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Introduction

THE RECESSION in the United States in the early 1980s and the ensuing rise of interest rates and collapse of commodity prices triggered the debt crisis that has dominated macroeconomics in the developing countries ever since. Despite the overriding emphasis on Latin America, other regions have not escaped the problems caused by these adverse shifts in the world economy. A strategy to deal with external debt and the formulation of internal policies that allow sustainable output growth within the limits of creditworthiness and macroeconomic stability are at the forefront of policymaking in most developing countries. These concerns are also the subject of this book.

A brief overview of external debt since 1980 contrasts developments in Turkey with those in other high-debt countries. This overview highlights the choices that need to be made and the tradeoffs involved in formulating an external debt strategy. At issue is whether to pursue policies that restrict expenditure to improve current account performance. To what extent will such policies sacrifice future output growth and thus undermine the benefits of the debt reduction that does take place? Do the alternatives allow satisfactory output growth within the limits set by creditworthiness? What role does exchange rate policy play in all this?

The social costs and benefits of any external debt strategy, and in fact its sustainability, depend to a large extent on the internal policies that form the counterpart of any external adjustment undertaken. External adjustment requires that a transfer be made to foreigners (or an adjustment made to a lower transfer received from them); internal adjustment brings about a matching internal surplus of savings over investment. The role the public sector can play in these adjustments is one of the main issues dealt with in this book. The central question is how to create a surplus of savings over investment and still maintain enough investment to sustain output growth.

An important part of any program of internal adjustment is the extent to which the public sector contributes directly to improving the savings surplus. This will typically require reducing the fiscal deficit. The remaining deficit will then be financed by issuing domestic or foreign debt or by creating revenue from monetization. But macroeconomic targets for, say, inflation and output growth, in addition to the constraints implicit in remaining creditworthy and solvent, restrict each financing method. Hence fiscal consistency must be considered. Do these targets and constraints allow the government to raise enough financing to cover the deficit that is part of its internal adjustment program? The lack of fiscal consistency forebodes future changes in policy and thus undermines the credibility of the fiscal program envisaged. Thus we discuss the interaction of fiscal deficits and the macroeconomic variables that influence fiscal consistency. Empirical work on Turkey shows the tradeoff that exists between fiscal policy adjustment and sustainable inflation. We discuss in particular how this tradeoff is affected by financial sector reform, economic growth, and real exchange rate policies as well as by interest rates on foreign and domestic debt. Further, we analyze situations in which postponing adjustment adversely affects the terms of the tradeoff.

Turkey has, in many ways, fared better than most highly indebted countries. An important question is whether this success can be attributed to factors specific to Turkey. If so, Turkey's experience would be of only limited interest to other countries. If, however, Turkey's relatively successful performance between 1980 and 1987 can be traced to consciously designed policies, the lessons would be of substantial interest to other debtor countries. The thesis of this book is that Turkey's experience is pertinent to other countries. Sustained growth within the limits set by creditworthiness is possible, and an analysis of Turkey's performance over this period can show us how.

Income distribution significantly affects adjustment and creditworthiness. Changes in real exchange rates, other relative prices, and public expenditure programs affect the distribution of income, real wages, and employment growth. The austerity that typically accompanies an adjustment program is often criticized for having an adverse impact on the poor.

Of course, the relevant comparison is not between how the poor fare before and after a crisis; in Turkey the events of 1978 to 1980 clearly show that the policies implemented at that time were not sustainable. Instead, the central issue is how the poor would have fared in the absence of an adjustment program. Important as this issue is, the lack of data and, for that matter, the state of economic theory do not allow us to go deeper than journalistic generalities. We therefore do not address this issue further.

A Historical Overview: Debt, Output Growth, and the Real Exchange Rate

Turkey experienced a debt crisis in 1978 and rescheduled a large amount of its debt between 1978 and 1980. Since then, the ratio of its gross external debt to its output increased from 28 percent in 1980 to 56 percent at the end of 1986. This ratio puts the country's debt burden well within the range of Latin America's. The 1986 value of Turkey's debt was actually higher than the average for the group of highly indebted countries listed in the International Monetary Fund's (IMF's) *World Economic Outlook.*[1] Thus by international standards, Turkey's external debt is high.

Such measures should, however, be seen in perspective. Countries such as the United States and the United Kingdom also relied extensively on external borrowing during earlier periods in their economic history. In the nineteenth century Britain financed much of its industrial revolution with money borrowed from cash-rich Holland. As the century progressed, Britain itself became a lender and financed much of the economic expansion of the United States and Argentina, which was at that time a dynamic economic power. The United States' movement toward the West and Argentina's extension of its railroad system were financed with money borrowed from abroad. The United States became a net lender only toward the middle of this century, a position that ended with the deficit of the past few years.

The historical examples show that extensive debt accumulation has occurred before; they also demonstrate that the borrower-lender cycles, which are part of this process, often last many decades. Major borrowers often take decades to become lenders. Thus short-term solutions to what has become known as the debt crisis may be unwarranted.

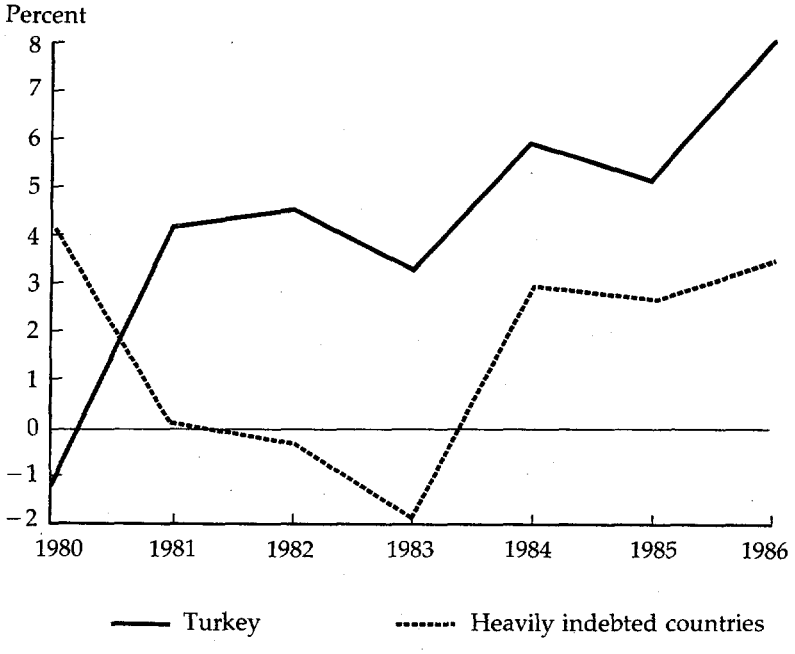
An essential feature of the two or three examples of successful external debt accumulation is that the high rate of foreign borrowing fueled substantial investment and thus output growth. The high output growth and accompanying increase in productivity enabled these countries to engage in lending rather than borrowing as time progressed and their investment needs declined. This element is perhaps the most worrisome aspect of the current debt situation: in almost all debtor countries output growth has fallen to a postwar low. The fifteen heavily indebted countries listed in the IMF's *World Economic Outlook* saw their annual growth in output fall from more than 5 percent in the 1970s to only 1 percent in the 1980s. The importance of high output growth is underscored by Turkey's performance since its series of debt reschedulings in the late 1970s.

The increase in the ratio of Turkey's gross debt to its output between

1980 and 1986 is in line with the average for the fifteen highly indebted countries (see table 4-1). It is surprising that Turkey's debt-output ratio did not rise more rapidly: as a percentage of gross national product (GNP), Turkey had a much lower surplus on its noninterest current account than the highly indebted countries had after their respective debt crises. This apparent inconsistency is explained by the much higher rate of output growth that Turkey managed to sustain. Turkey's debt-output ratio followed a path similar to that of the highly indebted countries, not because the surpluses on its noninterest current account were large, but because its output growth was high.

This is where Turkey differs most from the highly indebted countries. Figure 1 shows Turkey's growth rate from 1980 to 1986 compared with that of the highly indebted countries. Turkey's real growth rate exceeded that of the other countries by four to five percentage points almost every year. This was achieved in a world economy that became distinctly unfavorable after 1980. Even in Turkey, where output grew much faster than in most highly indebted countries, real interest rates on foreign debt are no longer below the real growth rate of the economy.

Figure 1. Real Output Growth in Turkey and the Heavily Indebted Countries, 1980–86



In debtor countries throughout the world, the ratio of debt to exports rose after 1980 in line with the ratio of debt to output. By this measure, Turkey has been much more successful than the highly indebted countries. Turkey was the only debtor country whose debt-export ratio fell after 1980—by one-third initially—and it rose only slightly afterward. The empirical analysis presented in this book shows that the depreciation of the real exchange rate after 1980 was a major factor contributing to the success of Turkey's export drive.

The counterpart to this real depreciation, however, was a substantial capital loss on Turkey's external debt. This loss contributed significantly to the increase in the debt-output ratio: between 1980 and 1986 it accounted for more than half of the increase in the ratio. Empirical results show, however, that the debt-export ratio will improve after a real devaluation: the volume of exports will increase enough to offset the decrease in price. Clearly, the debt-export ratio would have been more unfavorable if the depreciation had not taken place. A real devaluation causes a capital loss on foreign debt and thus reduces national wealth. Higher exports cannot undo this, but increased export orientation eases access to foreign capital markets. Turkey probably would not have had the access to external markets that it had if the reform program implemented since 1980 had not generated successful export performance. The real depreciation of the exchange rate was an essential component of that program.

Toward Formulating an External Debt Strategy

This brief survey suggests that three factors are essential to analyzing external adjustment. First, the noninterest current account is the fundamental measure of the net transfer of resources between a borrowing country and the rest of the world. Second, real interest rates paid on external debt interact with the growth rate of the economy and set the pace at which the dynamics of debt and output growth unfold over time. Third, exchange rate developments occur both between the borrower and its trading partners (the real exchange rate) and between the country's trading partners and the creditors themselves (the cross-currency exchange rates). An increase in the debt-output ratio can in fact be traced to these three factors (see chapter 1).

The noninterest current account deficit of the balance of payments is the fundamental measure of a country's external (im)balance: it equals the difference between total expenditure (net of interest payments on foreign debt) and nationally generated income. Its counterpart is the net transfer of resources from foreigners: that is, the increase in debt minus the interest payments made. If the noninterest current account is zero, the increase in debt will equal the interest

payments; in this case, the debt grows at the rate of interest. As long as there is a surplus on the noninterest current account, foreign borrowing will be less than the interest paid to foreigners; to put it another way, the growth in foreign borrowing will be less than the rate of interest, and a net transfer of resources to the rest of the world will occur. The opposite will happen when there is a deficit on the noninterest current account: in that case the debt will grow faster than the rate of interest, which will eventually lead to insolvency.

The second factor captures what might be called an autonomous effect inherent in the mechanics of debt, real interest rates, and output growth. If the noninterest current account is zero, the numerator of the debt-output ratio will grow at the rate of interest, and the denominator will grow at the (real) growth rate of the economy. Therefore, if the real interest rate exceeds (falls short of) the real growth rate of the economy, the debt-output ratio will rise (fall) if the noninterest current account is zero. This term therefore measures the dynamics inherent in the interplay between real interest rates and real output growth, referred to as the debt dynamics component. If real interest rates exceed the real growth rate by a substantial margin, the dynamics component will contribute significantly to increases in the debt-output ratio; the room for a noninterest current account deficit will be limited accordingly.

The final factor measures the capital loss a country incurs on its external debt when the exchange rate depreciates in real terms. The debt-output ratio measures the debt in terms of home goods; if the relative value of home goods falls, as it does after a real depreciation, the debt-output ratio will rise. Against that must be set the favorable impact of the real devaluation on exports, an important determinant of creditworthiness.

These three factors play a role in external debt strategies. Under current economic conditions, an external debt strategy involves making choices in two areas: how to achieve a sustainable ratio of external debt to GNP and the role of the real exchange rate. The first choice is between two ways of restraining the debt-GNP ratio:

1. Transfer net resources to creditors through sufficiently large surpluses on the noninterest current account.
2. Pursue a policy of high growth of output; high growth slows the extent to which external debt feeds on itself through escalating debt service costs.

The first option has been pursued by most Latin American and Eastern European debtor countries since 1981–82. The problem with this approach is vividly demonstrated by their experience. The only reliable and practical way to create a surplus on the noninterest cur-

rent account is to cut expenditure substantially. This may, however, cause substantial loss of output. First of all, the short-run effect of cutbacks in expenditure may be recessionary. A more fundamental cause of output losses is cutbacks that come out of investment and thus slow output growth.

This opens up the possibility that gains made through improvements in the noninterest current account will be offset by wide differences between the rates of real interest and real output growth. Effectively, what the numerator gains is at least partially lost again because the rate of increase in the denominator of the debt-output ratio slows down. This happened in most of the heavily indebted countries. Despite a substantial external adjustment, Turkey did not transfer resources to creditors through large surpluses on its noninterest current account. It thus avoided the destabilizing spiral in which most other heavily indebted countries seem to be trapped.

It must be asked whether the Latin American countries took this route by design or because no other option was available to them. Clearly, countries such as Brazil and Mexico would have liked to borrow more than they did after 1982. In that sense they were perhaps forced into the high-surplus, low-growth situation. Comparing them with Turkey shows, however, that this answer may be too superficial. Much of the increase in Turkey's external debt was funded by private sources. Internal policies clearly made repatriating past and current earnings attractive for Turkish citizens working abroad, as shown in the chapters that follow. In Latin America, however, the opposite occurred: the outflow of private capital was substantial (this is the capital flight problem). Internal policies gave the private sector little incentive to fund either private capital accumulation or public sector debt.[2] Although the external constraints eventually imposed on these countries were clearly not of their choosing, the internal policies that contributed to capital flight were. External constraints without capital flight would have required much less restraint of expenditures than with it. Thus Latin American countries may have had much more choice than is often asserted.

The second option relies on a policy of encouraging high output growth, which is intended to slow the dynamic process in which debt feeds on itself as debt service costs as a share of GNP escalate. The main problem with this strategy of low trade surplus and high growth is that the government needs to ensure that the extra expenditure allowed by the lower trade surplus is channeled into productive, trade-oriented capital accumulation. Even if this is done, through increased public sector investment, incentives for private investment, or both, the strategy could fail because it clashes with the export drive.

We argue that an export drive should also be part of a successful external debt strategy.

Higher investment expenditure increases aggregate demand for home goods and pushes up the real exchange rate. The growth strategy then crowds out exports and jeopardizes creditworthiness by diverting production away from traded goods. The only way out is to create room for exports by restraining public and private consumption. This also alleviates the pressure on imports and the trade balance that could result if consumption is not restrained as investment expenditure is increased. All of these points concern problems of internal adjustment, which are central to much of the discussion in this book.

The options are, in practice, mutually exclusive. Running high surpluses on the noninterest current account typically leads to slower growth as investment falls. As a consequence the debt dynamics component increases as the growth rate falls below the real interest rate on external debt. Conversely, higher growth and the resulting investment expenditure require continued net transfers of resources from abroad.

The second choice determining an external debt strategy concerns the role of the real exchange rate. A real depreciation raises the debt-output ratio but lowers the ratio of debt to exports. Should a country opt for real depreciation and export orientation and accept the associated losses on its external debt? Does an alternative set of policies involve less exchange rate depreciation?

A real appreciation lowers the ratio of external debt to output by lowering the price of foreign goods (in which the foreign debt is expressed) in relation to home goods (the GNP). A steady real appreciation implies, however, a steady increase in the relative price of home goods. In the absence of policy changes, such an increase would induce an increasing, excess supply of home goods. The only way to avoid this is to raise government expenditure, the one component of demand for home goods that is likely to be relatively less price sensitive and under the control of policymakers. Such a strategy would induce government expenditure to rise and exports to fall over time. In addition, domestic consumers would increasingly shift from buying more expensive home goods to buying less expensive foreign ones. Because this strategy often leads to a deteriorating trade balance, it would eventually have to be abandoned. The anticipation of such events underlies the exchange rate crises that have characterized many Latin American countries over the past few years.

Turkey adopted the opposite strategy over the period considered: with its concerted export drive, Turkey was committed to an exchange rate strategy designed to maintain or steadily improve its external

competitiveness. This required real depreciation of the exchange rate, which is essential to maintain creditworthiness. Commercial credit ratings invariably put a great deal of emphasis on the degree of export orientation in the economy. The conclusion seems clear: an export orientation based on the exchange rate is essential to an external debt strategy, notwithstanding the associated capital losses on external debt.

The purpose of this book is to assess the option taken by Turkey in the past and its leeway to continue with that choice in the future. A great deal of effort is devoted to establishing, with quantitative methods, the link between specific outcomes and the policy measures taken. This is important because the degree to which Turkey's performance since its debt crisis was policy induced will determine the extent to which Turkey's experience is of interest to other countries. If well-designed policies are behind Turkey's performance to date, other debtor countries might fare likewise by implementing similar measures. We conclude that much of Turkey's experience can in fact be repeated if other countries orient their economic policy the way Turkey did between 1980 and 1986. The questions of sustainability also exist in Turkey, however, particularly in the matter of fiscal policy; these questions are addressed in chapters 7 and 8.

Organization of the Book

The central question this book addresses is whether sustainable external borrowing, coupled with a fiscal policy consistent with other macroeconomic targets, permits enough investment for satisfactory output growth to be achieved. Can external balance and output growth be reconciled, or are they inherently opposed? The analysis of these issues focuses on the answers to three groups of questions:

1. How much external borrowing is consistent with sustained creditworthiness?
2. The answer to the first question sets the limits on external deficits. Internal adjustment to those external deficits requires a matching surplus of savings over investment. The second question is, how much of the matching internal adjustment should be brought about directly by the public sector? In other words, what should the fiscal deficit be?
3. The answers to the first two questions define the amount of surplus private savings over investment that is necessary to reconcile the external balance target from the first question with the fiscal deficit from the second. The third question, then, is, which policies are needed to induce the private sector to run this matching surplus without sacrificing output growth?

Although each question is well defined in its own right, the separation is more apparent than real. The answer to each question has implications for the others; the sequential presentation does an injustice to the relations that exist among them. The approach of this book does, however, take the interactions fully into account.

The first part of this book develops analytical models, which are then used in part 2 to analyze Turkey's performance from 1980 to 1986 and to assess its prospects for the future.

Part 1 consists of three chapters, each corresponding to one of the questions raised. Chapter 1 deals with solvency, creditworthiness, and the limits on issuing foreign debt. First, however, this chapter provides a simple decomposition method that traces increases in the debt-output ratio to its various driving factors: the noninterest current account deficit, the interplay between real interest rates and real output growth, and, finally, the exchange rate. It then analyzes solvency and creditworthiness and presents a simple method, designed by Cohen (1985, 1988), to assess quantitatively the limits on external borrowing implied by creditworthiness constraints.

Chapter 2 turns to the internal adjustment problem and examines what constitutes an appropriate fiscal deficit. Rather than attempting to assess optimal government borrowing policies (derived from, for example, the cost of future compared with current taxation), we suggest a more modest approach with less forbidding requirements for information. We present a simple quantitative method for assessing whether fiscal deficits are consistent with macroeconomic targets in other areas, such as inflation, output growth, and the real exchange rate. This method explores the effect of various factors—such as financial structure, foreign and domestic real interest rates, and the requirements imposed by sustainability of debt issue—on consistency.

In chapter 3, a methodology is developed to assess the impact of real interest rates, fiscal deficits, and various fiscal policy instruments on private saving, investment, and aggregate output growth. This methodology is used later, both to assess the factors contributing to Turkey's success in the past and to explore Turkey's options for the future.

The second part of the book applies the discussion in part 1. The first subject is external adjustment. To what extent are the past increases in debt caused by one-time capital losses due to, for example, an exogenous realignment of the major world currencies and to what extent by developments in Turkey's current account? Is Turkey's current account deficit in line with the sustainability requirements derived from creditworthiness constraints? What is the role of exchange rate policy? Since a real devaluation raises the cost of external debt but encourages exports, which effect dominates? What, in the end, consti-

tutes an acceptable level of foreign borrowing given creditworthiness constraints? These issues are covered in the first part of chapter 4.

Policy regarding internal adjustment to external targets is the focus of the second group of issues. To effect a transfer of resources abroad, the government needs to induce a matching surplus of domestic savings over investment. To assess the sustainability of the external improvement, it is important to analyze how this internal surplus is brought about. The government can increase its own surplus by cutting its (noninterest) deficit, rely on the inflation tax to extract resources from the private sector, or sell interest-bearing debt at real interest rates high enough to induce the private sector to increase its surplus of savings over investment. The extent of each factor's contribution is documented in the second part of chapter 4.

Chapter 5 analyzes in detail how the public sector contributed to the increase of savings over investment. In financing the fiscal deficits, did the government rely excessively on the inflation tax? Are the current level and financing of fiscal deficits consistent with the limits imposed by the government's macroeconomic targets? What do the past and proposed reforms of the financial sector imply for these questions? As a substitute for monetization, does issuing increased domestic debt postpone or resolve the problem of having fiscal deficits that are inconsistent with inflation targets? This book goes beyond the issues of consistency and budgetary implications, however, and uses quantitative methods to capture the interactions among fiscal policy, private savings, investment, and output growth.

First, even for given real interest rates, consistency must be considered: is fiscal policy compatible with the targets for inflation and output and the need to maintain external creditworthiness?

Second, we assess quantitatively the effect of fiscal deficits on real interest rates by investigating the link between fiscal deficits and private savings and investment. Given fiscal deficits, the government must choose between increased external borrowing, which would jeopardize creditworthiness, and higher domestic real interest rates, which would allow the deficits to be financed from domestic sources. We then assess the extent to which reduced fiscal deficits can reconcile this conflict by allowing output growth based on private investment without jeopardizing external balance. The high real interest rates that characterized this period were essential to bringing about the net surplus of private savings needed to reconcile external balance targets with fiscal deficits.

In addition, fiscal policy influences the economy through other channels. Hence discussing the size of fiscal deficits alone cannot determine the balance between private and public sector policies that will guarantee an acceptable accumulation of external debt and output

growth. Therefore chapter 6 discusses the macroeconomic importance of public sector investment and its interaction with private investment and output growth. A final issue explored is the method of financing the deficit, its implications for inflation, and its impact on the sustainability of the policies chosen.

Chapter 7 looks forward. First, it explores the targets of sustainable external debt accumulation. Second, it analyzes the fiscal deficit necessary to achieve an internal adjustment compatible with sustained output growth, external balance, and lower inflation. Finally, it investigates sustainable ways of financing the public sector deficit.

The third part of chapter 7 addresses the major issue covered in this book. Reducing the fiscal deficit to what can be financed given the macroeconomic targets for inflation, output growth, and external balance ensures that the fiscal policy is at least sustainable. Taking this measure does not, however, guarantee that those macroeconomic targets can or will be achieved, only that they are not inconsistent with the fiscal deficit. Whether the targets can in fact be achieved is discussed at the end. Can external balance and output growth be reconciled, or is the conflict between these two objectives inherent? The last section of chapter 7 answers this question with projections generated with the models developed in chapters 2 and 3. In addition, it explores cases in which external financing may not be forthcoming. Chapter 8 summarizes the findings of the previous chapters.

PART 1 *The Analytical Framework*

Introduction to Part 1

THE NEXT THREE CHAPTERS build the framework used in part 2 to analyze Turkey's recovery from the debt crisis. The framework is designed to show the choices Turkey made as part of its external debt strategy and how its policies contributed to the final outcome. After analyzing the past, we turn toward the future and use the framework to assess the feasibility of continued growth within the limits set by creditworthiness constraints. We also trace the likely consequences of several alternatives: what would happen to output growth and interest rates if Turkey lost its access to external capital markets? What would happen if no fiscal adjustment took place in such a situation?

Chapter 1 begins by presenting a simple method for decomposing the increase in the debt-output ratio. This method is used in part 2 to highlight why the debt-output ratio in Turkey increased in the late 1980s. The decomposition highlights the role played by the noninterest current account, the interplay between real interest rates and real output growth, and the effect of real exchange rate developments. These factors also enter into the formulation of an external debt strategy, which we address next. In the introduction we argued that to formulate an external debt strategy requires that choices be made in three areas. Each area is covered in turn in the following three chapters. First, how much external debt accumulation is advisable? The answer to this question defines the minimum transfer of resources that must be made to the rest of the world (or the maximum transfer that should be received). An analytical model to deal with this issue is presented in chapter 1, which discusses the concepts of solvency and creditworthiness and their implications for the limits on external deficits. The remaining two choices concern the internal counterpart to this external transfer. A surplus in the current account should be matched by a corresponding surplus of income over expenditure, of savings over investment. The first choice, then, is to decide how much

the public sector should contribute to this surplus. An approach to this problem is presented in chapter 2. Finally, once a target for the fiscal surplus (which could, of course, be negative; that is, a deficit) is set, how is that target to be reconciled with the target for the current account derived in chapter 1? What policies should the government adopt to ensure that the private sector does indeed generate the required matching surplus of savings over investment? How can the government avoid achieving this surplus at low rather than high investment levels, which would jeopardize output growth? The model presented in chapter 3 is designed to shed light on these issues.

1 Solvency, Creditworthiness, and Sustainable External Borrowing

THE RATIO of net external debt to gross national product (GNP) can increase for three reasons: increased resource transfers from the rest of the world to the borrowing country, interest payments on past debt at a real rate higher than the real growth rate of the economy, or capital losses incurred on outstanding debt as a result of depreciation of the real exchange rate. This chapter presents a decomposition method designed to highlight the extent to which each of these factors contributed to the changes in the debt-output ratio in Turkey.

The Dynamics of Debt, Output Growth, and the Current Account

Decomposition begins with the identity that the current account as a share of GNP equals the change in the value of net external debt, excluding capital losses arising from depreciation of the real effective exchange rate (that is, the weighted average of real bilateral exchange rates). Changes in the real effective exchange rate can, in turn, be broken down between changes in the real exchange rate of the domestic currency against the dominant foreign currency (such as the dollar) and cross-currency effects (such as changes in the value of the dollar vis-à-vis the deutsche mark). The analysis that follows is simplified by assuming only one foreign currency. The effects of cross-currency fluctuations are examined in the appendix to this chapter. The analysis is simplified further by assuming initially the gross and net external debt to be equal. Under these assumptions, the following holds:

$$\dot{eb}^* = \text{cad}, \tag{1-1}$$

where $e = EP^*/P$ is the real exchange rate of the Turkish lira against

the dollar, defined as the nominal exchange rate, E, times foreign prices, P^*, divided by the domestic price, P; b^* is the real value of the external debt in terms of foreign goods, defined as $b^* = B^*/P^*$, where B^* is the nominal value of the debt in terms of foreign goods; and cad is the current account deficit in real terms (that is, the local currency value of the current account deficit deflated by P). In addition, cad includes only real interest payments, r^*b^*e; the inflation component in foreign nominal interest rates, $\hat{p}^*b^*$, is included in the capital account, as it is in the discussion of domestic debt in chapter 2.

The increase in foreign debt does not, however, measure the net transfer of resources received from foreigners: the interest payments made on the debt must be taken into account. If interest payments are subtracted from both sides of equation (1-1) to obtain the net resource transfer, it becomes clear that this transfer equals the noninterest current account deficit (nicad) rather than the current account deficit itself. This is a more fundamental concept of external balance:

$$e(\dot{b}^* - r^*b^*) = \text{cad} - r^*b^*e = \text{nicad}. \tag{1-2}$$

Using the symbol ~ to indicate variables scaled by real GNP, y, and expressing equation (1-2) in terms of GNP yields:

$$e\left(\frac{\dot{b}^*}{y} - r^*\tilde{b}^*\right) = \text{ni}\tilde{\text{c}}\text{ad}, \tag{1-3}$$

where ni$\tilde{\text{c}}$ad = nicad/y and $\tilde{b}^* = eb^*/y$. Finally, straight differentiation for the change in the debt-output ratio $\tilde{b}^*$ yields:

$$\dot{\tilde{b}}^* = \dot{b}^*e/y - n\tilde{b}^* + \hat{e}\tilde{b}^*, \tag{1-4}$$

where n is the growth rate of real output and $\hat{e}$ is the rate of change of the real exchange rate e.

Using equation (1-4) to substitute out $\dot{b}^*$ from equation (1-3) gives the decomposition formula underlying much of the analysis in chapter 4:

$$\dot{\tilde{b}}^* = \text{ni}\tilde{\text{c}}\text{ad} + (r^* - n)\tilde{b}^* + \hat{e}\tilde{b}^*. \tag{1-5}$$

Equation (1-5) isolates three components underlying an increase in the debt-output ratio: the deficit on the noninterest current account or the net transfer of resources received from abroad; the debt dynamics term measuring the extent to which interest payments offset the tendency of real output growth to reduce the debt-output ratio; and the capital losses on foreign debt arising from depreciation of the real exchange rate.

The analysis presented in chapter 4 proceeds in two stages. The first is to determine the extent to which the increase in Turkey's debt-output ratio can be traced to changes in the real exchange rate of

the Turkish lira vis-à-vis the dollar and to cross-currency effects. The second is to define a debt measure that eliminates all exchange rate effects by evaluating Turkey's debt-output ratio at constant 1980 exchange rates. The increase in the ratio of this corrected debt measure is decomposed into the contributions made by the noninterest current account and by the remaining component, the excess of the real interest rate over the real growth rate of the economy. The appendix to this chapter describes how exchange rate losses are separated out. The decomposition of equation (1-5) leads naturally to the concepts of solvency and creditworthiness, which are discussed next.

Consider the decomposition of the debt-output ratio corrected for fluctuations in the exchange rate. By setting $\hat{e} = 0$ and $e = 1$ by choice of units, equation (1-5) becomes:

$$\dot{\tilde{b}}^* = \text{ničad} + (r^* - n)\tilde{b}^*. \tag{1-6}$$

Defining the minimum noninterest current account deficit that will hold the debt-output ratio constant as **ničad** yields

$$\textbf{ničad} = -(r^* - n)\tilde{b}^*. \tag{1-7}$$

Clearly, if $r^* \gtreqless n$, then **ničad** $\lesseqgtr 0$.

If the interest rate exceeds the growth rate of the economy, only a surplus on the noninterest current account is compatible with a constant debt to output ratio. A noninterest current account deficit, and in fact any surplus less than $(r^* - n)\tilde{b}^*$, will lead to escalating debt growth and interest payments that rise faster than the gross domestic product (GDP). This will eventually cause insolvency.

Solvency and Creditworthiness

It is important to distinguish between the concepts of solvency and creditworthiness. Solvency involves the ability to pay; creditworthiness involves both the ability and the willingness to pay.

Solvency

A country does not need to reduce the balance of its debt to remain solvent. Strictly speaking, solvency requires the debt to grow more slowly than the rate of interest, a very weak condition indeed. This condition is the same as the requirement that the discounted value of current and future consumption not exceed the discounted value of current and future output net of investment and minus the initial debt. An equivalent condition is that the discounted value of current and future surpluses on the noninterest current account be at least as large as the initial debt.

In other words, a country should devote at least some of its resources to servicing its debt, so that the increase in its debt does not exceed its interest payments. Otherwise the country ends up involved in a Ponzi scheme.

Solvency requires that the discounted value of total (public and private) consumption, C_t, not exceed the discounted value of output minus investment (public and private), $y_t - I_t$, minus the initial debt, b_0^*:[1]

$$\text{(1-8)} \quad \int_0^\infty \exp(-r^*t)[(y_t - I_t)/e_t]dt - b_0^* = \int \exp(-r^*t)(C_t/e_t)dt,$$

where $\exp(-r^*t)$ is the discount factor to correct for the time difference between 0 and t. The noninterest current account equals nationally generated output, including remittances, minus expenditure, excluding interest payments on the external debt:

$$\text{(1-9)} \qquad \text{nicad}_t = -(y_t - I_t - C_t).$$

Hence we can rewrite equation (1-8) as:

$$\text{(1-10)} \qquad \int_0^\infty \exp(-r^*t)\ (\text{nicad}_t/e_t)dt = -b_0^*.$$

Equation (1-10) shows that solvency requires the current and discounted value of the surplus on the noninterest current account (or minus the current account deficit) to equal at least the initial value of the debt.

Using the definition of the noninterest current account given in equation (1-2) allows equation (1-10) to be rewritten as:

$$\text{(1-11)} \qquad \int_0^\infty \exp(-r^*t)(\dot{b}^* - r^*b^*)dt = -b_0^*.$$

Integrating equation (1-11) yields:

$$\text{(1-12)} \qquad \lim_{t\to\infty} b_t^* \exp(-r^*t) - b_0^* = -b_0^*$$

or

$$\text{(1-13)} \qquad \lim_{t\to\infty} b_t^* \exp(-r^*t) = 0.$$

Equation (1-13) implies that for the country to remain solvent the debt will eventually need to grow slower than the rate of interest.

Creditworthiness

The distinction between creditworthiness and solvency is unique to the subject of external debt. In the case of internal debt (for example, a debt owed by a corporation), a firm's assets can be seized through the legal system if the firm does not meet its debt-service obligations.

If the value of the assets is high enough, the firm will be forced to pay. If the value of the assets falls short of the outstanding debt, the firm will be bankrupt. Where domestic debt is concerned, creditworthiness and solvency are not different concepts.

Foreigners will not, however, be able to seize domestic assets on a significant scale, especially if those assets belong to the debtor government. For this reason, the cost of defaulting on external debt is generally less than the value of the debtor's assets. This implies that a country can fail to be creditworthy (that is, it can seriously consider defaulting) even before it becomes insolvent.

To assess a country's creditworthiness therefore requires gauging whether the cost to the country of defaulting is less than the cost of its debt. A practical problem is that the cost of defaulting cannot be assessed reliably. A country that has not yet defaulted, however, clearly perceives that the burden of its debt falls short of the cost of defaulting. Otherwise it would have defaulted already. Creditworthiness can thus be maintained by preventing the burden of the debt from increasing further (Cohen 1988). A prudent debt strategy would be not to raise the debt burden above its current value. This may sound tautologically true, but it has important implications. For example, the trade surpluses that many Latin American countries were obliged to run after 1982 were in fact not prudent under this approach. Clearly, being forced to run trade surpluses of about 8 percent of GNP raises the burden of the external debt and might trigger default.

This approach to creditworthiness thus requires that the debt burden not increase. A second problem is how the debt burden is defined. Repayment requires not only a sufficiently high value of wealth, but also a surplus in traded goods of production over consumption (net exports). This is likely to be much more burdensome for a country whose resources are largely in the nontraded sectors of the economy than for one whose economy is oriented abroad. If the debt is more burdensome, a country might be more tempted not to repay, even if solvency requirements are met. Hence debt-export ratios are important for assessing creditworthiness, even though they overestimate the ratio of a country's debt to its output of tradable goods. Some traded goods that are produced domestically are likely to be sold at home. On the other hand, the debt-output ratio underestimates the debt burden, since GNP incorporates nontraded goods. Therefore a weighted average of the debt-output ratio and the debt-export ratio is used:

$$R^* = \gamma X^* + (1 - \gamma)Y^*, \tag{1-14}$$

with X^* (Y^*), the value of exports (home output), expressed in foreign goods as $X^* = X/e$ ($Y^* = y/e$).

For the choice of the weights we follow an approach suggested by Cohen (1988). Cohen suggests weights constructed so that no incentive remains to drive a wedge between actual and social costs of foreign exchange, at least for assessing creditworthiness. The measure of resources, R^*, should thus be set up so that any improvement in the debt-output ratio as a consequence of an appreciation of the real exchange rate will be offset by the negative effect of the real appreciation on the debt-export ratio. The question is how to choose γ. Choosing γ so that R^* does not depend on the real exchange rate implies that at the optimal choice of γ, small changes in e leave R^* unaffected:

$$\frac{dR^*}{de} = \gamma \frac{dX^*}{de} + (1 - \gamma) \frac{dY^*}{de}. \tag{1-15}$$

This leads to the following expression for γ:

$$\gamma = \frac{-\epsilon_e^{Y^*}}{(\psi_X \epsilon^{X^*} - \epsilon_e^{Y^*})}. \tag{1-16}$$

$\epsilon_e^{X^*}$ ($\epsilon_e^{Y^*}$) is the elasticity of $X^*(Y^*)$ for the real exchange rate e.

A feasible external debt strategy that maintains creditworthiness at least at current levels consists of a time path for foreign borrowing that will not lead to a rise in b^*/R^*. For later convenience we define the growth rate of R^*, n_R, as:

$$n_R = \frac{\psi_X \gamma n_{X^*}}{[\psi_X \gamma + (1 - \gamma)]} + \frac{(1 - \gamma) n_{Y^*}}{[\psi_X \gamma + (1 - \gamma)]}. \tag{1-17}$$

R^* has been constructed to be insensitive to real exchange rate depreciation; n_{X^*} (n_{Y^*}) is the growth rate of exports (GNP), both expressed for foreign goods; and n_{X^*} can in turn be linked to output growth, n^*, in the countries Turkey is exporting to:

$$n_{X^*} = \epsilon_{Y^*}^{X^*} n^*. \tag{1-18}$$

Here $\epsilon_{Y^*}^{X^*}$ is the elasticity of X^*, Turkey's exports in constant dollars, for output in the countries purchasing Turkey's exports.

By this definition, the following must hold to have a constant real debt burden:

$$\hat{b}^* - \hat{R}^* = 0, \tag{1-19}$$

with a "^" indicating the percentage change. Also, the rate of increase in foreign debt equals:

$$\hat{b}^* = \text{nicad}/(eb^*) + r^* \tag{1-20}$$

from equation (1-2). Combining equations (1-19) and (1-20) yields the

restriction on the noninterest current account required by this consideration of creditworthiness:

$$\text{nicad} = -(r^* - n)b^*e. \tag{1-21}$$

Equation (1-21) implies that creditworthiness requires a noninterest current account surplus equal to the debt times the excess of the real interest rate over the real output growth rate. Thus as long as the growth rate of real output is positive, a deficit on the current account, including interest payments, is in fact compatible with the constraints imposed by creditworthiness:

$$\begin{aligned} \text{nicad} &= -(r^* - n)eb^* < 0 \rightarrow \text{cad} = \text{nicad} + r^*eb^* \\ &= neb^* > 0. \end{aligned} \tag{1-22}$$

Expressing variables as a share of GNP produces the following expression of feasible external debt accumulation as a percentage of GNP, $\dot{eb}^*/y$:

$$\dot{eb}^*/y = (eb^*/y)n_R. \tag{1-23}$$

Applying this approach empirically requires the various elasticities to be estimated.

Empirical Preliminaries

The export elasticities of price and income are needed to derive the resource base measure R^* used in quantifying the creditworthiness limits to foreign borrowing. Estimating elasticities of demand for Turkish exports is difficult because the composition of Turkish exports has changed a great deal over the past few years. While total exports rose at an annual rate of 25 percent in real terms between 1980 and 1985, exports to the Gulf countries increased 42 percent in real terms over the same period. As a result, the share of exports going to the Gulf countries went from 21.5 percent in 1980 to 40.8 percent in 1985. We therefore estimate separate demand equations for exports to the Middle East and for exports to other countries.

The next problem is specification, which involves more than technicalities. At issue is whether Turkey competes with local producers in an export market or with other countries exporting to the same market. In the first case, the relevant price variable is a measure of Turkish export prices relative to a weighted average of, say, wholesale price indexes (translated into a common currency) in the export markets covered by the equation. In the second case, comparing price indexes for imports into Turkey's export markets is more appropriate. Arslan

and van Wijnbergen (1990) show that the second assumption has strong empirical support. Only those results are reported here.

Consider first the results for exports to the Gulf countries, X^{ol}:

$$\log(X_t^{ol}) = \underset{(1.62)}{-3.43} + \underset{(2.40)}{4.45}\log(\text{CMPRO}) + \underset{(1.75)}{0.57}\log(\text{RMOIL}) + \underset{(4.01)}{0.59}\log(X_{t-1}^{ol}). \tag{1-24}$$

$R^2 = 0.95$ $DW = 1.53$ Sample period: 1969–84; 2SLS

X^{ol} is the real value of Turkish exports to the Gulf countries expressed in terms of foreign goods (constant dollars). RMOIL is the total import bill of those countries in real terms, deflated by their own price index. CMPRO is the relative price of Turkish exports in terms of the aggregate import price index for those countries. The price elasticity of demand for Turkish exports is very high, and the long-run elasticity of all imports into the Gulf countries is 1.39 [0.57/(1 − 0.59)].

The results for exports to other countries, X^{oc} (principally the major members of the Organisation for Economic Co-operation and Development) are qualitatively similar but quantitatively quite different:

$$\log(X^{oc}) = \underset{(0.70)}{1.34} + \underset{(2.28)}{2.02}\log\left(\frac{P_M^X}{P_{\hat{X}}}\right) + \underset{(1.68)}{0.62}\log(M^{X^{oc}}). \tag{1-25}$$

$R^2 = 0.76$ Sample period: 1968–84; 2SLS

P_M^X is the dollar-based aggregate price index for imports into Turkey's export markets. $M^{X^{oc}}$ is the corresponding real value of imports into those export markets. If real income in Turkey's export markets, y_t^f, is used instead of total imports, the income elasticity increases substantially:

$$\log(X^{oc}) = \underset{(0.08)}{0.20} + \underset{(1.90)}{1.85}\log\left(\frac{P_M^X}{P_{\hat{X}}}\right) + \underset{(1.67)}{1.17}\log(y_t^f). \tag{1-26}$$

$R^2 = 0.76$ Sample period: 1968–84; 2SLS

A final elasticity needed for the Cohen approach to external debt is the supply elasticity of domestic real output relative to the real exchange rate (defined as the relative price of output from Turkey's trading partners compared with the price of Turkish goods). A simple regression yields:

$$\log(y_t^f) = \underset{(3.93)}{2.20} - \underset{(3.24)}{0.86}\log(e_t) + \underset{(5.99)}{0.05}\,\text{TIME}. \tag{1-27}$$

This completes the necessary preliminaries to applying this approach empirically to sustainable external debt accumulation.

Inserting these elasticities into equation (1-16) yields the value for γ used in this report: $\gamma = 0.60$, or a 60–40 weight distribution of exports and output.

