10. A general equilibrium assessment of twin-targeting in Turkey

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10.1 INTRODUCTION: MACROECONOMICS OF TWIN-TARGETING IN TURKEY

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 program currently sets the macroeconomic policy agenda in Turkey and relies mainly on two pillars: (1) fiscal austerity that targets a 6.5 percent surplus for the public sector in its primary budget[2] as a ratio to the gross domestic product (GDP); 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 percent 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 – hence the terms in the title: macroeconomics under twin-targeting.

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. In 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 on 1 January 2006 the CBRT announced that it will adopt full-fledged inflation targeting.

The purpose of this chapter is to provide an assessment of the key macro-economic developments in Turkey over the post-2001 crisis period and to provide a general equilibrium analysis of the macroeconomic policy alternatives of the twin-targeters. 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 disinfla-tion motives of the CBRT and imperatives of debt sustainability and fiscal credibility of the Ministry of Finance. Second, we study the reduction of the central bank's interest rates. Third, 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 rela-tively 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 inflation-ary 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, maintain-ing an integrated and coherent policy framework between the monetary and fiscal authorities is seen of prime importance for the success of the policy formulation at the macro scale.

Our premise in this chapter is that a proper modeling of the general equi-librium 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 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.

The current model shares many of the analytical structure of the Agénor 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 analyse the impact of disinflation and fiscal reforms on labor market adjustment and public debt sustainability. 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 chapter under four sections. First, we provide a broad overview of the recent macroeconomic developments in Turkey in Section 10.2. 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 10.3, we introduce and implement our CGE 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 10.4.

10.2   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 Brazilian turmoil, the economy first decelerated in 1998 with a growth rate of 3.1 percent, and then contracted in 1999 at the rate of −5.0 percent. 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 percent over the 2002–06 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 percent in 2002 to 7.7 percent in 2005, and from 50.1 percent to 5.9 percent in producer prices.

The post-2003 period has also meant a period of acceleration of exports,

where export revenues reached $91.7 billion 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 percent of the gross
national product (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. 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 percent in 2001 to 0.8 percent
by 2006. Consequently, the public sector borrowing requirement (PSBR)
as a ratio to the GNP fell from 16.1 percent to negative 3 percent, indicat-
ing a surplus, in 2006. Table 10.1 documents the main macro indicators of
the post-1998 Turkish economy under close IMF supervision.

10.2.1   Macroeconomic Prices and the Monetary Policy

The CBRT initiated an open inflation targeting framework starting 1
January 2006. The CBRT's current mandate is to set a 'point' target of
5 percent inflation of the consumer prices. Given internal and external
shocks, the CBRT has recognized an internal (of 1 percent) and an external
(of 2 percent) 'uncertainty' band around the point target. Thus, the CBRT
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 percent target
rate. The CBRT 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.[3]

Despite the positive achievements on the disinflation front, rates of inter-
est remained slow to adjust. The real rate of interest remained above 10
percent for much of the post-2001 crisis era, and generated heavy pressures
against the fiscal authority in meeting its debt obligations (Table 10.1). The
persistence of the real interest rates, on the other hand, had also been condu-
cive 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. The credit
interest rate, in particular, had been constrained by a lower bound of 16
percent 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.

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

Table 10.1   Basic characteristics of the Turkish economy under the IMF surveillance, 1998–2006

	Staff monitoring program initiated	Contagion of emerging market financial crises	IMF-directed disinflation program	Financial crisis	IMF-Directed Post-Crisis Adjustments				
					Under the three-party coalition government	Under the pragmatic and western-friendly Islamism of the AKP			
	1998	1999	2000	2001	2002	2003	2004	2005	2006
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

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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
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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
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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
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Table 10.1 *(continued)*

	Staff monitoring program initiated	Contagion of emerging market financial crises	IMF-Directed disinflation program	Financial crisis	IMF-Directed Post-Crisis Adjustments				
					Under the three-party coalition government	Under the pragmatic and western-friendly Islamism of the AKP			
	1998	1999	2000	2001	2002	2003	2004	2005	2006
Macroeconomic Prices									
Rate of Change of the Nominal Exchange Rate (TL/S)	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

Notes:

a. Deflated by the Producer Price Index.
b. Based on real wage indexes (1997 = 100) in manufacturing per hour employed. Turkstat data.

Source: SPO *Main Economic Indicators*; Undersecreteriat of Treasury, *Main Economic Indicators*; CBRT data dissemination system.

exchange market. The overabundance of foreign exchange supplied by the foreign financial arbiters seeking positive yields led significant pressures for the Turkish lira to appreciate. As the CBRT 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 percent in real terms against the US dollar and by 25 percent against the euro (in producer price parity conditions, over 2002–06).

