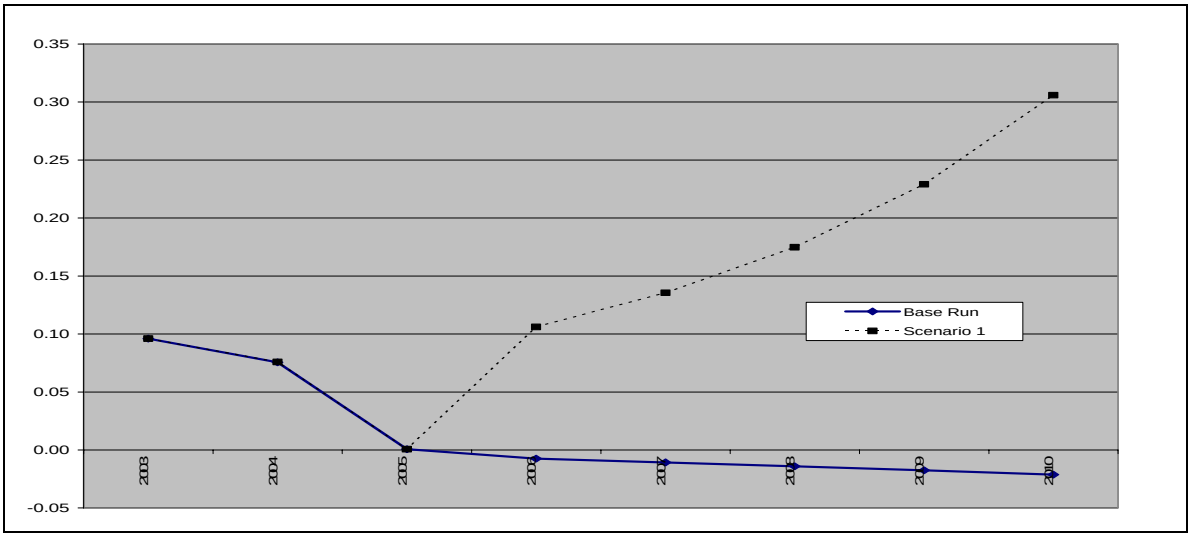


Figure 8. Public Sector Borrowing Requirement / GDP (Base Run and Scenario 1)



Note that the imposed constraint to maintain the 6.5% primary balance target precludes the government to conduct any viable anti-cyclical pro-active expenditure strategy either. The fiscal authority, constrained by the primary surplus target of the IMF program, is deprived off any adjustment role that it could have initiated against the external shock, and together with a central

bank which had a strict mandate of maintaining the inflation target and nothing else beyond, is bound to leave the domestic economy defenseless under such exogenous shocks of shrinking foreign inflows.

III-2-3. Seeking out Viable Policy Alternatives

Now we utilize the laboratory characteristics of the CGE apparatus to study alternatives of the current austerity programme. In the previous experiment we have observed that the Turkish economy was left defenseless against even an external shock of a very "modest" size. The macroeconomic response of the domestic market to a fall of the external finance to its pre-2003 level manifests how fragile the Turkish growth path is. In order to countervail this fragility and also to maintain a sustainable growth path for the economy, we now envisage the following scenario:

- Reduce the primary surplus target by half since 2003 (%3.2)
- Use the extra public "savings" as renewed public investments in social infrastructure by increasing investments on health and education services.
- Assume that the rise in public investments in social capital will increase the TFP productivity growth to reach 2% per annum (the 1970s average).[9]
- Maintain the exogenous specifications of the base-path with respect to foreign flows and the real interest rate intact.