Appendix: Exchange Rate Fluctuations and External Debt

Exchange rate developments influence the debt-output ratio through two channels. One is the real exchange rate, that is, the relative price of aggregate foreign goods compared with Turkish goods. This concept is closely related to the terms of trade. A real depreciation lowers the value of Turkish goods and thus raises the ratio of external debt to output. Equation (1-28) shows the mechanism:

$$\begin{aligned} \tilde{b}^* &= (B^*E/P)/y \\ &= [(B^*/P^*)(EP^*/P)]/y \\ &= b^*e/y. \end{aligned} \tag{1-28}$$

B^* is the dollar value of the debt, and P^* is the dollar-based, trade-weighted index of foreign prices. It is calculated as a geometric average of the dollar-based wholesale price indexes in Turkey's six major export markets outside the Middle East. Their respective share of total exports in 1980, rescaled to add up to 1, is used as the weight. b^* is the real value of the foreign debt in foreign goods: $b^* = B^*/P^*$. E is the nominal exchange rate against the dollar (local currency units per dollar), P is the domestic price level, y is the real GNP, and e is the real exchange rate, EP^*/P. Equation (1-28) shows that a real depreciation feeds directly into the debt-output ratio: capital losses on foreign debt increase the burden of the debt.

The second channel through which changes in the exchange rate influence the burden of the debt is the cross-currency exchange rate. Fluctuations in that rate may affect the dollar value of the debt even if Turkey's exchange rate against the dollar remains unchanged. For example, an appreciation of the deutsche mark against the dollar raises the dollar value of the debt since a substantial part of Turkey's external debt is denominated in deutsche marks. This is not captured in equation (1-28) because of the implicit assumption of a single foreign good.

To capture this effect, the value of the debt is defined in 1980 values of cross-currency exchange rates, B_c^*. The difference between the value evaluated at actual cross-currency exchange rates, B^*, and B_c^* is $\delta B^* = B^* - B_c^*$, which is the cumulative loss incurred since 1980 because of changes in the cross-currency exchange rate.

In fact, cross-currency exchange rate changes affect the level of foreign prices as well as the dollar value of the foreign debt. To capture this effect, too, we define P_c^* as the dollar-based foreign price index evaluated at 1980 cross-currency exchange rates. The difference from the actual foreign price level, P^*, is $\delta P^* = P^* - P_c^*$. We can then define a measure for the real value of the debt, expressed in foreign goods, but evaluated at 1980 cross-currency exchange rates:

(1-29) $$b_c^* = B_c^*/P_c^*.$$

This measure is used in chapter 4 (see table 4.3).

To isolate the effect of changes in the cross-currency exchange rate, the expression in equation (1-28) is decomposed further:

(1-30)

$$eb^* = e_{c,0}b_c^* + (\delta B^*/P^*)e_c + (\delta P^*/P^*)(\delta B^*/P_c^*)e_c + (e_c - e_{c,0})b_c^*.$$

The first term in equation (1-30) equals the debt-output ratio in constant Turkish liras, corrected for the effects of any change in cross-currency exchange rates since 1980 on the dollar value of the debt. The term e_c is the real exchange rate evaluated at 1980 cross-currency exchange rates, $e_c = EP_c^*/P$, and $e_{c,0}$ is the value of the same variable in the base year, $e_{c,0} = E_0P_{c,0}^*/P_0$.

The second term measures the effect of cross-currency fluctuations on the stock of external debt, while the third term captures the effect of cross-currency fluctuations on foreign prices. Finally, the fourth term captures the effect of the real depreciation of the Turkish lira against the dominant foreign currency, the dollar. Equation (1-3) provides the decomposition of external debt presented in chapters 4 and 5.

Finally, since we used a measure of real debt corrected for the cross-currency exchange rate effect on both the nominal dollar value of debt and the price level, the real interest rate also must be corrected for these effects. This should be done in two steps. First, the average nominal interest rate should be evaluated at 1980 cross-currency exchange rates. Call this measure i^*. This procedure ignores capital losses arising from cross-currency exchange rate changes and is therefore compatible with using a debt measure corrected for such fluctuations. Second, the real rate should be calculated using an inflation rate based on P^* to eliminate the effect of cross-currency exchange rate changes on the price level used to deflate the debt: $r^* = (1 + i^*)/(1 + \hat{P}^*) - 1$.

2 *Inflation, External Debt, and Financial Sector Reform: Toward Consistent Fiscal Policy Design*

THIS CHAPTER PRESENTS an integrated framework to assess whether fiscal deficits are consistent with other macroeconomic targets, in particular output growth and the rate of inflation. The model centers on the government budget constraint and can be used to derive either the deficit that can be financed given inflation targets or an equilibrium inflation rate for which no fiscal adjustment is necessary. The financeable deficit does not require more financing than is compatible with sustainable external and internal borrowing and with existing targets for inflation and output growth.

The consistency between fiscal deficits and other macroeconomic targets can thus be judged by looking at the government budget constraint. This constraint says that the sum of the noninterest deficit and the interest bill on foreign and domestic debt is equal to the sum of financing from all sources. Fiscal deficits can be financed in three ways: issuing external debt, issuing interest-bearing internal debt, and obtaining monetary financing. Macroeconomic targets, such as a target inflation rate, imply that there are restrictions on these sources of financing. These restrictions set the financeable deficit at a certain level; consistency requires that the actual deficit be brought in line with this financeable deficit. If the actual deficit exceeds the financeable deficit, one or more of the macroeconomic targets will have to be revised, or fiscal policy will have to be adjusted.

The model can be used to assess the effect on the relation between fiscal adjustment and sustainable inflation rates of various factors: financial sector reforms affecting base money demand, changes in interest rates paid on foreign and domestic public sector debt, output growth targets, and exchange rate policy. It can also be used to see what happens if the required fiscal adjustment is postponed. In chapter 5 the model is applied to an analysis of inflation, external debt, and financial sector reform in Turkey.

The framework is based on a view of inflation from the perspective of public finance. Phelps (1973) and Dornbusch (1977) provide an early analysis along such lines; the work presented here builds on Buiter (1985) and Anand, Rocha, and van Wijnbergen (1988). In this method, inflation is interpreted as the residual tax, which is residual because it restores balance among the public sector's expenditure plans, debt management, and revenue from traditional sources of taxation. Inflation acts as a tax because it forces the private sector to reduce expenditure just to maintain the real value of the money balances it desires to hold. Inflation drives a wedge between income and expenditure that is not offset by a real accumulation of assets, as do all taxes. Also, since its counterpart is the money that the central bank advances to the public sector, inflation allows the public sector to spend more than the traditional sources of revenue do; the amount spent matches the amount advanced by the central bank.

This method does not deny that, in the short run, demand pressure or cost-push factors such as changes in the nominal exchange rate may be important determinants of inflation. Such factors, however, contribute little to understanding sustained inflation. Excess demand pressure, as Friedman (1978) points out in his celebrated presidential address, should lead to accelerating rather than sustained inflation. Cost-push factors, such as changes in the wage or exchange rate or, for that matter, in public sector prices, can explain shifts in the level of prices, but not sustained inflation. Continued nomimal devaluation could explain a matching excess of domestic over foreign inflation, but not the factors determining the apparent need for a continued policy of nominal devaluation. A similar objection can be raised to strict monetarist explanations of inflation. The claim that sustained inflation is impossible without a matching growth in nominal balances is almost tautologous since without that growth the real money stock would approach zero or infinity. The claim does not, however, explain what drives the process of sustained monetization.

To explain sustained inflation rates requires analyzing the fiscal implications of sustained inflation, which is what the fiscal approach to inflation does. This approach received renewed attention after Sargent and Wallace (1981) used it to explain the paradoxical, negative links between inflation and money growth sometimes observed in practice. The concept of sustainability plays an important role in their analysis. Sustainability requires that inflation targets be consistent with their implied consequences for revenue generated by the inflation tax, on the one hand, and, on the other, with the public sector's surplus of expenditure over other sources of revenue.

The fiscal view of inflation posits that short-term links between inflation and deficits are likely to be tenuous, but that any deficit

coupled with sustainable, constant ratios of debt to output implies a particular inflation rate. The argument runs through what is known as the inflation tax. The concept of inflation tax is based on the same relation that makes monetarist explanations of inflation work so well after the fact: the real money stock is usually a stable function of interest rates and income within a given financial structure. For a given interest rate, level of income, and financial structure, consumers who wish to maintain money balances fixed in real terms have to accumulate nominal balances at the rate of inflation and in proportion to their desired level of real balances, m. Then revenue from inflation tax, $IT, = \hat{P}m(i, y)$, where $\hat{P}$ equals inflation, i the nominal rate of interest, y real income. Money is an interest-free liability of the public sector, however, and the public sector can cover real expenditure by issuing nominal liabilities: the private sector will run a matching surplus of income over expenditure to accumulate these money balances (that is, to pay the inflation tax).

By analogy with more conventional taxes, $\hat{P}$ can be considered to be the tax rate and m, the level of real money demand, the tax base. The fiscal authorities make a net gain only when the inflationary erosion of the money stock is not offset by the inflationary gains of domestic borrowers; hence the proper tax base is not the broad money stock (M2, for example), but the narrower concept of inside or base money, which is not offset by the debt that the private sector owes the banking system.

In addition, the government can issue money if real money balances rise with the level of real income; if this increase is one-for-one, seigniorage revenue net of inflation tax can be defined as $SR = nm(i, y)$, where n is the growth rate of real income.

Exchange rate policy plays an important role in all this (the analysis of Sargent and Wallace 1981 is extended to the open economy in Drazen and Helpman 1987 and van Wijnbergen 1991 to allow discussion of exchange rate policy). It can be argued that the exchange rate policy of many moderate- and high-inflation countries increases the relevance of public finance in analyzing inflation. Moderate and high inflation has forced many countries to offset differentials between their own and their trading partners' inflation by nominal devaluation that avoids disrupting real trade flows. Such a policy, however, eliminates the role of the exchange rate as a nominal anchor, since a blip in the price level will be automatically offset by a matching adjustment in the exchange rate. Thus in such an exchange rate policy the nominal exchange rate does not restrain developments in the level of domestic prices. If monetary policy is also accommodating because the central bank cannot resist monetization of fiscal deficits, no monetary anchors are left to tie down the price level. In such circumstances the public

finance approach to inflation becomes relevant to explaining short-run as well as medium-run inflation.

Even if a fixed exchange rate regime is adhered to, the approach suggested here is relevant. A fixed exchange rate regime (or, more generally, a predetermined exchange rate regime) implies a medium-term inflation rate: foreign inflation plus the rate of nominal devaluation embedded in the exchange rate regime (zero if the regime is truly fixed). Consistency between fiscal policy and the inflation rate implied by the exchange rate policy is important. Empirical evidence shows conclusively that the absence of this consistency is an important determinant of lack of credibility and the eventual collapse of a fixed exchange rate regime (Cumby and van Wijnbergen 1989). The approach suggested in this book could also be used to assess the sustainability of a fixed exchange rate regime.

The remainder of this chapter develops a formal framework for assessing the extent of existing inconsistencies and the size of the fiscal deficit correction required. We first discuss the appropriate concept of deficits and the link between deficits and changes in debt and monetary aggregates and then demonstrate the importance of financial structure in the links among inflation, debt, and fiscal deficits. This base is then used to assess the effect of financial sector reforms on sustainable deficits and, in general, fiscal consistency with exchange rate and inflation targets. We then show how to derive deficit levels that are consistent with internal and external debt strategies, inflation targets, and exchange rate policy. Finally, we present the econometric work necessary to apply the model to Turkey.

Fiscal Deficits, Money Creation, and Debt

Deriving the relation among fiscal deficits, money creation, and debt begins with the following relation:

$$D + iB + i^*B^*E = \dot{B} + \dot{B}^*E + D\dot{C}_g. \tag{2-1}$$

The left-hand side of equation (2-1) lists the expenses (net of taxes) of the public sector: its noninterest deficit D plus the nominal interest payments on its domestic and foreign debt; i (i^*) is the nominal interest rate on domestic (foreign) debt B (B^*); and E is the nominal exchange rate (in Turkish liras per dollar). These expenses must be covered by issuing domestic or foreign debt ($\dot{B}$ and $\dot{B}^*$) plus central bank advances to the public sector ($D\dot{C}_g$). The noninterest deficit D and the interest payments should include the obligations of all government entities: the central government, state enterprises, municipalities, local governments, and extrabudgetary funds.

Equation (2-1), although correct in an accounting sense, cannot as-

sess the consistency of fiscal policy with other macroeconomic targets. First, if used to derive restrictions on fiscal deficits, it would leave a major loophole because it does not cover the entire public sector. At issue is the treatment of the central bank. The government could easily shift a substantial part of its deficit into the central bank's accounts merely by changing its bookkeeping practices. After all, the central bank is part of the public sector and could undertake many functions normally handled by the treasury. To close this loophole, the profit-and-loss account of the central bank must be brought into the budget balance equation and the central bank into the definition of the public sector.

The importance of the latter addition cannot be stressed too much. Many countries run a balanced budget, sometimes under the force of a constitutional amendment, but in fact continue deficit spending by shifting treasury expenditure to the central bank. In Turkey, a substantial part of the interest payments on the central government's foreign debt is handled by the central bank and not recorded in the central government's budget.

The second issue is related to the first. Central bank credit to the government, DC_g, is in fact one public sector entity's claim on another. Debt consolidation would make that claim disappear. Moreover, it does not correspond to any asset in private portfolios and bears no obvious link to inflation, output growth, and so on. The link between central bank credit and money needs to be established.

To remedy these shortcomings, the following table presents a simplified central bank balance sheet.

Central Bank Balance Sheet

Assets	*Liabilities*
DC_g	NW
NFA^*E	Cu
	RR

The balance sheet shows that the central bank's liabilities consist of currency held by the public, Cu, and commercial bank reserves, RR. Assume, correctly for the case of Turkey, that no interest is paid on required reserves RR. The funds so obtained are used to hold net foreign assets, NFA^*E, and to extend credit to the government, DC_g. The balancing item is the central bank's net worth, NW. Now $Cu + RR$, currency in the hands of the public (Cu) and reserves held by commercial banks at the central bank (RR), equal the supply of base money, M. The balance sheet shows that M can be interpreted as the net liability of the central bank to the private sector. It also indicates

the uses made of the funds raised by issuing zero-interest debt (base money): $M = DC_g + NFA^*E - NW$. Thus base money is issued to cover credit to the government and the central bank's accumulation of net foreign assets that has not been covered by the central bank's accumulated profits or net worth (NW).

The central bank's profits consist of interest earnings on net foreign assets, i^*NFA^*E. In this simplified setup, the counterpart is an increase in its net worth, NW. Its profit-and-loss account thus reads $i^*NFA^*E = N\dot{W}$.

To incorporate the central bank into the public sector deficit identity, central bank profits must be subtracted from the deficit and its increase in net worth must be subtracted from the public sector's increase in liabilities (sources of financing). This leads to:

$$\text{(2-2)} \quad D + iB + i^*(B^* - NFA^*)E = \dot{B} + \dot{B}^*E + D\dot{C}_g - N\dot{W}.$$

Equation (2-2) includes the entire public sector, which closes one important loophole. It is, however, difficult to interpret. On the left-hand side, it lists interest payments on the net foreign debt of the public sector. On the right-hand side, however, it lists as a source of financing increases in gross foreign debt, excluding the central bank. It also includes claims of one government entity on another: DC_g is really an intergovernment agency debt that should be netted out. Consolidating the debt of the central bank and other government agencies is necessary to arrive at an economically meaningful concept of net public sector debt. This can be done in two steps. First the public sector foreign debt must be made net debt throughout by subtracting the change in the central bank's net foreign assets from the change in the government's foreign debt, B^*, on the right-hand side of the equation. To maintain equality it must then be added back in. The net result is:

$$\text{(2-3)} \quad D + iB + i^*(B^* - NFA^*)E$$
$$= \dot{B} + (\dot{B}^* - N\dot{F}A^*)E + D\dot{C}_g + N\dot{F}A^*E - N\dot{W}.$$

The resulting equation consolidates the foreign debt and assets of various government agencies, but it still includes what is essentially an interagency debt: central bank credit to the government, DC_g. This can be remedied by recognizing that the last three terms on the right-hand side of equation (2-3) equal the change in the supply of base money, M (see the central bank balance sheet above). Substituting this money supply identity into equation (2-3) yields:

$$\text{(2-4)} \quad D + iB + i^*(B^* - NFA^*)E = \dot{B} + (\dot{B}^* - N\dot{F}A^*)E + \dot{M}.$$

This equation also suggests the proper definition of money for an

analysis of inflation tax revenue and deficit finance. Clearly, the revenue derived from inflationary erosion of the private sector's deposits in the banking system, which is offset by inflationary erosion of outstanding loans to the private sector, does not increase net revenue. Therefore total currency held by the public plus total bank deposits (M2) minus bank loans should be used. But M2 minus bank loans equals base or inside money:

$$\begin{aligned} \text{M2} - L &= Cu + DD + TD - L \\ &= Cu + RR \\ &= M. \end{aligned}$$

Counting all of the central bank's liabilities (base money) as a public sector liability means that of the central bank's assets, the claims on nongovernment agents should be subtracted from the public sector's debt. In particular, the public sector's foreign debt must be measured net of the central bank's foreign assets (that is, the public sector foreign debt equals $B^* - NFA^*$).

In practice, there will be further complications.[1] In many countries the central bank not only takes reserves from commercial banks; it also lends to them and to the private sector. This requires that the definition of base money be adjusted so that the definition coincides with the central bank's net liabilities to the private sector. The balance sheets presented in the following table indicate the adjustments to be made.

Extended Central Bank (CB) Balance Sheet

CB		→	CB	
Assets	*Liabilities*		*Assets*	*Liabilities*
NFA^*E	NW		NFA^*E	NW
DC_g	C		DC_g	$Cu - DC_{pvt}$
DC_{dmb}	R			$RR - DC_{dmb}$
DC_{pvt}				
Monetary base			Adjusted monetary base	

The adjusted monetary base equals the monetary base minus central bank credit to commercial banks and other private sector agents. This concept equals the central bank's net noninterest-bearing liabilities to the private sector and is the appropriate concept for calculating the consistency with the deficit of revenue from the inflation tax.

The deficit measured in equation (2-4) still does not adequately capture the public sector's claim on resources, at least not in periods of inflation. Even though the right-hand side lists all the increases in the

public sector's net liabilities, these increases are in the nominal value, not the real value. The counterpart is to include nominal instead of real interest payments in the definition of expenditure. This inclusion is misleading, however: as is widely recognized, the domestic and foreign inflation components in nominal interest rates, $\hat{P}B$ and $\hat{P}^*(B^* - NFA^*)$, represent repayment of (real) principal and thus a capital account rather than a current account transaction. Taking this capital account transaction out of the identity on both sides and dividing all variables by the price level P yields

$$d + rb + r^*(b^* - nfa^*)e = \dot{b} + (\dot{b}^* - \dot{nfa}^*)e + \dot{M}/P. \tag{2-5}$$

Lowercase letters denote real variables, so $d = D/P$, the real value of the noninterest deficit; $P(P^*)$ is the domestic (foreign) level of prices; $\hat{P}(\hat{P}^*)$ is the corresponding domestic (foreign) inflation rate; b (b^*) is the real value of domestic (foreign) debt in terms of domestic (foreign) goods; m is the real money stock, M/P; nfa^* is the real value of the banking system's net foreign assets in terms of foreign goods; e is the real exchange rate, $e = EP^*/P$; and r (r^*) is the real rate of interest: $r = i - \hat{P}$, $r^* = i^* - \hat{P}^*$. The exact formula is slightly different:

$$(1 + r) = (1 + i)/(1 + \hat{P});\ (1 + r^*) = (1 + i^*)/(1 + \hat{P}^*). \tag{2-6}$$

The difference between the two ways of calculating $r(r^*)$ is of second order, but in discrete time it may nevertheless be substantial with high inflation rates. The calculations in this book always use the exact formula.

Two further extensions are in order. The first consists of the inclusion of changes in the real exchange rate, $\hat{e}$:

$$d + rb + (r^* + \hat{e})(b^* - nfa^*)e = \dot{b} + [(b^* - \dot{nfa}^*)e] + \dot{M}/P. \tag{2-7}$$

The second involves the splitting of $\dot{M}/P$, the real value of the increase in nominal base money, into two components:

$$\dot{M}/P = \dot{m} + \hat{P}m. \tag{2-8}$$

The first component represents the increase in the real value of base money, $\dot{m}$. The second represents the amount of nominal balances that must be accumulated to keep the real value of the money stock constant: $\hat{P}m$. Inserting equation (2-8) into equation (2-7) yields:

$$d + rb + (r^* + \hat{e})(b^* - nfa^*)e = \dot{b} + [(b^* - \dot{nfa}^*)e] + \dot{m} + \hat{P}m. \tag{2-9}$$

Equation (2-9) states that the fiscal deficit, including the central bank's profit-and-loss account but counting only real interest payments, equals changes in the real value of domestic and foreign debt plus revenue from seigniorage: the inflation tax ($\hat{P}m$) and increases in the real money stock ($\dot{m}$). In steady state, $\dot{m}$ equals nm, with n the real

growth rate of the economy. Outside steady state, monetization could produce other sources of revenue: changes in the real money stock that occur because of changes in inflation or interest rates, or changes that occur because financial innovations shift the demand for money.

Equation (2-9) as it stands, although no more than accounting, supports most of the analysis to come. Macroeconomic variables such as output growth and inflation have implications for the amount of money the private sector is willing to absorb for a given interest rate. Similarly, changes in financial structure and regulation also affect the amount of revenue from monetization that can be expected. Finally, creditworthiness and sustainability place constraints on the issue of interest-bearing debt. All such restrictions can be incorporated in equation (2-9). The next section considers how revenue from monetization is influenced by the private sector's choices about the makeup of its portfolio and by the structure of the financial system.

Revenue from Monetization and the Structure of the Financial System

The previous section argued that the appropriate money concept to use is net central bank liabilities to the private sector, that is, reserve money. It is important to understand how demand for base money responds to changes in financial sector regulation, to interest rates, and to inflation. This creates a practical problem because central bank liabilities are to different agents in the economy. Therefore an aggregate money demand function would probably not capture the sensitivity of reserve money demand to changes in the inflation rate, financial structure, and interest rates. A structural analysis that explicitly incorporates the structure of the financial sector and enters separate behavioral equations for different actors is more appropriate.

Underlying this analysis is a model describing private sector portfolio choice as a function of inflation, output growth, and interest rates. This gives the amount of currency, demand deposits, and time deposits the private sector is willing to hold with given rates of output, inflation, and interest. Coupled with a simple model of the financial sector incorporating reserve requirements and other bank regulatory policies, this model derives the demand for reserves by commercial banks. The demand for reserves is then added to the demand for currency already derived to produce an estimate of the total demand for base money with given rates of inflation, interest, and so on. This is then used to calculate revenue from monetization for different inflation rates, output growth rates, interest rates, and regulatory policies.

This indirect, structural method has a number of advantages. It allows the effect of changes in financial sector regulation on the fi-

nanceable deficit to be explicitly calculated by modeling the effect of that regulation on the aggregate demand for base money. This method is likely to be stable across changes in financial sector regulation. The following is an example of a simple fractional reserve banking system (that is, a system in which banks are required to hold a fraction of their deposits as reserves), but complicated regulatory systems can also be incorporated.

To analyze the determinants of the demand for the primary components of reserve money, consider first the private sector's demand for various monetary assets:

$$
\begin{aligned}
(Cu/P) &= f_C(y, \hat{P}, i_{DD}, i_{TD})w, \\
(DD/P) &= f_{DD}(y, \hat{P}, i_{DD}, i_{TD})w, \text{ and} \qquad (2\text{-}10) \\
(TD/P) &= f_{TD}(y, \hat{P}, i_{DD}, i_{TD})w.
\end{aligned}
$$

Demand for currency Cu, demand deposits DD, and time deposits TD, all as a share of real wealth w, depend on inflation $\hat{P}$ and the interest rates paid on demand and time deposits, i_{DD} and i_{TD}. More sophisticated financial structures would introduce additional factors. For example, with foreign exchange deposits available, exchange rate depreciation and foreign interest rates would probably influence demand for domestic assets. However, the time that has passed since foreign exchange deposits were introduced in Turkey has been too short to allow the influence of such factors to be analyzed econometrically.

Under a fractional reserve system, with reserve requirement ratios RR_{DD} and RR_{TD} against demand and time deposits, respectively, demand for base money M is:

$$
\begin{aligned}
M/(Pw) &= Cu/P + RR_{DD}DD/P + RR_{TD}TD/P \\
&= f_C(y, \hat{P}, i_{DD}, i_{TD}) + RR_{DD}f_{DD}(y, \hat{P}, i_{DD}, i_{TD}) \qquad (2\text{-}11) \\
&\quad + RR_{TD}f_{TD}(y, \hat{P}, i_{DD}, i_{TD}).
\end{aligned}
$$

Equation (2-11) can be used to derive the effect of changes in inflation, interest rates, and financial sector regulations on the demand for base money and their likely effect on the amount of revenue the public sector can expect to receive from monetization. Combining this information with equation (2-8) then allows assessment of the fiscal consequences of inflation and of financial sector reforms affecting, say, reserve requirements RR_{DD} and RR_{TD} or the interest rates paid on deposits in commercial banks.

The Design of Consistent Fiscal Policy

A consistent fiscal policy is defined here as a policy that can be sustained over the medium term without compromising another ma-

croeconomic target and without relying on unsustainable debt finance. Unsustainable debt finance implies debt issued at a rate higher than the growth rate of the resources available for eventual debt service. This is a more stringent requirement than solvency if the real interest rate exceeds the real growth rate of the economy (see chapter 1).

If R^* is the resource base for foreign debt and domestic output y is the resource base for domestic debt, the requirement to maintain a constant ratio of debt to resource base implies the following restrictions on debt issue:

$$\dot{b} = nb, \; \dot{b}^* - n\dot{fa} = n_R(b^* - nfa^*), \tag{2-12}$$

where $n(n_R)$ is the growth rate of $y(R^*)$. Inserting these restrictions on debt issue into equation (2-9) and expressing variables as percentages of gross national product (GNP) yield the following expression for the deficit reduction required for consistency, *RDR*:

$$\begin{aligned} RDR = {} & [\tilde{d} + r\tilde{b} + r^*(\tilde{b}^* - n\tilde{fa}^*)] \\ & - [n\tilde{b} + n_R(\tilde{b}^* - n\tilde{fa}^*) + n\tilde{m} + \hat{P}\tilde{m}]. \end{aligned} \tag{2-13}$$

A variable with a "~" is expressed as a share of GNP. *RDR* equals the actual deficit including real interest payments on foreign and domestic debt minus the financeable deficit, $[n\tilde{b} + n_R(\tilde{b}^* - n\tilde{fa}^*) + n\tilde{m} + \hat{P}\tilde{m}]$. A deficit reduction equal to *RDR* will bring fiscal deficits in line with other macroeconomic targets in the sense defined above.

If R^* is used as the benchmark for measuring foreign debt accumulation, real depreciation ($\hat{e} > 0$) will not affect fiscal balance: costs of debt servicing that are higher due to real depreciation will be offset by additional foreign borrowing under such a rule. This will not be the case if either exports or output is the benchmark. If the current debt-output ratio is used, equation (2-13) becomes:

$$\begin{aligned} RDR = {} & [\tilde{d} + r\tilde{b} + (r^* + \hat{e})(\tilde{b}^* - n\tilde{fa}^*)] \\ & - [n\tilde{b} + n(\tilde{b}^* - n\tilde{fa}^*) + n\tilde{m} + \hat{P}\tilde{m}]. \end{aligned} \tag{2-14}$$

Clearly, under a constant debt-output rule, a real depreciation ($\hat{e} > 0$) increases the *RDR* and therefore reduces the room for fiscal expansion.

Under a (constant) debt-export rule, equation (2-13) becomes:

$$\begin{aligned} RDR = {} & [\tilde{d} + r\tilde{b} + (r^* + \hat{e})(\tilde{b}^* - n\tilde{fa}^*)] \\ & - [n\tilde{b} + n_X(\tilde{b}^* - n\tilde{fa}^*) + n\tilde{m} + \hat{P}\tilde{m}]. \end{aligned} \tag{2-15}$$

Several factors influence export growth n_X. For our purposes, the two most important are the rate of output growth of the trading partners and the real exchange rate. With the constant elasticity export demand function presented in the next section, n_X can be written as:

$$n_X = \epsilon^X_{Y^*} n^* + \epsilon^X_e \hat{e}, \tag{2-16}$$

where n^* is the rate of output growth of the trading partners, and $\hat{e}$ is the rate of depreciation of the real exchange rate. $\epsilon^X_{Y^*}$ is the income elasticity of exports, and ϵ^X_e is the export demand elasticity of the real exchange rate e. Inserting equation (2-16) leads to the following expression of the required deficit reduction, *RDR*, as a function of growth rates, rate of real depreciation, and so on:

$$RDR = [\tilde{d} + r\tilde{b} + r^*(\tilde{b}^* - n\tilde{fa}^*)] - [n\tilde{b} + \epsilon^X_{Y^*} n^*(\tilde{b}^* - n\tilde{fa}^*) + n\tilde{m} + \hat{P}\tilde{m}] + (1 - \epsilon^X_e)\hat{e}\,(\tilde{b}^* - n\tilde{fa}^*)e. \tag{2-17}$$

Under this rule, real depreciation will relax the fiscal adjustment requirement if the export elasticity of the real exchange rate exceeds 1.

This framework will help derive the deficit reduction required to restore consistency between fiscal deficits and macroeconomic targets such as inflation, output growth, and (the rate of change of) the real exchange rate. In addition, this measure will be affected by output growth of trading partners, real interest rates abroad and at home, debt management policies, and measures influencing the financial structure, in ways specified in the preceding section. Before this measure can be applied, some empirical information is needed; in particular, the sensitivity of asset demand to inflation and interest rates. We turn to this next.

Empirical Preliminaries

Reserve money consists of currency in circulation and reserves held against demand deposits and time deposits. To derive demand for base money, asset demand functions describing the private sector's portfolio choice of currency, demand deposits, and time deposits are estimated as a function of inflation, income, and interest rates. Real wealth, a slow-moving variable, was omitted for lack of reliable data. The equations were estimated using quarterly data and semilogarithmic form in interest and inflation rates. The semilogarithmic form performed better than a fully logarithmic specification in a Box-Cox test.[2] The proxy for expected inflation is a combination of past and current values with weights determined by a second-degree polynomial without end-point restrictions using the Almon procedure.

We show two sets of estimates, one for the first quarter of 1977 to the third quarter of 1983 and one for the first quarter of 1977 to the fourth quarter of 1986. The sample is not extended backward for lack of a homogeneous time series of financial aggregates.[3] The equations were first estimated using a shorter sample period in order to test for structural shifts due to the introduction of foreign exchange deposits

in the fourth quarter of 1983 and the increase in informal repurchase agreements with government securities during 1985 and 1986 (see chapter 5). Consider demand for currency first (the entry below $\log[X(-1)]$ indicates the coefficient on the lagged endogenous variable):

77/1–83/3	c	$\ln(y_t)$	$i_{TD,t}$	$i_{DD,t}$	$\hat{P}_t^e$	$\log[X(-1)]$
$\log(Cu/P)$	−3.0	1.74	−0.77	−1.44	−0.97	0.53
	(1.28)	(2.50)	(3.20)	(4.13)	(4.11)	(4.39)
	$\bar{R}^2 = 0.94$	$\bar{\rho} = -0.37$	$H = -1.33$	SER = 0.043		

77/1–86/4	c	$\ln(y_t)$	$i_{TD,t}$	$i_{DD,t}$	$\hat{P}_t^e$	$\log[X(-1)]$
$\log(Cu/P)$	3.58	0.57	−0.69	−1.07	−1.51	0.28
	(3.10)	(2.42)	(3.67)	(3.01)	(3.79)	(1.77)
			$\bar{R}^2 = 0.83$	$H = -1.53$	SER = 0.069	

Both equations produce a good fit and coefficients with intuitive signs and high significance. The coefficient of the lagged term indicates a fast adjustment, which is expected, given the rather high and variable inflation rate over the period. The parameters change substantially when the period up to the fourth quarter of 1986 is included. The rather high income elasticity falls to more reasonable levels (a long-run elasticity of 0.78 instead of 3.70), but the coefficients on the interest and inflation rates are less affected. The already fast estimated adjustment speed increases considerably once the later period is included.

Consider next sight deposits. Estimating a similarly structured equation yields:

77/1–83/3	c	$\ln(y_t)$	$i_{TD,t}$	$i_{DD,t}$	$\hat{P}_t^e$	$\log[X(-1)]$
$\log(DD/P)$	1.57	0.90	−1.07	0.01	−1.50	0.43
	(0.75)	(1.99)	(4.77)	(0.02)	(5.19)	(3.50)
	$\bar{R}^2 = 0.97$	$\bar{\rho} = -0.44$	$H = -0.41$	SER = 0.038		

77/1–86/4	c	$\ln(y_t)$	$i_{TD,t}$	$i_{DD,t}$	$\hat{P}_t^e$	$\log[X(-1)]$
$\log(DD/P)$	8.90	−0.55	−0.96	0.60	−2.16	0.24
	(6.71)	(2.86)	(7.97)	(1.30)	(7.83)	(2.67)
			$\bar{R}^2 = 0.98$	$H = 0.58$	SER = 0.041	

This equation shows a similar pattern: significant coefficients with mostly intuitive signs and a substantial shift in parameters once the

period following the introduction of foreign exchange deposits is included. Income elasticity again declines substantially once the later period is included: in fact, the coefficient switches sign (note that the total of all derivatives of income must add up to zero in this portfolio model).

Finally, the equations for time deposits are:

77/1–83/3	c	$\ln(y_t)$	$i_{TD,t}$	$i_{DD,t}$	$\hat{P}_t^e$	$\log[X(-1)]$
$\log(TD/P)$	1.55	0.04	0.92	−0.01	−0.73	0.79
	(0.41)	(0.00)	(1.76)	(0.02)	(0.71)	(5.22)

$\bar{R}^2 = 0.99 \quad H = 0.42 \quad \text{SER} = 0.055$

77/1–86/4	c	$\ln(y_t)$	$i_{TD,t}$	$i_{DD,t}$	$\hat{P}_t^e$	$\log[X(-1)]$
$\log(TD/P)$	1.30	0.28	1.18	0.38	−1.41	0.68
	(1.94)	(1.02)	(4.61)	(1.21)	(2.23)	(7.48)

$\bar{R}^2 = 0.99 \quad H = 0.38 \quad \text{SER} = 0.055$

This equation also fits well. Only the coefficient on the sight deposit rate has the wrong sign, but it is not significant. In one respect, however, the pattern does differ from that observed in the previous two equations. The equation does not shift nearly as much when the period with foreign exchange deposits is included. In fact a formal F-test confirms the structural shifts in the currency and sight deposit equations but rejects them in the time deposit equation. One interpretation is that the shift into foreign exchange deposits that took place in the fourth quarter of 1983 was mostly out of currency and demand deposits, not time deposits (moreover, deposits may have been diverted from deposits held abroad). The equation is estimated over the longer period in each application of the consistency model presented in part 2. This completes the empirical preliminaries required to use the model.

3 External Debt, Investment, and the Public Sector

THE MODEL presented here is designed to shed light on the central questions raised in this book: can the objectives of external balance and satisfactory output growth be reconciled, and what is the role of fiscal policy in this tradeoff? The model focuses sharply on the role of fiscal policy and therefore covers only the relations necessary to explore the effect of fiscal policy on private savings and investment behavior, output growth, and external balance. It is used in chapter 6 to analyze Turkey's past and in chapter 7 to explore the tradeoffs among output growth, external debt, and real interest rates.

Structure of the Model

Several channels through which fiscal policy affects macroeconomic performance are highlighted. First is the relation between interest rates, fiscal deficits, and external balance. High real interest rates, by depressing private investment and consumption, create more room for fiscal deficits within a given external balance target. At the same time, high real interest rates complicate fiscal management by raising the cost of servicing the domestic public debt. The crucial issue is the sensitivity of private saving and investment with respect to the real interest rate.

A second channel concerns the relation between the composition of government expenditure programs and growth. A substantial part of total investment in Turkey is undertaken by the public sector. As a consequence, the allocation of government expenditure to consumption and investment is an important determinant of output growth for any given level of expenditure. Not all public sector investment projects are effective in promoting growth. The model highlights not only the amount but the composition of public investment. Public investment in infrastructure promotes private investment, while pub-

lic investment in manufacturing actually depresses private investment. Thus the composition of public investment is an important determinant of private investment and therefore of aggregate investment and output growth.

The final channels incorporated in the model are the effects of capacity utilization on private investment and of output growth on private saving and investment. These channels were important in the mid-1980s and are therefore incorporated in the model.

How the Model Works

If arbitrage between foreign and domestic interest-bearing assets is imperfect, because of either imperfect substitutability or explicit capital controls, the link between foreign and domestic interest rates is severed. External targets can then be maintained even if fiscal deficits increase because interest rate policy can be used to generate a matching, higher surplus of net private savings.[1] If arbitrage causes domestic interest rates to approximate foreign interest rates corrected for exchange rate depreciation, macroeconomic policy faces much tighter constraints: interest rates can no longer be used as an instrument.

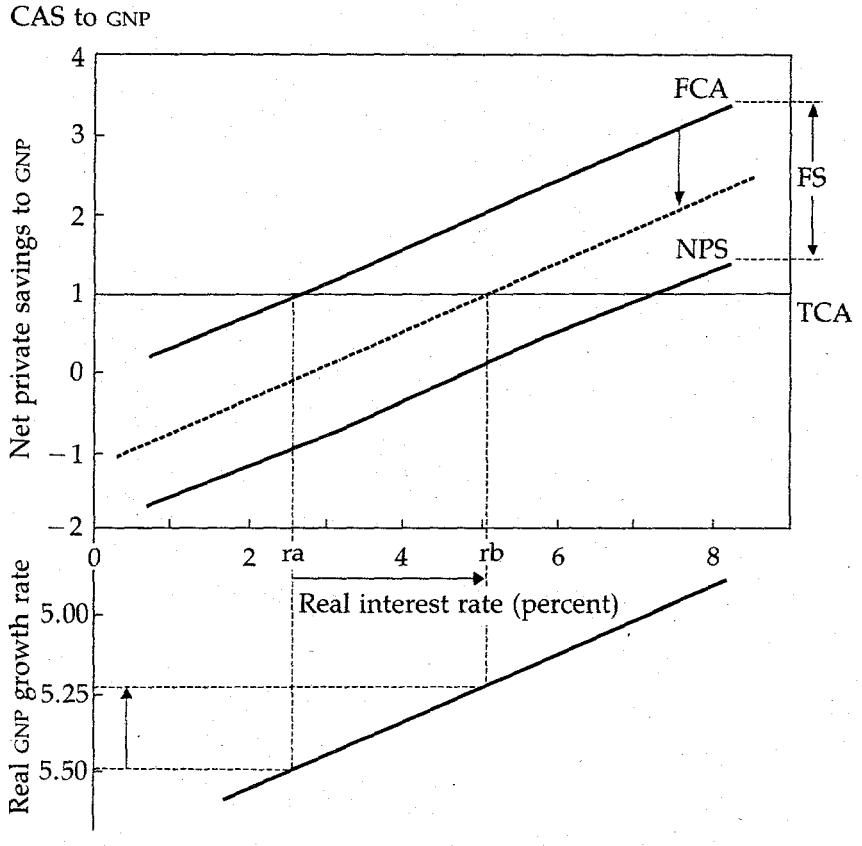
This issue is important in countries where foreign exchange deposit accounts are permitted. In Turkey, domestic interest rates are not tied closely to foreign interest rates adjusted for exchange rate depreciation; this did not change even in 1983, when foreign exchange deposits were introduced. Although interest rates on foreign exchange deposits may create a floor for domestic rates on comparable assets, arbitrage may not work in the opposite direction. The introduction of foreign exchange deposits is too recent to allow formal econometric tests to be performed; nonetheless, the volume of foreign exchange deposits seems to be too small to force domestic interest rates down. Massive shifts from foreign exchange deposits into domestic assets are unlikely even if a positive interest rate differential arises.

As long as domestic interest rates are not linked to foreign interest rates (that is, foreign rates plus exchange rate depreciation), macroeconomic policy has an additional degree of freedom. Changes in domestic real interest rates can affect the net surplus of private savings and thus resolve potential discrepancies between fiscal deficits and external targets.[2] In the process, private investment and output growth are affected. This is an important link between fiscal policy and output growth.

The mechanism of this link is shown in figure 3-1. Underlying this figure is the following identity, derived from the national accounts, with behavioral content built into private saving and investment:

$$\text{CAS} = \text{FS} + \text{NPS}(r) = \text{FS} + S_{pr}(r) - I_{pr}(r). \tag{3-1}$$

Figure 3-1. Fiscal Deficits, Real Output Growth, and Real Interest Rates for Given Current Account Targets



CAS, current account surplus.

FCA, feasible current account surplus.

TCA, target current account surplus.

FS, fiscal surplus=minus the fiscal deficit.

NPS, net private savings surplus (private savings minus private investment).

The private sector's surplus of savings over investment, NPS = $S_{pr} - I_{pr}$, is shown as a function of the real rate of interest. A higher rate will depress private sector investment and increase private savings, thus increasing NPS. This is represented by the upward sloping line marked NPS in figure 3-1. The external surplus that is compatible with given real interest rates (FCA, feasible current account) is then represented by the sum of NPS and the fiscal surplus (FS; or minus the fiscal deficit). The horizontal line TCA is the target value for the current account. The real interest rate at which the current account target TCA equals the feasible current account FCA is the real rate at which fiscal policy and current account targets are in line.

An increase in fiscal deficits represents a decline in the fiscal surplus and therefore a downward shift in the feasible current account line FCA. To meet the same current account target, a higher interest rate is needed to produce the required surplus of private savings over private investment (r shifts from ra to rb). A cut in fiscal deficits will allow lower real interest rates for given current account targets and thus higher private investment.

The analysis so far does not draw the connection between fiscal deficits and output growth. It focuses on the effect of the fiscal deficit on private investment; output growth depends on total investment, however, not on private investment alone. Clearly, the effect that changes in fiscal deficits have on output growth depends on whether the underlying adjustment is made out of public investment or public consumption. The model therefore distinguishes between public consumption and investment. Output growth depends on the sum of public and private investment:

$$\log(y) - \log[y(-1)] = \text{fct}\{[I_g + I_{pr}(r)]/y\}. \tag{3-2}$$

For given levels of public sector investment and fiscal deficit, equations (3-1) and (3-2) yield a negative link between output growth and improvements in the current account of the balance of payments. This can also be read from the figure. The bottom part graphically presents the relation summarized in equation (3-2). The top part shows how higher real interest rates are necessary for the current account to improve with a given fiscal deficit; the bottom part then shows how higher real interest rates affect private investment and depress output growth. This conflict between external balance and output growth is at the core of the macroeconomic problems caused by the debt crisis.