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 illusionary tendency to fall when measured in the overvalued lira units.

10.2.2 Fiscal Policy and Debt Management

The current fiscal policy stance in Turkey relies primarily on expenditure restraint. 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 indirect/excise taxes on goods and services (to 21 percent as a ratio to the GNP, or about 70 percent of total tax revenues), while the contribution of direct income taxes to the budgetary revenues are observed to fall especially after 2000.

Data reveal a secular fall in the budget deficit through the post-2001 crisis adjustments and is now reduced to less than 1 percent to the GNP. As discussed above, much of the aggregate budget expenditures can be explained by the high costs of debt servicing, and the main logic of the current austerity program rested on maintaining the debt turnover via only primary surpluses. 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. 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.

All of these painful adjustments on the fiscal front can be contrasted against the 'gains' over the existing debt burden of the public sector. Data from the Ministry of Finance[4] reveal that, as a ratio to the GNP, gross public debt of the aggregate public sector has fallen from 68.1 percent in 2000 to 63.1 percent by the end of 2006, a decline of only 5 percentage points. This could have been achieved despite the very rapid rise in the rate of growth of GNP (7.2 percent per annum over the whole period), and the very strict fiscal austerity measures of primary surplus targets (of

6.5 percent to the GNP for 2002 and beyond). 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 declined from 25.2 percent in 2000 to 16.9 percent in 2006; while the domestic debt burden increased from 43.1 percent to 46.2 percent 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.

In fact, appreciation of the lira 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 (PPP) 'correction' of the real exchange rate, for instance, would increase the burden of external debt to 76.8 percent 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 may severely worsen the current account financing possibilities.

10.2.3 Persistent Unemployment and Jobless Growth

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. The rate of open unemployment was 6.5 percent in 2000, increased to 10.3 percent 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 24.5 percent in 2005.

On the other hand, the participation rate fluctuates around 48 percent to 50 percent, 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. According to Turkish Statistical Institute (Turkstat) data, the excess labor supply (unemployed plus underemployed) is observed to reach 13.6 percent of the labor force by the end of 2006 (Figure 10.1).

Thus, to conclude, two important characteristics of the post-crisis

Figure 10.1   Labor participation rate and total unemployment

adjustment path stand out. First, 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. Second, 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.

10.3   COMPUTABLE GENERAL EQUILIBRIUM MODELING ANALYSIS

Given the overview of the recent macroeconomic developments, we now develop a real-financial CGE model for Turkey. In what follows, we provide a bird's-eye overview of the model, and invite the interested reader to the Political Economy Research Institute website for a full algebraic description.[7]

10.3.1   The Algebraic Structure of the Model and Adjustment Mechanisms

Product markets

The model is fairly aggregate over its microeconomic structure but accommodates a relatively detailed treatment of the public accounts, 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.

Sectoral production is modeled via multilevel functions. At the top level total output is given as a Leontief specification of value-added and intermediate inputs. The value-added in each sector is generated by combining labor, as well as public and private physical capital. At the last stage of this multilevel production a sector-specific public capital combines with the composite input under a Cobb-Douglas specification. The composite primary input, in turn, is defined to be a combination of private capital and labor aggregate L_i through a constant elasticity of substitution (CES) type of production function.

Public capital is assumed to be fixed and sector-specific. Private capital is mobile across sectors and the movement is directed by the difference in the differentiated private profit rates. Labor's wage rate is fixed in the short run and the labor market clears through quantity adjustments on employment.

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:

$$s^p = s_0^p\left(\frac{1 + \text{int}D}{1 + E[Inf]}\right)^{\sigma_{SAV}^{H}} \tag{10.1}$$

with $E[Inf]$, the expected inflation rate and s_0^p is a 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.

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:

$$\frac{PK \cdot P^{INV}}{NomGDP} = \left(1 + \frac{\Delta RealGDP_{-1}}{\Delta RealGDP_{-1}}\right)^{\sigma_{ACC}}\left(\frac{1 + \text{int}LD}{1 + E[INF]}\right)^{-\sigma_{INTI}} \tag{10.2}$$

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 domestically,[8] $FDDom^H$, holdings of government bonds, GDI^H and portfolio investments abroad, PFI^H.[9]

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 $(1 + \Delta\epsilon^{exp})$:

$$H^D = \frac{H^0 PRIVCON^{\theta_{CON}^H} (1 + E[Inf])^{-\theta_{Inf}^H}(1 + intD)^{-\theta_{DD}^H}}{[(1 + \Delta\epsilon^{exp})(1 + intDF)]^{\theta_{DF}^H}} \quad (10.3)$$

Household allocation on domestic versus 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. Total portfolio investments of households abroad is taken to be a fixed fraction of total household financial wealth, and the demand for government bonds by households is regarded as a function of the expected bond interest rate, $E[intB]$.