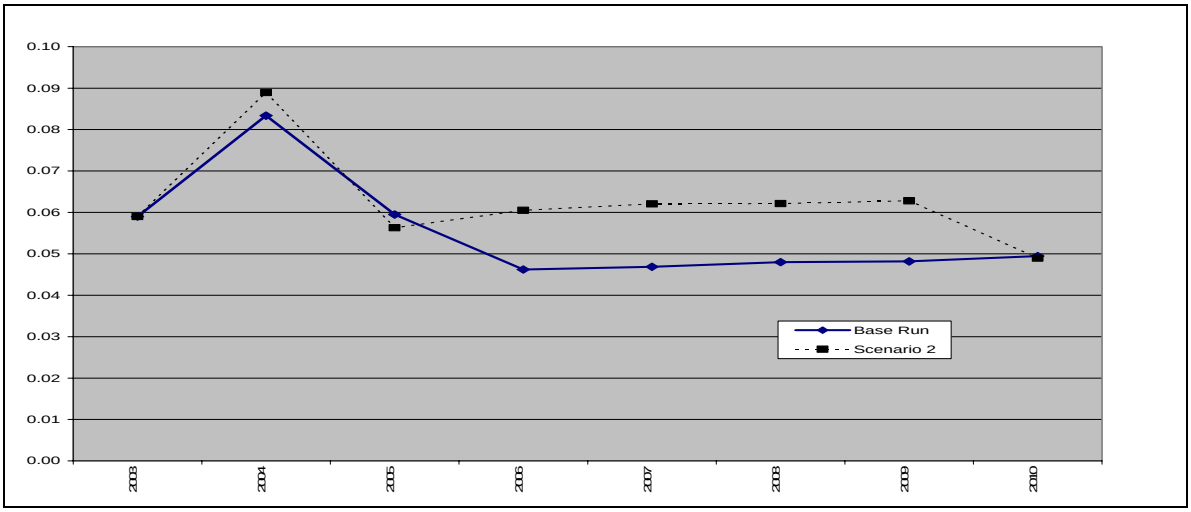
Admittingly, the assumptions of the Scenario 2 are quite arbitrary in its specification with respect to exogenous flows. Clearly the future time horizon is open to debate and it is virtually impossible to exhaust all possibilities on what the 2006 and beyond is likely to bring to the global and Turkish macroeconomic environment. Nevertheless, we decided to keep track of the base-path under an alternative specification as outlined above. The scenario, thus, responds to the following query: "*if the business-as-usual macroeconomic environment could have been*

[9] Public funds, especially allocated to social/productive spheres of the economy to maintain the social capital investments (on education, health, protection of environment…etc.) are among the mechanisms to achieve an endogenously-driven, sustainable growth pattern. Glomm and Ravikumar (1992), Barro (1991) and Jung and Thorbecke (2003) form a small set of many studies on the productivity of public spending/investments. Utilizing an endogenous growth model where public funds to education contribute to the formation of human capital of the future generations, Voyvoda and Yeldan (2005) study the trade-off between the short-term debt dynamics and the long-term growth.

maintained, could one envisage a superior policy environment to the current programme targets?"

We summarize the macroeconomic results of this alternative package also in Table 4 and portray some of the important variables in the figures below.

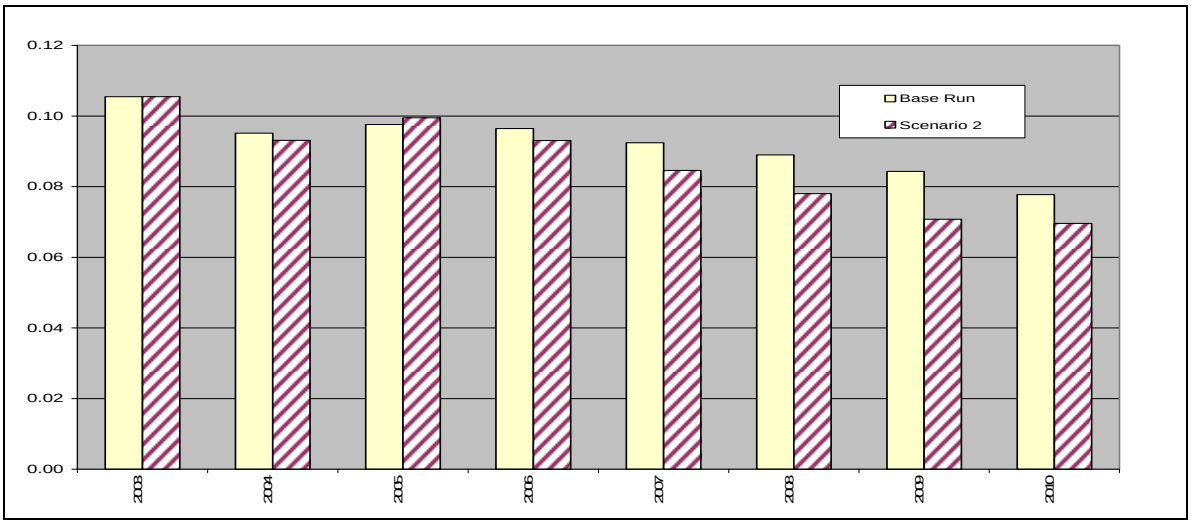
Figure 9. Real GDP Growth (Base Run and Scenario 2)



The GDP under the Scenario 2 environment maintains a more rapid rate of growth. The real growth rate instantly responds to changes in government fiscal policy and productivity and is observed to be on average one percentage point higher than the base-path.