Econometric Results

This section estimates the parameters in the behavioral equations of the model, beginning with a private consumption function. Then

the results are presented for an investment function linking private fixed capital formation to capacity utilization, real interest rates, and output, followed by the results for a growth equation linking total fixed capital formation and real GNP growth.

Private Consumption

Private consumption (CONKP, nominal consumption deflated by the consumer price index, CPI) depends on the real interest rate, inflation, current income, and a proxy for wealth (permanent income). The real interest rate used is the highest (compound) interest rate paid on time deposits, net of taxes, and converted into a real rate using CPI inflation as the inflation term.

Permanent income is approximated by the trend growth in private disposable income. This trend is calculated by a regression of the logarithm of private disposable income on time, a constant, and a dummy to distinguish the period before and after 1978. The dummy variable takes the value zero before 1978 and one for 1978 and after. It captures a shift in the level of the time path of real income associated with the severe downturn in 1978. After 1978 output growth recovered to growth rates roughly similar to those characteristic of the years before 1978. Clearly, output has not reached the level it would have achieved if the downturn had not occurred in 1978. Therefore the shift is modeled as a break in the level of income rather than in the coefficient of the time trend. The results of this regression are summarized in equation (3-3):

$$\text{(3-3)} \qquad \log(\text{PERYP}) = \underset{(164.0)}{4.47} + \underset{(13.5)}{0.058}\ \text{TIME} - \underset{(2.01)}{0.10}\ \text{DUM1}$$

$$R^2 = 0.97 \quad \text{DW} = 0.47$$

Temporary income TMPYP is defined as the excess of actual income over trend: TMPYP = *YP*/PERYP, where *YP* is actual disposable income, and PERYP the permanent component.

With these definitions, the private consumption regression yields the following estimates:

$$\text{(3-4)} \quad \log(\text{CONKP}) = \underset{(1.92)}{-1.54} - \underset{(2.12)}{0.82}\log(1 + \text{RDEP}) - \underset{(2.37)}{0.77}\ \text{LCPIINF}$$

$$+ \underset{(7.91)}{1.35}\log(\text{PERYP}) - \underset{(0.32)}{0.19}\log(\text{TMPYP})$$

$$R^2 = 0.96 \quad \text{DW} = 1.72 \quad \text{Sample period 1970–86; 2SLS}$$

The effect of the real after-tax deposit rate RDEP on private consumption is negative, and significantly so. In addition, private consumption depends negatively on inflation and has almost the same coefficient. This has also been found in consumption analysis for some industrial countries (see Bean 1986 for similar evidence for the United Kingdom). Finally, the effect of permanent income on consumption is strongly positive, as expected, with a coefficient not significantly different from 1. The coefficient on temporary income is low and insignificant. These results fit well with accepted theories of consumer behavior.

Private Investment

The investment equation is derived eclectically. Private fixed capital formation (that is, investment net of changes in stock) depends, first, on anticipated future sales, proxied here by lagged output $Y(-1)$ (output is lagged because data on current output clearly are not available when investment decisions are made). In addition, the real after-tax lending rate (RLEND), converted into a real rate using the GNP deflator, is used to capture the cost of funds.[3] However, the prevalence of credit rationing and the use of credit subsidies suggest that quantities, in addition to prices, are likely to be important. This effect was captured, in an admittedly crude way, by including the ratio of credit to the private sector to output (CRD/Y) as an explanatory variable. In addition, capacity utilization in manufacturing (CPUTL) was included as a proxy for the ratio of expected sales to output capacity. The final explanatory variable is less conventional. The (lagged) share of infrastructure investment in total public investment, SHINF, is included in an attempt to assess the degree to which public sector investment in infrastructure complements private investment. The econometric results are remarkably good:

$$\text{(3-5)}\quad \log(\text{GFKF}) = \underset{(4.20)}{-15.7} + \underset{(2.52)}{1.24}\log(\text{CRD}/Y) + \underset{(6.49)}{1.21}\log[Y(-1)] - \underset{(4.17)}{1.69}\log(1+\text{RLEND}) + \underset{(1.40)}{1.45}\log(\text{CPUTL}) + \underset{(1.15)}{0.35}\log[\text{SHINF}(-3)]$$

$R^2 = 0.79$ DW $= 1.66$ Sample period 1970–86; 2SLS

The regression shows that both the quantity and the cost of credit have a strong and significant impact on private sector capital forma-

tion. The real after-tax lending rate has a negative sign and is significantly different from zero: the t-statistic equals 4.17. The credit variable is also highly significant. The precision of the coefficients on capacity utilization and on the share of infrastructure investment in total public sector investment is low, although they have the correct sign.

Investment and Output Growth

The relation between investment and output growth is derived using a simple one-factor production function. With Y as output and K as capital, the assumed relation is:

$$Y = aK;\ Y(-1) = aK(-1), \tag{3-6}$$

and

$$K = (1 - d)K(-1) + \mathrm{GFKF}(-1). \tag{3-7}$$

This period's capital stock equals last period's stock times 1 minus the rate of depreciation plus gross fixed capital formation. Dividing Y by $Y(-1)$ and using equation (3-6) gives:

$$Y/Y(-1) = 1 + n_Y = [\mathrm{GFKF}(-1)/K(-1)] + 1 - d. \tag{3-8}$$

Using equation (3-6) to substitute out $K(-1)$ from equation (3-8) yields:

$$n_Y = [\mathrm{GFKF}(-1)/Y(-1)] - d. \tag{3-9}$$

Equation (3-7), however, applies to total capital, not the capital stock that is in use in a particular year. For this reason, equation (3-9) was applied to the rate of change in capacity output rather than to the rate of growth of actual output. A measure of capacity output was derived by combining actual real GNP with the measure of capacity utilization from the investment equation:

$$\mathrm{YKA} = Y/\mathrm{CPUTL}. \tag{3-10}$$

This measure is imperfect, since CPUTL applies only to manufacturing but is used to derive aggregate capacity, not just capacity output in manufacturing. However, no better measure was available. The resulting equation yields:

$$\text{(3-11)} \qquad \log(YKA) = \underset{(0.20)}{0.016} + \underset{(1.20)}{0.45}\,[GFKF(-1)/Y(-1)] + \underset{(28.3)}{0.94}\log[YKA(-1)]$$

$R^2 = 0.98$ DW = 1.67 Sample period 1970–86; OLS

Or, writing the equation to explain the rate of growth yields:

$$\text{(3-12)} \qquad \log(YKA) - \log[YKA(-1)] = \underset{(0.20)}{0.016} + \underset{(1.20)}{0.45}\,[GFKF(-1)/Y(-1)] - \underset{(1.70)}{0.06}\log[YKA(-1)]$$

In the model used for the simulations, equation (3-12) was employed, with the coefficient for log[YKA(−1)] on the right-hand side set equal to zero.

Determinants of the degree of capacity utilization also need to be incorporated in analyses of short-run growth. In this respect, import liberalization, real wage flexibility, and macroeconomic policies ensuring the availability of imports all played an important role. We will, however, abstract from such determinants of the difference between actual and capacity output growth in order to keep the medium-term focus of the framework developed here.

Appendix: Data and Equations Used in the Model

Equations Used in the Model

(1)	LGNPKP	=	0.02 + 0.48 (INFGNP (− 1)) + (LGNPKP (− 1))
(2)	LADISP	=	log (GNPKP − ADISG)
(3)	LPERYP	=	4.47 + 0.058 (TIME) − 0.10 (DUM1)
(4)	LTMPYP	=	LADISP − LPERYP
(5)	LCONKP	=	−1.54 − 0.82 (LIRDEP) − 0.77 (LCPIINF) − 0.19 (LTMPYP) + 1.35 (LPERYP)
(6)	PSVGNP	=	[exp (LADISP) − CONKP]/GNPKP
(7)	LGFKF	=	−15.68 + 1.24 (LCRDY) − 1.69 (LIREND) + 1.45 (LCPUTL) + 1.21 (LGNPKP (− 1)) + 0.35 (LSHINF (− 3))
(8)	PIFGNP	=	exp (LGFKF)/GNPKP
(9)	NPSGNP	=	PSVGNP − PIFGNP − PSCGNP
(10)	DEFGNP	=	NPSGNP + CAGNP
(11)	GIFGNP	=	DEFGNP + REVGNP − GECGNP
(12)	INFGNP	=	PIFGNP + GIFGNP,

where

ADISG	=	disposable income of the government
CONKP	=	private consumption
CAGNP	=	current account deficit as a share of GNP
DEFGNP	=	government deficit as a share of GNP
DUM1	=	dummy equal to 1.0 from 1978 to 1986
GECGNP	=	government current expenditure as a share of GNP
GIFGNP	=	government fixed investment as a share of GNP
GNPKP	=	real GNP
INFGNP	=	total fixed investment as a share of GNP
LADISP	=	log of private disposable income
LCONKP	=	log of private consumption
LCPIINF	=	log of 1 plus the growth in CPI
LCPUTL	=	log of capacity utilization in private industry
LCRDY	=	log of credit to private sector as a share of GNP
LGNPKP	=	log of GNP
LGFKF	=	log of fixed private investment
LIRDEP	=	log of 1 plus real after-tax time deposit rate (real rate calculated using CPI inflation)
LIREND	=	log of 1 plus real effective interest rate for lending
LPERYP	=	log of permanent disposable income of private sector
LSHINF	=	log of the share of infrastructure investment in fixed public investment
LTMPYP	=	log of the ratio of disposable income to permanent disposable income for the private sector
NPSGNP	=	net private saving as a share of GNP
PIFGNP	=	private fixed investment as a share of GNP
PSCGNP	=	private stock change as a share of GNP
PSVGNP	=	private gross saving as a share of GNP
REVGNP	=	government revenue as a share of GNP.

Table 3-1. Effective Cost of Borrowing, 1970–86
(percent)

Cost	*1970*	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*
Nominal interest rate (A)	10.00	10.00	10.00	12.00	12.50	14.00	14.00	14.00	15.50
Commission and taxes (B)	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10
Nominal borrowing rate (C)	15.10	15.10	15.10	17.10	17.60	19.10	19.10	19.10	20.60
Nominal borrowing rate, compounded (D)	15.98	15.98	15.98	18.23	18.80	20.51	20.51	20.51	22.25
Compensating balances (E)	0.36	0.35	0.43	0.35	0.39	0.36	0.33	0.37	0.35
Interest rate on CDs (F)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Effective cost of loans to borrower									
Nominal [C − (E.F)]/(1 − E)	23.59	23.23	26.49	26.31	28.85	29.84	28.51	30.32	31.69
Nominal compounded [D − (E.F)]/(1 − E)	24.96	24.58	28.03	28.04	30.81	32.05	30.62	32.56	34.23

Cost	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*
Nominal interest rate (A)	18.58	25.67	33.00	38.00	38.00	45.60	52.00	52.00
Commission and taxes (B)	5.10	10.10	8.80	7.80	7.30	7.50	6.50	6.40
Nominal borrowing rate (C)	23.68	35.77	41.80	45.80	45.30	53.10	58.50	58.40
Nominal borrowing rate, compounded (D)	25.87	40.86	48.82	54.28	53.59	64.64	72.63	72.48
Compensating balances (E)	0.46	0.52	0.49	0.38	0.29	0.32	0.33	0.30
Interest rate on CDs (F)	0.00	0.00	0.00	0.00	0.00	5.10	7.50	14.60
Effective cost of loans to borrower								
Nominal [C − (E.F)]/(1 − E)	43.85	74.52	81.96	73.87	63.80	75.69	83.62	77.17
Nominal compounded [D − (E.F)/(1 − E)	47.90	85.13	95.73	87.55	75.48	92.66	104.71	97.29

CD: certificate of deposit.
Source: Central bank, Capital Markets Board, Institute of Bankers, World Bank staff estimates.

Table 3-2. National Accounts, Expenditures in the GDP at Current Market Prices, 1967–87

Expenditure	*1967*	*1968*	*1969*	*1970*	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*
GNP	101.48	112.49	124.89	147.78	192.60	240.80	309.80	427.10	535.80	675.00	872.90
Net factor income from abroad	−0.53	−1.55	−2.27	2.59	3.81	9.01	15.27	17.27	16.46	10.83	9.69
GDP	102.01	114.05	127.17	145.19	188.79	231.79	294.53	409.83	519.34	664.17	863.21
Imports of goods and manufactures	6.49	7.38	7.58	11.74	18.68	25.68	34.49	57.20	74.17	95.78	115.55
Exports of goods and manufactures	5.15	4.97	5.09	7.57	11.22	16.56	26.02	30.03	30.81	48.45	45.46
Domestic absorption	103.35	116.46	129.66	149.35	196.25	240.90	303.00	437.00	562.70	711.50	933.30
Total consumption	84.60	94.00	104.50	120.10	160.30	192.40	246.80	348.50	442.40	544.60	715.50
Private consumption	71.79	78.97	86.91	102.83	133.36	164.00	210.00	301.50	378.50	460.00	599.20
Government consumption	12.81	15.03	17.59	17.27	26.94	28.40	36.80	47.00	63.90	84.60	116.30
Gross domestic investment	18.75	22.46	25.16	29.25	35.95	48.50	56.20	88.50	120.30	166.90	217.80
Gross domestic fixed investment (GDFI)	16.85	20.26	23.61	27.34	32.30	46.90	59.30	76.10	107.90	153.70	210.80
Changes in stocks	1.90	2.20	1.55	1.91	3.75	1.60	−3.10	12.40	12.40	13.20	7.00
Discrepancy in GDP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government GDFI	8.87	10.68	11.73	14.26	15.95	20.20	25.10	35.00	53.80	74.70	107.80
Private GDFI	7.99	9.57	11.88	13.08	16.25	26.70	34.20	41.10	54.10	79.00	103.00
Changes in government stock	0.80	0.80	0.39	0.19	1.25	−0.10	−3.40	11.00	11.60	3.60	6.30
Changes in private stock	1.10	1.40	1.16	1.73	2.50	1.70	0.30	1.40	0.80	9.60	0.70
Government investment	9.67	11.48	12.12	14.45	17.20	20.10	21.70	46.00	65.40	78.30	114.10
Private investment	9.09	10.97	13.04	14.81	18.75	28.40	34.50	42.50	54.90	88.60	103.70
Foreign deficit	−1.87	−3.96	−4.77	−1.58	−3.65	−0.10	6.80	−9.90	−26.90	−36.50	−60.40
Government investment in infrastructure	6.20	7.64	8.23	9.22	9.88	11.26	14.89	21.16	29.53	43.45	63.34
Domestic saving	17.41	20.05	22.67	25.09	28.49	39.39	47.73	61.33	76.94	119.57	147.71

Expenditure	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*Revised 1987*
GNP	1,290.70	2,199.50	4,435.20	6,553.60	8,735.10	11,551.90	18,374.80	27,789.40	39,190.50	53,749.70	55,757.20
Net factor income from abroad	13.20	41.55	102.75	138.40	110.70	37.40	160.90	234.80	21.50	12.80	—
GDP	1,277.50	2,157.95	4,332.45	6,415.20	8,624.40	11,514.50	18,214.00	27,554.60	39,169.00	53,737.00	—
Imports of goods and manufactures	122.08	213.63	663.97	1,082.10	1,564.10	2,258.40	4,247.90	6,522.30	8,104.40	11,310.30	—
Exports of goods and manufactures	74.78	125.58	317.12	713.10	1,265.60	1,811.50	3,573.70	5,762.40	7,060.20	10,372.40	—
Domestic absorption	1,324.80	2,246.00	4,679.30	6,784.20	8,922.80	11,961.40	18,888.20	28,314.50	40,213.30	54,674.90	56,576.00
Total consumption	1,085.80	1,844.00	3,731.40	5,375.60	7,148.20	9,664.70	15,313.00	22,483.20	31,441.40	41,884.00	42,628.60
Private consumption	913.20	1,550.00	3,187.30	4,675.50	6,208.80	8,489.20	13,691.50	20,151.50	26,997.70	37,034.50	37,373.90
Government consumption	172.60	294.00	544.10	700.10	939.40	1,175.50	1,621.50	2,331.70	3,443.70	4,848.50	5,254.70
Gross domestic investment	239.00	402.00	947.90	1,408.60	1,774.60	2,296.70	3,575.20	5,831.30	9,771.90	12,791.00	13,947.40
Gross domestic fixed investment (GDFI)	279.60	449.30	863.60	1,241.40	1,646.90	2,167.70	3,311.90	5,591.10	9,230.30	12,719.00	13,886.20
Changes in stocks	−40.60	−47.30	84.30	167.20	127.70	129.00	263.30	240.20	541.60	72.00	61.20
Discrepancyin GDP	0.00	0.00	0.00	−0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government GDFI	136.30	235.50	484.90	766.90	1,005.50	1,218.60	1,811.30	3,257.30	5,477.90	7,528.00	7,550.10
Private GDFI	143.30	213.80	378.70	474.50	641.40	949.10	1,500.60	2,333.80	3,752.40	5,191.00	6,336.10
Changes in government stock	−14.10	−26.30	23.50	97.30	39.10	−46.00	1.90	−47.90	43.50	−244.80	−41.10
Changes in private stock	−26.50	−21.00	60.80	69.90	88.60	175.00	261.40	288.10	498.10	316.80	102.30
Government investment	122.20	209.20	508.40	864.20	1,044.60	1,172.60	1,813.20	3,209.40	5,521.40	7,283.40	7,509.00
Private investment	116.80	192.80	439.50	544.40	730.00	1,124.10	1,762.00	2,621.90	4,250.50	5,507.80	6,438.40
Foreign deficit	−34.10	−46.50	−244.10	−230.60	−187.70	−409.50	−513.30	−525.10	−1,022.80	−925.20	−818.90
Government investment in infrastructure	81.85	134.15	268.45	440.90	668.20	762.80	1,166.40	2,052.10	3,500.40	4,451.70	—
Domestic savings	191.70	313.95	601.05	1,039.60	1,476.20	1,849.80	2,901.00	5,071.40	8,727.60	11,852.90	—

— Not available.

Source: State Planning Organization, State Institute of Statistics.

Table 3-3. Price Indexes, 1967–87

Year	Export price index	Import price index	Wholesale price index	Public investment deflator	Consumer price index	Private investment deflator	GNP deflator index
1967	1.00	0.98	0.97	0.97	0.94	0.99	0.98
1968	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1969	1.00	1.00	1.07	1.06	1.06	1.04	1.05
1970	1.29	1.32	1.14	1.11	1.13	1.13	1.19
1971	1.78	1.77	1.33	1.36	1.35	1.41	1.38
1972	1.84	1.77	1.57	1.53	1.55	1.80	1.62
1973	2.35	2.38	1.89	1.73	1.77	1.80	2.00
1974	3.15	3.47	2.45	2.06	2.19	2.14	2.57
1975	3.10	4.01	2.70	2.33	2.86	2.43	2.95
1976	3.58	4.51	3.12	2.74	3.12	2.91	3.45
1977	4.37	5.57	3.87	3.58	3.93	3.83	4.29
1978	8.25	8.54	5.90	5.18	6.37	5.83	6.17
1979	9.40	12.96	9.87	8.41	10.41	9.54	10.58
1980	27.28	48.39	20.04	17.86	20.23	20.41	21.52
1981	35.49	68.80	27.40	28.14	27.84	28.41	30.52
1982	48.44	98.87	34.32	33.83	36.94	36.59	38.93
1983	59.35	123.28	44.84	44.87	47.59	47.79	49.81
1984	98.05	181.42	88.17	88.41	89.29	88.53	74.82
1985	141.53	258.17	95.40	102.17	100.46	100.27	107.83
1986	175.52	288.18	120.88	151.52	135.42	142.86	140.52
1987	215.70	361.46	168.20	196.97	182.14	185.71	181.82

Source: State Planning Organization, State Institute of Statistics.

Table 3-4. Data for Growth Equations

Date	LGNPCA	INFGNP	LCPUTL	MPIDEF	LRER
1970	0.680789	0.201823	4.152614	1.100000	7.063665
1971	0.771529	0.180046	4.152614	1.264286	7.203348
1972	0.861349	0.183311	4.152614	1.106250	7.071251
1973	0.890166	0.212682	4.152614	1.190000	6.999177
1974	0.948892	0.201419	4.152614	1.334615	6.888953
1975	1.048291	0.237880	4.152614	1.357895	6.843153
1976	1.124478	0.230878	4.152614	1.306232	6.877428
1977	1.162664	0.259069	4.152614	1.296036	6.834312
1978	1.230778	0.234477	4.112512	1.384184	6.720507
1979	1.294174	0.224686	4.044804	1.229248	6.564237
1980	1.311976	0.200489	4.016383	2.248837	6.906440
1981	1.335904	0.200070	4.050045	2.253927	7.062387
1982	1.335432	0.192121	4.077538	2.539948	7.230936
1983	1.376570	0.188332	4.110874	2.474799	7.322455
1984	1.376570	0.188132	4.127134	2.424882	7.461171
1985	1.412193	0.195132	4.141546	2.396748	7.483794
1986	1.486839	0.201337	4.162003	2.036583	7.454645

Variable: LGNPCA = Log of real GNP adjusted for capacity utilization.
INFGNP = Share of real gross fixed investment to GNP.
LCPUTL = Log of capacity utilization.
MPIDEF = Log of ratio of import price index to GNP deflator.
LRER = Log of real exchange rate.

Table 3-5. Data for Investment Function

Date	*LGFKF*	*LCPUTL*	*LIREND*	*LCRDY*	*LSHINF*	*LGNPKP (−1)*
1970	2.475774	4.152814	0.103586	5.478658	−0.446287	4.813403
1971	2.525729	4.152814	0.043802	5.334343	−0.562119	4.924143
1972	2.754035	4.152814	0.080842	5.384831	−0.579819	5.013963
1973	2.944444	4.152814	0.036858	5.406732	−0.371064	5.042780
1974	2.883099	4.152814	0.006140	5.338508	−0.776529	5.101507
1975	3.074544	4.152814	0.109832	5.469472	−0.798508	5.200905
1976	3.145872	4.152814	0.088949	5.524745	−0.597837	5.277092
1977	3.248435	4.152814	0.046341	5.508728	−0.579819	5.315278
1978	3.224474	4.112512	−0.087219	5.365629	−0.400478	5.343290
1979	3.103278	4.044804	−0.171322	5.223481	−0.446287	5.338978
1980	2.896995	4.018383	−0.146700	5.078754	−0.634878	5.328359
1981	2.798420	4.050045	0.247707	5.301770	−0.673345	5.369240
1982	2.820818	4.077538	0.306516	5.402713	−0.446287	5.413442
1983	2.967046	4.110874	0.238538	5.521089	−0.430783	5.446306
1984	3.035833	4.107134	0.162314	5.364320	−0.446287	5.503704
1985	3.073079	4.141546	0.243519	5.393960	−0.400478	5.553738
1986	3.182220	4.162003	0.299632	5.498602	−0.356675	5.630842

Variable: LGFKF = Log of real fixed private investment.
LCPUTL = Log of capacity utilization in private sector.
LIREND = Log of real effective interest rate on loans.
LCRDY = Log of credit to private sector as share of GNP.
LSHINF = Log of share of infrastructure investment in public fixed investment.
LGNPKP = Log of real GNP.

Instruments: In logs (capacity utilization, credit to private sector as a share of GNP, share of infrastructure investment in public fixed investment, real GNP, lagged private fixed investment, real interest rate on U.S. dollars, public sector deficit as a share of GNP, real exchange rate).

Table 3-6. Data for Consumption Function

Date	*LCONKP*	*LIRDEP*	*LCPIINF*	*LPERYP*	*LTMPYP*	*LRER*
1970	4.510880	−0.003901	0.073427	4.644758	−0.051559	7.063865
1971	4.592948	−0.108361	0.177887	4.702552	0.005896	7.203348
1972	4.661612	−0.068624	0.138150	4.780346	0.011101	7.071251
1973	4.778128	−0.063196	0.132724	4.818140	−0.006788	6.999177
1974	4.924888	−0.143396	0.212922	4.859340	0.033554	6.888953
1975	4.957890	−0.124898	0.194425	4.933728	0.032888	6.843153
1976	4.993393	−0.089980	0.159507	4.981521	0.054802	6.877428
1977	5.028956	−0.161280	0.230808	5.049316	0.048640	6.834312
1978	4.965355	−0.391293	0.482960	5.007108	0.129964	6.720507
1979	5.003243	−0.342747	0.491168	5.064902	0.089027	6.584237
1980	5.059783	−0.430119	0.864400	5.122696	0.013103	6.906440
1981	5.123618	0.024393	0.319307	5.180490	−0.025581	7.062387
1982	5.124428	0.060679	0.282821	5.238284	−0.044218	7.209360
1983	5.183928	0.120634	0.253327	5.296078	−0.053906	7.322455
1984	5.288230	0.074957	0.375878	5.353872	−0.031448	7.461171
1985	5.301274	0.079176	0.371458	5.411686	−0.052489	7.483794
1986	5.295126	0.107280	0.298621	5.469480	−0.034472	7.454645

Variable: LCONKP = Log of nominal private consumption divided by CPI.
LIRDEP = Log of real interest rate on time deposits adjusted for withholding tax.
LCPIINF = Log of one plus the rate of inflation in the CPI.
LPERYP = Log of permanent disposable income.
LTMPYP = Log of temporary disposable income.
LRER = Log of real exchange rate.

Instruments: In logs (permanent disposable income, temporary disposable income, real exchange rate, public sector deficit as a share of GNP, real interest rate on U.S. dollars).

PART 2 *The Framework Applied*

4 External Adjustment, Exchange Rate Policy, and Output Growth

TURKEY'S EXTERNAL DEBT statistics provide, at first sight, a series of puzzles. A great deal of external adjustment has clearly taken place since the crisis of 1978–80. The current account deficit is much lower, measured against GNP, than before the crisis: an average of 2.5 percent beginning in 1981 compared with 5.3 percent for the three years preceding 1978. Turkey actually had a surplus on its noninterest current account every year after 1981, except 1983, when the deficit was low. Indicators of creditworthiness invariably rank Turkey high on the list of reliable borrowers. Nevertheless, the ratio of gross debt to output increased from 28 percent to 56 percent between the end of 1980 and 1986.[1] On this account, Turkey has moved in line with the average for the countries that the International Monetary Fund (IMF various years) classifies as countries with recent debt servicing problems (see table 4-1).[2]

In fact, it is surprising that the debt-output ratio did not rise more rapidly in Turkey than in the highly indebted countries: Turkey had a much lower noninterest current account surplus as a percentage of GNP than the group of highly indebted countries did after their respective debt crises (−0.25 percent of GNP for Turkey over the period 1980–86 compared with an average 2.6 percent over 1982–86 for the highly indebted countries). This apparent inconsistency can be explained by the much higher growth rate that Turkey managed to sustain after 1980. Turkey's debt-output ratio followed a path similar to that of the highly indebted countries, not because its surpluses were large, but because its output growth was high.

A second puzzle is that Turkey's debt has, over the past few years, risen much faster than one would expect from the current account numbers alone. Part of the solution to this puzzle can be found in the real exchange rate developments over the period. Between 1980 and 1986, Turkey's export-weighted real exchange rate depreciated 48 per-

Table 4-1. Measures of the Overall Debt Burden, for Turkey and Countries with Recent Debt Servicing Problems, 1980–87
(percent)

Measure	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987 (estimated)*
Turkey								
Debt (billions of U.S. dollars)[a]	16.3	16.9	17.6	18.2	20.8	25.5	32.5	37.3
Medium and long term	13.8	14.7	15.9	16.0	17.6	20.8	25.6	28.8
Short term	2.5	2.2	1.8	2.3	3.2	4.8	6.9	8.5
Debt to GNP	28.0	28.6	32.8	35.6	41.5	47.9	55.9	57.6
Debt to exports	284.1	198.3	175.0	192.9	180.5	194.5	260.5	227.2
Current account surplus to GNP	−5.0	−2.8	−1.6	−3.6	−2.8	−1.9	−2.6	−1.5
Noninterest current account surplus to GNP	−3.9	−0.8	1.2	−0.4	0.4	1.4	1.0	2.2
Countries with recent debt servicing problems								
Debt to GDP	32.5	37.6	43.7	47.6	47.6	49.1	51.3	53.9
Debt to exports	151.5	186.1	240.9	254.6	246.3	266.8	309.5	313.4
Current account surplus to GDP	−3.6	−5.9	−5.5	−2.0	−0.9	−0.5	−1.8	−1.5
Noninterest current account surplus to GDP	−0.5	−1.7	−0.5	2.8	4.1	4.2	2.5	2.6

Note: For comparability, Turkey's debt figures refer to gross debt. In the rest of the chapter net debt is used. The debt-export ratio refers to the ratio of year-end debt to exports of goods and services (and for Turkey, also workers' remittances) during the year. Countries with recent debt servicing problems are defined as those which incurred arrears on external payments in 1985 or rescheduled their debt during the period from the end of 1983 to the end of 1986.

a. A billion is 1,000 million.

Source: Undersecretariat of Treasury and Foreign Trade, central bank, and IMF WEO (October 1987).

cent. This factor alone caused capital losses on Turkey's external debt that explain more than half of the increase in the debt-output ratio. Depreciation of the local currency (Turkish lira) is not the only means by which exchange rate developments influence Turkey's debt statistics. Even if the export-weighted real exchange rate is kept constant, the real value of the debt can increase because of changes in cross-currency exchange rates.[3] Such effects should be distinguished from other sources of debt increase because they are often one-time capital losses rather than indications of a sustained imbalance.

Exchange rate developments also explain another feature of Turkey's debt statistics. Although the debt-output ratio deteriorated

steadily from 1980 to 1987, the ratio of external debt to exports, after a dramatic improvement between 1980 and 1981, remained roughly constant at a level substantially below the average for the highly indebted countries (see table 4-1).[4] Arslan and van Wijnbergen (1990) show that developments in the real exchange rate are the main factor explaining the high export growth that took place in Turkey.[5]

This brief survey of Turkey's external debt situation suggests that three factors are important for an analysis of external adjustment. First is the noninterest current account, the fundamental measure of the net transfer of resources between Turkey and the rest of the world. Second are developments in the exchange rates, both in the rates between Turkey and its trading partners (captured by the real exchange rate) and in the rates between Turkey's trading partners and creditors themselves (cross-currency exchange rates). Third is the way real interest rates paid on external debt interact with the growth rate of the economy to set the pace at which the dynamics of debt and output growth unfold over time. The quantitative analysis of Turkey's external debt highlights the importance of these three factors and clarifies the driving forces behind Turkey's external debt. Understanding these forces is essential to assessing the sustainability of Turkey's current external deficits.

A discussion of external adjustment is incomplete, however, without an analysis of the internal policies that provide the counterpart to the current account performance. How the internal adjustment, which forms the counterpart to an improvement in the external balance, is achieved is an important determinant of sustainability. Moreover, the way in which consistency between internal policies and external targets is brought about determines whether both fiscal plans and external targets can be met without jeopardizing output growth. Finally, this chapter analyzes, as a counterpart to the analysis of external adjustment, the respective contribution of the government and the private sector to the adjustment process.

The following analysis, based on a decomposition of the sources of the increases in Turkey's ratio of external debt to GNP, highlights the actual debt strategies chosen by Turkish policymakers. The increase in the debt-output ratio can be traced to three components.[6] The first term equals the noninterest current account deficit of the balance of payments. This is the fundamental measure of a country's external (im)balance: it equals the difference between total expenditure (net of interest payments on foreign debt) and nationally generated income. Its counterpart is the net transfer of resources received from foreigners: that is, the increase in debt minus the interest payments made. If the noninterest current account is zero, the increase in debt equals interest payments, and the debt grows at the rate of interest. As long

as there is a surplus on the noninterest current account, foreign borrowing is less than interest payments to foreigners; to put it another way, the growth in foreign borrowing is less than the rate of interest, and a net transfer of resources to the rest of the world takes place. The opposite happens when a deficit exists in the noninterest current account: in that case the debt grows faster than the rate of interest, which eventually leads to insolvency.

The second component captures what might be called an autonomous effect inherent in the mechanics of debt, real interest rates, and output growth. If the noninterest current account is zero, the numerator of the debt-output ratio grows at the rate of interest, and the denominator grows at the (real) growth rate of the economy. Therefore, if the real interest rate exceeds (falls short of) the real growth rate of the economy, the debt-output ratio rises (falls) when the noninterest current account is zero. This term therefore measures the dynamics inherent in the interplay between real interest rates and real output growth. This is the debt dynamics component.

The final term measures the capital a country loses on its external debt when the exchange rate depreciates in real terms. The debt-output ratio measures the debt in terms of home goods; if their relative value falls, as it does after a real depreciation, the debt-output ratio rises. Against that must be set the favorable effect of the real devaluation on exports, an important determinant of creditworthiness.

In assessing the contributions of these factors to Turkey's external debt, it is important to see whether they occur because of one-time events or are likely to continue. This is particularly relevant for assessing the effect of the real exchange rate and of fluctuations in the cross-currency exchange rate. An increase in real debt due to a one-time real depreciation clearly creates less need for adjustment than an increase in debt due to a fundamental imbalance such as a deficit on the noninterest current account.

The following section uses the decomposition to highlight the debt strategy chosen by Turkish policymakers, outlines the potential pitfalls, and assesses the possibility of continuing this approach in the future.

External Debt, Exchange Rates, and Output Growth

A significant problem in assessing year-to-year developments in debt is related to exchange rates. This problem has two aspects. The first is the effect of changes in cross-currency exchange rates on the dollar value of Turkish debt; the second is the effect of changes in the real exchange rate on the debt-output ratio for a given real value (in foreign goods) of the external debt.[7] Discussion of these effects is

followed by an assessment of the relative contribution of the current account and of the debt dynamics term to increases in the debt-output ratio.

Cross-Currency Exchange Rate Fluctuations and the Value of External Debt

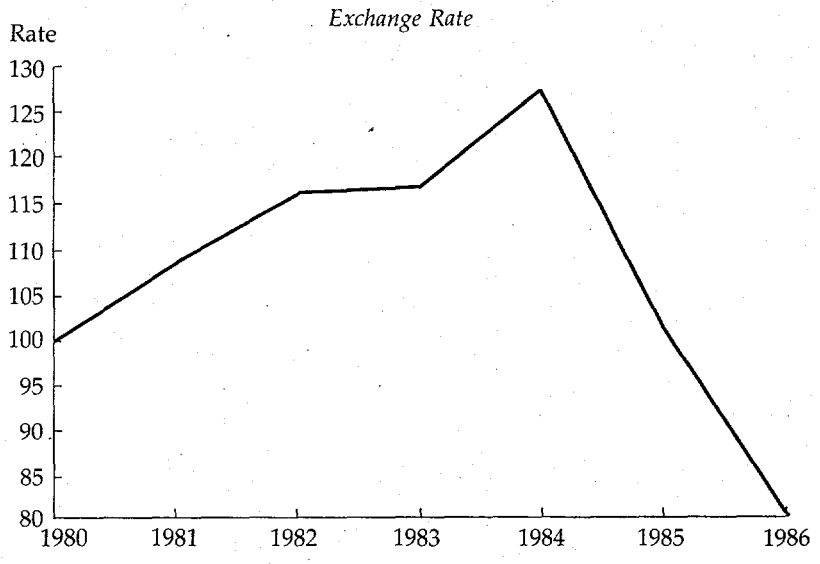
Fluctuations in the cross-currency exchange rate create a problem for interpreting year-to-year changes in the dollar value of Turkey's external debt. A substantial and rising part of Turkey's external debt is denominated in hard currencies such as the deutsche mark, the yen, and the Swiss franc. The share of these three currencies in the total external debt (measured net of the foreign assets of the banking system) rose from 22 percent in 1980 to 40 percent in 1986. The ratios are similar when evaluated at fixed cross-currency rates: 22 percent in 1980 and 38 percent in 1986. By 1986 the dollar had by and large lost the ground it had gained against the deutsche mark and the yen between 1980 and 1984. In 1984, however, the share of the deutsche mark, the yen, and the Swiss franc was 31 percent when evaluated at actual rates; the share at constant rates was a high 36 percent. With such a large component of the debt denominated in nondollar currencies, fluctuations in the cross-currency rate can cause substantial fluctuations in the total (dollar) value of the debt.

The capital loss in 1986 was a hefty 6.4 percent of GNP, and a substantial part of this loss was incurred through the currency pooling system of the World Bank ($800 million, or 1.4 percent of GNP). To a large extent these losses simply offset capital gains made when the dollar appreciated against the deutsche mark, the yen, and the Swiss franc.

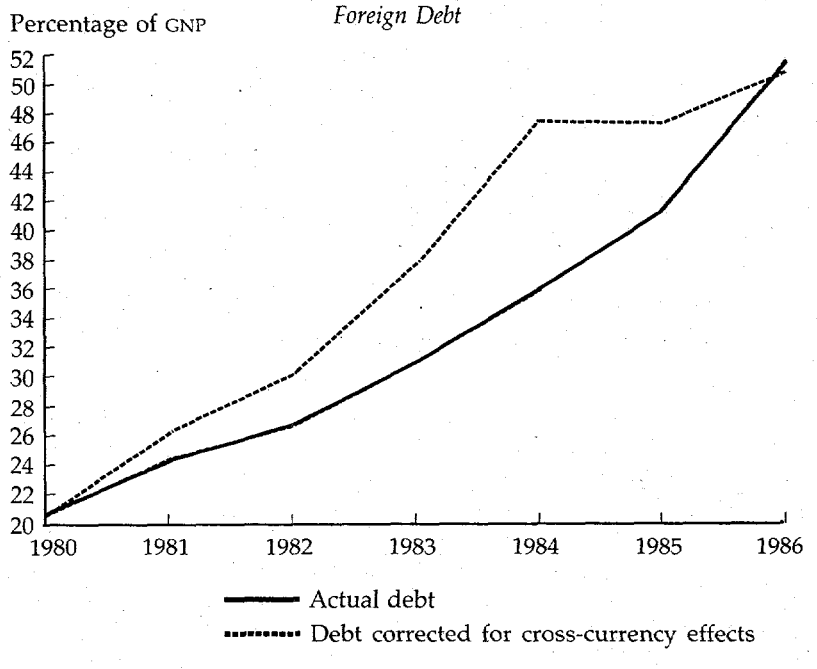
Interpreting these fluctuations should be set against the likelihood that they will recur. A one-time loss, though deplorable because it reduces Turkey's wealth, calls for less change in policy than a loss that is likely to happen again. Appropriate responses by policymakers could include reducing expenditures in line with reduction in the country's net wealth and attempting to restructure the currency composition of the debt. Both measures are more important for capital losses likely to recur, in whatever direction, than for one-time events.

Figure 4-1 shows the extent to which this has taken place. First it presents the exchange rate of the dollar against a basket made up of the deutsche mark, the yen, and the Swiss franc, with weights proportional to their respective weights in Turkish external debt at the end of 1980.[8] Almost the entire rise in the dollar between 1980 and 1984 was offset by the fall in the dollar in 1985 alone. Moreover, figure 4-1 plots two measures of Turkey's external debt (public and private sector combined, both net of foreign assets), expressed as a share of

Figure 4-1. The Weighted Cross-Currency Exchange Rate and Its Effect on Foreign Debt, 1980–86



Note: The exchange rate is based on the U.S. dollar compared with the deutsche mark, the yen, and the Swiss franc. The currency composition of the debt at the end of 1980 was used to derive the weights.



real GNP. The actual debt-output ratio, $\tilde{b}^*$, is converted into Turkish goods (in constant Turkish liras) by multiplying the real value of dollar debt by the real exchange rate at the end of the period and expressing it as a share of real GNP.[9] The corrected debt-output ratio, $\tilde{b}^*_c$, is similar, but the measure converts all nondollar debt into dollars at 1980 exchange rates. The corrected debt is the highest measure of the two. This procedure eliminates the effect that changes in the cross-currency exchange rate have on the dollar value of the debt.

Figure 4-1 demonstrates that the two measures may give different answers to the question of how much Turkish debt increased in a given year. During 1986, for example, the ratio of debt to GNP increased by almost ten percentage points. Once the effect of cross-currency fluctuations is eliminated, however, the increase was only three and a half percentage points. Moreover, from 1980 to 1986 the difference between the two measures was quite small. The two measures of debt were equal in 1980 by definition; after that, the actual value increased more slowly because of the rapid appreciation of the dollar. In late 1984 and thereafter, as the dollar began its slide, the difference moved in the other direction. By the end of 1986 the two values were close once again, at 51.1 percent for the corrected value and 51.4 percent of GNP for the actual value, including the exchange rate losses due to cross-currency fluctuations.

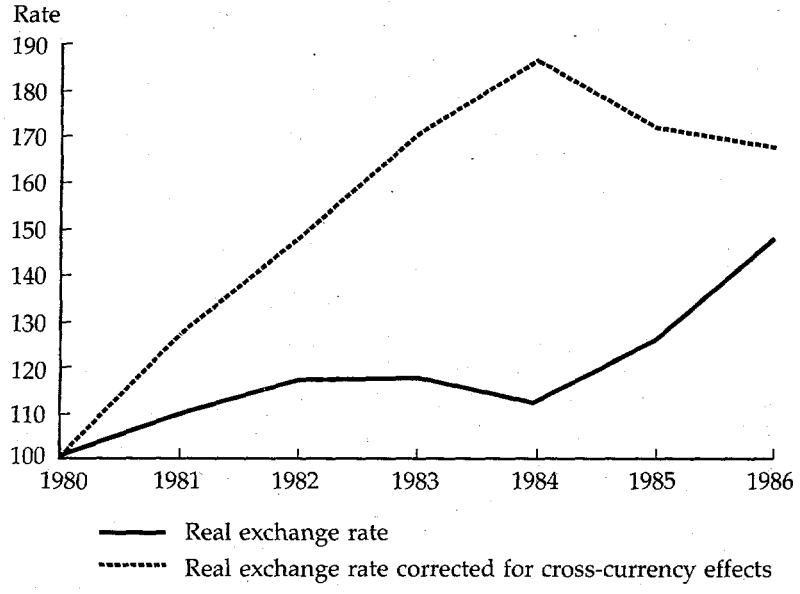
This implies that the indicator used does not affect the outcome of the assessment of the adjustment effort over the whole period; but eliminating one-time capital losses due to fluctuations in the cross-currency exchange rate probably does yield a better view of the adjustment effort from year to year.

External Debt and the Real Exchange Rate

Exchange rate developments influence the debt situation through a second channel that is different from, but affected by, fluctuations in the cross-currency exchange rate. If the real exchange rate of Turkey changes in relation to that of its trading partners, the ratio of external debt to GNP will also change.[10] Clearly, with a real depreciation, the debt-output ratio will increase for a given value of the real debt (in foreign goods) and real GNP.