A crucial decision of the enterprise sector is how to allocate their profits between funds to private investment and funds to government bonds. This decision depends on the average profit rate expected from production activities and, on the other hand, expected returns on government debt instruments:

$$\frac{PK \cdot P^{INV}}{\Delta GDI^E} = \mu_{GDI}^E \left[\frac{(1 + E[intB])}{(1 + avgRPR_{-1})} \right]^{-\sigma_{GDI}^E} \quad (10.4)$$

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, $intR$. 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:

$$(1 + intDF) = (1 + intFW) \quad (10.5)$$

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:

$$(1 + intFW) = (1 + intFW^{RF})(1 + riskpr) \qquad (10.6)$$

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

$$riskpr = contag + \frac{\kappa}{2}\left(\frac{\sum ForDebt}{\sum E_i}\right)^2 \qquad (10.7)$$

In Equation (10.7) *contag* is an exogenous coefficient used to capture the characteristic changes in the 'sentiments' in world capital markets. 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.

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. With a mandated target of the 'primary surplus-GNP ratio', the government's fiscal policy is basically centered around the primary balance. A fiscal deficit is still realized if interest costs on the outstanding public debt exceeds the primary surplus. The public sector borrowing requirement, $PSBR$, is financed by either an increase in foreign loans or by issuing bonds. Of crucial importance is the realization of the interest rate on government bonds. The expected rate of return on this instrument is defined as:

$$E[intB] = (1 - PR^{default})\,intB \qquad (10.8)$$

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:

$$PRdefault = 1 - e^{-\gamma_n}\frac{(DomDebt^G + ForDebt^G)}{GTaxRev} \qquad (10.9)$$

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 Agénor et al. (2006) the expected inflation rate is formulated as a function of the government's 'credibility inficator', that is, the inverse of the probability of default, $PR^{default}$, and the targeted rate of inflation in the previous period:

$$E[Inf] = (1 - PR^{default})Inf^{trgt} + PR^{default}Inf_{-1} \qquad (10.10)$$

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.

10.3.2 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 twin-targeting. 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. Second, 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 10.2. As valid for all types of modeling exercises of the current genre, the simulation results should not be taken as

Table 10.2   Experiment results

	Base year (2003) data	EXP-1: Effects of increased foreign capital inflows	EXP-2A: Reduce central bank interest rate	EXP3: Reduce central bank 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$)	−9.201	−22.491	−9.234	−9.511
Unemployment Rate (%)	10.55	10.35	10.69	7.63
Average Profit Rate (%)	16.15	16.20	16.20	16.80
As Ratios to the GDP				
Private Consumption	68.98	71.10	67.60	68.80
Private Investment	17.91	20.30	19.70	20.00
Imports	28.06	29.70	28.39	28.35
Exports	19.09	16.92	19.34	19.33
Current Account Balance	−3.72	−8.75	−3.73	−3.80
Financial Rates and Prices				
Inflation Rate (CPI)	25.30	18.72	27.72	28.23
Expected Inflation Rate	17.65	18.83	16.58	16.79
Expected Depreciation Rate	41.66	41.78	41.56	41.58
Realized Depreciation Rate	−1.01	−9.52	0.98	0.97
Central Bank Interest Rate ($intR$)	40.27	40.27	20.00	20.00
Interest Rate on Domestic Deposits ($intD$)	40.27	40.27	20.00	20.00

Table 10.2 (continued)

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
Perceived Probability of Default on Gov. Debt	0.50	0.58	0.43	0.44
Ratio of Foreign Debt to Central Bank 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
Central Bank Foreign Reserves	0.21	0.20	0.21	0.21

Table 10.2   (continued)

	Base year (2003) data	EXP-1: Effects of increased foreign capital inflows	EXP-2A: Reduce central bank interest rate	EXP3: Reduce central bank interest rate and reduce payroll taxes
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

a 'forecast' of the future, but rather ought to be regarded as quantitative insights on the relevant macroeconomic outcomes of alternative policy environments.

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.[10] These magnitudes exceeded the previous peaks hit in the global financial markets before the eruption of the 1997 Asian crisis.

As outlined in Section 10.2, Turkey too had been one of the major beneficiaries of this financial glut. Balance of payments data indicate that the finance account has depicted a net surplus of $103.3 billion over the 'AKP (Justice and Development Party) 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. It is also observed that 64 percent of the total inflows (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 percent had been used for reserve accumulation of the CBRT.