The rise in GDP is the end result of two conditions: first, the rise in public investment expenditures; and second, the rise in productivity growth. The rise in public investment expenditures increases the volume of public services. Following the rationale of the Staff Monitoring Program that together with increasing social capital expenditures, the private expenditures are also increased, i.e., the private sector is "crowded in", the expansion also spreads to the private sector. The increase in output production calls for a rise in both types of labor demand and fixed real wages help the unemployment ratio to fall below the 7% mark by 2010.

Figure 10. Unemployment Rate (Base Run and Scenario 2)



The pro-active stance of the fiscal authority is thought to be complemented indirectly by an active central bank who is charged with maintaining not only by price stability, but also by maintaining a competitive real exchange rate, and directing the external flows into productive investments via capital controls, if necessary, against short-term speculative inflows.

The undesirable side of this alternative scenario is with respect to its results on the evolution of the debt dynamics. As the primary surplus target is reduced, Turkey continues to maintain its net debtor situation throughout the modeling horizon. The public sector borrowing requirement, even though reduced, still remains significant at about 3% of the GDP. Consequently the domestic debt stock as a ratio to GDP stabilizes at a path about ten –fifteen percentage points higher than the base run.

Figure 11. PSBR / GDP (Base Run and Scenario 2)

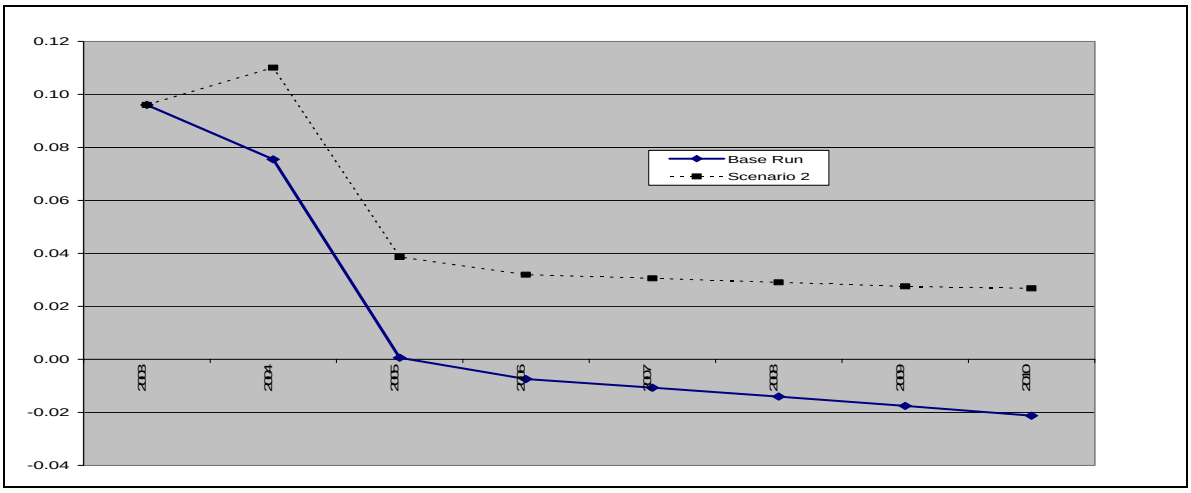
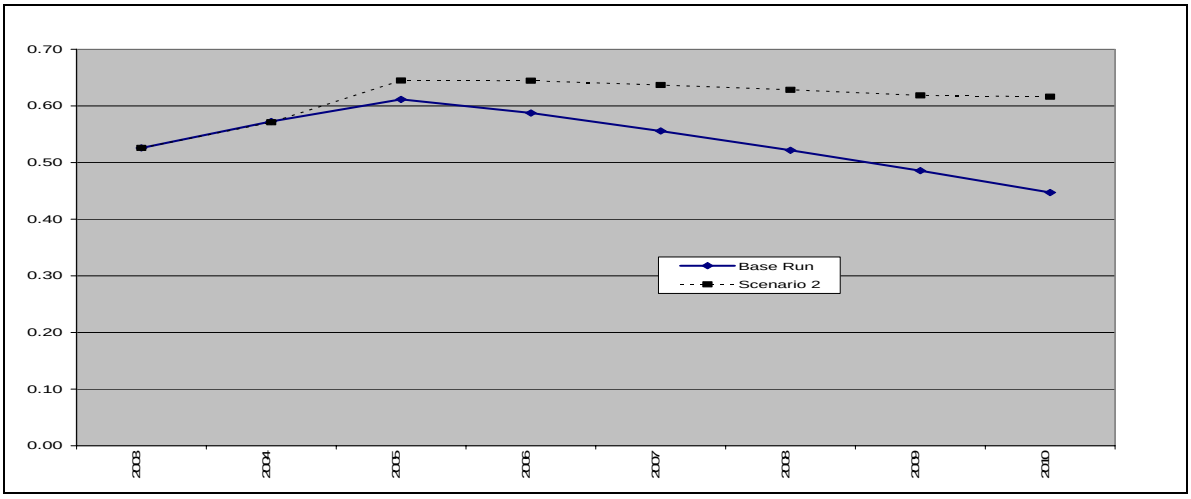