Figure 4-2 shows the real exchange rate both with and without correction for cross-currency fluctuations. Contrary to their effect on the debt statistics, the cross-currency effects on the real exchange rate do not completely cancel out over the period under consideration: the average real rate of depreciation was 6.7 percent, while the real exchange rate, corrected for cross-currency effects, depreciated an average of 9 percent a year. In the debt measure, the effect does cancel

Figure 4-2. The Real Exchange Rate, in 1980 Export Weights, 1980–86



out because of the increasing share, even measured at 1980 exchange rates, of nondollar hard currencies toward the end of the period. The rise in the deutsche mark, the yen, and the Swiss franc toward the end of the period therefore receives a higher weight than the offsetting fall from 1980 to 1984. The price indexes are evaluated using fixed weights, so changes in the composition do not affect the real exchange rate.

Table 4-2 lists the debt-output ratio using actual prices and actual valuation of debt components ($\tilde{b}^*$); the debt-output ratio with the dollar value of the debt evaluated at the 1980 exchange rates ($\tilde{b}_c^*$); and two measures of the debt-output ratio evaluated at the 1980 cross-currency rates and 1980 value for the real exchange rate. The last two measures correct not only for cross-currency fluctuations on the dollar value of the debt but also for changes in the real exchange rate between Turkey and its trading partners. The former of the two measures reflects the influence of fluctuations in the cross-currency exchange rate on the foreign price index used to deflate the dollar value of the debt and to calculate the real exchange rate, whereas the latter measure uses actual exchange rates in the calculation of the foreign price index.

Table 4-2. The Ratio of Net Total External Debt to GNP, *Adjusted for Exchange Rate Effects, 1980–86*
(percent)

Year	At actual values	At 1980 cross-currency rates	At 1980 cross-currency and real exchange rates[a]	
			A	B
1980	20.8	20.8	20.8	20.8
1981	24.8	26.7	21.0	24.5
1982	27.3	31.0	20.8	26.5
1983	31.7	38.4	22.5	32.7
1984	36.4	47.8	25.6	42.9
1985	41.6	47.6	27.6	37.9
1986	51.5	51.1	30.3	34.6

a. A uses a foreign price index corrected for fluctuations in the cross-currency exchange rate to calculate the real value of the debt. B uses actual values for the foreign price index (see the appendix to chapter 1).

As shown earlier, the cross-currency correction did not have a cumulative effect from 1980 to 1986; the faster rise of the corrected measure between 1980 and 1984 was offset by the more rapid increase in the actual debt-output ratio in 1985 and 1986. The debt-output ratio evaluated at 1980 relative prices and exchange rates was, however, far below the other two ratios. It began with the same base-year value of 20.8 percent in 1980, since that is the base year of all price indexes and constant cross-currency calculations; by 1986 it rose to only 34.6 percent of GNP rather than 51 percent as the other two measures did (see table 4-2). Thus no less than 55 percent of the total increase in the debt-output ratio was due to the effect of the exchange rate.

Cross-currency fluctuations did in fact moderate this effect: their direct effect on the dollar value of the debt was about zero when taken cumulatively over the period, but they slowed the real depreciation of the Turkish lira by 14 percent over these six years (that is, if the cross-currency exchange rates of 1980 had prevailed throughout the period, the real exchange rate would have depreciated an additional 14 percent over those six years). If the cross-currency rates of 1980 are used in the calculation, the rise in the debt-output ratio was even less; it rose to only 30.3 percent in 1986 (see column A in table 4-2).

Clearly, developments in the real exchange rate greatly increased the burden of the external debt. A basic conflict is, however, inherent in external debt management. Empirical evidence strongly suggests that credit ratings and default probabilities depend not only on the debt-output ratio but also, among other things, on the share of GNP

that is exported abroad. All else being equal, an export-oriented economy is considered more creditworthy than an economy that turns away from international trade (McFadden and others 1985). There is some rationality to this: eventually debt service will require more production than consumption of traded goods. Achieving this would naturally seem easier in a trade-oriented country than in a country that relies heavily on import substitution. Empirical results presented in chapter 1 show that the debt-export ratio will improve after a real devaluation: the volume of exports will increase enough to offset the negative price effect of the real devaluation. A real devaluation causes a capital loss on foreign debt, however, and thus reduces national wealth. Higher exports cannot undo this since they do not add to wealth; the resources devoted to producing export goods could have been used to produce home goods. Increased export orientation does, however, ease access to foreign capital markets.

By this measure, Turkey was much more successful than the highly indebted countries. The ratio of exports (of goods and nonfactor services) to GNP hovered between 5 and 7 percent between 1967 and 1980. The reform measures implemented after 1980 caused a dramatic change. Exports jumped to 11 percent of GNP in 1980, up from 7.15 percent in 1979, and they have been increasing as a share of GNP ever since. Exports reached 20.7 percent of GNP in 1985, decreased to 18 percent in 1986 because of developments in the Middle East, and grew an estimated 30 percent in real terms in 1987. The net effect is that while the Turkish debt-output ratio steadily deteriorated, the ratio of debt to exports, after a substantial improvement between 1980 and 1981, by and large remained constant.

The empirical analysis reported in chapter 1 shows that the real depreciation achieved after 1980 was an important contributor to the successful export drive. Without a real depreciation, the analysis suggests, exports would have increased by only a few percentage points of GNP (see also Arslan and van Wijnbergen 1990). This fact needs to be taken into account when assessing the effect of the real exchange rate on the debt. Clearly, the debt-export ratio would have been much more unfavorable without the depreciation that actually took place. Turkey probably would not have had the access to external markets it did enjoy without the successful export performance generated by its reform program. The real depreciation of the exchange rate and the policies supporting it were essential to that program.

The Dynamics of External Debt

Eliminating exchange rate losses from the debt-output ratio allows us to focus on two other contributing factors: the noninterest current

account deficit and a term measuring the interplay between real interest rates and the real growth rate. The debt dynamics term equals the debt-output ratio times the excess of the real interest rate over the growth rate of real output. If 55 percent of the increase in the debt-output ratio can be attributed to developments in the real exchange rate, the remaining 45 percent must be due to these two factors.

In Turkey the noninterest current account behaved differently than it did in the highly indebted countries, where for many years the actual current account was close to zero because of a large surplus on their noninterest current account. In Turkey the current account improved steadily after 1984. It was negative before 1984 (except in 1982, when there was a large surplus) and has been positive since then. Turkey clearly did not follow the strategy of the Latin American countries, which primarily used large surpluses on their noninterest current account to slow the increases in their debt-output ratios.

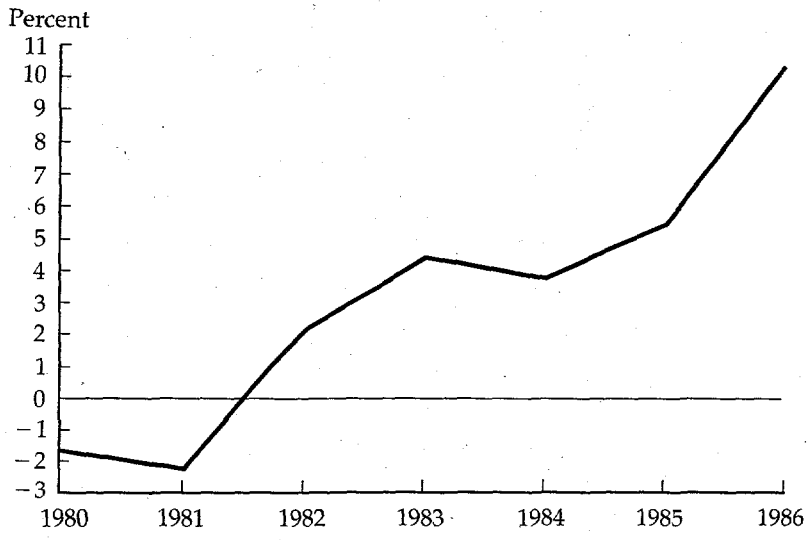
Consider next the debt dynamics component. Interest rates on Turkey's external debt were low in the early 1980s, which indicates that rescheduled, long-term, concessional debt was a major component of the total debt. However, as new debt entered at shorter maturities and higher interest rates, the average cost of external debt increased.

Measuring real interest rates is complicated by the cross-currency fluctuations that occurred after 1980. These fluctuations affected nominal interest rates. The average nominal cost of Turkish debt including capital losses due to fluctuations in the cross-currency exchange rate rose from 3.2 to 24.0 percent between 1980 and 1986. Corrected for exchange rate fluctuations, nominal rates actually fell from 8.3 to 7.2 percent over the same period. Cross-currency exchange rate fluctuations also affect real rates if the currency composition of the debt does not match the currency composition of exports that underlies the weights used in the foreign price index. Figure 4-3 shows the real rate on foreign debt (corrected for currency fluctuations),[11] which rose dramatically, from a negative 2.2 percent in 1981 to a very high 10.4 percent in 1986. The increasing use of Dresdner accounts as an instrument of public sector borrowing is one reason that the cost of foreign debt rose.

Dresdner accounts are a scheme through which the Dresdner Bank in Germany collects the deposits of Turkish workers abroad and transfers them to the central bank of Turkey. The Dresdner accounts started growing rapidly after 1981, when annual interest rates in Germany declined from a peak of 13 percent to around 6 percent, while those on the Dresdner accounts—which are set by the central bank of Turkey—remained at 12 to 14 percent. After 1981 the attractiveness of the Dresdner accounts was maintained by a large interest rate differential.

The high real rate of interest in countries such as Germany is an-

Figure 4-3. The Real Interest Rate on the Foreign Debt, 1980–86



Note: The real interest rate is corrected for cross-currency effects.

other reason for the increase in the cost of foreign debt. Although the real rate will probably fall from its high 1986 value, Turkey is clearly losing much of the leeway it originally had on this component.

The implication of these rates can be judged by comparing them with the real growth rate of the economy. This is where Turkey is most strikingly different from the highly indebted countries. Figure 4-4 shows Turkey's economic growth rate since 1980 compared with that of the countries classified by the IMF as having debt servicing difficulties. Turkey's growth rate exceeded their real growth rate by four to five percentage points in almost every year after 1980. On average, the real growth rate in the Turkish economy exceeded the average growth rate in the highly indebted countries by no less than four percentage points from 1980 to 1986. The average cost of external debt for these highly indebted countries was probably less than five percentage points below Turkey's cost.

The net result of combining these two developments is given in table 4-3, which shows the contribution to the increase in the debt-output ratio, corrected for cross-currency fluctuations and real depreciation of the Turkish lira, of several factors: the current account, the debt dynamics component, and a term correcting interest rates for

Figure 4-4. Real Output Growth in Turkey and in Countries with Debt Servicing Difficulties, 1980–86

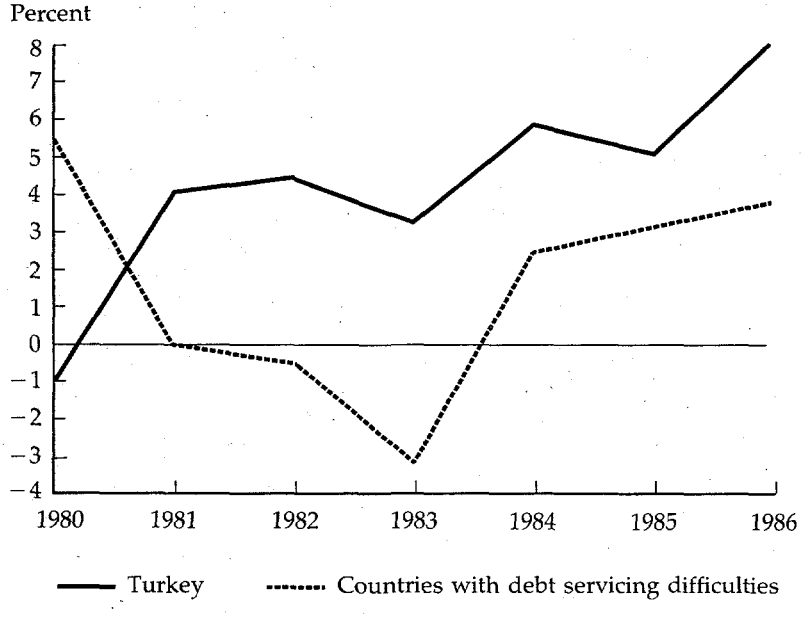


Table 4-3. Causes of Changes in the Debt-Output Ratio, 1980–86
(percent)

		Cause of the change		
Year	*Change in the debt-output ratio*	*Noninterest current account deficit to* GNP	*Difference between the interest and growth rates*	*Interest rate corrected for* CCE
1980	−0.9	0.3	−0.2	−1.0
1981	0.2	2.0	−1.3	−0.5
1982	−0.2	1.4	−0.5	−1.1
1983	1.6	2.5	0.2	−1.1
1984	3.1	0.6	−0.5	2.9
1985	2.1	−1.7	0.1	3.7
1986	2.7	−2.3	0.6	4.4

CCE: cross-currency exchange rate.

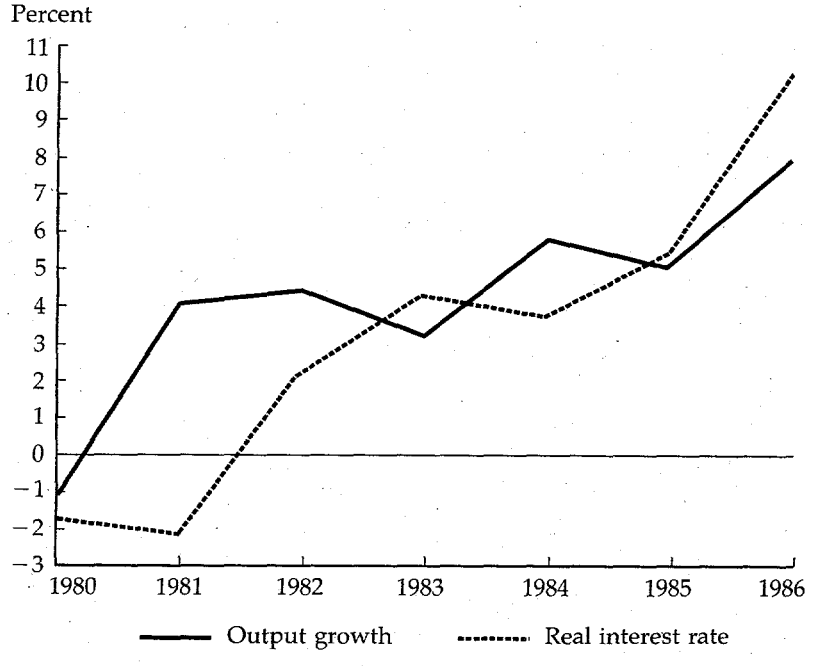
Note: The numbers for the noninterest current account are not directly comparable with the official statistics used elsewhere because exchange rate losses are treated differently and because of errors and omissions.

Source: Based on the concept of the debt-output ratio that is labeled A in table 4-2. See the appendix to chapter 1.

cross-currency fluctuations. The results are as expected given the current account, the real interest rate, and the real growth just presented. Over those five years, the contribution of the debt dynamics term was in fact negative. The cumulative increase in the corrected debt-output ratio was more than fully accounted for by the noninterest current account and exchange rate losses.

The annual data reveal more. Although Turkey's output growth increased, the real interest rate rose even more.[12] As a consequence, the debt dynamics component, which was negative earlier, contributed significantly for the first time in 1985 and 1986 (see figure 4-5). In 1986, 22 percent of the increase in the debt-output ratio was due to the excess of the real interest rate over the real growth rate of the economy. This was in spite of the high real growth rate that year. The actual contribution increased by more than half a percentage point of GNP that year, and one percentage point over 1985 and 1986 combined. The debt dynamics term was still small, however, and its contribution increased mostly because of the large increase in the noninterest current account surplus in 1986. A large debt dynamics term tends to cause instability in the economy because the debt is feeding on itself

Figure 4-5. Debt Dynamics: Interest Rates and Output Growth, 1980–86



through rapidly escalating debt service costs. If this term exceeds the surplus on the noninterest current account, the debt-output ratio will continue to increase simply by the destabilizing effect of interest payments on past debt. In Turkey this was not the case in 1986, when the noninterest current account surplus exceeded the debt dynamics term.

The overall assessment is clear. Turkey, by design or by coincidence, did not reduce its expenditure in the early 1980s as much as most highly indebted countries did. Turkey's current account was in deficit during most of the period. The noninterest current account was mostly negative before 1984 (except for 1982) and was positive only later; from 1981 to 1986 the surplus averaged 0.4 percent of GNP. However, Turkey's debt-output ratio did not increase more rapidly than that of the highly indebted countries because the growth rate of the Turkish economy was also high. In the mid-1980s this process became more difficult: the interest rates on Turkey's debt increased as the pre-1978 debt was gradually phased out. At the same time, though, Turkey's noninterest current account performance improved considerably.

The real rate of interest will probably not stay at more than 10 percent in the future, but sustaining an 8 percent growth rate of the real GNP is probably also unlikely. The debt dynamics term will probably continue to contribute to the debt-output ratio, which precludes sustained leeway for deficits on the noninterest current account. A growth-oriented strategy is probably still possible if output growth can be maintained at 5 percent or more, since real interest rates are likely to stay at around that level. Substantially less leeway exists now, however, than in the early 1980s, when real rates on Turkey's debt were less than its output growth. They were, in fact, negative. As a consequence, to achieve a stable debt-output ratio in the future now requires a positive surplus on the noninterest current account.

Financing the External Transfer: The Contribution of the Public and Private Sectors

The preceding sections show the driving factors behind the increase in the ratio of Turkey's external debt to GNP. Although much of the increase was due to capital losses caused by changes in the exchange rate, more fundamental factors also contributed: 45 percent was due to the cumulative effects of noninterest current account deficits and the difference between interest rates and output growth. A striking feature of the pattern of external adjustment was the shift in the relative contribution of these two factors. For most years before 1984, the noninterest current account was in deficit, while output growth rates

exceeded the real cost of foreign debt (see figure 4-5). After 1984, this pattern was reversed: a net transfer of resources occurred as the noninterest current account turned into a surplus. The average resource transfer over the period 1981–86 was 0.4 percent of GNP and has been rising: the noninterest current account deficit in 1981 (0.8 percent of GNP) became a surplus (1.04 percent of GNP) in 1986. Since interest rates rose faster than the growth rate, a matching improvement in the debt-output ratio did not take place.

This pattern is even more pronounced when the public sector's contribution to the external adjustment is viewed in isolation. This can be done by subtracting the private sector's net asset accumulation plus interest earnings from the noninterest current account.[13] Table 4-4 shows that Turkey's public sector began to make a net transfer of resources to other countries after 1980. In fact, its noninterest surplus on the external account increased substantially from 0.5 percent of GNP in 1981 to 3.2 percent in 1986.

How did the government accomplish this net transfer of resources abroad? What were its sources of revenue? Was the domestic surplus matched by an increase in the government's own (noninterest) surplus, or was the revenue raised from the private sector? To the extent that the latter took place, which instrument was used, monetization or issue of interest-bearing debt? Is interest-bearing debt being issued at sustainable levels? The answers to these questions should throw some light on the sustainability of current policies. In particular, by selling interest-bearing debt to the private sector, the government diverts private savings from uses that may be more productive. In addition, if the government borrows domestically at real interest rates

Table 4-4. Net Transfer of Resources abroad by the Public and Private Sectors, 1980–86
(percentage of GNP)

Year	Current account surplus	Interest payments	Noninterest current account surplus	Net transfer of resources	
				Private	Public
1980	−5.0	1.2	−3.9	3.5	−7.4
1981	−2.8	2.0	−0.8	−1.3	0.5
1982	−1.6	2.7	1.2	1.2	0.0
1983	−3.6	2.8	−0.8	0.2	−0.6
1984	−2.8	3.2	0.4	−0.7	1.1
1985	−1.9	3.3	1.4	−3.1	4.5
1986	−2.6	3.7	1.0	−2.1	3.2

Note: The net transfer of resources by the private sector equals the net private sector foreign borrowing minus interest payments.

that exceed the cost of foreign debt, its budgetary position will in fact deteriorate over time and cause greater adjustment problems in the future.

Table 4-5 and figure 4-6 indicate the domestic sources of financing that the government used to achieve the external transfer. Several patterns emerge. First, the substantial adjustment that did take place was almost completely brought about by a matching improvement in the primary surplus of the public sector. The improvement in the discounted value of the primary surplus between 1980 and 1986 actually exceeded the total external transfer, also discounted to 1980, by almost 8 percent. Almost all the adjustment took place in 1981, however, and fiscal performance has not improved since.

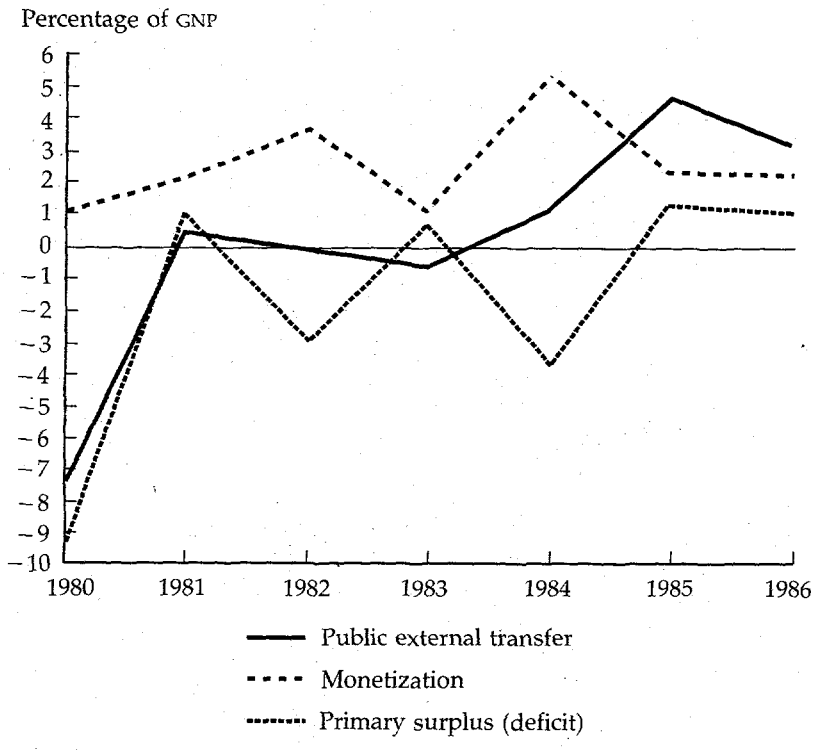
A second pattern emerges in which monetization almost mirrors the primary (noninterest) surplus of the public sector (see figure 4-6). Whenever the deficit worsens, monetization increases almost one for one. This suggests that monetization is the residual source of financing and that the increased deficits are financed more or less automatically through the central bank. This gives cause for concern: if monetization truly accommodates the fiscal deficit, there is very little to anchor domestic prices. Even with an effectively passive supply of money, the exchange rate could act as a nominal anchor to tie down the price level. The exchange rate policy focuses, however, on maintaining real competitiveness, not on reaching a nominal exchange rate target. This means that price increases will eventually be matched by exchange rate adjustment and that exchange rate policy will not play a role in anti-inflation policy. This may be necessary to maintain high

Table 4-5. Domestic Financing of External Transfers, 1980–86
(real values, as percentage of GNP)

Year	*Public sector net external resource transfer*	*Change in real net domestic debt*	*Monetization*	*Government primary surplus*
1980	−7.4	0.9	1.1	−9.3
1981	0.5	−2.7	2.2	1.0
1982	0.0	−0.8	3.6	−2.9
1983	−0.6	−2.4	1.1	0.7
1984	1.1	−0.5	5.2	−3.7
1985	4.5	0.9	2.3	1.3
1986	3.2	0.0	2.1	1.0

Note: In 1986 the Mass Housing Fund (MHF) accumulated a large surplus, which was deposited mostly in Emlak Bank. This increase will probably decrease when the MHF's expenditure programs are fully implemented. This increase is therefore taken out of the public sector's noninterest surplus, which increases the net public liabilities.

Figure 4-6. Means of External Adjustment, 1980–86



export growth. In that case, fiscal developments become more important for inflation because they ultimately determine how much monetization is needed.

Third, the level of monetization has consistently exceeded the primary (fiscal) deficit, thus enabling the Turkish government to make the external transfer. Recently, however, the level of monetization has been decreasing, while the rate at which interest-bearing debt is issued has been increasing. The government's primary surplus has also improved without, however, reducing its domestic financing needs. Instead, it has increased its transfer of resources abroad. The adjusted noninterest current account surplus has increased substantially since 1984. The implication is that the public sector has been substituting an interest-free financing mode, monetization, for one on which interest must be paid.

Reduced monetization is a necessary (although by no means sufficient) condition for sustained success in reducing inflation. However,

there is an analogy with the discussion of external debt in the preceding sections: the difference between the interest rate at which the debt is issued and the output growth rate is an important indicator of whether the debt issue policy is feasible over the longer term. This is cause for concern. The real rate on domestic government debt is high and well in excess of the real growth rate: in 1986 and 1987, respectively, the rate on domestic debt was 12 to 13 percent,[14] and the growth rate was 7 to 8 percent; the growth rate will probably be even lower—6 percent or less—in the future. Given these large differences, debt servicing costs will escalate rapidly, which will make it even more difficult to comply with the limits on monetization that are imposed by inflation targets. Current monetary restraint is thus bought at the risk of putting much more pressure on central bank financing in the future.

The sustainability of the current financing match of government expenditure is seriously in doubt. Interest rates are so much higher than the real growth rate of the economy that sustained reliance on debt issue at the current levels is not possible. The rapidly increasing share of interest in the budget bears testimony to this conclusion.

Fundamental changes have been made in Turkey. The initial disequilibrium was so large, however, that sustainability has not been achieved. Although the public sector achieved a surplus of 3.2 percent of GNP on its external noninterest current account, which is well within the limits set by continued creditworthiness, the deficit on its internal account suggests that its creditworthiness will not be sustained without further changes in its fiscal policy. The public sector as a whole barely has a surplus on its noninterest account, and its reliance on issuing high-cost domestic interest-bearing debt is growing. If the government continues to borrow at real rates of interest far in excess of the output growth rate, the debt-output ratio will grow rapidly, and pressure on budgetary debt servicing requirements will escalate.

This discussion of external adjustment and the public sector's role in the matching internal adjustment process sets the stage for the remainder of this volume. Chapter 5 details the fiscal deficit and its method of financing. Chapter 6 takes a broad view of the interaction between fiscal policy and the behavior of private saving and investment. The focus is on how Turkey managed to achieve acceptable debt accumulation while maintaining high investment and output growth. The final chapter assesses the possibility of sustaining this strategy in the future and the requirements such a goal imposes on fiscal policy.

5 Internal Adjustment: The Size and Financing of the Fiscal Deficit

CHAPTER 4 HIGHLIGHTED the public sector's contribution to Turkey's net external transfer and how this contribution was financed. This chapter provides a more detailed analysis of the size and financing of Turkey's public sector deficits after 1980. It reviews the changes in the financing mix and the factors that caused those changes. Developments in the financial system, in particular, affected revenue from monetization negatively, and since this decline in monetization was not matched by a reduction in primary deficits, reliance on the issuing of debt increased. This chapter explores the implications of the recent increase in the issuing of interest-bearing debt and assesses the extent to which the current levels and financing of fiscal deficits are consistent with the financing limits imposed by macroeconomic targets such as inflation and output growth. It also estimates the effect on deficit financing of a number of measures taken in the financial sector.

Sources of Financing

The real public sector deficit improved significantly in 1981 (see table 5-1), deteriorated in 1982, and improved again in 1983. After 1983, however, the fiscal situation worsened significantly. The real deficits were larger during 1984–86 than in the four preceding years, even excluding all capital losses due to changes in the exchange rate for the stock of net foreign currency liabilities. The picture looks considerably worse when the capital losses are taken into account. To a large extent this worsening of the deficit reflects the burden of higher real interest payments. This may be seen in the differences between the primary deficit (excluding all interest payments) and the real deficit (see table 4-5 and figure 4-6 for data on the primary deficit and table 5-1 for the real deficit).

Although the real deficit worsened, the primary deficit did not.

Table 5-1. Real Public Sector Deficits and Sources of Finance, 1980–87
(percentage of real GNP)

Source of finance	*1980*[a]	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
1. Money financing	0.7	1.8	3.5	0.9	5.7	2.6	1.7	1.8
2. Domestic debt financing	−2.2	−2.3	0.1	−1.3	−0.2	1.9	0.4	2.4
3. External debt financing								
Including capital losses	7.8	2.9	4.4	4.8	6.1	4.6	10.9	3.7
Excluding capital losses	2.3	−0.5	1.7	2.1	4.2	1.9	3.6	2.3
4. Total real public sector deficit								
Including capital losses	6.4	2.4	8.0	4.4	1.6	9.1	12.7	7.9
Excluding capital losses	0.8	−1.0	5.3	1.6	9.7[b]	6.4	5.7	6.5

— Not available.
a. Base year.
b. The large number for 1984 is somewhat misleading. In that year, the central bank assumed a substantial part of the outstanding liabilities of the state enterprises when the public sector was debt consolidated. Since these debts were not recorded before, the consolidation shows up as an increase in the deficit. The data for other years are not affected by this consolidation.
Source: Central bank, Undersecretariat of Treasury and Foreign Trade, State Planning Organization, State Institute of Statistics, and Public Participation Fund.

Also, after 1980 the trend of the real deficit resembled that of the public sector borrowing requirement. One of the main differences between the two is that the borrowing requirement includes the inflation premium in nominal interest payments. Thus both the real deficit and the borrowing requirement rose after 1984, while the noninterest deficit did not. This suggests that real interest payments, as well as the inflation component in nominal interest payments, were rising.

The increase in interest payments reflects both higher real interest rates and higher debt. Until 1985, the deficits were mostly financed by monetization and external borrowing. Real domestic debt actually declined between 1980 and 1984. After 1985, however, money financing declined and domestic debt financing increased. Three factors reduced the potential for money financing. First, the reserve requirement ratios progressively declined until late 1987, which reduced the demand of the banking system for base money for a given stock of bank deposits. Second, financial innovations decreased the demand of businesses for money. Third, the substitution of foreign exchange deposits for Turkish lira deposits has decreased the demand of individuals for money.

The reduced scope for monetization (at given rates of inflation) and constraints on external financing led to increasing reliance on issuing domestic debt since primary deficits did not decline. The increased reliance on interest-bearing debt came, however, at a high cost. First, zero-cost money financing shifted to high-cost debt issue: the real interest rate on Treasury paper was about 12 percent in 1987. Second, the cost of foreign debt also increased. This was mostly caused by

the increasing share of nonconcessional borrowing from multilateral institutions and from an unconventional source of foreign exchange, the Dresdner Bank account scheme, on which interest rates were 6 to 7 percent above Euromark rates (Euromark rates are the interest rates on mark-denominated deposits in the European—or offshore—market, that is, outside Germany).

Issuing debt at rates of interest well in excess of GNP growth rates is not sustainable. Although the total stock of domestic debt remained low, the government's interest expenses on domestic debt rose sharply from between 0.5 and 0.7 percent of GNP before 1984 to an estimated 2.5 percent in 1987. Also, interest payments on the government's and the central bank's foreign exchange liabilities increased, from below 1.6 percent of GNP before 1984 to an estimated 3.5 percent in 1987.[1]

The government thus had less leeway on money financing, especially if tighter inflation targets were to be met. In addition, a slowdown in domestic debt issue became necessary to avoid escalating debt service, since interest rates were much higher than the growth rate of the economy. Since external borrowing on a much larger scale was not feasible or advisable (see chapter 7), improving the primary deficit became necessary.

Foreign Exchange Financing of Public Sector Deficits

The stock of the net foreign exchange liabilities of the public sector increased significantly from $9.8 billion (14 percent of GNP) in December 1979 to $27.1 billion (46 percent of GNP) in December 1986.[2] The public sector's stock of net foreign currency liabilities does not correspond exactly with its stock of net external debt. This is because some of the central bank's assets and liabilities in foreign exchange do not constitute external debt.[3] Since these differences are more important for liabilities than for assets, the public sector's net foreign exchange liabilities are larger than its net external debt. For instance, at the end of 1986, the stock of net foreign exchange liabilities was almost $1 billion more than the net external debt ($26.2 billion).

The fluctuations of the dollar disguised the growth of foreign liabilities before 1984 and overstated their growth thereafter. However, when comparing 1979–80 and 1986, whether fluctuations in the cross-currency exchange rate are corrected for is unimportant because at the end of 1986 the cross-currency rates had more or less returned to their 1980 levels.

It does matter, however, whether changes in Turkey's real exchange

rate against those of its trading partners are considered. Table 5-2 shows that the increase in the real value of the public sector's foreign currency liabilities was largely caused by the real depreciation of the Turkish lira. After 1981, the annual increase in the public sector's foreign currency liabilities exceeded 4 percent of GNP. The increase over the 1980–86 period is more than halved, however, once capital losses due to changes in the exchange rate are taken out.

For the public sector as a whole, the share of foreign exchange credit from private sources increased, as did the share of short-term liabilities. These trends were closely related to the rapid increase in the foreign exchange deposits in commercial banks (which are partly rechanneled to the central bank) and in the Dresdner accounts.

In addition to the Dresdner accounts, the central bank, through reserve requirements, absorbed part of the increasing stock of foreign exchange deposits held in Turkish commercial banks. These foreign exchange deposits were introduced in December 1983 and grew rap-

Table 5-2. Foreign Exchange Financing of Public Sector Deficits, 1980–86
(percentage of GNP)

Variations	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
Total real variations in net foreign liabilities	7.8	2.9	4.4	4.8	6.1	4.6	10.9	3.7
Cross-currency effects on stocks of net foreign liabilities	−0.4	−2.0	−2.4	−5.0	−9.5	9.5	7.9	6.0
Cross-currency effects on foreign prices	0.0	0.3	0.6	2.0	4.6	−4.9	−2.1	−0.1
Total cross-currency effects	−0.4	−1.7	−1.7	−3.0	−4.9	4.6	5.8	5.9
Real variations in net foreign liabilities adjusted for cross-currency fluctuations	8.2	4.6	6.1	7.8	11.0	0.0	5.1	−2.2
Capital loss due to real exchange rate depreciation[a]	5.9	5.1	4.5	5.7	6.8	−1.9	1.5	−4.5
Total variations corrected for real exchange rate depreciation and cross-currency effects	2.3	−0.5	1.7	2.1	4.2	1.9	3.6	2.3

a. Turkish liras to the U.S. dollar.
Source: Central bank, Undersecretariat of Treasury and Foreign Trade, State Institute of Statistics, and IMF, *International Financial Statistics.*

idly, reaching $3.4 billion by the end of 1986. The commercial banks voluntarily deposit some of their foreign exchange resources in the central bank to help them manage their reserves and clear checks. In addition to these voluntary deposits, the central bank imposed a 15 percent reserve requirement ratio on these foreign exchange deposits in early 1986. The increase in the Dresdner accounts and the commercial banks' foreign exchange deposits with the central bank accounted for one-third of the increase in the public sector's net foreign liabilities between 1980 and 1986.

The large number of Turkish workers living abroad and the measures taken to attract their savings to Turkey were important elements in the external financing of the government. The introduction of the Dresdner accounts and the foreign exchange deposits in Turkish banks generated a large inflow of foreign exchange resources, which were channeled, for the most part, to financing the public sector deficits. These unusual sources of foreign exchange financing partly offset the constraints on the more conventional sources of foreign financing, such as borrowing from official agencies and, especially, borrowing from private commercial banks. This factor clearly differentiates Turkey from most other debtor countries, whose foreign exchange was more constrained because they depended more on traditional sources of foreign exchange financing.

Money Financing and Financial Sector Reform

A large share of public sector deficits in Turkey is financed through the central bank. The ability of the central bank to finance public sector deficits originates in two basic sources. First, the central bank captures a large inflow of foreign exchange resources. It does this by borrowing directly from abroad, by holding the foreign exchange deposits of Turks working abroad, and by imposing reserve requirements on foreign exchange deposits held in Turkish banks. These resources are then used to finance the public sector deficits—for instance, to service the public sector's external debt. Second, the central bank also finances the public sector by expanding the domestic money base, that is, by creating money. This section analyzes domestic money financing.

Revenue from Money Creation and Financing the Public Sector Deficits

Table 5-3 provides information on money financing in Turkey from 1979 through 1987. The first row shows total revenue from annual expansion of the base money as a percentage of GNP, which is total

Table 5-3. Money Financing of Public Sector Deficits, 1979–87
(percentage of GNP)

Source of revenue	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
Nonadjusted base money[a]	4.6	3.2	4.2	3.4	3.2	3.6	2.9	2.0	2.5
Inflation tax	6.9	5.9	1.9	2.1	3.2	3.7	3.2	2.2	3.4
Seigniorage	−2.3	−2.7	2.3	1.3	0.0	−0.1	−0.3	−0.2	−0.9
Due to output growth	−0.1	−0.1	0.4	0.5	0.4	0.7	0.5	0.8	0.7
Due to other factors	−2.2	−2.6	1.9	0.8	−0.4	−0.8	−0.8	−1.0	−1.8
Base money	2.3	1.7	1.0	1.5	1.2	1.0	1.0	1.0	1.5
Excess reserves	1.0	0.7	1.7	0.0	0.7	0.2	0.7	0.6	0.8
Required reserves	1.4	0.9	1.5	1.9	1.4	2.4	1.2	0.4	0.2
Adjusted base money[b]	0.7	0.7	1.8	3.5	0.9	5.7	2.6	1.7	1.8
Other indicators									
Inflation[c]	78.5	89.6	28.3	26.2	37.1	49.7	44.2	30.7	55.1
Output growth	n.a.	−1.1	4.1	4.5	3.3	5.9	5.1	8.0	6.8
GNP (billions of Turkish liras)	2,199.5	4,435.2	6,553.6	8,735.0	11,551.9	18,374.8	27,789.4	39,309.6	58,387.2

— Not available.
n.a. Not applicable.
a. Estimated.
b. Adjusted base money is nonadjusted base money minus rediscounts plus import deposits.
c. From the December consumer price index.
Source: Central bank.

seigniorage, $[(M_t - M_{t-1})/\text{GNP}_t]$, where M_t is base money—currency, required reserves, and excess reserves (vault cash in commercial banks and free bank deposits in the central bank).[4] Currency is held by the nonbank private sector, while reserves constitute the banking system's demand for base money.

Total seigniorage was high in 1979: 4.6 percent of GNP. Such revenue then oscillated between 3.2 and 4.2 percent of GNP between 1980 and 1984 and declined steadily afterward to an estimated 1.7 percent of GNP in the first semester of 1987. Two factors explain most of these variations: the reserve requirement regime, which includes the reserve requirement ratios, computation methods, and the banks' compliance with the rules; and the portfolio behavior of asset holders, which is influenced by inflation, interest rates, output growth, and the emergence of close substitutes for domestic money. These factors are analyzed in more detail below.

The public sector is not the only beneficiary of money creation; the central bank also rediscounts credit to the private sector, usually at interest well below market rates. To assess how much of the increase in base money is channeled to the public sector, the changes in central bank rediscounts to the private sector must be subtracted from the total increase in base money. Similarly, import deposits in the central bank are not included in the standard concept of base money, but they are a central bank liability to the private sector. Changes in these deposits thus change public sector revenue from monetization.[5]

Net revenue from money creation therefore equals the change in base money itself, adjusted for rediscounts paid to and deposits received from the private sector.[6] Before 1984 a significant share of the inflation tax was transferred back to the private sector through rediscounts at negative real interest rates. The public sector absorbed only 57 percent of the total seigniorage that was collected by the central bank during 1980–83.[7] In 1984 the central bank reduced the volume of rediscounts and kept them low. The large proportion of revenue from monetization absorbed by the public sector in 1984 reflects that decrease in the central bank rediscounts to the private sector. After 1984, however, total revenue from the creation of adjusted base money decreased for the same reasons that the demand for unadjusted base money declined: the reserve requirements decreased, and private portfolio behavior changed with the introduction of foreign exchange deposits.

To understand why total seigniorage declined after 1984, it is useful to look at a breakdown of the increases in base money. Table 5-3 presents the total revenue generated by the creation of base money broken down by the inflation tax, $p_t M_t/\text{GNP}_t$, and the real growth of base money, $\{[M_t - (1 + p_t) M_{t-1})]/\text{GNP}_t\}$, where p_t is the CPI inflation

rate for each year. The first component, the inflation tax, arises from the attempt of asset holders to keep their annual money balances constant in real terms. If inflation is constant at, say, 30 percent a year, the holders of financial assets must reserve a share of their savings to increase their stock of nominal assets (currency and deposits) by 30 percent a year in order to maintain their real stocks constant. These additional nominal flows of money, which are demanded by asset holders and supplied by the central bank at a negligible cost, can then be transferred to the public sector to finance the purchase of real goods and services.

The second component measures variations in the real stock of base money. Variations can occur because of changes in real output, inflation, or interest rates, as well as such factors as financial innovations or changes in the reserve requirement regime. Real output, inflation, and interest rates affect demand for base money by affecting demand for financial assets—currency and deposits (the base for required reserves). Factors such as changes in reserve requirement ratios have a more direct effect on the demand for base money, since they change required reserves for a given real stock of deposits. Finally, innovations in the financial system may affect demand for base money either directly (for example, the development of an interbank market reduces the bank's excess reserves for the same real stock of deposits) or indirectly (for example, better cash management may reduce the firm's demand for sight deposits).

Most of these factors trigger one-time changes in base money. An increase in reserve requirements that raises the demand for base money by, say, 0.5 percent of GNP yields extra revenue equal to 0.5 percent of GNP for the government in the year the requirements are raised. Afterward, however, reserve requirements remain constant. Similarly, a drop in the inflation rate raises the demand for base money; that one-time increase yields extra revenue in the year it takes place. This one-time effect should be distinguished carefully from the negative, continuing effect a cut in inflation has on the inflation tax; as long as the inflation rate stays down, revenue from the inflation tax remains low. Table 5-3 shows the amount of seigniorage arising from output growth and from other factors.[8] This distinction is relevant because output growth is recurrent and will continue to generate seigniorage gains. The other factors are mostly one-time shifts that do not recur.

Of course, inflation tax and the other component, the real changes in base money, are not independent. For instance, any factor that causes base money to expand in real terms, such as strong output growth, eventually also generates more revenue from inflation tax,

since such revenue equals the inflation rate (the tax rate) times the real stock of base money (the tax base).