In this first policy experiment we first study the macroeconomic adjustment mechanisms against this continued inflow of finance capital into the Turkish economy. 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 2003–06). 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.[11] 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 10.2.

The immediate effects of the increased inflow of foreign capital are felt in the currency markets. The exchange rate appreciates by 9.5 percent and cost savings on the import side leads to a fall in the inflation rate to 18.7 percent, from 25.3 percent. Appreciation of the exchange rate leads to a rise in imports and the current account deficit widens to increase by about four-fold to reach $22.5 billion in 2003 prices. As a ratio to the GDP, it increases to 8.7 percent from its base value of 3.7 percent. 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 percent and serves for the liquidity requirements of this expansion.

The aforementioned expansion of the economy is limited, however, only to the private sector. Given the fiscal constraint on the primary surplus target, the 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 central bank 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 the government's debt instruments, in particular, expands to 60 percent from 36.3 percent. The government's interest expenditures as a ratio to the GDP rises to 25 percent and that of the public sector borrowing requirement increases to 28 percent. Increased interest expenditures lead to a widening of the

fiscal deficit. Consequently there is a worsening of the fiscal credibility of the government. The credibility index 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 turnover 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 percent to 52.9 percent) and to the foreign reserves of the central bank (from 235 percent to 264 percent). As a result of these adverse developments on external fragility, the 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 central bank 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 central bank. In general, the burden of the interest rates has a significant contractionary effect on the Turkish financial sector. The cost of central bank 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 a reduction of the central bank'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 central bank interest rate by half. Again, as above, no further change is envisaged, when experimenting with this simulation, in the policy instruments or in the parameterization of the exogenously set variables.

Note that given the algebraic characterization of the loanable funds market, the central bank 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 percent) 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 percent.

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 public sector borrowing requirement to less than 1 percent of the GDP, and the increase of the credibility index by 7 percentage points.

It is not clear, however, whether the central bank 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 percent level, and it is this problem we aim to tackle in the next experiment.

EXP-3: Complement central bank interest rate reduction with labor tax reform

In this experiment we continue on the policy environment of the previous experiment and complement the central bank's interest reduction strategy with a labor tax reform. Keeping the central bank'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 burdens on the labor markets. Employer-paid social security contributions averaged about 36 percent

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 the social security system can be as high as 15 percent while an employer in a typical risk occupation contributes as much as 22.5 percent.

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 central bank rate of interest at half of its base run value, we reduce the payroll tax by half, from its base rate of 19 percent. The lower tax revenues are not compensated by any other taxes. The results of the experiment are depicted under column EXP-3 in Table 10.2.

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 percent 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 percent) 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 a percentage of GDP, public investments are observed to fall to 3.2 percent from its base value of 4.4 percent (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 remains 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.[12]

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 percent to 28.2 percent), 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.

10.4   CONCLUDING COMMENTS AND POLICY DISCUSSION

In this chapter, we reported on the current state of the macroeconomic policy environment in the Turkish economy throughout 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 percent to the GDP); and an inflation targeting central bank whose sole mandate is to maintain price stability. Accordingly both policy questions are analysed 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 indebtedness with increased external fragility. In the medium to long run the increased fiscal and external fragilities along with a persistent and high unemployment manifest a severe impasse, whose resolution will likely 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 (1) reducing the central bank's interest rates along with (2) 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 close observation 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 percent 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 towards 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 public sector borrowing requirement to GDP ratio in the short run, and implement a fiscal policy to maintain a level of household income capable of addressing 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 with elsewhere more effectively (see, for example, Gibson, 2005; ISSA, 2006; Voyvoda, 2003; Voyvoda and Yeldan, 2005).

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 a 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.

NOTES

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2. That is, balance on non-interest expenditures and aggregate public revenues. The primary surplus target of the central administration budget was set 5 percent to the gross national product.
3. Further institutional details of the central bank's inflation targeting framework can be found in the December 2005 document, 'General framework of inflation targeting regime and monetary and exchange rate policy for 2006', accessed December 2006 at: www.tcmb.gov.tr/yeni/announce/2005/A NO2005-45.pdf.
4. http://www.maliye.gov.tr.
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 percent.
6. See, for example, UNCTAD, *Trade and Development Report* (2002 and 2003), New York and Geneva.
7. http://www.peri.umass.edu/Alternatives-to.382.0.html.
8. 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 10.1).
9. Both residents' portfolio investments abroad, PFI^a, and non-residents' portfolio investments at home, PFI^{non}, 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.
10. See, for example, Institute for International Economics, http://www.iie.com.
11. 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.
12. Note, however, that this comparison is valid against the base run. One witnesses a slight loss in fiscal credibility relative to *EXP-2*.

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