Figure 12. Public Domestic Debt / GDP (Base Run and Scenario 2)



These results are to be expected as the main objective of the current alternative program is not exclusively destined for debt turn-over, but rather is focused with the objective of increasing social capital as well as employment. The results clearly emphasize the tacit dilemma faced by the policy makers of the Turkish economy, —the need to maintain debt turnover *versus* provision of an expansionary investment environment with a mandate of increased provision of

social capital. The current alternative depicted in Scenario 2 tries to address both of these objectives, albeit in a very modest and somewhat arbitrary scale. The fiscal authority is charged with increased social capital expenditures; yet, it is clear that without an equally active central bank that would take explicit responsibility in increasing credit at a lower interest cost and maintaining a competitive real exchange rate, the fruits of the alternative macro setting might not be realized in full.

IV. Concluding Comments

In this paper, we reported on the current state of the macroeconomic policy environment in the Turkish economy over the 2000s. 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 the Turkish Treasury and the Central Bank are divorced from all other concerns of macroeconomic stability and provision of public services. The program, which is planned to be in operation at least until 2009, is criticized heavily given its priority to targets on fiscal debt rather than growth, and its implicit preference for finance over industry. Furthermore, the program is accused of lacking credible public support and of general ignorance on its social welfare implications.

Thus, given the dubious macro-policy environment, we attempted to investigate the growth and welfare consequences of the current austerity program as well as specification of an alternative macroeconomic environment. To this end, we made use of a computable general equilibrium model, calibrated to Turkish data over 2003-2005. First, we studied the implications of the austerity program focusing exclusively on fiscal balances and an inflation targeting central bank. We maintained the fiscal targets of the IMF program to attain a primary surplus of 6.5% as a ratio to GNP until 2010.

As simulated over the time horizon as above, the model results forcefully disclose the tacit dilemma of the "primary surplus program": attainment of fiscal targets to maintain the warranted rates of primary surplus deprives the social/productive spheres of the economy from the most needed public funds to maintain the social capital investments on education and health. The numerical results of the model suggest that with the implementation of such a program, the fiscal

debt constraint could be resolved but the productive sphere of the real economy might be severely hampered.

Our results also underscore the fragility of the current growth path of the economy. In an alternative specification where we reduced the external inflow into the domestic economy and allowed for a possible rise of the interest rate to their pre-2003 level (external flows at 1.4% of the GDP, and interest rate at 27%) the economy would slow down rapidly with a contraction of the GDP growth to *minus* 4% and an increase of the unemployment ratio to more than 20%.

In contrast, an alternative program that allows for increased public investments in social capital and charges the central bank with the task(s) of reducing credit costs and maintaining a competitive real exchange rate (rather than targeting for the inflation solely) is likely to achieve superior outcomes over the current staff monitoring program. Admittingly, such a comprehensive program that seeks strong coordination between the fiscal and the monetary authorities would necessitate a strong bureaucracy and a well-administered taxation regime. Yet, the model results here emphasize that alternatives on the dual-targeting regime do exist. Furthermore, our model indicates that what is needed is a "general equilibrium" approach in investigating the distortionary effects of taxation on accumulation patterns of the economy, and to address the dilemmas that policy alternatives possess.

Clearly a promising avenue of further research within our theoretical framework would be building a larger scale general equilibrium model that admits a financial sector in tandem with the real side of the economy together with a public sector that interact within a "more realistic" market setting. In contrast to the simple Walrasian models, financial-linked models would enable one to consider simultaneous changes in a variety of fiscal and monetary instruments and provide ways to understand short-to-medium run responses by making it possible to observe the transition paths of the modeled economies. This would be more conducive in addressing the political economy dilemmas likely to be faced in real policy setting. These issues, of course are beyond the scope of the current model, which we merely consider as an initial step to understand how the developing economies work and adjust to internal and external shocks as well as to the policy directives.

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