In Turkey the bulk of seigniorage revenue originates in the inflation tax because high inflation rates prevailed throughout most of the period. Table 5-3 shows the high positive correlation between inflation tax revenue and the rate of inflation. This is because the inflation elasticity of all the components of base money is lower than unity (in absolute value). Hence when inflation increases, the real stock of base money decreases, but it does so less than proportionately.[9] In other words, the tax base (the stock of base money) declines as the tax rate (inflation) increases, but the correspondence is less than one for one. Therefore, inflation tax revenue increases as inflation rises.

The high inflation rates in 1979 and 1980 generated large inflation tax revenues in those years. Total seigniorage revenue from the creation of base money was lower, however, since the increasing rates of inflation in both years also generated large one-time seigniorage losses as the real stock of money adjusted to the higher inflation. In 1981 the reverse was true. Revenue from the inflation tax declined substantially because of a sharp decrease in the inflation rate. But the lower inflation rate also produced a large increase in the real money stock and thus a one-time seigniorage gain for the central bank. The final result in 1981 was actually an increase in total seigniorage revenue.[10]

In 1982 revenue from the inflation tax was about the same as in 1981 (inflation rates were approximately the same), while the gain due to increases in the real money stock was less. Most of the real stock of base money had already been adjusted to lower inflation rates in 1981. Therefore, total revenue in 1982 was lower than in 1981. Inflation rates increased again in 1983 and 1984, generating an increase in inflation tax revenue, as expected. The real stock of base money declined in both years, also as expected. Total revenue increased slightly between 1983 and 1984.

In 1985 and 1986, however, the link between the developments in inflation and seigniorage revenue was broken. Inflation rates declined in 1985 and 1986, which generated the expected decrease in inflation tax revenue. The real stock of base money did not increase, however, despite decreasing inflation rates and strong output growth. Instead, the real stock of base money declined through the first semester of 1987.

Three reasons can account for the decline in the real stock of base money and the resulting seigniorage losses after 1984. First, the reserve requirement ratios were progressively reduced after 1985. Lower reserve requirement ratios for the same real stocks of demand and time deposits caused the banking system to lower its demand for real base money. Second, after 1985 the volume of short-term sales

increased, as did repurchases of government securities by banks and firms. The development of such repurchase agreements (a liquid financial instrument) therefore reduced the growth of the firms' demand for sight deposits and, given the same reserve requirement ratios, for base money. Finally, after December 1983 both firms and individuals were allowed to hold deposits in foreign exchange in Turkish banks. The rapid growth of these foreign exchange deposits was partly responsible for the relatively slow growth of Turkish lira deposits. This development significantly affected individuals' demand for sight deposits in Turkish liras since more than 85 percent of the stock of foreign exchange deposits was held by individuals. As a result of the reduced demand of individuals and firms for Turkish lira deposits, the demand for real base money also decreased. The increases in the reserve requirement ratio after September 1987 partly offset the reduced demand for base money by firms and individuals. These increases were probably temporary, however, since the government's policy was to lower reserve requirements in order to reduce the spread between deposit and lending rates.

The Reserve Requirement Regime and the Demand for Real Base Money

An important component of the demand for base money is the commercial banks' obligation to hold reserves against deposits. Reserve requirements have an important effect on the demand for base money and thus, possibly, on the public sector's potential revenue from monetization. Higher reserve requirements, for given asset demands by the private sector, led the banking system to demand more base money. The effects of general equilibrium could in principle offset this increased demand for base money because of changing interest rates and shifting asset demands (Romer 1985). Reserve requirements essentially tax financial intermediation and drive a wedge between deposit and lending interest rates. The tax burden tends to be shifted forward, as higher interest rates on loans, or backward, as lower interest rates on deposits, depending on the interest elasticity of loans and deposits. If the burden shifts backward, higher reserve requirements lead to lower deposit rates and to an increase in deposits. This in turn could offset the increase in the demand for base money. The evidence for Turkey points toward a shift to higher lending rates; thus a backward shift and its effects are unlikely.

Turkey's reserve requirement ratios were high in the early 1980s—35 percent for demand deposits and 30 percent for time deposits.[11] In January 1983 the two ratios were equalized at 25 percent (see

table 5-4). The lower statutory ratio did not, however, produce a loss of seigniorage revenue. The reason why lies in the actual rather than the required reserves. The effective reserve requirement ratio (actual required reserves to total deposits) did not decrease in 1983, even though the statutory rates were lower.[12] The effective ratio actually increased because of greater compliance with central bank regulations (see figure 5-1).

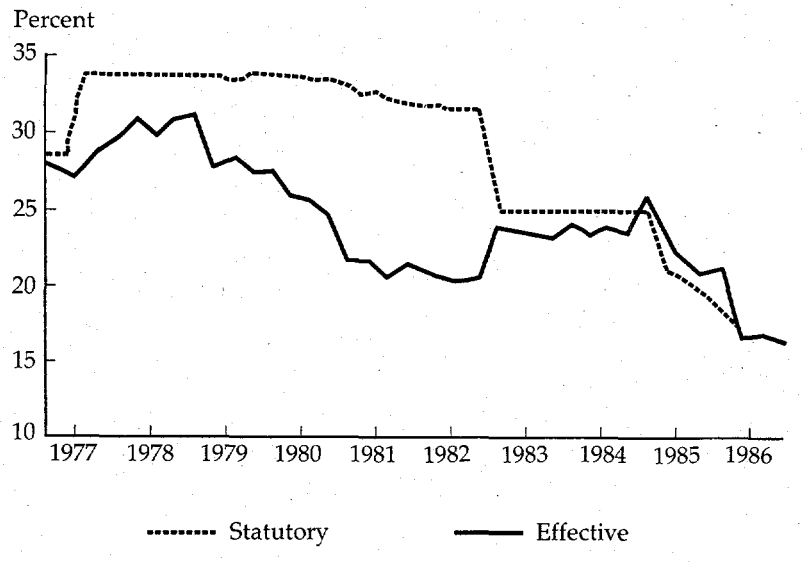
This changed beginning in 1985. Both the statutory and the effective ratios began to decline in April 1985, when the monetary authorities began to reform the reserve requirement regime. The reform included a move toward contemporaneous reserve requirements, which reduced the lag between computation and maintenance from six to two weeks; gradual reductions in the reserve requirement ratios; and a parallel reduction in the interest rate paid on required reserves. The revenue loss caused by the initial reduction in the statutory ratios was partly offset by the reduction in the lag between computation and maintenance. After 1985 the effective ratio was slightly higher than

Table 5-4. Reserve Requirement, Liquidity Requirements, and Interest Paid on Reserves, 1979–88
(percent)

	Reserve requirement ratio		*Interest paid on required reserves*[a]		*Liquidity requirement ratio*[b]		
Month and year	*Sight deposits*	*Time deposits*	*Sight deposits*	*Time deposits*	*Excess reserves*[c]	*Bonds*	*Total*
January 1979–June 1980	35.0	30.0	5.0	8.0	—	—	10.0
July 1980–June 1981	35.0	30.0	10.0	16.0	—	—	10.0
July 1981–May 1982	35.0	30.0	20.0	26.0	—	—	10.0
May 1982–December 1982	35.0	30.0	12.7	19.6	—	—	10.0
January 1983–December 1983	25.0	25.0	19.6	19.6	—	—	10.0
January 1984–March 1985	25.0	25.0	6.2	47.6	—	—	15.0
April 1985–June 1985	21.0	21.0	29.6	29.6	—	—	15.0
July 1985	20.0	20.0	25.5	25.5	—	—	15.0
August 1985	20.0	20.0	19.9	19.9	—	—	15.0
September 1985	20.0	20.0	17.6	17.6	—	—	15.0
October 1985	19.0	19.0	11.4	11.4	—	—	15.0
November 1985–December 1985	19.0	19.0	5.6	5.6	—	—	15.0
January 1986	19.0	19.0	0.0	0.0	—	—	15.0
February 1986–March 1986	18.0	18.0	0.0	0.0	—	—	15.0
April 1986–May 1986	17.0	17.0	0.0	0.0	—	—	15.0
June 1986–September 1986	16.0	16.0	0.0	0.0	—	—	15.0
October 1986–June 1987	15.0	15.0	0.0	0.0	3.0	12.0	15.0
July 1987–August 1987	10.0	10.0	0.0	0.0	5.0	18.0	23.0
September 1987–December 1987	12.0	12.0	0.0	0.0	5.0	18.0	23.0
December 1987	14.0	14.0	0.0	0.0	5.0	18.0	23.0
February 1988	16.0	16.0	0.0	0.0	5.0	23.0	28.0

— Not available.
a. Compounded interest rates.
b. Liquidity requirements are imposed on both sight and time deposits.
c. Vault case or free deposits.
Source: Central bank.

Figure 5-1. Statutory and Effective Reserve Requirement Ratios, 1977–86



the statutory ratio because the reductions were phased in. During 1986 the central bank decreased the ratios to 15 percent and stopped paying interest on required reserves, which partially offset the loss in revenue caused by lower reserve requirements.

Interest rates on deposits were controlled at the same time that reserve requirement ratios were reduced. This is one reason the reduction of reserve requirements during 1985–86 and the implied reduction in the taxation of financial intermediaries were not shifted backward in the form of higher deposit rates. In addition, the high intermediation spreads and the real interest rates on loans (which are free) strongly suggest that most of the tax was shifted forward in Turkey.

This is borne out by the data. Tables 5-3 and 5-5 reveal how reduced reserve requirement ratios affected revenue generated by the creation of money in 1985 and 1986. The average stock of currency in relation to GNP was constant from 1984 to 1986—about 3.5 percent (table 5-5). As a consequence, the contribution of currency to seigniorage revenue was also constant—around 1 percent of GNP (table 5-3). Also, the total average deposit base (both demand and time deposits) increased from 17.9 percent of GNP in 1984 to 19.9 percent in 1986. But the required reserve component of total revenue from base money decreased dramatically during 1985 and 1986, after peaking in 1984.[13] This suggests that the reduction in reserve requirement ratios during 1985–86 had

Table 5-5. Average Monetary Aggregates, 1979–87

Monetary aggregate	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
Currency	111.7	189.3	260.1	370.0	448.8	669.0	953.3	1,361.4	1,810.2
	(5.1)	(4.3)	(4.0)	(4.2)	(3.9)	(3.6)	(3.4)	(3.5)	(3.2)
Demand deposits	204.7	356.9	480.0	609.4	933.4	989.0	1,374.8	1,977.4	3,108.2
	(9.3)	(8.0)	(7.3)	(7.0)	(8.1)	(5.4)	(5.0)	(5.0)	(5.5)
Firms	—	—	285.4	391.0	527.9	645.5	920.3	1,344.9	2,042.7
			(4.3)	(4.5)	(4.6)	(3.5)	(3.3)	(3.4)	(3.6)
Individuals	—	—	194.6	218.4	405.5	343.5	454.5	632.5	1,065.5
			(3.0)	(2.5)	(3.5)	(1.9)	(1.7)	(1.6)	(1.9)
M1	317.6	549.2	752.6	984.7	1,392.1	1,687.3	2,346.7	3,361.5	4,945.0
	(14.4)	(12.4)	(11.5)	(11.3)	(12.0)	(9.2)	(8.5)	(8.6)	(8.7)
Time deposits	56.7	110.7	385.5	946.5	1,266.4	2,295.5	4,085.9	5,858.2	7,203.3
	(2.6)	(2.5)	(5.9)	(10.8)	(11.0)	(12.5)	(14.7)	(14.9)	(12.7)
M2	374.3	659.9	1,138.1	1,931.2	2,658.5	3,982.8	6,432.6	9,219.7	12,148.3
	(17.0)	(14.9)	(17.4)	(22.1)	(23.0)	(21.7)	(23.2)	(23.5)	(21.4)
Foreign exchange	—	—	—	—	0.2	211.4	784.4	1,903.2	3,917.0
					(0.0)	(1.1)	(2.8)	(4.9)	(6.9)
M2X	—	—	—	—	2,658.7	4,194.2	7,217.4	11,122.9	16,065.3
					(23.0)	(22.8)	(26.0)	(28.4)	(28.3)
Annual inflation (December to December, percent)	78.5	89.6	28.3	26.2	37.1	49.7	44.2	30.7	55.1
Average inflation (percent)	57.6	110.9	36.8	23.1	31.4	48.4	45.0	34.6	38.8
Average interest rates (percent)									
Demand deposits	2.4	3.2	3.8	3.8	17.3	4.6	4.6	8.2	9.4
Six-month deposits	9.2	11.1	36.8	41.0	33.2	49.3	51.4	44.8	37.2
One-year deposits	20.0	21.2	36.9	37.5	34.3	40.5	45.1	47.1	43.0
Nominal GNP	2,199.5	4,435.2	6,553.6	8,735.0	11,551.9	18,374.8	27,789.4	39,176.9	58,387.2

— Not available.
Note: Figures are billions of Turkish liras, with percentage of GNP in parentheses, unless otherwise noted.
Source: Central bank, State Institute of Statistics.

a negative effect on the central bank's ability to generate revenue from money creation. The fiscal effect of reducing the reserve requirements should always be taken into account when designing financial sector reforms. Of course, the other side of the coin is a gain in welfare caused by a reduction of the tax burden. Moreover, the revenue effects were moderated because the central bank stopped paying interest on reserves.

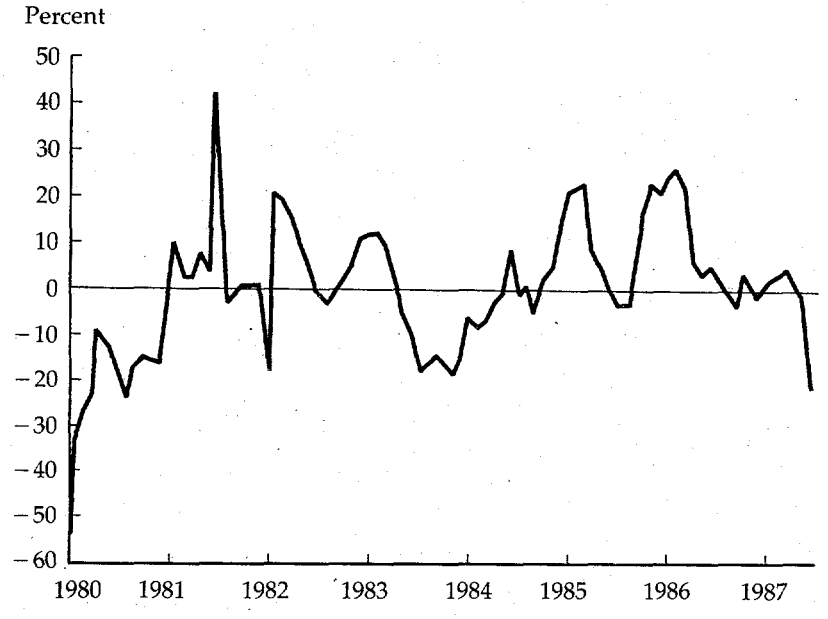
Most seigniorage revenue is produced by the inflation tax. In Turkey, the burden of the inflation tax mainly fell on the holders of currency, holders of demand deposits, and bank borrowers. Holders of time deposits largely escaped the inflation tax. Currency holders, however, bore the inflation tax fully since currency earns no interest. The burden of the tax was slightly reduced for holders of demand deposits, which do earn some interest. In addition, demand deposit holders received implicit interest payments in the form of free banking services (check clearing, movement of funds, and other conveniences offered by the large network of branches in Turkey). The inflation tax burden was apparently negligible for time deposit holders. Although interest rates on time deposits were generally controlled after 1981, they were also kept significantly positive in real terms, as shown in table 5-5 and figure 5-2.[14] Most of the burden of noninterest-bearing reserve requirements on time deposits was thus transferred forward to bank borrowers in the form of very high lending rates.[15] As a consequence, the inflation tax collected in 1986 (2.2 percent of GNP) was borne mainly by bank borrowers (1 percent of GNP), holders of currency (0.8 percent), and holders of demand deposits (0.4 percent).[16]

Financial Innovation and Seigniorage

The effects of financial innovation on the demand for money in the United States are extensively documented. During the 1970s, the emergence of close substitutes for sight deposits and the introduction of better cash management techniques depressed the growth of demand for sight deposits. These developments also explain in part the overprediction of demand functions based on earlier data. The data in table 5-5 suggest that a similar phenomenon took place in Turkey, where the share of demand deposits in the GNP dropped from 8.1 percent in 1983 to 5.4 percent in 1984 and continued to decline in 1985. The high inflation and reduced interest rates on demand deposits in 1984 partly explain the fall. The extent of the fall and the stagnation of the real stock of demand deposits after 1984, when inflation was decreasing, suggest that exogenous factors caused structural shifts in the demand for money.

The fall in the ratio of sight deposits to GNP was caused by a decline

Figure 5-2. Real Interest Rates on Six-Month Deposits, 1980–87

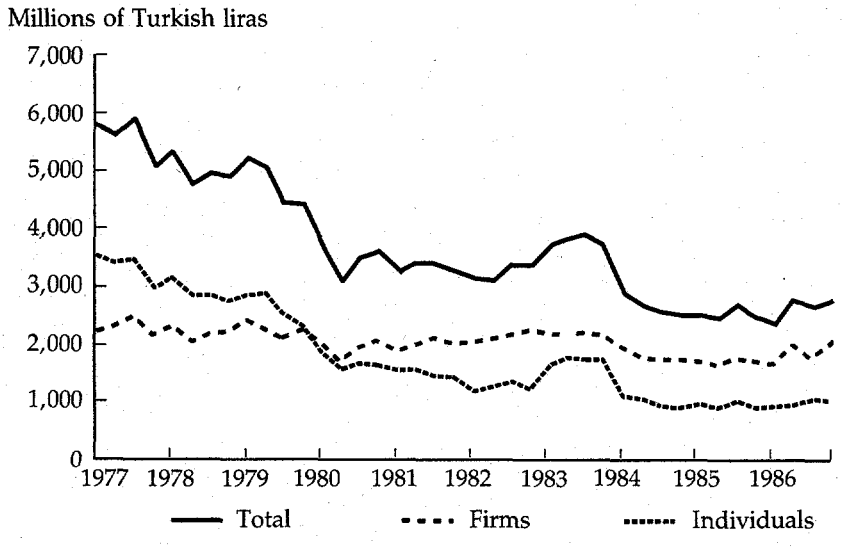


Note: Data are ex post or observed real rates.

in the demand of both firms and individuals for sight deposits (see table 5-5 and figure 5-3). Although the decrease was more pronounced in sight deposits held by individuals, those held by firms also decreased in 1984 and 1985 and increased only slightly in 1986. A possible explanation for the behavior of firms lies in the creation in 1984 of an informal market for agreements to repurchase government securities. Although repurchase agreements were illegal in Turkey, firms and commercial banks increasingly engaged in this kind of operation. Most of these informal agreements were short term (less than a month) and could be used for cash management. Therefore, the development of informal repurchase agreements probably reduced the firms' need to maintain real stocks of sight deposits for use in transactions.

The estimate of demand functions for sight deposits supports the hypothesis that structural shifts occurred in the 1980s. Figure 5-4 shows the difference between the actual and predicted values of the demand of firms for sight deposits, which are based on econometric estimates (see chapter 2).

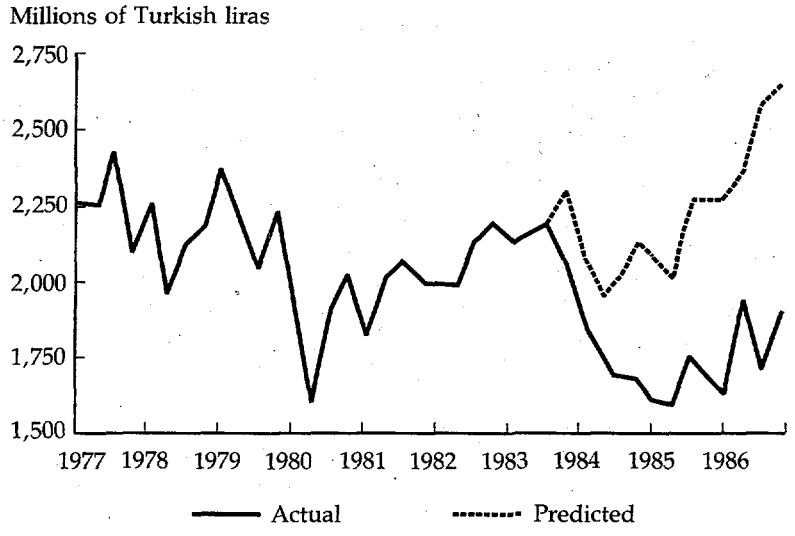
Figure 5-3. Real Sight Deposits, 1977–86
(base = 1980)



During 1985 and 1986 commercial banks held approximately 75 percent of the stock of outstanding government securities. In the first semester of 1987, they held only 60 percent; the remaining stock was held by individuals and firms.[17] Most of the stock of securities held by companies was held under informal repurchase agreements with banks. Since the overall stock of government securities increased substantially after 1984, the volume of repurchase agreements probably increased accordingly. Unfortunately, directly testing the effect of this factor on firms' demand for money is not possible.[18] Moreover, other factors may also have caused firms' demand for money to decrease. In general, better cash management also reduces the size of the stock of sight deposits required to finance a given number of transactions. Finally, firms switched from Turkish lira deposits to foreign exchange deposits, although this factor seems to have been more important for individuals.

The creation of the informal market for repurchase agreements was a natural development in the Turkish financial system once an auctioning system for Treasury paper was introduced. These repurchase agreements broadened the market for government securities and allowed the government to issue more bonds and bills to finance its deficit. Such financial innovations also reduce the real revenue from money creation by reducing the base of the inflation tax. This loss

Figure 5-4. Actual and Predicted Demand of Firms for Sight Deposits, 1977–86
(base = 1980)



Note: The sample period for actual values is from the first quarter of 1977 to the third quarter of 1983. The cutoff point was chosen because foreign exchange deposits, another factor in the shift of demand, were introduced in the fourth quarter.

should be seen as an inevitable cost of implementing a regular system for selling government securities and of forming a market for these securities.[19] This loss should be taken into account in formulating fiscal and monetary policies. Otherwise, attempting to maintain the same revenue from monetization when the demand for money is declining will lead to higher inflation.

Currency Substitution and Seigniorage

The introduction of foreign exchange deposits in December 1983 was a major cause of the decrease in the real demand for sight deposits. The stock of foreign exchange deposits in Turkish banks increased dramatically, reaching approximately 7 percent of GNP in June 1987. This was equal to 32 percent of M2 at that time. A central question is how much of the increase was at the expense of the growth of deposits in Turkish liras. This matters because shifts out of domestic deposits reduce the amount of reserves banks are required to hold and hence

the demand for base money. This in turn reduces the revenue the government can expect from monetization. Such a reduction does not take place if the increase in foreign exchange deposits is caused by a transfer from abroad.

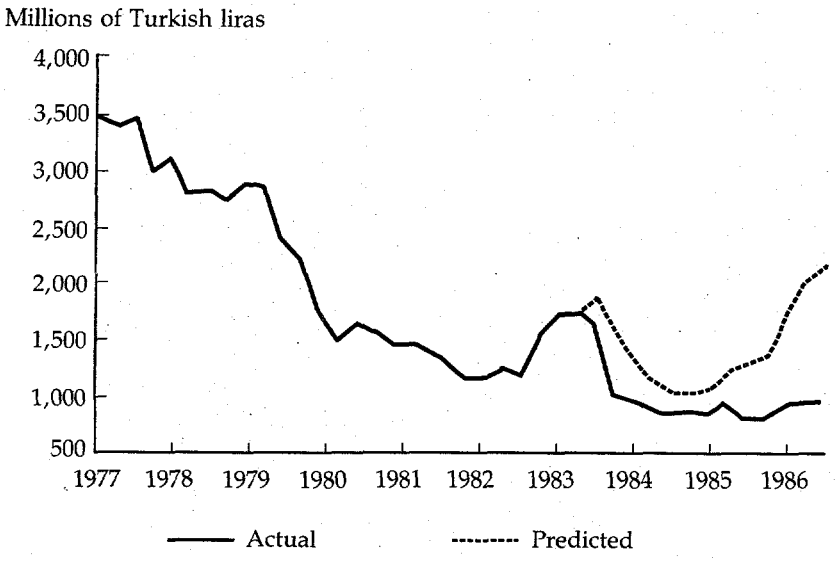
By the end of 1987, the share of foreign exchange deposits held by residents was close to 70 percent of all deposits. There is no precise breakdown in holdings by firms and by individuals. Still, close to 90 percent of the total stock was held by individuals, and most of the increase in foreign exchange deposits came from portfolio shifts made by domestic residents.

The issue is not yet settled, however. Part of the observed increase in foreign exchange deposits may have been the result of residents transferring their existing stocks of foreign exchange into the formal domestic financial system. If these stocks had been held abroad or in the informal domestic financial system (the black market), they would be the product of previous currency substitution. The introduction of foreign exchange deposits may or may not have accelerated a process of currency substitution. The shift into foreign exchange deposits was by residents; but if their assets had been outside the official financial system, the effect on the government's revenue from monetization would still not have been negative.

Table 5-5 and figure 5-5 suggest another process. Demand deposits declined substantially between 1983 and 1986, and that decline cannot be explained by changes in interest rates, inflation, or income. The demand for sight deposits was predicted by taking all those variables into account.[20] The equation tracks well until the end of 1983 but then increasingly overpredicts individuals' demand for sight deposits. No such prediction error takes place in individuals' demand for time deposits. The conclusion seems clear: most of the shift into foreign exchange deposits was, in fact, from domestic sight deposits. Therefore the introduction of foreign exchange deposits accelerated the process of currency substitution, since most of the deposits came from domestic demand deposits denominated in Turkish liras.

One of the significant costs of introducing foreign exchange deposits was the reduced demand for base money caused by accelerated currency substitution.[21] The introduction of foreign exchange deposits also generated an important inflow of foreign exchange, part of which could be channeled toward financing the public sector deficits. Imposing reserve requirements on the stock of foreign exchange deposits allowed the government to recover part of the real revenue lost as a result of the lower required reserves on domestic deposits. In January 1986 the monetary authorities imposed a reserve requirement ratio of 15 percent on the stock of foreign exchange deposits in Turkish banks. The ratio was initially imposed on a marginal basis (that is, it was

Figure 5-5. Actual and Predicted Demand of Individuals for Sight Deposits, 1977–86
(base = 1980)



applied only to the increase in the stocks from that date forward). In mid-1986, however, the banks were asked to progressively apply the ratio of 15 percent to all existing stock. This measure generated a significant inflow of foreign exchange resources to the central bank, amounting to approximately 1 percent of GNP in 1986. If this factor is taken into account, the seigniorage loss observed in 1986 (−0.3 percent of GNP) was actually a seigniorage gain.

But the net gains were reduced by the interest paid on the required reserves of foreign exchange deposits. The interest rates were approximately equal to the London interbank offered rate (LIBOR), which is close to the market interest rates charged on foreign loans.[22] During 1986 the volume of interest payments was negligible, since most of the increase in the stock of required reserves took place in the second half of the year. The marginal cost, however, was high—equal to LIBOR plus the devaluation of the Turkish lira against the dollar or the deutsche mark. When market interest rates are paid on reserves, the required reserves on foreign exchange deposits should not be added to the usual definition of base money.[23] Instead, the required reserves on foreign exchange deposits should be added to the stock of net foreign exchange liabilities of the public sector.

Thus the imposition of reserve requirements on foreign exchange

deposits did generate an important source of funds for the government. It also implied a shift from zero-cost financing (the inflation tax) to high-cost financing (interest-bearing foreign exchange reserves). This leads to increasing interest costs, particularly when a policy of real depreciation of the exchange rate is pursued by the government. This factor must be taken into account, even though the government perceives a net benefit from substituting scarce foreign exchange resources for domestic resources.

Domestic Debt Finance

All segments of the public sector in Turkey now issue interest-bearing debt to finance their own expenditures or transfers to other segments. After 1984, public sector domestic debt increased because of net sales of government bonds and bills, borrowing from commercial and development banks, and the issuing of revenue-sharing certificates.[24] Only the Treasury can issue bonds and bills. The state enterprises are the main users of bank credit, although agencies of the central government also borrow from banks. Only the Public Participation Fund, an extrabudgetary fund, issues revenue-sharing certificates.

In assessing the extent of debt issue, it is important to distinguish net debt from gross debt. Net domestic debt is the public sector's gross debt minus its assets in the domestic financial system. Net domestic debt is the relevant measure because its increase captures the actual absorption of private sector resources by the public sector. For instance, bank holdings of government securities are financed partly by central government deposits and partly by private sector deposits.[25] Financing the purchase of Treasury bills with government deposits clearly does not yield net revenue to the public sector. Local government authorities, state enterprises, and, in particular, extrabudgetary funds also have deposits in commercial banks. In some cases, the deposits of the extrabudgetary funds are passed as credit to the private sector (the Mass Housing Fund's financing of private residential construction through the Emlak, Anadolu, and Pamuk banks). Such deposits clearly should be netted out against gross debt if they are in fact credits and not hidden grants. In other cases, such as the Defense Fund, these deposits reflect accumulated surpluses. Temporary surpluses should be netted out to assess the actual deficit. They should perhaps be ignored when assessing the need for deficit reduction, since the matching expenditure is probably only delayed and will eventually take place.

A final issue in assessing domestic borrowing is that although nominal increases in assets and liabilities convey information about the size

and trends of financing the domestic debt, the increase in the real value of the stock of net domestic debt is a better measure of the public sector's net claim on private resources. Table 5-6 shows the real increase in net public sector domestic debt.

Before 1985, recourse to domestic debt finance was limited (see tables 5-6 and 5A-7 for complete data). The Treasury sold bonds and bills sporadically and at terms that were frequently unattractive—the bonds had very long maturities and fixed nominal interest rates, which, especially in the late 1970s, were below the rate of inflation. Also, interest rates on short-term bills (which were issued mostly to pay contractors) were higher but still below inflation rates. The prevalence of negative real rates of interest contributed to the low rate of debt accumulation.[26] In fact, the real value of the debt fell because inflation eroded the outstanding stock of debt, which more than offset nominal increases in debt. The central government was therefore able to roll over the stock of domestic debt at very favorable rates. State enterprises borrowed from commercial banks (at market interest rates) less during this period. Finally, during 1980–82 the real increase in the assets of the extrabudgetary funds also produced a real decrease in net domestic debt.

After 1984, however, the public sector began to resort to domestic debt finance. In 1984, the central government issued more bonds and bills, and in May 1985 it began to sell public securities regularly through public auctions. In 1985 the increase in real net debt amounted to almost 2 percent of GNP, mainly because of the strong sales of bonds and bills. During 1985 and 1986 state enterprises and agencies of the central government borrowed extensively from commercial banks. The increase in total real net debt was moderated, however, by the increase in the assets of extrabudgetary funds in the domestic financial system. In fact, although the sale of revenue-sharing certificates increased every year after their introduction at the end of 1984, net deposits of the extrabudgetary funds as a group increased until the first semester of 1987. During the first half of 1987 the increase in revenue-sharing certificates and other liabilities more than offset the extrabudgetary funds' accumulation of assets in the financial system. The first semester of 1987 thus showed an increase in real net debt, mostly because of increased sales of bonds and bills and large sales of revenue-sharing certificates.

The High Cost of Debt: Implications of Current Trends

The interest expenses of the public sector rose rapidly in the mid-1980s. Interest paid by the central government and central bank alone increased from 1.1 percent of GNP in 1981 to 2.3 percent in 1983, 4.8

Table 5-6. Domestic Debt Finance of Public Sector Deficits, 1980–87
(percentage of GNP, unless otherwise noted)

Variations	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
Nominal variations								
Central and local governments[a]	1.3	0.1	2.1	−0.3	1.9	2.7	1.2	3.8
Bonds and bills	1.9	0.8	1.0	0.8	2.2	2.5	2.1	3.5
Bank credits	0.0	0.6	1.7	−0.2	0.5	1.2	0.0	0.9
Bank deposits	0.5	1.3	0.5	0.8	0.9	1.0	0.9	1.3
State enterprises[b]	1.7	−0.1	0.7	0.6	−0.5	0.7	1.6	−0.5
Bank credits	2.1	0.7	0.8	0.8	0.0	1.3	2.6	0.2
Bank deposits	0.5	0.8	0.1	0.2	0.5	0.5	1.0	0.7
Extra budgetary funds[c]	−0.2	−0.9	−1.7	−0.4	−0.5	−0.2	−1.6	0.1
Revenue-sharing certificates	0.0	0.0	0.0	0.0	0.1	0.5	0.6	1.5
Assets in banks	0.1	0.9	1.7	0.4	0.6	1.5	2.2	—
Total	2.8	−0.9	1.1	−0.2	0.9	3.2	1.2	1.9
Real variations								
Central and local governments	−0.3	−0.4	1.5	−1.2	1.0	1.4	0.4	1.0
State enterprises	−1.7	−1.1	0.0	−0.3	−1.3	0.2	1.0	−1.1
Extra-budgetary funds	−0.1	−0.8	−1.4	0.2	0.2	0.3	−1.0	0.7
Total	−2.2	−2.3	0.1	−1.3	−0.2	1.9	0.4	0.6
Indicators								
Inflation (December's consumer price index)	89.6	28.3	26.2	37.1	49.7	44.2	30.7	17.4
GNP (billions of Turkish liras)	4,435.2	6,553.6	8,735.0	11,551.9	18,374.8	27,789.4	39,176.9	26,896.5

—Not available.
a. Bonds and bills plus bank credits minus bank deposits.
b. Bank credits minus bank deposits.
c. Revenue-sharing certificates minus assets in banks.
Source: Central bank, Undersecretariat of Treasury and Foreign Trade, and Public Participation Fund.

Table 5A-7. Net Domestic Debt of the Public Sector, 1979–87
(millions of Turkish liras)

Item	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
I. Net Domestic Debt of Central and Local Governments (I.1 + I.2 + I.3 − I.4)	85,129.8	144,373.0	153,704.4	339,005.1	301,073.1	646,048.6	1,386,216.9	1,876,954.6	4,064,835.2
I.1 Bonds	96,842.3	141,133.3	159,964.9	185,943.2	360,266.9	530,836.5	1,031,852.1	1,511,290.8	2,407,850.5
I.2 Bills[a]	8,993.5	47,946.7	81,207.5	140,673.9	53,034.2	291,806.1	490,304.8	822,555.8	1,923,313.7
I.3 Bank credits	10,992.0	10,751.0	52,303.0	196,430.0	168,158.0	263,942.0	592,499.0	589,846.0	1,118,959.0
a. Commercial banks	10,935.0	10,691.0	50,672.0	195,360.0	167,393.0	232,723.0	566,762.0	561,988.0	1,090,543.0
b. Development banks	57.0	60.0	1,631.0	1,070.0	765.0	31,219.0	25,737.0	27,858.0	20,418.0
I.4 Government deposits	31,698.0	55,458.0	139,771.0	184,042.0	280,386.0	440,536.0	728,439.0	1,046,738.0	1,384,688.0
a. Commercial banks	26,206.0	46,330.0	93,694.0	109,110.0	210,463.0	342,012.0	601,365.0	845,281.0	1,117,696.0
b. Development banks	5,492.0	9,128.0	46,077.0	74,932.0	69,923.0	98,524.0	127,074.0	201,457.0	211,992.0
II. Net Domestic Debt of State Enterprises (SEEs) (II.1 − II.2)	178,327.0	251,192.0	244,398.0	307,562.0	376,999.0	286,269.0	485,107.0	1,092,426.0	1,721,730.0
II.1 Bank credits	192,526.0	285,587.0	333,761.0	406,818.0	503,367.0	507,079.0	857,230.0	1,858,928.0	2,862,058.0
a. Commercial banks	77,998.0	159,037.0	160,778.0	156,169.0	199,342.0	174,024.0	438,994.0	1,346,920.0	2,248,900.0
b. Development banks	114,528.0	126,550.0	172,983.0	250,649.0	304,025.0	333,055.0	418,236.0	512,008.0	613,658.0
II.2 SEE deposits	14,199.0	34,395.0	89,363.0	99,256.0	126,368.0	220,810.0	372,123.0	766,502.0	1,140,328.0
a. Commercial banks	14,169.0	34,381.0	89,360.0	99,114.0	122,572.0	220,288.0	372,025.0	761,759.0	1,138,293.0
b. Development banks	30.0	14.0	3.0	142.0	3,796.0	522.0	98.0	4,743.0	2,035.0
III. Net Domestic Debt of Extrabudgetary Funds (EBFs) (III.1 − III.2)	0.0	−7,356.0	−66,842.0	−218,234.0	−267,987.0	−365,997.0	−426,054.0	−1,053,219.0	−1,029,209.0
III.1 Revenue-sharing certificates	0.0	0.0	0.0	0.0	0.0	10,000.0	150,000.0	370,000.0	766,480.0
III.2 EBF deposits	0.0	7,356.0	66,842.0	218,234.0	267,987.0	375,997.0	576,054.0	1,423,219.0	1,795,689.0
IV. Net Domestic Debt of the Public Sector (I + II + III)	263,456.8	388,209.0	331,260.0	428,333.1	410,085.1	566,320.1	1,445,269.9	1,916,161.6	4,757,356.2

a. Data for 1979–84 are estimates.
Source: Central bank, Undersecretariat of Treasury and Trade, and Public Participation Fund.

percent in 1986, and 6 percent in 1987. The total interest expenses of the public sector were estimated to be 6 percent of GNP in 1986 and about 7.5 percent in 1987 (excluding payments on state enterprises' short-term external debt). Table 5-7, although incomplete, shows that interest payments on both domestic and foreign debt rose rapidly between 1980 and 1987.

The interest paid on the central government's foreign debt grew the most. This increase reflects the shift from concessional debt to loans from multilateral institutions, which lend at market rates. The central bank's debts generate the second-largest increase in total interest expenses on foreign liabilities. The interest expenses of the central bank increased from about 0.5 percent of GNP in 1980–84 to 1.4 percent in 1986, most of the increase caused by interest paid on Dresdner accounts. Thus, although the Dresdner accounts and foreign exchange deposits relaxed the constraints on foreign exchange, they were also costly for the government. In 1987 the interest rates paid on the Dresdner accounts were 6 to 7 percent above corresponding Euromark interest rates.

The public auctions of government securities and revenue-sharing certificates, which began in early 1985, allowed the government to rely more on domestic debt finance. Although these innovations allowed for more flexibility in macroeconomic management, they also proved costly for the government. The real interest rates paid on public sector domestic debt were higher than the GNP growth rate, a situa-

Table 5-7. Nominal Interest Expenses on Total Public Sector Debt, 1980–87
(percentage of nominal GNP)

Expenses	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
On domestic debt	—	—	—	—	—	—	2.7	—
Central government	0.5	0.6	0.4	0.7	1.0	0.9	1.7	2.5
State enterprises	—	—	—	—	—	—	1.0[a]	—
On foreign exchange debt	—	—	—	—	2.1	2.6	3.5	—
Central government	0.2	0.5	0.6	1.1	1.4	1.5	1.7	2.1
Central bank	0.4	0.6	0.6	0.5	0.5	0.8	1.4	1.4
Dresdner accounts	0.1	0.1	0.1	0.2	0.1	0.3	0.7	0.8
Bank deposits	—	—	—	—	0.0	0.1	0.2	0.2
State enterprises (MLT)	—	—	—	—	0.2	0.3	0.4	—
Total interest[b]	—	—	—	—	—	—	6.2	—

— Not available.
a. Estimated.
b. Excluding interest expenses on state enterprises' short-term debt.
Source: Undersecretariat of Treasury and Foreign Trade, central bank, and Banks' Association of Turkey.

tion that rapidly generated interest expenses on domestic debt that grew faster than GNP (see table 5-7).

Interest expenses on the central government's domestic debt alone jumped from less than 1 percent of GNP before 1984 to an estimated 2.5 percent in 1987. This increase was much faster than that of the debt itself and reflects the rapid rise in the cost of internal debt. In addition, the interest expenses of the state enterprises also increased substantially, as did their reliance on expensive bank credit; the real interest rate on their bank credit exceeded 30 percent during 1985 and 1986. The shift toward this relatively expensive source of financing was the result of the reduced availability of subsidized central bank rediscounts.

The increase in the cost of debt is shown clearly by the real rate of interest paid on auctioned government securities. Real rates on government bonds and bills were high during 1985 and 1986 (see table 5-8 and figures 5-6 and 5-7). In early 1987 the real rates decreased, but in the second semester of the year rates returned to their previous, high levels. In December 1987 real interest rates turned negative in response to large increases in administered prices after the November elections. These adjustments raised the CPI inflation rate to 11 percent for that month. Since this represents a one-time shift in the price level, the figure for December cannot be used to calculate real interest rates.

Table 5-8. Average Real Interest Rates on Government Securities, 1985–87
(percent a year; unweighted averages except for 1987)

			1987		
Type of security and rate	*1985*	*1986*	*January–November*	*September–November*	*December*
One-year bonds					
Backward looking	7.0	12.4	7.6	8.3	−8.0
Forward looking	12.6	10.7	—	—	—
Six-month Treasury bills					
Backward looking	12.1	17.4	7.4	12.6	−9.0
Forward looking	20.6	15.7	10.2	—	—
Revenue-sharing certificates					
Backward looking	1.92	6.2	—	—	—
Forward looking	9.71	2.7	—	—	—

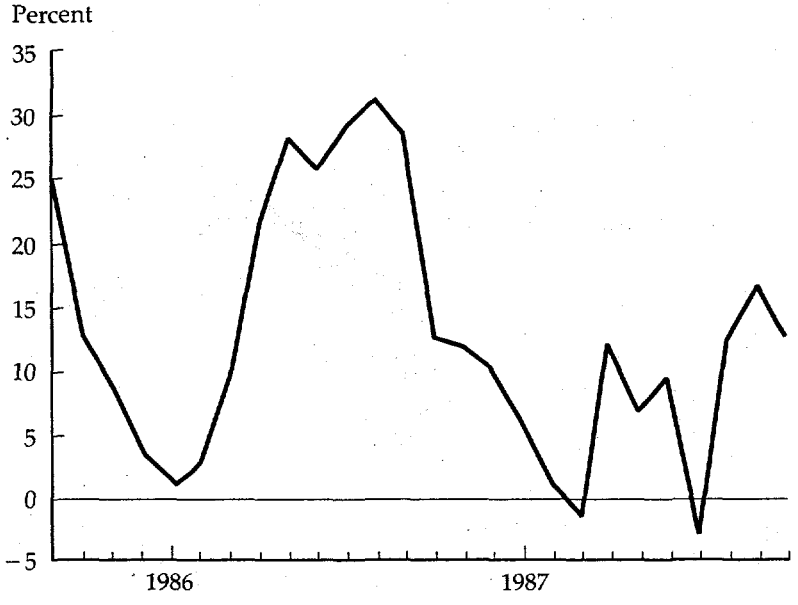
— Not available.

Note: Backward-looking rates are measured with $r_t^b = (1 + i_t)/(P_t/P_{t-1}) - 1$, where r^b is the backward-looking real rate at t, i_t the nominal interest rate at t, and P_t the CPI at t. Inflation rates are measured in periods matching the maturity of the instrument and with k as the number of months over which the inflation and interest rates are calculated. Forward-looking rates are measured with $r_t^f = (1 + i_t)/(P_{t+1}/P_t) - 1$, where r_t^f is the forward-looking rate at t.

Source: Undersecretariat of Treasury and Foreign Trade, State Institute of Statistics, and Capital Markets Board.

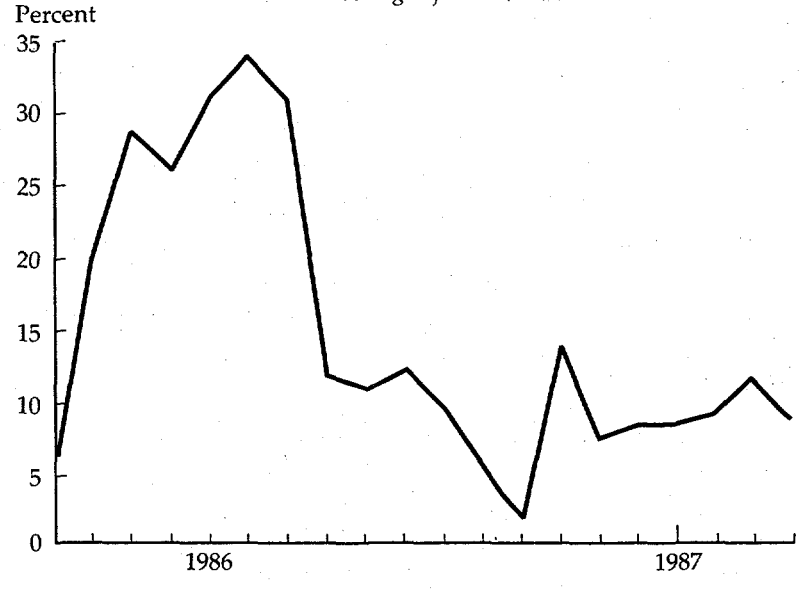
Figure 5-6. Real Interest Rates on Six-Month Treasury Bills, 1985–87

Backward-Looking Inflation (CPI)



Note: Data are for the fourth quarter of 1985 to the third quarter of 1987.

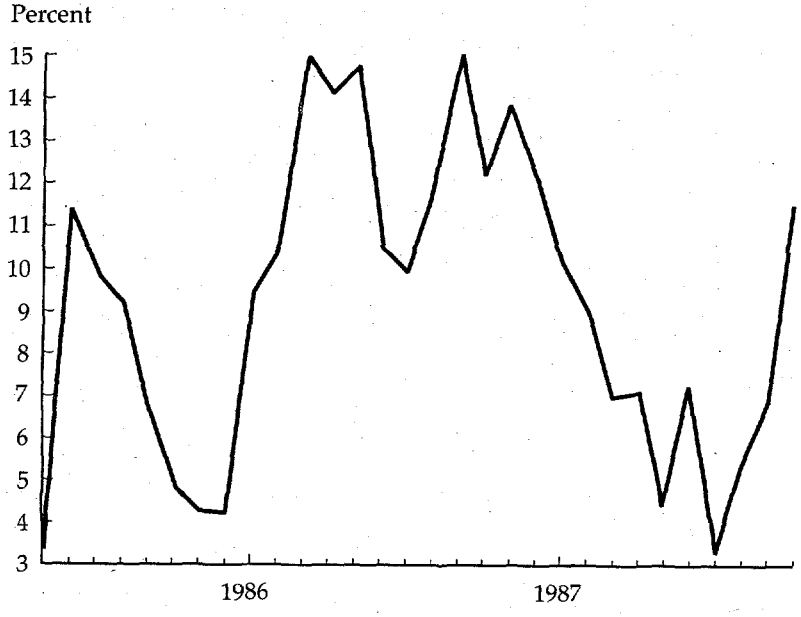
Forward-Looking Inflation (CPI)



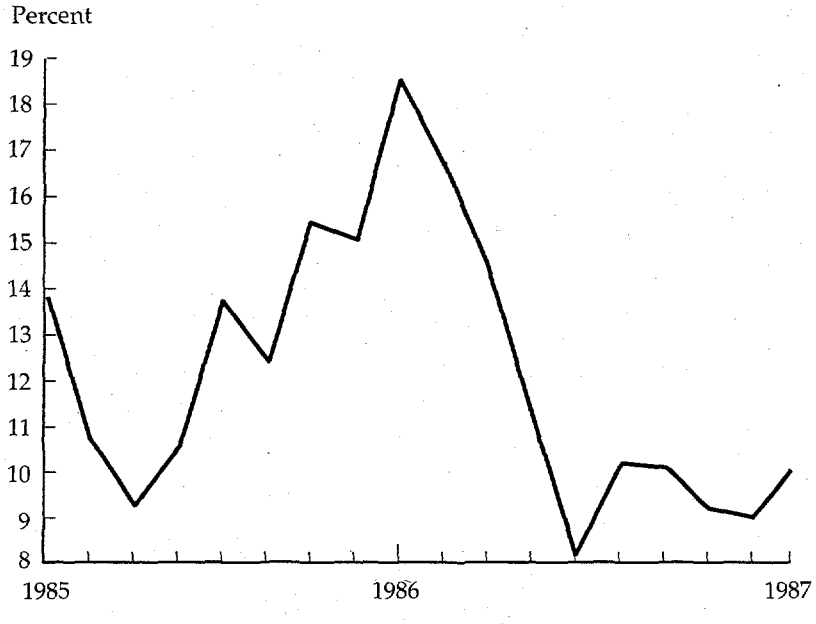
Note: Data are for the fourth quarter of 1985 to the first quarter of 1987.

Figure 5-7. Real Interest Rates on One-Year Treasury Bills, 1985–87

Backward-Looking Inflation (CPI)



Forward-Looking Inflation (CPI)



These rates reflect the cost of issuing new debt, which is the marginal cost of financing domestic debt. The shortened maturity of government domestic debt implies, however, that high marginal rates are quickly translated into a high average cost of debt since previous debt is refinanced much more frequently at short maturities. The bulk of the auctioned debt was sold at maturities of one year or less.[27] As a consequence, the average maturity of the total outstanding public sector debt declined dramatically after the auction system was introduced because the stock of old long-maturity bonds was being redeemed (see table 5-9).

The net cost of debt was even higher than the high real rate on the Treasury bills suggests. This is because the government maintains substantial deposits in the banking system at interest rates far below the rates at which it borrows. For example, the extrabudgetary funds held deposits equal to 579 billion Turkish liras at the beginning of 1986; the average rate of return was 10 percent in nominal terms. This raised the net nominal cost of the debt (the difference between the total interest payments and the total interest receipts divided by net debt) from 60 to 79 percent a year for the public sector as a whole.[28]

The high cost of domestic debt finance is determined largely by the high real cost of auctioned government debt. Why is this rate so high? The ratio of public domestic debt to GNP is in fact quite low, as shown in table 5-10. The ratio of the average capital value of bonds and bills to GNP between 1980 and 1984 was about 3 percent, while the ratio of the average face value to GNP was between 6 and 10 percent. In June

Table 5-9. Average Maturity of Government Securities and Their Share of the Total, 1983–87

Type of security and share	*1983*	*1984*	*1985*	*1986*	*1987*
Bonds	115	75	42	24	21
	(9.6)	(6.2)	(3.5)	(2.0)	(1.7)
Bills	3	5	5	6	7
Total	100	49	30	18	15
	(8.3)	(4.1)	(2.5)	(1.5)	(1.2)
Share (percent)					
Bonds					
More than 3 years	58.8	30.8	17.3	8.7	3.4
1.5 to 3 years	27.7	13.7	9.0	15.0	23.2
1 year	0.0	18.3	41.5	41.1	29.0
Bills (3, 6, and 9 months)	13.5	37.2	32.2	35.2	44.4

Note: Number of months, with the number of years in parentheses.
Source: Undersecretariat of Treasury and Foreign Trade.

Table 5-10. Stock of Bonds and Bills Outstanding at the End of the Year, 1979–87
(percent)

Ratio to GNP	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
Bonds and bills									
Capital value[a]	—	3.2	3.3	3.2	3.2	3.2	4.0	4.8	5.5
Face value[a]	—	10.0	7.6	6.5	6.4	5.8	6.2	7.1	7.9
M2	20.1	21.4	14.7	12.8	12.6	15.9	18.7	20.0	25.7
M2X	20.1	21.4	14.7	12.8	12.6	14.4	16.3	16.6	29.4
Total net debt to GNP	—	7.21	5.5	4.3	3.6	2.6	3.3	4.3	4.3
Bank holdings of bonds and bills									
Capital	26.6	28.8	42.7	55.2	46.7	80.4	93.7	95.4	72.7
Face value	6.9	11.3	19.9	28.8	22.0	50.4	63.5	64.1	50.4

— Not available.
a. Geometric averages of end-of-year stocks.
Source: Undersecretariat of Treasury and Foreign Trade.

1987, the market value of the stock was estimated to be 6.7 percent of GNP, in between a capital value of 5.5 percent and a face value of 7.9 percent. Of course although the debt remains small, so does the financial sector as a whole. In Turkey, the ratio of M2 to GNP was only 24 percent in 1986, which is much lower than the average ratio for developing countries—36 percent in 1984. An increase in supply is likely to depress the price of an asset (and thus its return) in relation to the size of the private sector's asset portfolio: the smaller the portfolio, the more negative the effect of supply on price. A more important explanation, however, involves both the structure of the auctioning system and the current macroeconomic environment.

The auctioning system influences the return on government paper, which is substantially higher than the after-tax return on comparable time deposits. In 1979–87 a large share of the stock of government securities was held by banks, as shown in table 5-10.[29] Nonbank participation in the auctions was negligible, and secondary market activity consisted mostly of informal repurchase agreements between firms and commercial banks. Mutual funds did not exist before mid-1987, and both pension funds and insurance companies held low amounts of government securities in their portfolios. Although some wealthy individuals participated in the auctions, either directly or indirectly through their banks or brokers, the banks did not promote the sale of securities to the vast pool of time deposit holders, for fear of promoting their own disintermediation and losing an attractive spread in the carryover of securities. As a result, arbitrage between deposits and

securities did not take place: government securities competed with loans, not deposits, in the portfolio of banks.

As a result, Turkey's interest structure is the reverse of that observed in most countries. Interest rates on government securities usually set the floor for the spectrum of interest rates on securities with the same maturity. The default risk on government paper is supposed to be the lowest and its liquidity the highest. Figure 5-8 shows that in Turkey the interest rates, net of tax, on six-month and one-year time deposits remained lower than the interest rates on corresponding government securities (which are tax-exempt) from 1985 to 1987.

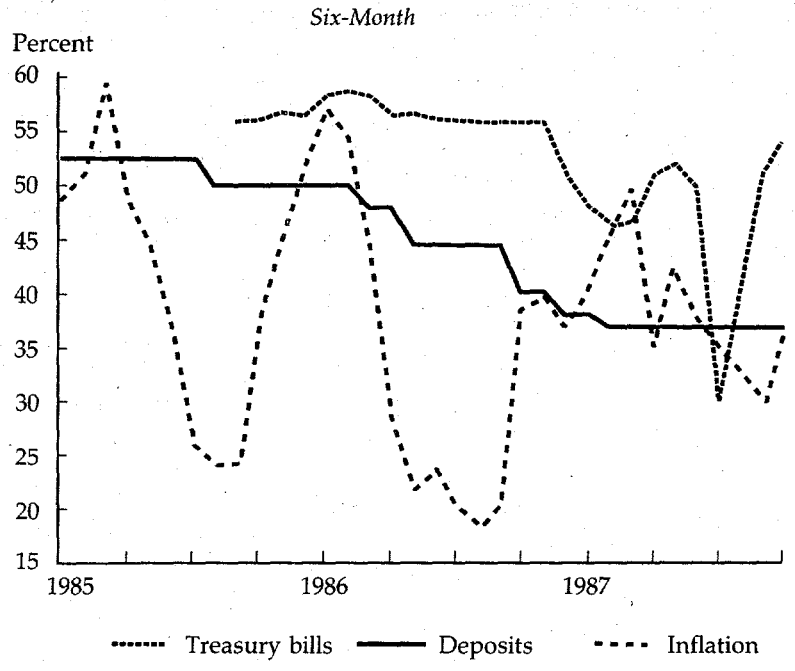
Table 5-11 shows that the interest rates on government paper are close to the revenue that banks obtain from loans. The compounded annualized prime rate before the imposition of intermediation taxes was 60.2 percent in 1985 and 1986. The income from loans, unlike the income from government paper, is subject to a corporate profit tax. The effective (as opposed to the statutory) tax rate paid by banks is about 16 percent, so their after-tax return is about 51 percent.[30] This resembles the interest rate on one-year government securities (50.2 percent in 1985 and 48.7 percent in 1986). Clearly, the return on government paper is closely linked with the return on loans to prime borrowers.[31]

This argument explains why the rate of interest on government securities is as high as comparable after-tax bank lending rates. It does not, however, explain why both are as high as they are. Arbitrage could also take place at low interest rates. To explain why the rates on assets in bank portfolios are so high, one needs to look at the cost of funds to those banks. Table 5-11 shows the average cost of bank funds, the average cost of loans, the effective prime lending rates before and after imposition of taxes on intermediation, and the interest rates on government securities. Reserve and liquidity requirements and operating costs drive a wedge between the cost of funds and the cost of loans. The basic rate charged to prime borrowers is close to the average cost of lendable funds.

The rates in table 5-11 are annual, noncompounded percentages. The effective interest rate received by the bank on a typical three-month commercial loan is compounded quarterly.[32] In addition, to arrive at the effective interest rate paid by prime borrowers, all intermediation taxes (the surcharge for the Resource Utilization Support Fund and the financial transactions tax) must be added. From 1980 to 1986 these rates were very high in real terms.

The final question, then, is why time deposit rates were so high, particularly during 1985 and 1986. One explanation is macroeconomic in nature. Given reduced current account deficit targets and large fiscal deficits, macroeconomic equilibrium requires high real interest

Figure 5-8. Interest Rates on Six-Month and One-Year Treasury Bills and Deposits, 1985–87



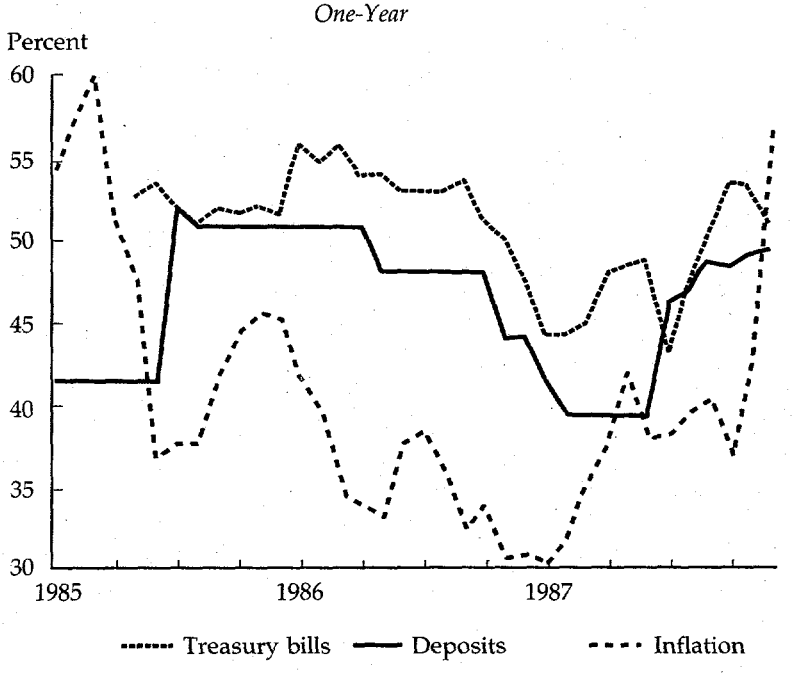


Table 5-11. Average Cost of Lendable Funds, Lending Interest Rates, and Interest Rates on Government Securities, 1983–86
(percent a year)

Type of fund and rate	1983		1984		1985		1986	
	Interest rates	Share	Interest rates	Share	Interest rates	Share	Interest rates	Share
Sight deposits[a]	8.8	42.6	5.0	26.8	5.0	23.4	10.0	25.4
Time deposits[b]	n.a.	57.4	n.a.	73.2	n.a.	76.6	n.a.	74.6
One month	43.0	0.0	35.0	3.8	35.0	3.2	29.0	4.9
Three months	49.0	5.5	53.0	61.0	45.0	34.6	36.0	28.8
Six months	47.0	15.7	52.0	5.1	50.0	34.2	41.0	25.0
One year	45.0	26.2	45.0	3.3	55.0	4.6	48.0	15.9
Average cost								
Deposits[b]	30.3	100.0	39.2	100.0	37.5	100.0	32.2	100.0
Lendable funds[bc]	47.1		51.4		55.3		50.7	
Prime rate								
Before compounding and intermediation taxes	48.0		50.0		50.0		50.0	
After quarterly compounding	57.3		60.2		60.2		60.2	
After quarterly compounding and intermediation taxes	75.0		67.8		69.6		69.6	
Interest rates on government securities								
Six months	—		—		56.2		55.5	
One year	—		—		50.2		48.7	

n.a. Not applicable.
— Not available.
Note: Data are as of the end of November, which avoids the year-end window dressing of balance sheets by commercial banks.
a. Excluding public sight deposits.
b. Interest rates are uncompounded.
c. The average cost of lendable funds is higher than the average cost of funds because of reserve and liquidity requirements (after deductions for interest paid on reserves) and operating costs. Information on reserve and liquidity requirements is provided in table 2-8. The operating costs per unit of deposits between 1983 and 1986 were 7.9, 7.4, 7.9, and 8.9 percent, respectively.
Source: Central bank, Banks' Association of Turkey.

rates. Higher real interest rates generate higher private savings and reduce private investment. The improvement in the net private savings allows the current account deficit to be reduced and the fiscal deficit to remain large. Therefore, during 1985 and 1986 the high interest rates on deposits and loans reduced the effect of the fiscal deficit on the current account.

The Turkish government cannot continue to issue debt at interest rates as high as the ones documented here. When real rates of interest are higher than the growth rate of real GNP, the ratio of interest expenses to GNP tends to snowball unless the government generates a primary surplus large enough to offset the rising interest expenses or monetizes the deficit.

However, Turkey now has less room for monetizing the deficit. Two factors reduced the scope for monetization by reducing the demand for money and the revenue from the inflation tax for a given level of inflation. First, the demand of firms for money decreased as firms and banks began to develop informal agreements to repurchase government securities. Second, the demand of individuals for money also decreased because of currency substitution. The resulting decrease in the demand for money means that higher levels of inflation were required to generate the same revenue from the inflation tax. Tighter inflation targets produced even less inflation tax revenue. The only option left the Turkish government, therefore, is to cut the noninterest (primary) deficit and thus avoid escalating the rates of debt service and inflation.

Macroeconomic Consistency, Financial Sector Reform, and Financing the Government Deficits

The preceding sections analyzed actual deficits and their financing since 1980. How should one evaluate such deficits? Is there a manageable way of assessing whether they are too low or too high? This volume presents a modest analysis of these issues. First the derivation of the financeable deficit is presented for given macroeconomic targets. Then the consequences of various financial sector reforms are explored for the fiscal deficit and its consistency with other macroeconomic targets.

Consistency of Fiscal Policy

Three sources of financing public sector expenditure are available beyond the regular tax system: external borrowing, monetization, and issuing domestic interest-bearing debt. The amount that can be expected from each source depends on other macroeconomic targets, such as inflation, output growth, and interest rates. The revenue from these three sources of financing can be combined to calculate the financeable deficit. This is defined as the deficit that does not require more financing than is compatible with sustainable external borrowing, existing targets for inflation and output growth, and a sustainable internal debt policy (see chapter 2 for the framework).

Underlying the framework of the financeable deficit is a model describing private portfolio choice as a function of inflation, output, and interest rates. This gives the amount of currency, demand deposits, and time deposits the private sector is willing to hold given output, inflation, and the level and structure of interest rates. This is then coupled with a simple financial sector model incorporating reserve

requirements and other bank regulatory policies to derive the demand of commercial banks for reserves. The demand for reserves is then added to the demand for currency to produce an estimate of the total demand for base money given inflation, interest rates, and so on. This is then used to derive total revenue from monetization (seigniorage) for different output growth rates, interest and inflation rates, and regulatory policies.

The amount of revenue that can be collected through monetization depends critically on inflation and financial structure. Inflation affects both components of base money. Higher inflation reduces the demand for cash balances, as the empirical analysis presented in chapter 2 demonstrates. It also affects the amount the private sector is willing to hold as demand and time deposits. It will thus influence both the private sector's demand for currency and the commercial banks' demand for reserves. Both directly influence aggregate demand for base money. The structure of the banking system, the particular regulatory framework in which it operates, and the interest rates on bank deposits determine the level of reserves. This level is, in turn, one of the two components of reserve money and the basis on which the inflation tax is levied. Thus the regulatory framework within which the banking system operates has an important effect on the amount of revenue the government can expect from monetization.

In addition to revenue from monetization, the government receives revenue from external and domestic debt issue based on its external borrowing policies and debt management approach. The following discussion uses the results derived in chapter 7 to detail the relationship between this revenue and government policies (see tables 5-12 and 5-13).

Table 5-12. Inflation Tax and Seigniorage at Various Inflation Rates
(percentage of GNP)

Inflation rate (percent)	*Currency*	*Demand deposits*	*Time deposits*	*Base money*	*Inflation tax revenue*	*Total seigniorage revenue*
15	3.0	7.5	17.5	6.8	1.0	1.4
20	2.9	7.3	16.7	6.6	1.2	1.6
25	2.9	7.1	16.0	6.4	1.4	1.8
30	2.8	6.9	15.3	6.2	1.6	2.0
35	2.7	6.7	14.7	6.0	1.8	2.2
40	2.7	6.5	14.1	5.8	2.0	2.3
45	2.6	6.3	13.5	5.7	2.1	2.5
50	2.6	6.1	13.0	5.5	2.2	2.6
55	2.5	6.0	12.5	5.4	2.4	2.7
60	2.5	5.8	12.1	5.2	2.5	2.8

Table 5-13. Financeable Deficit at Various Inflation Rates
(percentage of GNP)

Inflation rate (percent)	*Financeable deficit*	*Actual deficit in 1986*	*Required deficit reduction*
15	4.4	5.7	1.3
20	4.6	5.7	1.1
25	4.8	5.7	0.9
30	5.0	5.7	0.7
35	5.2	5.7	0.5
40	5.3	5.7	0.4
45	5.5	5.7	0.2
50	5.6	5.7	0.1
55	5.7	5.7	0.0
60	5.8	5.7	0.1

Underlying the results presented are various targets and assumptions. The first assumption is a 6 percent growth rate for real GNP. The reserve requirements and nominal interest rates on demand and time deposits prevailing in mid-1987 (10 percent) are used. Only that part of the liquidity requirement over which no interest is paid is incorporated; the remainder is included in the definition of interest-bearing public sector debt held by the banking system. It is assumed that the issuing of interest-bearing domestic debt is kept to a rate that will maintain the ratio of domestic debt to GNP constant. This assumption is made because the interest rate on domestic debt issue is high: 12 percent a year and well above the real growth rate of the economy in 1987. Servicing the debt will require an increasing percentage of GNP if debt issue is used more extensively. In the case presented here, the public sector can expect the issue of internal and external debt to be slightly more than 3 percent of GNP if sustainability and creditworthiness constraints are to be met.

Table 5-12 assesses potential revenue from seigniorage and the inflation tax for various inflation rates.[33] Demand for currency, demand deposits, and time deposits is used as a function of interest rates to calculate base money demand at various rates of inflation. Total demand for base money is then used to calculate revenue from inflation tax and total revenue from monetization (seigniorage).

Table 5-12 shows several relations. Total demand for base money equals 6.0 percent of GNP at an inflation rate of 35 percent, which was the prevailing rate in 1986. But demand for base money is very sensitive to inflation. As inflation rises from 15 percent to, say, 60 percent, demand for currency falls from 3 to 2.5 percent of GNP. Demand for deposits drops even further (when nominal interest rates are assumed

to be fixed). The combined total of demand and time deposits falls from a predicted 25 percent of GNP at 15 percent inflation to 17.9 percent at 60 percent inflation. Not surprisingly, total demand for base money also falls: from 6.8 percent of GNP at 15 percent inflation to 5.2 percent at 60 percent inflation. Higher inflation clearly produces higher revenue from inflation tax: this revenue increases from 1 percent of GNP at 15 percent inflation to 2.5 percent at 60 percent. Total revenue from monetization therefore also rises, although at a slightly slower rate because the other component, the real changes in base money, actually declines as inflation rises. This effect is negligible, however.

Inflation clearly affects both the revenue that the authorities can expect to receive from monetization and the financeable deficit. Inflation tax revenue rises with the inflation rate, but not equally. Higher inflation erodes the demand for base money and thus the base on which the inflation tax is levied. This effect only begins to dominate at very high rates of inflation: only at annual rates above 200 percent does the revenue from inflation tax decline as inflation increases.

Table 5-13 gives the financeable deficit, defined as the deficit that is sustainable without compromising any of the macroeconomic targets mentioned. It consists of the total revenue from monetization given in table 5-12 plus the revenue from sustainable issue of internal and external debt. Subtracting the financeable deficit from the actual deficit indicates how much the deficit must be cut to achieve macroeconomic consistency. The actual deficit is the deficit registered in 1986, net of capital losses on the external debt.[34]

The actual deficit in 1986 was compatible with a sustained inflation rate of almost 50 percent: the required deficit reduction is zero at that rate. Moreover, a target rate for inflation of 20 percent implies a financeable deficit of 4.6 percent of GNP or a required deficit reduction of about 1 percent of GNP for the actual deficit in 1986. The real deficit in 1987 was larger than in 1986, so the required deficit reduction had to be correspondingly larger. The data in the tables, however, assume constant nominal interest rates. In particular, the time deposit rate is fixed at 55 percent, which implies that the real rate of interest is 29 percent, clearly an unsustainable situation. Real rates would have to rise to similar levels for the Treasury to be able to issue bonds, and the consequences for debt-service cost are predictable. An alternative situation assumes that lower nominal rates of interest, in line with inflation, are needed to maintain real rates of interest. This situation would lead to comparatively low demand for time deposits. The empirical analysis in chapter 2 suggests, however, that some of this demand (almost one-third) will shift to demand deposits. This shift would moderate the effect of lower time deposits on base money de-

mand and on the basis for the inflation tax. The net effect would be a decrease in the financeable deficit at 20 percent inflation and an increase in the required deficit reduction, from about 1 percent to 1.2 percent of GNP.

Several comments are in order. First, 1 percent of GNP is in fact a large adjustment. It would, for example, require a 9 percent cut in public sector investment or a 13 percent cut in public sector consumption. Second, a larger cut would be needed if instead of a zero real depreciation, the real exchange rate would depreciate at a positive rate over the five years under consideration. Third, the increase in the real deficit in 1987 implied a larger required deficit reduction. Fourth, the derivation also assumes a target real growth rate of 6 percent a year. Lower rates of output growth would require larger cuts in the deficit.

Fiscal Implications of Financial Sector Policy

The preceding sections demonstrate the importance of revenue from monetization for financing government expenditure in Turkey. Changes in the financial regulations thus have important fiscal consequences. Changes in reserve requirements, shifts out of domestic assets, changes in the interest rate structure on deposits, for example, all influence the level of reserve money the private sector and the commercial banks hold at a given inflation rate. Fiscal consequences of reforms affecting any of these variables should therefore be taken into account.

Consider, for example, changes in reserve requirements. These were increased from 10 percent in mid-1987 to 14 percent by the end of 1987 on all domestic currency deposits (see table 5-4). This clearly raised the level of required reserves for a given inflation rate and structure of interest rates on deposits. The demand for base money increased, as did revenue from monetization. Empirical analysis suggests that the increase in base money probably yielded a one-time gain in extra revenue of 1 percent of GNP; in addition, since the demand for base money will remain high as long as the reserve requirements are kept at 14 percent instead of 10 percent, the gains in both inflation tax and seigniorage are recurrent. The tax is now levied on a higher base. As a consequence, the increased reserve requirements ease the burden of fiscal adjustment by 0.25 percent of GNP for each year the reserve requirements are kept at 14 percent. This lowers the sustainable inflation rate by more than 10 percent, to 50 percent, the 1987 rate.

In many countries, reserve requirements are different for deposits of different maturity. Turkey's end-of-1987 reserve requirement of 14 percent is not unusual for demand deposits. In many other countries of the Organisation for Economic Co-operation and Development, the reserve requirements for time deposits are much lower. The same

framework can be used to assess the fiscal implications of lowering the reserve ratio for time deposits from 14 percent to, say, 5 percent. This reduction would have a substantial effect on the demand for base money, since reserves held against time deposits are a major component of base money. The equilibrium level of base money demand would respond to such a regulatory change by dropping 1.5 percent of GNP. This would present a one-time revenue loss of the same magnitude for the public sector. In addition, future revenue from inflation tax and seigniorage would be reduced, since the demand for base money would be lower for a given rate of inflation. The loss would be substantial: at an inflation rate of 40 percent, this cut in the reserve requirements would produce a combined loss in inflation tax and seigniorage of 0.4 percent of GNP each year. Any measure to cut the reserve requirements should therefore be accompanied by fiscal measures to offset this substantial, negative effect on the budget.[35]

Increases in the interest rates on demand deposits have similar consequences. Increasing the rate on demand deposits to 50 percent (which would make it positive even at the high December-to-December 1987 inflation rate)[36] would trigger a substantial shift out of cash balances: almost 1.3 percent of GNP. Since reserve requirements on demand deposits are 14 percent, this shift lowers the demand for base money by 86 percent of the shift. The econometric analysis reported in chapter 2 also suggests that demand would shift out of nonfinancial assets and into demand deposits, also by about 1.3 percent of GNP, but that this would raise demand for base money by not more than 14 percent of the 1.3 percent shift. The net effect on the demand for base money and on revenue from monetization would thus be negative. By coincidence, the magnitude of the required fiscal adjustment is almost identical to that required after reserve requirements are cut from 14 percent to 10 percent.

These results should be interpreted with care. Pointing out the negative fiscal consequences of, say, a cut in reserve requirements does not imply that no such cuts should be undertaken. High reserve requirements carry efficiency costs that have not been incorporated in this analysis. It does mean, however, that reform packages incorporating measures like this should also specify how and the extent to which the inevitable fiscal consequences should be handled.

Summary and Conclusions

The conclusions of this chapter are clear. The noninterest (primary) deficit of Turkey's public sector improved substantially after 1980, although most of the improvement occurred immediately, and progress was slow in the years that followed. The improvement in the primary deficit also failed to keep pace with the rapid acceleration of

interest payments on the public sector's domestic and foreign debt. As a consequence, actual real deficits (corrected for the accounting distortions introduced by inflation), increased substantially in the mid-1980s.

Interest payments rose because of both rising interest rates and rising debt. Interest rates on foreign debt increased for two reasons: the concessional bilateral debt was gradually replaced by nonconcessional debt owed to multilateral institutions, and high-cost Dresdner accounts were increasingly used as sources of foreign exchange. Part of the reason for the high cost of domestic debt was the auctioning system. In practice, participation was limited to commercial banks, and private individuals were excluded for the most part. This effectively led to arbitrage with bank lending rates rather than deposit rates. Both were too high, but lending rates were substantially higher than time deposit rates. The macroeconomic reason was that the mismatch between fiscal deficits and external balance targets required real interest rates to be high in order to generate private savings.

At such real interest rates, issuing further debt would create rapidly accelerating interest payments because interest rates are substantially higher than the rate of real output growth. Instead, reliance on debt finance increased as revenue from monetization declined because of changes in the financial structure that undermined the basis for monetization as a source of revenue. Changes such as the introduction of foreign exchange deposit accounts and improvements in the cash management of firms are unlikely to be reversed, so monetization will not be able to replace the decreased reliance on debt finance that became necessary. As a consequence, reducing the primary fiscal deficits is unavoidable if macroeconomic stability is to be maintained.

This chapter developed a framework to assess the fiscal implications of financial sector measures, targets for inflation and output growth, the level of real interest rates, and creditworthiness constraints on foreign borrowing. The base case is clear: current fiscal deficits are out of line with other macroeconomic targets. A cut of 1.2 percent of GNP in the 1986 deficit, and close to 2 percent of GNP in the 1987 deficit, would be needed to restore macroeconomic consistency in Turkey.

Two important issues are not discussed in this chapter. First, the macroeconomic reasons for high real interest rates, alluded to here, are the principal topic of chapter 6. Also, the public sector affects the behavior of private sector saving and investment, which involves not only the size of the deficit but also other parameters of fiscal policy, such as the composition of expenditure. These aspects are discussed further in chapter 6, which deals with public sector policy, private saving and investment, and the relation between fiscal deficits, public investment, external balance, and output growth.

6 Internal Adjustment: Fiscal Policy, Private Savings and Investment, and Growth

CHAPTER 4 DEMONSTRATED how Turkey adopted a growth-oriented debt strategy rather than one of sustained high surpluses on the noninterest current account to keep its debt-output ratio in check. The key factor in the success or failure of such a strategy is an internal adjustment program that relies on reduced consumption rather than reduced investment to generate the internal surplus required. If consumption does not fall, either external targets or output growth must be sacrificed—the former if investment is not reduced, and the latter if it is. This chapter shows how Turkey balanced its debt-output ratio and how fiscal policy contributed to this achievement. The success of this strategy, however, is being jeopardized by deteriorating fiscal deficits and the ensuing reliance on high-cost internal debt.

An internal adjustment program designed to complement external balance targets has two components. The first is the extent to which the external transfer is matched by a reduction in the fiscal deficit rather than an increase in the surplus of private sector savings. This is the subject of chapters 4 and 5. The second, the subject of this chapter, is the specific manner in which the matching private sector surplus is achieved. The interaction between decisions on private sector saving and investment and fiscal policy becomes important at this stage.

The way consistency between internal policies and external targets is achieved determines whether both fiscal plans and external targets can be met without jeopardizing output growth: does the private sector run a surplus at high or at low levels of savings and investment? If the surplus is achieved by increasing savings for sustained levels of investment, output growth can be maintained. If, however, the adjustment comes mostly out of investment cutbacks for given rates of private saving, external adjustment is bought at the cost of lower output growth.

An obvious part of the solution is to shift government expenditure away from consumption and toward investment. Table 6-1 shows the extent to which this shift was achieved in Turkey. As a consequence, the rate of public sector saving (revenue minus current expenditure as a percentage of revenue) increased substantially from 1980 to 1986 and reached its highest level since 1967 (see figure 6-1). However, not much is gained by such a strategy if, in the end, additional public sector investment simply replaces reduced private sector investment. In Turkey private investment did not decline as a share of GNP between 1981 and 1985, and it actually increased after that.[1] Private investment is now even higher than it was during the period 1972–80.

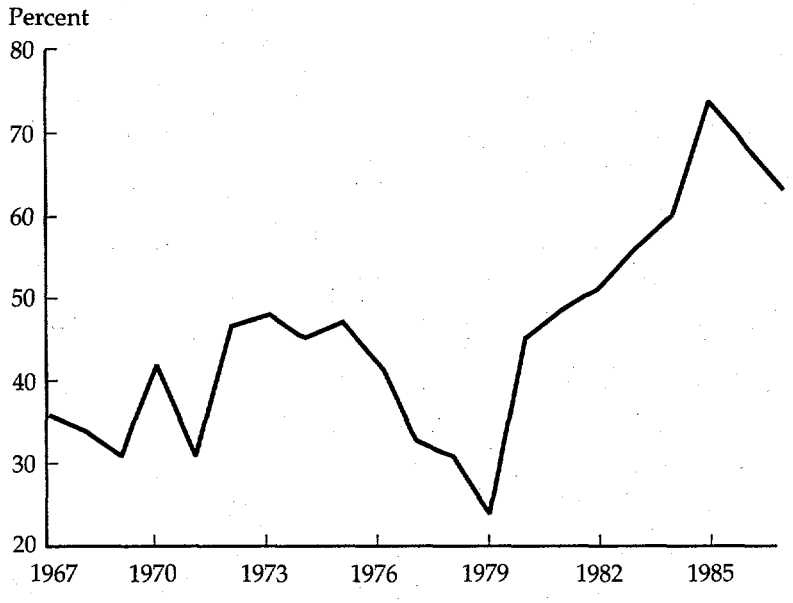
Finally, government consumption cannot necessarily be cut enough to make room for public sector investment and still generate a fiscal surplus (or reduced fiscal deficit) sufficient to effect the external transfer. Government consumption was reduced substantially from 12.3

Table 6-1. Principal Macroeconomic Indicators, 1980–87
(percentage of GNP)

								1987	
Indicator	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*First estimate*	*Revised estimate*
Total consumption	84.1	82.0	81.8	83.7	83.3	80.9	77.7	77.9	76.5
Public	12.3	10.7	10.8	10.2	8.8	8.4	8.8	9.0	9.5
Private	71.9	71.3	71.1	73.5	74.5	72.5	68.9	68.9	67.0
Fixed investment	19.5	18.9	18.9	18.8	18.0	20.1	23.6	23.7	24.9
Public	10.9	11.7	11.5	10.6	9.9	11.7	14.0	14.0	13.6
Private	8.5	7.2	7.3	8.2	8.2	8.4	9.6	9.7	11.3
Stock changes	1.9	2.6	1.5	1.1	1.4	0.9	1.4	0.1	0.1
Public	0.5	1.5	0.5	−0.4	0.0	−0.2	0.1	−0.5	−0.1
Private	1.4	1.1	1.0	1.5	1.4	1.0	1.3	0.6	0.2
Current account	−5.5	−3.5	−2.2	−3.5	−2.3	−1.9	−2.6	−1.7	−1.5
Imports of goods and net fiscal surplus	15.0	16.5	17.9	19.6	23.1	23.5	20.7	21.0	—
Exports of goods and net fiscal surplus	7.2	10.9	14.5	15.7	19.5	20.7	18.0	19.3	—
GNP growth (percent)	−1.1	4.1	4.5	3.3	5.9	5.1	8.0	6.8	—
Inflation rate from the CPI (percent, annual average)	110.9	36.8	23.1	31.4	48.4	45.0	34.6	38.8	—

— Not available.
Source: State Planning Organization, State Institute of Statistics.

Figure 6-1. Public Sector Savings Rate as a Share of Public Disposable Income, 1967–87



Source: State Planning Organization.

percent in 1980 to 8.4 percent in 1985 and 8.8 percent in 1986, but public sector investment rose by roughly the same amount. In that case, to keep private investment strong, sufficient private savings must be generated to complete the internal adjustment effort. Interest rate policy is one way in which Turkey restrained, at least partially, private consumption. Using interest rate policy to stimulate private saving, however, reduces private investment and creates the need to promote private investment. The adjustment effort must come mostly out of private consumption rather than private investment.

Fiscal policy and real interest rates influence these developments. First, fiscal policy may directly affect the surplus of net private savings (that is, private savings net of private investment) through real interest rate–based crowding out. The overall fiscal deficit is important for this interaction. Second, fiscal policy influences private saving and investment through the composition of government expenditure rather than the size of the deficit. Third, the method of financing the

deficit is relevant. Monetization, inflation, and credit policy in general all influence private savings and investment behavior.

In Turkey, fiscal deficits and the deficit on the current account of the balance of payments moved more or less in tandem during most of the 1970s and 1980s. This pattern was broken in 1986–87, however, when fiscal deficits deteriorated, the current account deficit improved, and real interest rates rose significantly. This suggests that high real interest rates were necessary to induce a higher surplus of net private savings, which prevented the increase in fiscal deficits from spilling into the current account. This mechanism was important for Turkey.

Nevertheless, several recent developments do not fit easily in this explanation. If high real interest rates created room for higher fiscal deficits without a matching deterioration in the current account, why was Turkish output growth so high? High real interest rates presumably slow private investment and thus output growth. To understand why this did not happen in Turkey, one needs to analyze mechanisms other than real interest rates and the size of fiscal deficits through which fiscal policy influences private investment.

Fiscal policy influences the private sector not only through the fiscal deficit but also through the composition of expenditure. Government investment induces capital accumulation, which allows the negative effects of fiscal deficits on output through higher real interest rates to be offset somewhat by shifting government expenditure away from consumption and toward investment.

In addition to this direct substitution effect, the composition of government expenditure influences private investment indirectly. Public sector investment, especially in infrastructure, often stimulates rather than replaces private investment expenditure. Public sector investment in roads, for example, makes places that were previously inaccessible more attractive to private sector investors. For this reason, private sector investment did not suffer much from the high real interest rates that prevailed from 1982 to 1987.

Besides the composition of expenditure and the level of the deficit, how deficits are financed also affects economic output. Inflation influences private savings behavior for a given level of the real interest rate. Thus financing the deficit by increased reliance on inflation tax affects the real rate necessary for the fiscal deficit to be consistent with the external balance. The trend in inflation did not change significantly after 1981, and this channel therefore does not play a role in the analysis of the period 1981–86 presented here. It does, however, become important in the discussion of the period 1988–92 presented in chapter 7, which examines growth and debt tradeoffs under alternative inflation targets.

The links highlighted in this section are quantified in the econome-

tric model described in chapter 3. The framework already outlined and the model supporting it are used first to analyze the past and then in chapter 7 to explore the tradeoffs among output growth, external debt, and real interest rates that restrict the choices open to Turkish policymakers.

The model and the surrounding analysis focus squarely on medium-term growth; the short-run macroeconomic issue of how to ensure continued high capacity utilization as output capacity expands is not dealt with in this book. In this context, import rationing and excess capacity should be avoided by keeping real wages flexible and the real exchange rate in line with the aggregate demand for and supply of Turkish goods.

Real Interest Rates and Private Savings and Investment Behavior: The Role of Fiscal Deficits

Consider first the size of fiscal deficits and their possible effect on real interest rates. If the arbitrage between foreign and domestic interest-bearing assets is imperfect, either because of imperfect substitutability or explicit capital controls, the link between foreign and domestic interest rates is severed. External targets can then be maintained even if fiscal deficits increase because interest rate policy can be used to generate a matching surplus of net private savings. If, however, arbitrage causes domestic interest rates to follow foreign interest rates corrected for exchange rate depreciation, macroeconomic policy faces tighter constraints and interest rates can no longer be used as an instrument.

This became an important issue when foreign exchange deposit accounts were introduced at the end of 1983. Interest rates on foreign exchange deposits clearly establish a floor for the level of domestic rates on comparable assets. Domestic rates below the rate on foreign exchange deposits (corrected for exchange rate depreciation) would almost certainly erode the domestic deposit base of the banking system by encouraging large shifts out of domestic deposits. However, arbitrage may not work in the other direction. The period since the introduction of foreign exchange deposits is too short for formal econometric tests to be performed. Nonetheless, the volume of foreign exchange deposits appears to be too small to force domestic interest rates down. Shifts from foreign exchange deposits into domestic assets would not be massive even if a positive interest rate differential arose.

Domestic interest rates in Turkey between 1980 and 1986 were not tied closely to foreign interest rates adjusted for depreciation of the

exchange rate. Figure 6-2 compares the nominal interest rate on six-month time deposits in Turkey and the United States. The rates for deposits in the United States are corrected for the rate at which the Turkish lira actually depreciated against the U.S. dollar over the period.[2] The rise in interest rates in 1985 and 1986 was well above the rise that can be explained by changes in foreign interest rates (after correcting for the exchange rate). In fact the foreign rates corrected for depreciation fell in 1985 and 1986 significantly below their 1980–84 average. The discrepancy is even more pronounced when lending rates are used as a basis for comparison. This is not surprising, since arbitrage cannot narrow the gap between foreign and domestic lending rates: Turkey's foreign and domestic banks do not compete for business loans; domestic banks have a virtual monopoly.

As long as domestic interest rates are not linked to foreign interest rates (plus exchange rate depreciation), macroeconomic policy has an additional degree of freedom. Changes in the domestic real interest rates can resolve potential discrepancies between fiscal deficits and external targets by affecting the surplus of net private savings.

The mechanism is based on the following identity, derived from the national accounts, but with behavioral content built into private saving and investment:

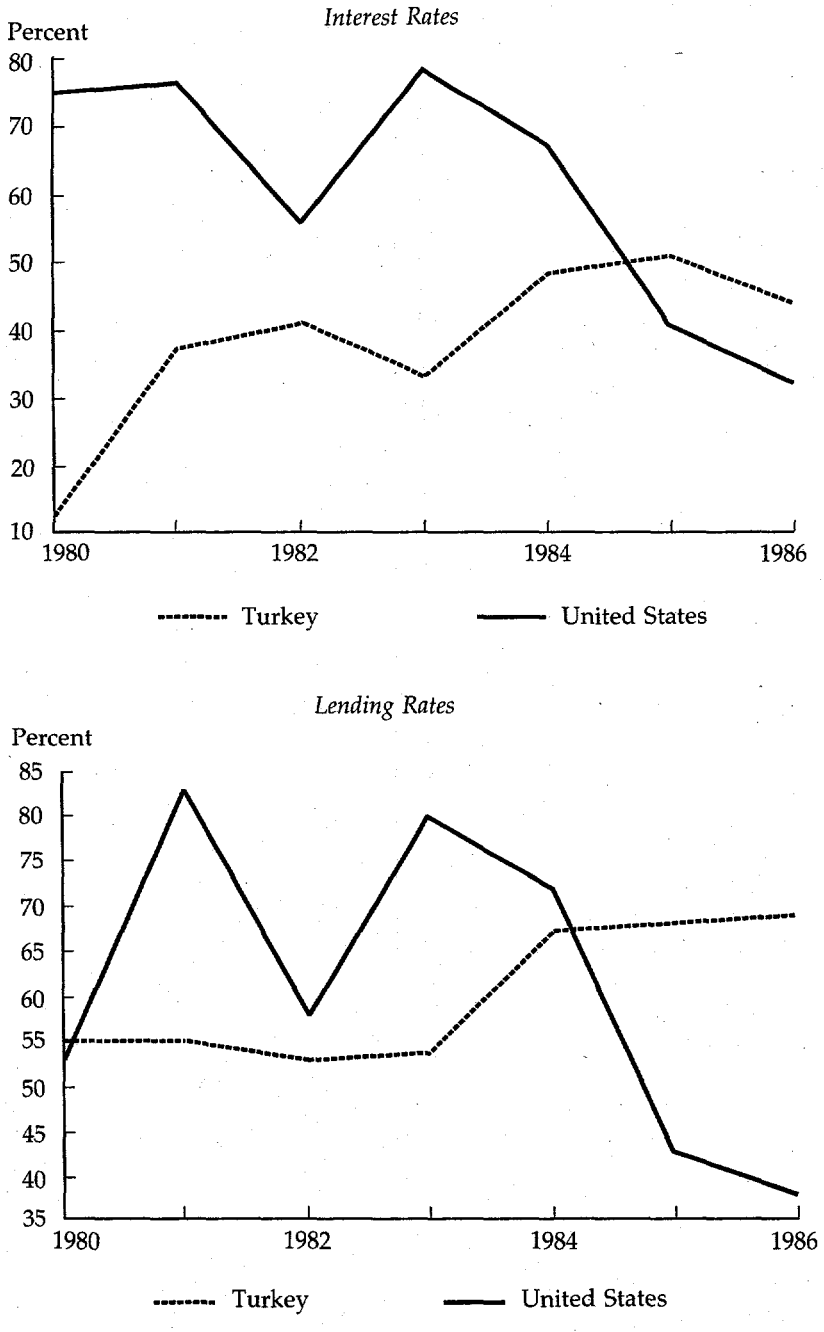
$$\mathrm{CAS} = \mathrm{FS} + \mathrm{NPS}(r)$$

CAS is the current account surplus, FS is the fiscal surplus, NPS is the net private savings surplus, and r is the real interest rate. The private sector's surplus of savings over investment, NPS, is shown as a function of the real rate of interest. A higher real interest rate will slow private sector investment and increase private saving, thus increasing NPS. The econometric results summarized in figure 3-1 suggest that a rise of 2.5 percentage points in the real interest rate increases NPS by one percentage point of GNP.

Thus, to meet the same current account target when the fiscal deficit increases requires a higher interest rate to create the required surplus of private savings over private investment. A cut in the fiscal deficit thus allows lower real interest rates for a given current account target and higher private investment.

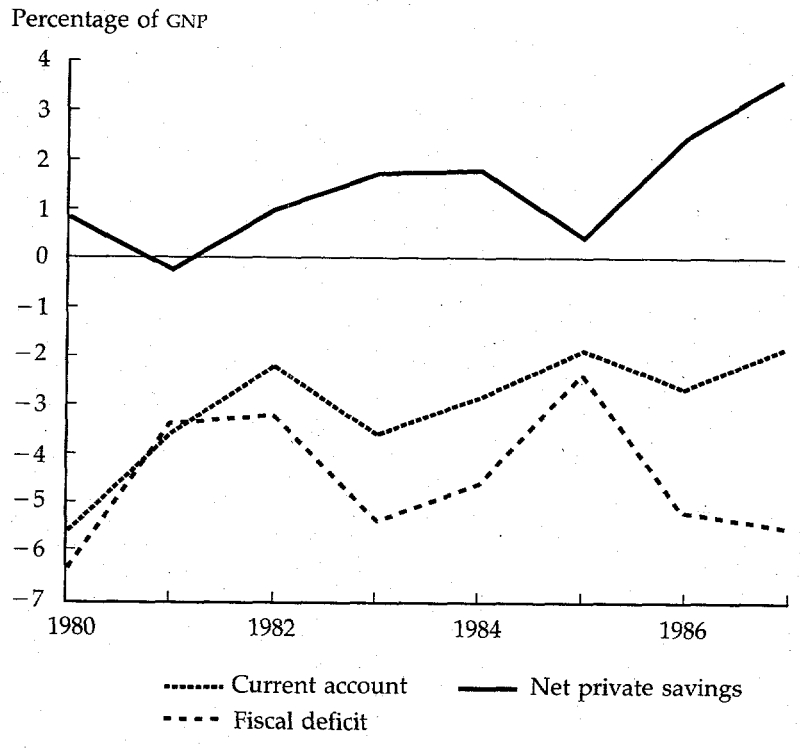
How real interest rates are determined is not important here. What matters is that the econometrically verified relation between the behavior of private saving and investment and the real interest rate implies that the combination of the fiscal deficit and the current account target is restricted for a given real interest rate; it also implies that fiscal policy is restricted by the need to meet current account

Figure 6-2. Domestic and Foreign Interest and Lending Rates on Six-Month Deposits in Turkey and the United States, 1980–86



Note: The exchange rates are forward-looking, annual averages.

Figure 6-3. Fiscal Deficits and the Current Account, 1980–87



Source: State Planning Organization.

targets without keeping real interest rates higher than those prevailing on the world market (corrected for real depreciation of the Turkish lira).

Fiscal deficits and external balance should move more or less in line with each other if real interest rates remain constant, but they can diverge if real interest rates change. Figure 6-3 shows the national accounting measures of the current account, the fiscal surplus, and the private sector's surplus of savings over investment in Turkey between 1980 and 1987. The fiscal deficit and the current account deficit moved along similar paths until 1986, when the fiscal deficit worsened, but the current account performance did not. This was also the year in which real interest rates began to rise dramatically. The approach taken here, although not a substitute for the econometric analysis presented in chapter 3, might be useful for examining macroeconomic developments after 1980.

Private Sector Response to Fiscal Policy

Fiscal policy affected both private investment and private saving. Its net effect over this period was to raise both private investment and savings rates considerably.

Fiscal Policy and Capital Accumulation: Crowding Out or Crowding In?

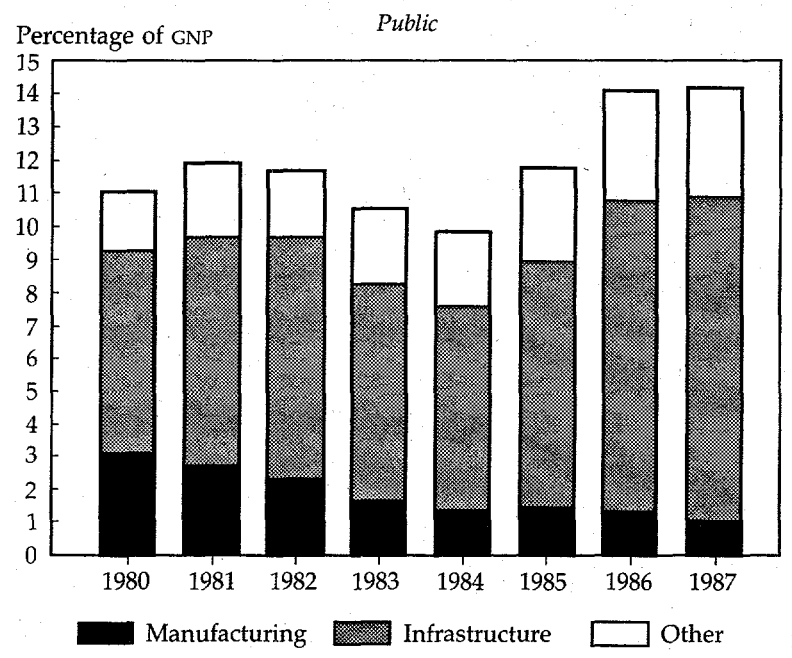
Aggregate investment recovered from the sharp cutbacks made during the macroeconomic turmoil of 1978–80. The share of total fixed investment in GNP in 1986–87 was 5.8 percentage points higher than the average for 1967–71. This is the period just before the major increase in public sector investment that triggered the fiscal and current account deficits of the mid-1970s and eventually culminated in the reschedulings of 1978–80. In fact, the share of fixed investment in 1987 was almost equal to that in the peak year 1977 (23.7 and 24.2 percent, respectively). This recovery occurred despite a substantial increase in real interest rates. Several factors explain this somewhat surprising development.

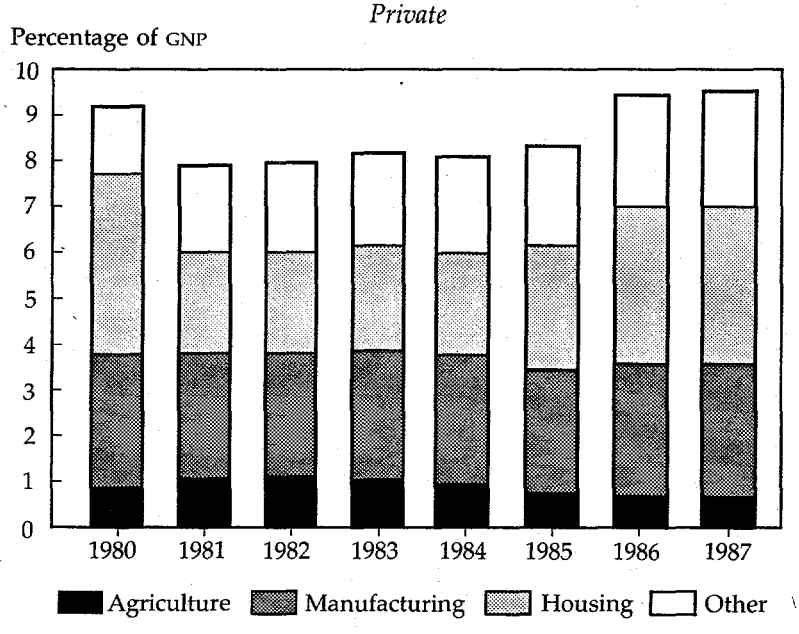
By far the largest part of the increase in investment was due to higher public sector investment (see figure 6-4). The ratio of public sector capital expenditure to GNP increased from 11 to 14 percent between 1980 and 1987. Public sector investment made up 60 percent of total government expenditure (net of stock changes) in 1987, up from 47 percent in 1980. This shift in government expenditure toward investment is the main reason output growth did not suffer from the mismatch of fiscal deficits and external targets, which produced high real interest rates.

Private fixed investment, although higher than the low point (7.2 percent of GNP) reached in 1982, did not, by 1987, recover significantly beyond the levels reached in the early 1970s. It averaged 9.6 percent in 1986–87 compared with 9 percent of GNP from 1967 to 1972. Private investment net of housing remained sluggish: 5.7 percent of GNP in 1981 and only 6.1 percent in 1986 and 1987 (see figure 6-4). Investment in housing increased sharply in the mid-1980s, partly in response to the availability of subsidized credit from the Mass Housing Fund.

High real interest rates were an important factor behind the relatively lackluster performance of private sector investment. Domestic real rates of interest to nonprime borrowers were sometimes higher than 30 percent between 1981 and 1987 (see figure 6-5).[3] A counterfactual model in which real lending rates from 1981 through 1986 are kept at 10 percent (compared with the actual average of 22.5 percent

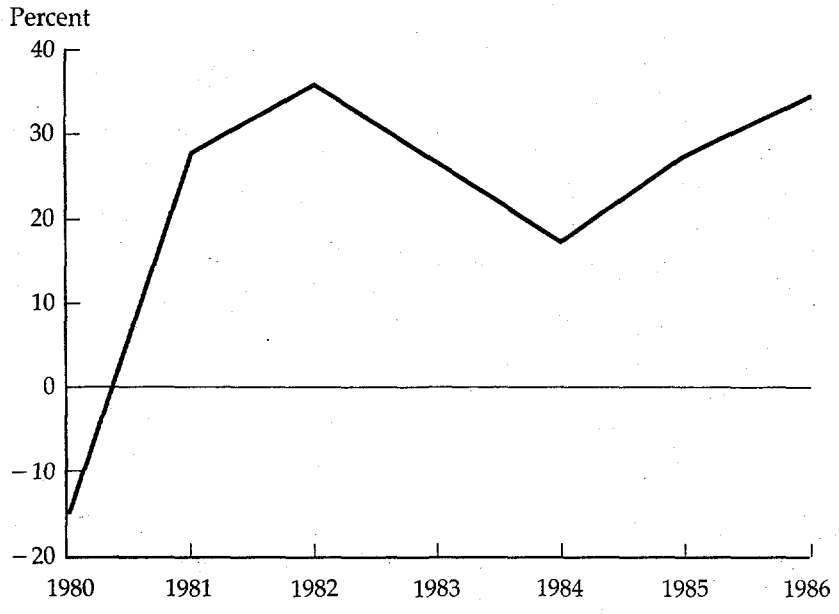
Figure 6-4. Public and Private Investment, by Sector, 1980–87





Source: State Planning Organization.

Figure 6-5. Real Interest Rate for Lending, 1980–86

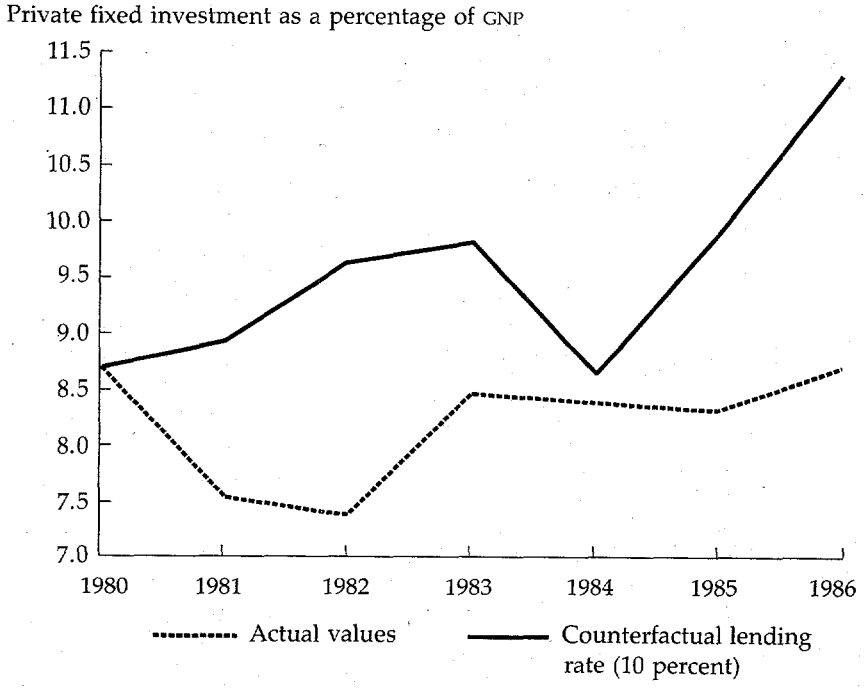


over the same period) produces private investment an average of 19 percent higher over the period (see figure 6-6).

Several factors worked against the negative effect of high real interest rates, which is why private investment actually rose between 1982 and 1987. First, the government consistently offered generous investment incentives. In particular, investment in housing was promoted through the Mass Housing Fund, but other sectors also benefited from extensive promotional measures. The exact level and effect of investment incentives are difficult to quantify, but they probably increased over the period. In addition, nominal interest payments are tax deductible, which cushioned the effect of high real interest rates, especially as inflation rose. Second, except in 1984, the growth rate of credit extended to the private sector was consistently higher than that of output, in most years by a substantial margin. Simulations show that if real credit had grown only as much as gross domestic product (GDP) from 1981 on, investment would have been reduced almost 9.5 percent (see figure 6-7; the effect of the growth of credit above that of GDP is measured by the difference between lines C and D).

Third, capacity utilization increased over this period. In the early 1980s capacity utilization was low because of the investment boom

Figure 6-6. Interest Rates and Private Investment, 1980–86

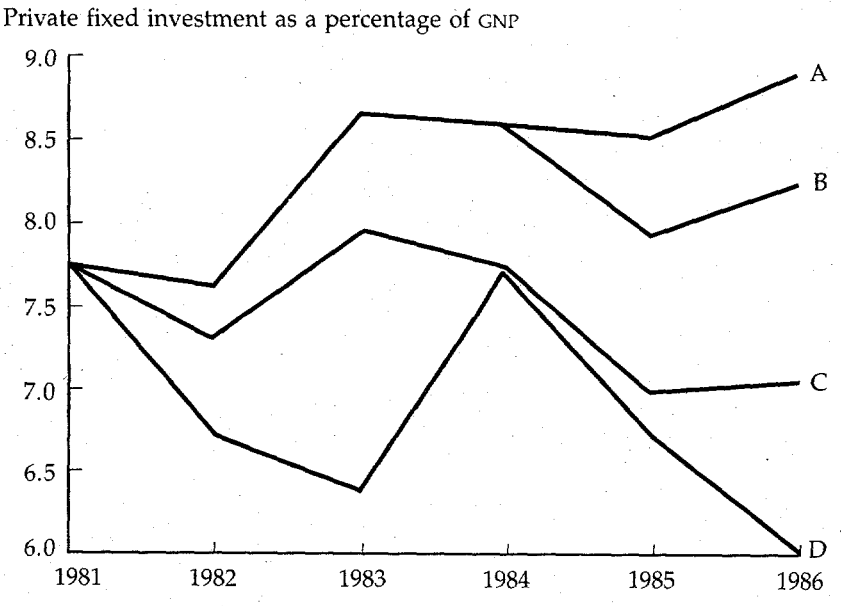


Source: See chapter 3.

of 1975–77, which created additional capacity, and the slump that followed the debt crisis of 1978. With the high growth of output after 1981 and the low rate of investment in the early 1980s, capacity utilization improved substantially by 1984 (see table 6-2). Econometric analysis suggests that the increase in capacity utilization between 1981 and 1983 led to an increase in private fixed investment of 0.7 percent of GDP. Without the increase in capacity utilization, the increase in private fixed investment would have been 9 percent lower. Improvements in capacity utilization after 1983 added another half a percent of GDP to investment (see figure 6-7; the effect of improved capacity utilization is measured by the difference between lines B and C).

The final factor in the rise of private investment is directly related to fiscal policy, specifically, the composition of public investment. After 1980, the government shifted much of its investment toward areas in which public investment complements rather than competes

Figure 6-7. Simulations of the Effect of Public Policy on Private Investment, 1981–86



A: base run, actual values.
B: base run plus the share of government investment in infrastructure fixed at the 1981 level from 1981.
C: B plus capacity utilization in the private sector fixed at the 1981 level from 1981.
D: C plus the share of total credit to the private sector as a share of GDP fixed at the 1981 level from 1981.

Source: Based on results generated by the econometric model presented in chapter 3.

with private sector investment. Large cuts were made, for example, in public sector investment in manufacturing. At the same time, the share of infrastructure[4] increased from 50 percent to almost 70 percent of total public investment (see figure 6-4). The largest increase was in transportation and communications, where fixed investment grew in real terms an average of 17 percent annually after 1981, from 18 percent of public investment in 1981 to 34.3 percent in 1987. Public sector investment in power, education, and health also increased rapidly.

The shift in public sector investment toward infrastructure has important implications for private capital formation. The empirical analysis presented in chapter 3 shows that increasing infrastructure's share

Table 6-2. Capacity Utilization in Private Sector Manufacturing, 1977–87
(percent)

Year	*State Institute of Statistics*	*Istanbul Chamber of Industry*
1977[a]	63.6[b]	—
1978	61.1[b]	—
1979	57.1[b]	45.0
1980	55.5	51.1[b]
1981	57.4	62.1
1982	59.0[c]	66.8
1983	61.0[c]	69.6
1984	62.0[c]	72.0
1985	62.9[c]	72.7
1986	64.2[c]	72.0
1987	—	73.6[d]

— Not available.
a. July–December 1977.
b. Unweighted.
c. Fourth quarter.
d. First two quarters only.
Source: State Institute of Statistics, Istanbul Chamber of Industry.

of public sector investment expands private investment. However, since only investment in completed infrastructure triggers private investment, a considerable lag exists: public sector investment in infrastructure has a significant effect on private sector investment only after three years.

Figure 6-7 shows what would have happened if infrastructure's share of investment had remained at its 1981 value of 51 percent instead of rising to 69 percent, as it did by 1987. After the three-year lag, private investment would have decreased by 0.7 percent of GNP in 1985 and 1986. This represents an 8 percent decrease in private investment. The shift toward infrastructure in the public sector investment program had a positive influence on the recovery in private sector investment that took place in the mid-1980s.

The negative effect of high rates of interest, which clearly dominated in the early 1980s, was gradually offset by the other measures discussed. By 1986 the net positive effect exceeded the negative effect by 1 percent of GNP. Therefore the overall effect of fiscal policy and improved capacity utilization on private investment was positive, the high real lending rates notwithstanding.

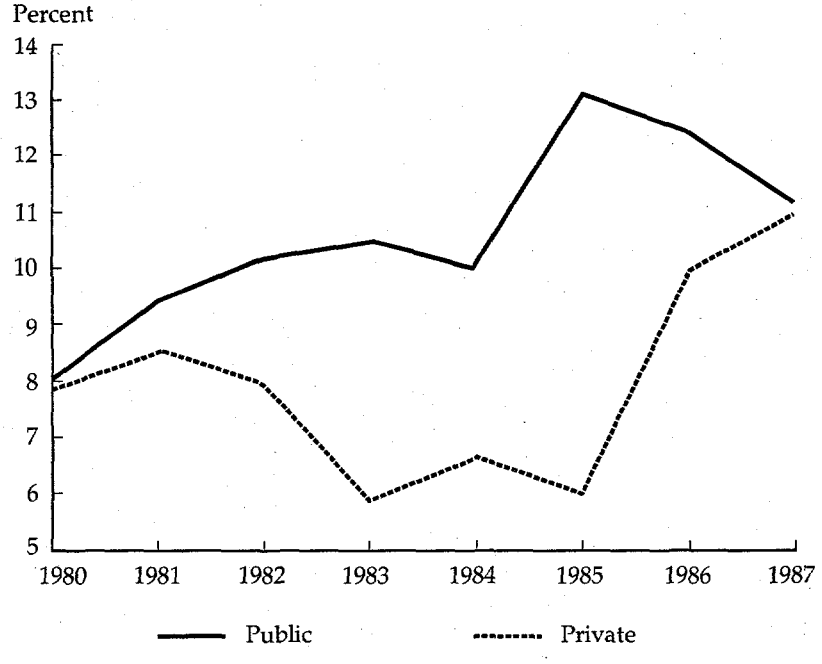
Real Interest Rates, Income Growth, and Private Saving

Public investment increased substantially, while other measures helped to mitigate the negative effect of that increase on private invest-

ment over the period 1980–87. At the same time, fiscal deficits deteriorated, but the deficit on the current account of the balance of payments was in fact reduced as a percentage of GNP. What made these apparently disparate developments consistent was a substantial increase in private savings. Private savings reached a low point in 1983 (5.9 percent of GNP, down from 7.8 percent in 1980) but increased after 1985 to reach 11 percent in 1987 (see figure 6-8). This section explores some of the reasons for this improved savings performance and assesses the likelihood of its continuing in the future.

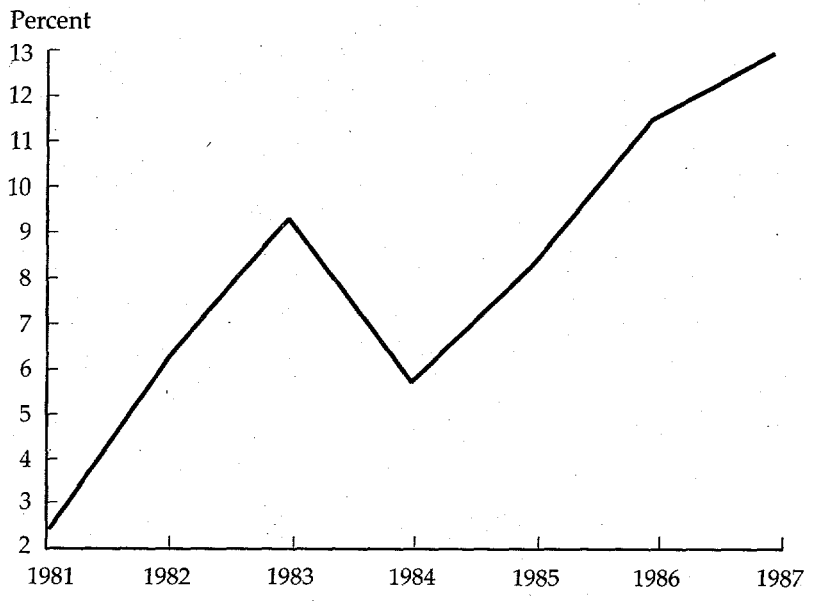
Rising real rates of interest were a significant factor contributing to the increase in private savings. The maximum after-tax real rate of interest on time deposits rose from −3.5 percent in 1980 to almost 6 percent in 1984 and to about 13 percent in 1987 (see figure 6-9). Not all deposit rates increased that much; for example, the rate on demand deposits turned sharply negative in the mid-1980s. This did not affect

Figure 6-8. Public and Private Savings as a Percentage of GNP, 1980–87



Source: State Planning Organization.

Figure 6-9. Maximum Real Interest Rate on Time Deposits, 1981–87



private saving, however, since demand deposits are not an important vehicle for private saving.[5]

The sharp rise in interest rates explains much of the even sharper rise in the private savings rate that occurred after 1985. Without the increase in real rates, savings would have been lower by perhaps 0.8 percent of GNP in 1985 and almost 2 percent by the end of 1986.

Although the developments in interest rates explain much of the improvement in savings performance after 1985, the increase in savings cannot be fully attributed to the increase in real interest rates. The econometric analysis suggests that only two of the five percentage points of increase can be attributed to the simultaneous rise in the real rate of interest.

Another important factor, especially in 1986–87, is that the higher than average growth in the economy and in private disposable income is perceived as only temporary. The propensity to buy consumer goods with temporary income is about half the propensity to do so with permanent income. The perception that an increase in disposable income is temporary, rather than permanent, therefore has less effect on consumption than on saving. This factor alone would account for about 1.5 to 2.0 percentage points of the increase in savings in 1986 and 1987.

This relation has important implications for the near future. A decline in private savings will probably follow the return of output growth to a more sustainable 5 or 6 percent (see chapter 7). This would effectively make the current level of fiscal deficits difficult to maintain without increasing external imbalances again. Reducing fiscal deficits could, however, have severe costs for output growth unless the cutbacks are properly designed. The tradeoff involved is the subject of the next section.

Fiscal Deficits, Interest Rates, and Growth

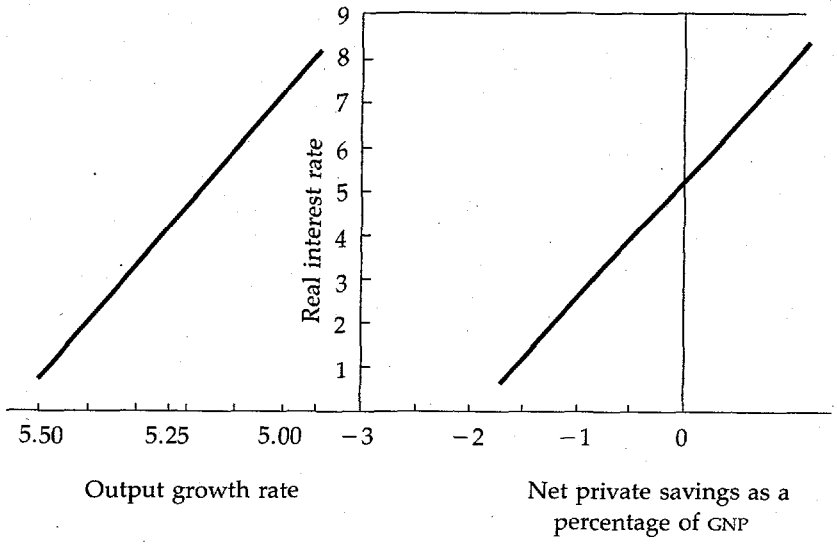
Large fiscal deficits did not prevent a satisfactory current account performance. The price for this performance was the need to maintain ever higher real rates of interest. The empirical analysis shows that in Turkey such a policy was effective because it restrained private consumption and, to a lesser extent, private investment expenditure. Deleterious effects on output growth were avoided until 1987. The preceding analysis identifies high public sector investment as the most important reason that output growth did not slow down. This section uses the econometric model of chapter 3 to quantify this link.

Figure 6-10 presents the results of simulation runs made with the econometric model summarized in chapter 3. Interest rates are varied, but fiscal deficits are adjusted to maintain external balance targets. First, the fiscal cutbacks necessary to sustain external balance as interest rates decrease are assumed to come entirely from government consumption. Public sector investment is assumed to remain constant. The figure shows that a cut in interest rates of five percentage points causes a drop in the private sector's surplus of savings over investment equal to 2.1 percent of GNP (see the upper panel of figure 6-10).[6] A substantial part of the decline in net private savings is due to increased private investment in response to lower real interest rates. Since public sector investment is fixed by assumption, output growth goes up an average of 0.5 percentage point over the five years of the model (the base run simulates the period between 1981 and 1986).

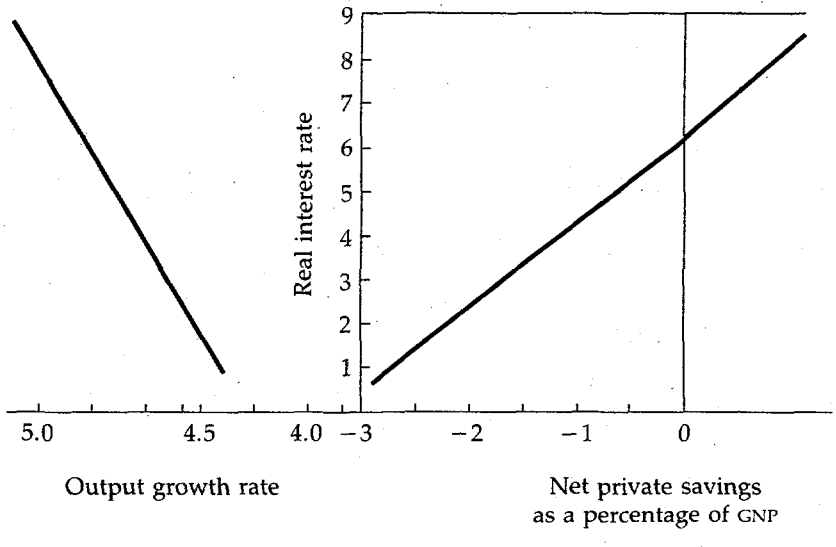
The results are very different when the fiscal cutbacks are assumed, perhaps more realistically, to come from public sector investment as well as from consumption. If all government expenditure is cut proportionally, 60 percent of the cut comes from reductions in the public sector's investment program. The results are summarized in the lower panel of figure 6-10. Although the lower interest rates stimulate private investment, the cut in public sector investment more than offsets this: as a result, output growth actually declines by an average 0.5 percentage point over the five-year simulation period. Shifting from no cut in public sector investment to a 60 percent fiscal adjustment

Figure 6-10. The Effect of Changes in the Fiscal Deficit on Interest Rates and the Output Growth Rate

Entire Fiscal Cut from Public Consumption



60 Percent of Fiscal Cut from Public Investment



Source: Based on results generated by the econometric model presented in chapter 3.

from cutbacks in public investment therefore causes a drop of a full percentage point in the growth of GNP for the five years.

Cutting public sector investment reduces output growth, which in turn leads to a smaller surplus of private sector savings over investment. As a consequence, fiscal deficits and public sector investment must be cut further to maintain external balance, growth slows more, and so on. As a result, a cutback of five percentage points in real interest rates requires a cut in the fiscal deficit of 2.1 percentage points if external balance is to be maintained by reducing government consumption. However, with 60 percent of the cuts in public sector investment, deficits must be reduced by 2.8 percentage points, or 0.7 percent of GNP.

The analysis also suggests a threshold at which the fall in public sector investment just offsets the increase in private investment triggered by lower real rates. If only 28 percent of the cut in government expenditure is in public sector investment, output growth is not affected. A caveat concerns the medium-term nature of this model; a short-run recession triggered by such a fiscal retrenchment could still lower output.

The arguments presented here do not imply a blanket endorsement of increasing public sector investment, which does, of course, come at a cost.[7] They do highlight, however, the important role that public sector investment played in Turkey's strong growth performance during the mid-1980s. Moreover, they show that stabilization programs that reduce public sector investment have high and permanent negative effects on output. These cuts in output are in addition to those that arise because of short-run macroeconomic problems, which are not covered here.

The Composition of Investment: A Warning Sign?

This discussion suggests that the level of investment did not threaten continued high growth in Turkey's economy. However, the composition of investment was possibly a reason for concern. The adverse effect of high interest rates was predominantly on investment in manufacturing. The share of manufacturing in private investment fell in response to strong public sector support of investment in housing through the Mass Housing Fund. Investment by the private sector apparently shifted away from the main export sectors, agriculture and manufacturing. The share of each sector in total private fixed investment fell by five percentage points between 1981 and 1987. New incentives, such as the preferential credit extended by the Mass Housing Fund, played a role in this shift. Public sector investment also shifted out of manufacturing and into infrastructure.

If sustained, this change in the composition of investment could cause problems in the future. The combined effect of these developments in the private and public sectors was a substantial decline in the share of total investment in the main export sectors. This could affect the link among export growth, the real exchange rate, and the cost of external debt identified in chapter 4. With less capital in the sectors producing tradable goods, the real exchange rate must shift even more to achieve a given export target. This in turn increases the capital losses Turkey will sustain on its external debt. Reorienting investment incentives toward the main export sectors should receive serious consideration by policymakers seeking to reverse this unfavorable shift in the tradeoff between export growth and the cost of external debt. Lowering the real interest rates and reallocating incentives to the traded goods sectors would allow the export drive to continue with a slower increase in the debt-output ratio.

7 Can Output Growth and External Balance Be Reconciled?

TURKEY IS one of the few countries that have managed to maintain high output growth after rescheduling their debt. The country achieved and maintained high levels of capacity utilization over the period 1980–87, with exports by far the fastest growing component of aggregate demand. The increase in the debt-output ratio was to a large extent the counterpart of this successful export drive, which was made possible by a continued real depreciation of the Turkish lira. The depreciation was, in turn, responsible for more than half of the increase in the debt-output ratio between 1980 and 1986. The large capital losses on external debt did not jeopardize Turkey's creditworthiness: in early 1988 its debt was traded on the secondary market for 98 cents on the dollar. This is the highest quotation of all the developing countries.

Exports, Output Growth, and External Borrowing

In the early 1980s, Turkey benefited from low real interest rates on its debt, which allowed the output growth rate to be higher than the interest rate. As the real interest rate became unfavorable in the mid-1980s, Turkey's noninterest current account improved. This is, however, where the questions arise on Turkey's entire adjustment experience. The improved noninterest current account was accompanied by a growing fiscal deficit, increased reliance on the issuing of high-cost domestic debt, and continued high, although declining, monetization. Moreover, high real interest rates were necessary to create sufficient private savings. At the same time incentives were used to prevent a slowdown in private investment.

At issue are whether monetization at current levels is compatible with government inflation targets; whether reduced monetization, if necessary and coupled with restrained external borrowing, dictates a

fiscal adjustment to avoid faster growth of domestic debt; and whether after such a fiscal retrenchment high output growth can still be maintained. These questions are at the core of this chapter.

First what constitutes a sustainable rate of foreign borrowing is analyzed, and a target is developed for Turkey given export prospects, external developments, and anticipated domestic output growth. The results of that analysis and the consistency calculations presented in chapter 5 add up to a maximum financeable fiscal deficit. This chapter analyzes the sensitivity of that financeable deficit to different debt management and exchange rate policies and to variations in output growth. The target for the financeable deficit and for external balance requires a particular surplus of private savings over investment, which restricts the government's leeway on interest rate policy. The major outstanding question is whether Turkey can maintain the high output growth rates of the past. These issues are pursued in this chapter, together with a series of policy alternatives. The various models introduced in the preceding chapters are used to provide quantitative estimates of the tradeoffs involved.

Solvency, Creditworthiness, and Foreign Debt

Assessing a country's room for external borrowing involves two considerations: solvency and creditworthiness. Solvency concerns ability to pay and is intricately linked with the noninterest current account, rates of real interest and output growth, and, finally, the initial level of debt. To remain solvent, a country should not plan to spend more than its current and future income (discounted) minus its initial debt. This implies that the noninterest current account surplus should at least equal the initial debt times the difference between the real interest cost of foreign debt and the real output growth rate.[1]

A number of important consequences follow from this. First, a country with a higher income or a lower debt can borrow more than a country with a higher debt-output ratio. Second, the more expensive a country's external debt, the higher its surplus on the noninterest current account must be to maintain solvency. Third, the higher a country's growth rate, the greater its leeway in borrowing without jeopardizing solvency. This is why so many debtor countries face a vicious circle: slow growth implies less room for external borrowing, which in turn causes slower growth, and so on.

For most countries, the constraints imposed by solvency are not very restrictive. Turkey's ratio of net foreign debt to GNP is 51 percent. Even if the average real interest rate on its external debt remains as high as 8 percent, solvency would require a surplus on the noninterest current account of only 1 percent of GNP to achieve a real output

growth rate of 6 percent. This chapter assumes an average real interest on foreign debt of 6 percent, which implies a lower limit of zero on the noninterest current account. A continued deficit on the noninterest current account would eventually jeopardize solvency given the current interest rates and the projected output growth rates.

Solvency, however, is not the only consideration. Ability to pay does not necessarily imply willingness to repay. Therefore, creditworthiness (which depends on the lenders' assessment of a country's ability and willingness to repay) often imposes tighter constraints than solvency alone. Repayment requires a country not only to have the value of its wealth high enough to allow repayment, but also to generate a surplus of production over consumption of traded goods (net exports). This is likely to be especially burdensome for a country with most of its resources in sectors that produce nontraded goods. Such a country might be tempted to default more than an outward-oriented one, even if requirements for solvency are met. Thus debt-export ratios are important for assessing creditworthiness.

Assessing the precise limits imposed by the constraints of creditworthiness is difficult for several reasons. First, although debt-export ratios are important, they are biased estimates of the ratio of a country's debt to its output of tradable goods. Some domestically produced tradables are likely to be sold at home rather than abroad. So the true measure lies somewhere between the debt-output ratio (which also counts nontradables) and the debt-export ratio, which excludes tradable goods produced and sold at home. This chapter follows a method pioneered by Cohen (1985, 1988). This method involves choosing the ratio in between the debt-output and the debt-export ratios so that no incentives can overvalue or undervalue the exchange rate simply to improve mechanically the indicators of creditworthiness. This ratio is influenced by the price elasticity of export demand and output supply. The outcome for Turkey places a 60 percent weight on the debt-export ratio and a 40 percent weight on the ratio of debt to GNP. This construct is referred to as the debt-resource ratio. The three measures of creditworthiness are presented in table 7-1.

A second, more fundamental problem involves not so much how to choose a particular indicator of creditworthiness but how to assess whether the value of the indicator chosen is too high (high values indicate low creditworthiness). An indicator is too high if the burden of servicing the debt at that value exceeds the likely penalty for not complying with the repayment terms. The problem with this definition is that nobody really knows how high that penalty is. This chapter adopts Cohen's simple, but forceful, method. The cost of default is not known, but if a country has not defaulted at the current value of its debt-resource ratio, that value is, by implication, not yet too high.

Table 7-1. Measures of Creditworthiness, 1979–86

Year	*Net debt to* GNP	*Net debt to exports*	*Net debt to resources*
1979	15.0	2.3	1.4
1980	20.8	2.1	1.4
1981	24.8	1.7	1.1
1982	27.3	1.5	1.0
1983	31.7	1.7	1.2
1984	36.4	1.6	1.1
1985	41.6	1.7	1.2
1986	51.5	2.4	1.6

Otherwise the country would have defaulted already. A cautious borrowing policy is one that keeps the debt-resource ratio from rising.

A borrowing policy designed to lower debt-resource ratios rapidly is not necessarily wise. Although lower debt-resource ratios do indicate higher creditworthiness, the transitional costs of reaching that lower ratio clearly raise the cost of servicing the existing debt. Since creditworthiness involves comparing the cost of defaulting on the current debt with the cost of servicing it, such a strategy, which has been imposed on many heavily indebted countries, lowers rather than increases current creditworthiness.

Sustainable Current Account Deficits

How much foreign borrowing is compatible with maintaining the debt-resource ratio at its current value and thus with maintaining the level of creditworthiness? The debt-resource ratio, a weighted average of the debt-output and the debt-export ratios, depends on the growth rate of the borrowing country and of its trading partners. The growth rate of a country's trading partners is one determinant of its likely export growth. The other is the elasticity of demand for the borrowing country's exports compared with the income of the countries to which it exports.

Empirical analysis (see chapter 2 for documentation) suggests that the income elasticity of demand for Turkey's exports is high: 1.6 for exports to countries of the Organisation for Economic Co-operation and Development (OECD) and 4.0 for exports to the oil-exporting countries in the Gulf region. This results in a weighted value of 2. Thus, if the weighted output[2] of Turkey's trading partners grows by four percentage points, Turkey's exports are likely to grow by eight percentage points. The real exchange rate, because of its construction, does not affect the amount of borrowing that is feasible.

Table 7-2 presents the maximum increase in foreign debt that will avoid a rising debt-resource ratio for different growth rates at home and abroad. The table shows the feasible current account deficit under different assumptions on growth rates for Turkey and for its trading partners. The numbers indicate, as expected, that lower growth rates, whether at home or abroad, allow less debt to accumulate. In fact a zero growth rate at home and abroad precludes further borrowing (this possibility is outside the range of the table). Raising the growth rate of domestic output by four percentage points allows an extra current account deficit of 1.5 percent of GNP for a given rate of foreign output growth. A slump abroad lowers borrowing potential: if the trading partner's growth falls from, say, 4 percent to zero, the amount of feasible debt accumulation decreases about 0.3 percent of GNP.

A 6 percent output growth rate is feasible for Turkey if some policy adjustments are implemented. Moreover, the International Monetary Fund and the World Bank estimate that Turkey's trading partners will grow at a combined weighted rate of 3.5 percent from 1987 to 1992. This suggests that the feasible current account deficit for Turkey is 2.5 percent of GNP. This is about the same level as Turkey's current account deficit in 1986 (2.6 percent of GNP) and is substantially larger than the deficit in 1987.

How does this allowable current account deficit compare with the solvency constraint? At an average real interest rate on foreign debt of 6 percent, a current account deficit of 2.5 percent of GNP translates into a noninterest current account surplus of 0.5 percent of GNP at the current debt-output ratio.[3] The solvency constraint implies a zero noninterest current account at a real interest rate of 6 percent, so

Table 7-2. Sustainable Current Account Deficits under Various Output Growth Rates
(percentage of GNP)

	Sustainable deficit given certain output growth rates (percent) of Turkey's trading partners[a]					
Output growth rate of Turkey (percent)	*0*	*1.0*	*2.0*	*3.0*	*3.5*[b]	*4.0*
3.0	1.1	1.2	1.3	1.4	1.4	1.5
4.0	1.5	1.6	1.7	1.8	1.8	1.8
5.0	1.9	2.0	2.0	2.1	2.2	2.2
6.0	2.2	2.3	2.4	2.5	2.5	2.6
7.0	2.6	2.7	2.8	2.9	2.9	3.0

a. Growth rates are aggregated by the partners' respective shares of Turkey's exports.
b. International Monetary Fund and World Bank estimate for 1987–92.

this result confirms that creditworthiness constraints are tighter than solvency constraints.

Furthermore, all additional foreign borrowing is assumed to be available to the public sector. This is probably reasonable because the private sector is not expected to borrow much from abroad, with the exception of nonresidents who own foreign exchange deposits that enter the commercial banking system. These holdings probably should be interpreted as remittances and counted as above-the-line inflows rather than capital account transactions.

Macroeconomic Consistency, Foreign Borrowing, and the Public Sector Deficit

Macroeconomic consistency requires more than keeping external deficits within the limits of solvency and creditworthiness. Domestic output growth, inflation targets, and internal debt management all affect the financing of public expenditure. Chapter 2 developed a quantitative framework to derive the implications of these targets for the size of the financeable deficit, defined as the deficit that does not require more financing than is compatible with sustainable external borrowing, existing targets for inflation and output growth, and a sustainable internal debt policy.[4] This section explores the sensitivity of the outcome of that exercise to the assumptions made on debt management, real exchange rate policy, and output growth.

In the base case derived in chapter 5, a number of assumptions are made about debt management. Internal debt grows at the same rate as output so as to maintain a constant debt-output ratio, and external debt grows at the same rate as total resources so as to maintain a constant debt-resource ratio. The assumption of a constant real exchange rate after 1988 precludes any capital losses on foreign debt. This produces a required deficit reduction of 1.2 percent of GNP compared with the government's deficit in 1986, if a minimum target of 20 percent inflation is to be met. Changes in these assumptions and their potential effect on output growth are discussed in the sections that follow.

The Fiscal Implications of Debt Management

What would have happened if Turkey had not adopted a policy of relaxed external deficit and moderate issuing of internal debt? In particular, what are the fiscal consequences of the policy of debt substitution followed in many debtor countries? Many of those countries paid off relatively cheap external debt with revenue raised by issuing much more expensive domestic debt.

Assume that Turkey did not increase its external debt between 1980 and 1986, other than the increase caused by capital losses due to exchange rate depreciation, but that it issued internal debt instead. After cross-currency exchange rate fluctuations and real depreciation of the Turkish lira are taken into account, Turkey's debt-output ratio increased only 13.8 percent of GNP. The rest of the increase was due to capital losses. What would have happened if Turkey had issued an equivalent amount of internal debt instead of increasing its external debt-output ratio by 13.8 percent of GNP?

First, a mechanical debt swap produces a one-time sale of domestic debt that retires an equivalent amount of external debt. This effectively amounts to a debt buyback scheme. This experiment considers only the budgetary consequences of exchanging one type of debt instrument for another. It does not consider the problem associated with transferring resources to foreigners.

Such a debt swap becomes problematic when domestic real interest rates are substantially higher than the average cost of real interest on the foreign debt, which is the case in Turkey. Over the period 1988–92 the real cost of domestic debt in Turkey is projected to be six percentage points higher than the average real cost of foreign debt. As a consequence, the increased interest burden imposed by such a debt swap would raise the actual fiscal deficit 0.8 percent of GNP in each subsequent year. Moreover, the deficit reduction consistent with 20 percent inflation would rise to 2.1 percent of GNP, up from 1.2 percent in the base case. Alternatively, the equilibrium inflation rate would jump from 50 to 85 percent a year if no fiscal adjustment is undertaken.

A straight asset swap is not, however, the form this debt substitution takes in most highly indebted countries. To effect the implied transfer to foreigners, a government must increase either its own surplus or the net private savings surplus by a matching amount. Typically, the domestic counterpart of the increased external transfer is a gradual increase in the issue of domestic debt, which is absorbed by an increase in the surplus of net private savings. This, in turn, requires higher real interest rates. Such a strategy raises the cost of the internal debt even higher and thus worsens the effect on the budget even further. Assume that such a debt substitution strategy is implemented between 1987 and 1992, the period considered in this chapter. Since over that period the real cost of interest on the foreign debt is assumed to equal the real rate of output growth, the entire adjustment must come from the noninterest current account. To achieve the target reduction of 13.8 percent of GNP over a five-year period thus requires a large positive shift (2.7 percent of GNP, 13.8 divided by 5) in the noninterest current account each year.

To increase net private savings requires a higher real interest rate.

The empirical analysis in chapter 6 suggests that the necessary increase in savings requires domestic real interest rates to increase almost seven percentage points. This raises not only the cost of servicing the additional domestic debt created by this policy but also the cost of refinancing previous debt. This is important because most of Turkey's internal debt has a short maturity (in December 1986, the maturity of 76 percent of the internal debt was one year or less). This swap would greatly affect Turkey's budget. To remain consistent with a 20 percent inflation target after implementing such a debt substitution policy, Turkey would have to reduce its fiscal deficit by an amount equivalent to 3.6 percent of GNP. This is almost twice the adjustment necessary after implementing a straight asset swap. The budget deterioration would be so large, in fact, that covering it through monetization would no longer be feasible. Issuing more debt would be even worse because the real interest rates are so high. Finally, external debt would not be available because the scheme was designed to reduce external debt. Thus a substantial fiscal cutback would be unavoidable. This raises the issue of whether output growth could in fact be sustained, which is explored later.

The Fiscal Consequences of Exchange Rate Policy

Turkey aggressively promoted exports, and the exchange rate was a principal instrument of that policy. Turkey's export-weighted real exchange rate depreciated an average 6 percent in real terms after 1980. This was the most important factor behind Turkey's extremely successful export drive. Its counterpart was to increase capital losses on its foreign debt. In spite of increases in its debt-output ratio, Turkey's export growth was so high that its debt-export ratio remained fairly stable after 1981.

The tradeoff is clear. Continued depreciation of the real exchange rate will help to keep exports growing faster than real GNP: the cost is an escalating debt burden, as measured by the debt-output ratio. The net impact on the debt-export ratio is positive, however, and the tradeoff depends on the target that is adopted for external borrowing. If a debt-output ratio oriented toward solvency is the constraint on external borrowing, higher real depreciation will severely restrict the room for fiscal deficits. If, however, the debt-export ratio is the constraint on external borrowing, this result will be reversed because the price elasticity of Turkish exports is high.

Table 7-3 demonstrates these effects using the consistency model introduced in chapters 2 and 5. The table presents the fiscal cutbacks required to maintain consistency with a 20 percent inflation rate given different rates of real depreciation. Two situations are presented. In

Table 7-3. Depreciation in the Real Exchange Rate, Fiscal Adjustment, and Feasible External Borrowing
(percentage of GNP)

Depreciation in real exchange rate (percent)	*Constant debt-output ratio*		*Constant debt-export ratio*	
	FCA	*RDR*	*FCA*	*RDR*
0	2.6	1.2	2.5	1.3
5.0	0.8	3.0	3.6	0.2
10.0	0.0	4.9	4.7	−0.9

FCA: feasible current account deficit.
RDR: required deficit reduction.

the first, external borrowing is restricted to the amount that would leave the debt-output ratio unaffected (this amount is positive since output is growing). Under such an external debt policy, capital losses on the foreign debt caused by real depreciation of the exchange rate severely restrict fiscal policy. The required cut in the fiscal deficit is 1.2 percent of GNP at zero real depreciation;[5] at 5 percent real depreciation, the cut jumps to 3.0 percent. If the real exchange rate depreciates an average of 10 percent over five years, the required deficit reduction increases to at least 4.9 percent of GNP. The main reason is that the room for external financing is reduced from 2.6 percent at zero depreciation to 0.8 percent at a real depreciation of 5 percent. At a real depreciation of 10 percent the room for external borrowing is nil.[6]

The results are very different if the target is to maintain a constant debt-export ratio. In this case, real depreciation eases the room for external borrowing since the volume effect on exports offsets the valuation effect on debt. Feasible external financing thus increases from 2.5 percent of GNP at zero real depreciation to a very high 3.6 and 4.7 percent of GNP at 5 and 10 percent real depreciation, respectively.

Both options are extreme. The target of a constant debt-output ratio is too restrictive to guide external borrowing. Pursuing an export promotion policy based on the exchange rate while ignoring the favorable effect this has on creditworthiness unduly restricts external borrowing. The real depreciation necessary for the strategy of export promotion to be successful causes capital losses on the external debt. Maintaining the debt-output ratio then requires a reduction in foreign borrowing. By requiring fiscal restraint, it might even threaten the export boom that the real depreciation was intended to produce. This could happen if the fiscal restraint reduces investment in export sectors either directly or indirectly. The other policy, keeping the debt-export ratio constant, also clearly carries high risks. If the export boom

falters, the economy is left with a high debt-output ratio and the possibility of a sudden cutoff of external funds.

Elements of both strategies should be taken into account, although precisely how cannot be quantified. This chapter therefore removes the real exchange rate from the decision on how much can be borrowed externally. This method implies that the real exchange rate (and the macroeconomic policies necessary to support a target for the real exchange rate) can be used to promote exports and to achieve other macroeconomic targets the government has in mind. The effect of a real depreciation on the debt-output ratio does not affect the amount of foreign borrowing that is feasible under this approach.

The Fiscal Implications of Variations in Output Growth

Higher growth allows more internal debt to be issued since the target is a constant debt-output ratio; it also increases the demand of both the banks and the private sector for real money balances as well as the scope for revenue from monetization for a given inflation rate. More growth therefore allows a larger deficit and requires less fiscal adjustment. This is at the core of the conflict between stabilization policy and growth: if stabilization policies cut output growth, further fiscal adjustment is needed to maintain macroeconomic consistency. This adjustment may, in turn, slow growth further.

Table 7-4 indicates the extent of the tradeoff. A target of 4 percent growth instead of 6 percent reduces the room for financing by about 1 percent of GNP: for a 20 percent inflation target, the required deficit reduction becomes 2.2 percent of GNP at 4 percent real output growth instead of 1.2 percent at 6 percent. A recession highlights the tradeoff more starkly: a sustained period of only 2 percent growth in real income raises the adjustment required to maintain a 20 percent inflation target to at least 3.3 percent of GNP. Numbers this large raise the specter of a self-fulfilling prophecy: a deficit reduction this severe could easily validate the low growth rate on which it was premised.

Table 7-4. The Fiscal Implications of Output Growth

Output growth (percent)	*Required deficit reduction to achieve 20 percent inflation (percentage of GNP)*
2	3.3
4	2.2
6	1.2

Fiscal Adjustment, Output Growth, and External Debt

The analysis has until now focused on the revenue the government can expect to receive from various sources of financing given its macroeconomic targets. Reducing the fiscal deficit to what can be financed given those targets ensures that the fiscal policy is at least sustainable. If the adjustment is made, achieving the stated macroeconomic targets will not be jeopardized by fiscal crises, high inflation, or escalating interest payments. It does not guarantee, however, that those macroeconomic targets can or will be met, only that the fiscal deficit is not inconsistent with them. Whether the targets can be achieved is now taken up.

The central question is whether the requirements of external restraint and consistency leave enough room for public and private investment and satisfactory output growth. Can external balance and output growth be reconciled, or is there an inherent conflict between them? This section generates projections using the models developed in chapters 2 and 3 that should answer this question.

Output Growth and External Balance: The Base Case

The projections incorporate the restrictions on the current account that creditworthiness implies. Thus the external borrowing limit is 2.5 percent of GNP, which is a more liberal target than the low current account deficit of 1987. Besides giving more leeway to the external account, the projections also assume that the fiscal corrections necessary for macroeconomic consistency will, in fact, be implemented. This means a reduction in the fiscal deficit of 1.2 percent of GNP compared with 1986. Compared with 1987, this cut in the fiscal deficit would be substantially larger. Public sector investment is assumed to be constant in real terms in 1987 and to grow at 5 percent thereafter. This implies a gradual reduction in the share of public sector investment in GNP.

A lower fiscal deficit combined with a more liberal current account target allows the surplus of private savings over investment to fall. This is exactly what lower real interest rates produce. The decline in the fiscal deficit, if implemented, allows real interest rates to fall gradually by three percentage points over the period 1988–92. Private savings fall from the high levels achieved in 1987 to reach a respectable 11.8 percent of GNP at the end of the period. Lower real interest rates also produce an increase in private investment's share of GNP, which rises by one percentage point over the period. This increase is just enough to offset the gradual slowdown in the rise of public sector investment. As a result, private investment increases its share of total

investment by four percentage points. The share of total capital formation remains at 20 to 21 percent of GNP. The most important result is that output growth is maintained at an average rate of 6 percent throughout the period. This growth rate is respectable compared with the 1980–85 average, although it is below the performance in 1986 and 1987. Accelerating inflation and decreasing share of inventory accumulation in GNP strongly suggest, however, that the average growth rate of almost 7.5 percent in 1986 and 1987 was caused by the pressure of unsustainable aggregate demand. Continuing such a high growth rate is probably incompatible with stable macroeconomic performance unless much higher investment rates bring aggregate supply in line with aggregate demand.

Real interest rates on foreign debt are projected to average 6 percent through 1992; this implies that with a 6 percent real growth rate, real interest payments do not by themselves lead to further increases in the debt-output ratio. As a consequence, the ratio of net debt to output stays roughly constant at about 53 percent of GNP. If measures are taken to impose fiscal restraint and restore consistency with other macroeconomic targets, sustained output growth is possible without escalating foreign debt.

Four caveats should be stressed at this point. First, the projection depends heavily on substantial fiscal correction. Indications are that the deficit increased substantially after 1986. The corrective measures necessary for the base case to be feasible are commensurately large.

Second, the projection assumes that the bulk of the fiscal correction comes from current expenditure, subsidy cuts, or tax increases. Public sector investment is assumed to be constant in real 1987 terms and to be increasing at slightly below the growth rate of the economy after that (5 percent instead of 6 percent). If the fiscal adjustment comes out of public sector investment, growth performance will fall short of the projections for the base case.

Third, no real depreciation of the exchange rate is projected beyond 1988, and exports are predicted to grow at 7 percent in real terms.[7] If a policy of real exchange rate depreciation is followed instead, the debt-output ratio increases faster because of the capital losses incurred.[8] Alternatively, more fiscal adjustment is needed to offset this effect.

Fourth, the projection assumes that the foreign financing necessary to cover a current account deficit of 2.5 percent of GNP is indeed forthcoming. This requires additional financing, since Turkey now must meet substantially increased repayment obligations. The implicit assumption is that these obligations can be refinanced and that additional funds are available to allow a current account deficit of 2.5 percent of GNP. Of course, in the current external environment additional

funds might not be raised. Therefore what happens if this additional financing does not materialize is also considered.

External Adjustment with Fiscal Restraint

The results are dramatically different when a cutback in the current account deficit is imposed. This alternative assumes a zero current account deficit throughout the simulation period.[9] The internal adjustment is brought about by a matching cut in public sector investment. The effect on output growth is severe: by 1992, the growth rate has fallen by two percentage points. Output growth falls by an average of 1.5 percentage points over the five-year period.

Both private savings and investment fall in a period of slower growth, but savings fall much more than investment (1.8 and 0.5 percent of GNP, respectively). Net private savings therefore decline by 1.3 percent of GNP over the simulation period. This also has an adverse effect on fiscal policy: to maintain external balance requires a further round of fiscal cutbacks. By the end of the period, fiscal deficits must be cut by 4 percent of GNP instead of 2.5 percent, which is the initial cutback in the current account. Many highly indebted countries that follow orthodox policies encounter this vicious circle. Fiscal retrenchment to achieve external balance causes a slump at home, which necessitates more of the same measures that triggered the slump in the first place. By the time this destabilizing process works itself out, output growth has declined two percentage points a year.

The so-called stabilization program does benefit the external account. The debt-output ratio falls, although by less than the cumulative cutback in the current account: 8.9 percent of GNP compared with the cumulative current account improvement of 12.7 percent. The shortfall of nearly four percentage points is due to the slowdown in output growth, which reduces by almost one-third the beneficial effects that cutting the current account has on the debt-output ratio.

External Adjustment without Fiscal Restraint

The public sector could also shift the burden of adjustment to the private sector by issuing more internal debt rather than by adjusting its fiscal deficit. This would create a situation very similar to the second debt-substitution projection discussed earlier. The outcome would be an increase in the real interest rates of almost six percentage points, which the government would have to match when issuing its own securities. The fiscal situation would rapidly deteriorate even if more debt were not issued because the interest payments on the existing debt would rise. The resulting deficit would be too large to be financed

by monetization. Issuing debt at interest rates far above the real growth rate of the economy would rapidly escalate debt service obligations.

This is in many ways the worst possible case: no external funds are forthcoming, and the public sector fails to adjust to the situation. Macroeconomic stability would be in doubt in such circumstances. Although by no means likely, this projection serves a useful purpose. It demonstrates the need for additional foreign financing coupled with adjustments in fiscal policy to restore consistency with a growth-oriented debt strategy. The alternatives are a slowdown in output growth if the public sector does adjust to reduced external financing or macroeconomic instability if it does not.

External restraint comes at the high cost of lost output growth. This loss occurs directly if the internal adjustment relies on a cut in public sector investment. Cuts in public sector consumption, in addition to what is already assumed in the base case, are probably no longer possible on a large scale. Public sector savings have already increased a great deal over the past few years (see figure 3-1). Alternatively, if the government relies on the issuing of debt, private sector investment falls substantially because interest rates must be raised. In addition, the interest rate rises to levels that make issuing more internal debt highly destabilizing. The conclusion is clear. The secondary market quotation of Turkey's debt suggests that external debt is not threatening Turkey's creditworthiness at current levels or at higher anticipated levels. Internal adjustment is necessary to maintain consistency with inflation and other targets, but pushing for tighter external policies seems both unnecessary and potentially damaging to Turkey's prospects for growth and internal balance.

8 Summary and Conclusions

THIS BOOK DOCUMENTS how Turkey managed after rescheduling its debt to maintain high output growth without jeopardizing creditworthiness. Few countries that have recently rescheduled debt have matched Turkey's achievement. The country achieved and maintained high levels of capacity utilization from 1980 to 1986, and exports were by far the fastest-growing component of aggregate demand. The increase in the debt-output ratio that occurred was largely the counterpart to this successful export drive. The continued real depreciation of the Turkish lira made the export drive possible, and the depreciation was responsible, in turn, for more than half of the increase in the debt-output ratio between 1980 and 1986. The large capital losses on its external debt caused by this real depreciation did not jeopardize Turkey's creditworthiness. Turkey had among the highest commercial assessments of creditworthiness of the main debtor countries. One reason Turkey's creditworthiness remained high is that after 1980 the high rate of export growth substantially improved the debt-export ratio.

The Strategy So Far: Achievements and Concerns

Understanding the extent to which external factors and internal policies helped to bring this about is important for assessing whether the same growth-oriented debt strategy can be pursued in the future, understanding the risks, and determining the policy adjustments essential to its continued success. Assessing the contribution of economic policy to Turkey's success is important for another reason. If luck rather than conscious policy design determined Turkey's success, other countries cannot learn much from Turkey's experience. If economic policy played an important role, however, Turkey's growth-

oriented debt strategy has a better chance of being successful elsewhere.

External Adjustment: The Role of Exchange Rate Policy, External Debt, and Output Growth

Turkey's net external debt increased substantially between 1980 and 1986, from 21 to 51 percent of GNP.[1] It did so, however, in a manner very different from that of most other debtor countries. Three striking features characterize Turkey's external debt strategy and explain why Turkey is in a much better position than most other debtor countries. First, Turkey's ratio of external debt to exports fell on average by one-third after 1980. A major reason for the improvement in the debt-export ratio is the sustained real depreciation of the Turkish lira against the currencies of Turkey's trading partners. The depreciation improved the competitiveness of Turkish goods abroad and produced a spectacular surge of Turkish exports. The counterpart to this real depreciation was, however, a large capital loss on the external debt. Turkey's loss contributed substantially to the increase in its debt-output ratio; in fact, it accounts for more than half of the increase between 1980 and 1986. The empirical results presented in this book show, however, that the debt-export ratio will actually improve after a real devaluation: the volume of exports will increase enough to offset the lower price. A real devaluation causes a capital loss on foreign debt and thus a reduction in national wealth. Higher exports cannot undo this, but increased export orientation eases access to foreign capital markets.

Second, Turkey continued to have access to foreign capital after it rescheduled its debt in the late 1970s. One reason was the set of measures that made repatriating their savings attractive for Turkish workers abroad. Another was the continued support of multilateral institutions. Turkey could and did run a much lower noninterest current account surplus[2] than did the group of countries with problems servicing their debt after their debt crises; −0.25 percent of GNP over 1980–86 for Turkey compared with 2.6 percent over 1982–86 for the heavily indebted countries. Turkey therefore did not have to cut back expenditure as dramatically as most highly indebted countries did after 1982.

Turkey's access to foreign capital markets and Latin America's lack of access are closely related to their respective economic policies and are not a matter of luck. After 1980 Turkey always offered attractive investment opportunities, especially to Turkish workers abroad. The main elements were and still are a variety of foreign exchange risk insurance schemes (Dresdner accounts and foreign exchange deposits) and very attractive real rates of return. This contrasts starkly with

the often unpredictable and sometimes confiscatory policies followed in Latin America. Capital flight did not take place in Turkey to the extent it did in Latin America; on the contrary, the inflow of private sector capital was large.

This inflow enabled Turkey to maintain a high rate of output growth, the third important difference between Turkey and the highly indebted countries. Turkey's annual growth rate after 1980 was on average four percentage points higher than that of the highly indebted countries. A short recession after its debt crisis was followed by seven years of high output growth, on average more than 5 percent in real terms after 1981. Although Turkey's external debt increased relatively more than that of other countries, its debt-output ratio did not because its output grew so much faster than theirs.

The high real growth rate implied that the economy grew faster than the interest payments on the existing debt, especially after the early 1980s, when real interest rates were low. At that time a large part of Turkey's debt was still on concessional terms. The lower costs of debt service allowed for more borrowing. The noninterest current account deficit was the driving force behind the increase in Turkey's external debt in the early 1980s.

The real interest rate became unfavorable in the mid-1980s as non-concessional multilateral loans and high-cost deposits by Turkish workers abroad became important sources of foreign financing. At the same time, Turkey improved its noninterest current account, which ran a surplus after 1984.

The rise in interest rates on its external debt marks a fundamental difference between the mid- and the early 1980s. The increase in the cost of Turkey's foreign debt greatly reduced the leeway for external deficits. It also accentuated Turkey's need to maintain a high rate of growth of its GNP in order to avoid rapid acceleration of debt service costs as a share of GNP. Turkey was successful on both counts.

In short, Turkey successfully struck a balance between external restraint and continued output growth. The internal policies that formed the counterpart to this external transfer, however, give some reason for concern.

Internal Adjustment: Fiscal Policy, Real Interest Rates, and Investment Expenditure

Turkey adopted a growth-oriented strategy rather than sustaining high surpluses on its noninterest current account to keep the debt-output ratio in check. In such a strategy, the government must ensure that the extra expenditure allowed by the lower trade surplus is indeed channeled into investment and not into consumption. If consumption

increases, either output growth or external balance will be sacrificed. But the high growth rate from 1980 to 1987 suggests that the additional borrowing was indeed used to finance investment.

In fact, Turkey not only restrained total consumption but reduced it as a proportion of GNP. Government consumption (net of interest expenses and other transfers) was reduced substantially, from 12.3 percent of GNP in 1980 to 8.8 percent in 1986. An important part of the budgetary resources freed by this cut in consumption was used to finance increased public sector investment. Public investment increased by 3 percent of GNP after 1980 to reach almost 14 percent of GNP in 1987. The sustained public sector investment program was an important factor, together with the strong shift toward export incentives, influencing Turkey's high output growth rates after 1980.

Because of the rise in public sector investment, the cut in government consumption did not, however, translate into lower public sector deficits. This occurred even though tax revenue rose as a share of GNP after the value added tax was introduced in 1985 (some of the increase in tax revenue was offset by rising noninterest transfer payments). In fact, after the initial decrease in the public sector's noninterest deficit in 1981, no significant improvement took place. Thus ever higher real interest rates were necessary to reconcile persistent fiscal deficits with external balance targets. High real interest rates induced the private sector to run a matching surplus of savings over investment, which enabled Turkey to sustain fiscal deficits without endangering the current account.

Private consumption, after rising from 72 percent of GNP to 74.5 percent between 1980 and 1984, fell to 69 percent in 1987. The econometric work presented here shows that the rising real interest rates on bank deposits contributed significantly to the increase in private savings. The after-tax real interest rate on time deposits rose from −3.5 percent in 1980 to almost 6 percent in 1984 and close to 13 percent in 1987. Econometric analysis suggests that the private savings rate would have been lower by 2 percent of GNP in 1987 if real rates on time deposits had not increased after 1984.

The high real rates on time deposits also triggered high real lending rates, as banks attempted to maintain their profit margins. However, this did not lead to the expected decline in private investment: although private investment did not boom, it did recover from its low point in 1981 to reach levels similar to those of the early 1970s. The composition of private sector expenditure, like public expenditure, shifted away from consumption and toward investment.

Government policies played an important role in this shift. First, the government provided generous investment incentives from 1980 to 1987. In addition, tax deductibility of nominal interest payments

cushioned the effect of high real interest rates, especially as inflation rose. Second, the amount of credit available to the private sector grew consistently faster than the economy. Third, the growth-oriented fiscal policy and the strong export drive contributed to sustained improvements in capacity utilization, an important determinant of private investment behavior. Finally, the composition of public investment shifted away from areas in which it competes with private investment and toward areas in which the two are complementary. Public sector investment in manufacturing was cut, while public investment in transportation and communications, power, health, and education was increased rapidly. The share of infrastructure in public sector investment rose from below 50 percent in 1980 to about 70 percent in 1986. These factors more than offset the negative effect of high real interest rates on private investment performance. Of course, if high real interest rates make increasing investment incentives necessary, the budget is affected negatively: the cost of public sector debt increases, as does the cost of providing investment incentives.

In summary, the clear improvement in Turkey's noninterest current account was only partly brought about by matching cuts in fiscal deficits. The government needed to continue investing in infrastructure, health, and education to maintain growth. This prevented further cuts, so that a larger surplus of private savings over investment was needed to reconcile fiscal deficits with current account targets. High real interest rates were instrumental in producing this surplus of private net savings. Moreover, Turkey extensively used tax policy, investment incentives, credit policies, and a public sector investment program that was complementary to the private sector's investment plans. All this meant that high real interest rates reduced consumption rather than investment. Thus high real interest rates did not prevent a recovery of private investment; rather, they sustained high growth of the economy.

A counterpart to this strategy is the problem of increased public debt caused by high real interest rates in the presence of interest-bearing government debt. Turkey's domestic public sector debt is small by international standards but rising, as are the associated interest payments. Sustainability of the current fiscal policy is thus an issue in Turkey.

So far we have not addressed one issue that has played a controversial role in Turkey's successful recovery from the debt crisis. Celasun and Rodrik (1989), for example, stress that recovering growth and maintaining a high degree of capacity utilization significantly worsened the distribution of income from 1980 to 1987. The available data present a not altogether clear picture of the question of income distribution in Turkey. A survey conducted by TUSIAD (1986) shows that the

overall income distribution in 1987 was better in the rural areas but worse in the urban areas than it had been in 1973. At the same time Boratav (1990) shows that agricultural income declined substantially and that the agricultural terms of trade deteriorated 53 percent between 1976 and 1986. Thus, although income distribution within agriculture may have improved, agriculture's position compared with that of urban areas probably did not.

Moreover, real wages fell after 1977. A recent survey of manufacturing industries shows that real wages fell about 47 percent between 1978 and 1986. Of this decline, 16 percent occurred between 1978 and 1980 and the rest after 1980. The data of the Social Insurance Institute show a larger drop early (about 40 percent between 1978 and 1980) and a much smaller decline of about 13 percent after that. Even if most of the decline took place before the recovery program, that program probably did not alleviate the problems associated with a deteriorating distribution of income. The exception, of course, is that high growth means relatively high employment growth, and the absence of employment growth is probably the single most important determinant of adverse shifts in income distribution.

What else can be done is not entirely clear. Turkey perhaps could have made greater use of the tax system. Personal income taxes, as in most developing countries, fall disproportionally on wage income. Personal exemptions have been eroded by inflation. A wage rebate system, in which wage earners are eligible to take income tax credits if they document expenditures, was initiated to improve compliance with the value added tax and to assist low-income groups; eligibility is now so general, however, that the program has lost its focus on poverty. In all these areas there is clear room for improvement. The very poor are typically not in the tax system at all and thus cannot be reached by it. The only alternatives may be well-targeted government expenditure on health, education, and so on and, no less important, a buoyant economy. For a strong economy, the macroeconomic issues of sustainability and consistent government policy must be resolved.

Is the Current Fiscal Policy Sustainable?

After 1980, government consumption fell more than public investment increased, and government revenue increased as a share of GNP. Yet fiscal deficits rose substantially after an initial improvement in 1981. To a large extent the worsening fiscal situation reflects the burden of higher interest payments on both foreign and domestic debt. The higher cost of interest paid on foreign debt reflects the increasing share of nonconcessional loans and expensive Dresdner deposits. Interest expenses on the domestic debt also increased: from less than 1

percent of GNP before 1984 for the central government alone to an estimated 2.5 percent in 1987. This increase exceeded the rate of increase in the debt itself by a wide margin, reflecting the rapid rise in the cost of domestic debt.

Real interest rates on auctioned government securities were high once the auctioning system began in 1985. These high rates were rapidly translated into a high average cost of debt as the maturity of government domestic debt was shortened. Moreover, the net cost of debt was even higher than the average gross cost suggests: the government maintained substantial demand deposits in the banking system at interest rates far below the rates at which it borrowed. This raised the net cost of the debt (the excess of total interest payments over total interest receipts divided by net debt).

Two major reasons explain the high cost of the public sector's domestic debt. First, because nonbank participation in the auctioning process is limited, government securities compete with loans in the portfolio of banks, not with time deposits, and lending rates are much higher than deposit rates. Turkey's interest structure is therefore the reverse of that usually observed in the financial systems of other countries. The rate of return on government securities in Turkey is well above the after-tax rate of return on time deposits of corresponding maturities.

Lending rates, in turn, are high because the cost of funds to the banks is high. The high spread between bank lending and borrowing rates can be traced almost completely to operating costs, taxes, and reserve requirements. The deposit rates are also high, however, and this has pushed up bank lending rates and the cost of government debt alike. This is the second reason for the high cost of the public sector's domestic debt. The main explanation of the need to maintain high rates on time deposits is macroeconomic. If current account deficits are reduced and fiscal deficits are large, higher real deposit rates are needed to generate an increase in private savings. The resulting improvement in the surplus of net private savings (that is, private savings minus private investment) allows deficits on the current account to be reduced and fiscal deficits to remain large.

To sum up, one reason for high interest rates on government securities is that the particular way they are marketed makes them compete with lending rates, which are much higher than deposit rates. Simplifying the access of individuals to government securities would reduce the cost of government debt substantially. In addition, relatively few banks participate in the auction, which increases the possibility of collusion and produces a noncompetitive market structure. This too might keep interest rates high. Opening the auction would alleviate this problem. Further reductions can be expected if the policies for

macroeconomic adjustment suggested here are implemented; these policies, especially a significant reduction in the fiscal deficit, would allow much lower real interest rates on deposits and thus reduce the pressure on lending rates and the cost of public sector debt.

The public sector began making a net external transfer of resources after 1984, when the interest payments on its foreign debt exceeded additional foreign borrowing. The transfer was initially accomplished by a substantial improvement in the noninterest fiscal surplus. After 1982 the government began financing its contribution to the external transfer by relying increasingly on monetization and the issuing of high-cost debt. Monetization at high rates is incompatible with lower inflation, and issuing debt at real rates much higher than the real growth rate of the economy threatens Turkey's fiscal balance and achievement of inflation targets in the future. In the meantime, the cost of debt is likely to remain much higher than the growth rate of the economy. This means that continuing primary fiscal deficits will result in a steady escalation of interest payments and an accompanying deterioration of the fiscal deficit.

The problems associated with issuing more debt became even more urgent as the scope for monetization, an alternative source of financing, diminished and shifts in the financial structure reduced the demand for base money. The development of informal repurchase agreements for government securities between firms and banks as well as the introduction of foreign exchange deposit accounts (which increased currency substitution) reduced the demand for money of firms and individuals, respectively. Both factors are natural developments in the financial system. The resulting decrease in the demand for money, however, meant that higher inflation was required to generate the same revenue from the inflation tax. Inflation was very high throughout the period, and in fact accelerated to more than 50 percent. Such high inflation undoubtedly hampers investment and efficient allocation of resources, since high inflation typically also produces high variability of relative prices. Inflation clearly must be brought down, which would produce even less inflation tax revenue.

Thus monetization at current levels is incompatible with the government's inflation targets. Reduced monetization, coupled with restrained external borrowing, dictates a fiscal adjustment to avoid escalating domestic debt service. The only alternative is to reduce significantly the noninterest fiscal deficit. At issue is whether high output growth can still be maintained after such a fiscal retrenchment.

Options for the Future

Until now large fiscal deficits have not prevented a satisfactory current account performance. The price for this success has been the need

to maintain increasingly high real rates of interest to elicit the required surplus of net private savings. Higher real interest rates cannot, however, explain the entire increase in private savings. Our econometric analysis suggests that a substantial part of the increase is due to the above-average growth rates achieved in 1986 and 1987 (8 percent and almost 7 percent, respectively). Private savings are projected to decline if growth rates fall to a more sustainable 5 or 6 percent a year. This is one reason for concern: unless interest rates rise further or substantial fiscal cutbacks are made, the fall in private savings will cause the current account to deteriorate in the future. Moreover, the reduced leeway on both sources of domestic finance cannot be compensated fully by increased external borrowing. The interest rates on external borrowing have also risen higher than the output growth rate. Therefore a cut in the primary (noninterest) deficit is unavoidable. The alternatives are escalating debt service payments or much higher inflation rates.

What is the extent of the required cutback in the fiscal deficit? This book derives a financeable deficit as a target for macroeconomic policy. A financeable deficit does not require more financing than is compatible with sustainable external and domestic borrowing and with the government's targets for inflation and output growth.

Fiscal Adjustment and Output Growth Reconciled

Reducing the fiscal deficit to the extent indicated ensures that the fiscal policy is at least sustainable given other macroeconomic targets. It does not, however, guarantee that those macroeconomic targets will be achieved, only that the fiscal deficit is not inconsistent with them. To what extent would such an adjustment program allow investment to maintain output growth at, say, 5 or 6 percent, about the 1981–85 average? In turn, would such an investment program be compatible with creditworthiness constraints on external borrowing?

This book suggests that the answer depends on how the adjustment is implemented. Fiscal retrenchment allows lower real interest rates and thus more private investment. However, total investment (and therefore output growth) declines if public investment is cut substantially. Cuts in public consumption or increased tax revenues do not have such a negative effect on output growth; in fact, their effect on total investment may be positive since the probable response to lower real interest rates is that private investment will increase and public investment will not fall. The empirical analysis documented here shows the effect on output growth when a deficit cut of 5 percent of GNP comes out of consumption alone and when it is made across the board.[3] Making such a large cutback by reducing public sector

investment rather than by making budget transfers or reducing public consumption reduces output growth by several percentage points a year.

Analysis of Turkey's export prospects, cost of external debt, and anticipated growth rate suggests that current account deficits of at most 2.0 to 2.5 percent of GNP are compatible with maintaining Turkey's creditworthiness if the suggested internal adjustment measures are taken. This would be equivalent to a surplus on the noninterest current account of 0.5 to 1.0 percent of GNP.

The combination of reducing the fiscal deficit substantially and adopting a current account target that is more liberal than Turkey's actual performance in 1987 allows a smaller surplus of private savings over investment. This creates room for lower real interest rates: based on econometric analysis, interest rates are projected to fall by more than 3.5 percentage points from 1987 to 1992. Private investment would therefore increase slightly. Total investment remains above 20 percent of GNP, which is high enough to produce an average growth rate of close to 6 percent. This is higher than the rate averaged during 1981–85, but lower than the average over 1986–87. Accelerating inflation and the falling share of inventory accumulation strongly suggest that the 1986–87 growth performance is not sustainable.

Real rates on Turkey's foreign debt are projected to settle at around 6 percent, which equals the growth rate of real output. Therefore, real interest payments on external debt do not by themselves lead to a rising debt-output ratio. Moreover, the surplus on the noninterest current account is assumed to remain small, so the debt-output ratio is not likely to deteriorate further if the real exchange rate remains at its current level. Thus export growth would slow to at most 6 to 7 percent in real terms given current projections of the output growth of Turkey's trading partners. If, alternatively, a policy of real depreciation is adopted to promote real export growth, the debt-output ratio will increase in line with the accompanying capital losses. Higher real interest rates would reduce the current account deficit at the cost of reduced output growth.

What If External Financing Is Not Forthcoming?

The analysis summarized in the preceding paragraphs presumes that the necessary external financing is available. Turkey has entered a period of substantially increased repayment obligations, and these obligations require additional financing. The amortization of rescheduled debt is occurring at a faster pace, which may cause temporary problems of liquidity. Although these should be recognized as tempo-

rary, with refinancing as the proper solution, additional funds may not be forthcoming in the current external environment.

An extreme alternative assumption would be that no additional (net) foreign financing is available. This implies a target of zero for the current account deficit. Under this assumption, Turkey has two options: to cut its primary fiscal deficit in order to effect the external transfer or to pass the burden of adjustment on to the private sector by issuing domestic interest-bearing debt.

Under the first option, the public sector bears the burden of adjustment. The repercussions of this option on output growth would be severe, especially if the entire cut in the fiscal deficit falls on public investment. Moreover, the additional, required reduction in the deficit is even higher than the initial cut in the current account deficit. According to the econometric analysis, private savings would fall more than private investment, and another round of fiscal cutbacks would be necessary. The debt-output ratio would fall less than the current account would improve because output growth would be slower.

Under the second option, instead of making the fiscal correction, the government could shift the burden of adjustment to the private sector. This would require a substantial increase in real interest rates to generate the necessary private surplus of savings over investment. The fiscal situation would deteriorate rapidly, even if no new debt were issued, because the service on existing debt would escalate. The resulting overall deficit would be too large to finance by monetization at any inflation rate. However, issuing new debt at real interest rates much higher than the real growth rate of the economy would lead to explosive debt service obligations and a major fiscal crisis.

In many ways this is the worst-case scenario: no external funds are forthcoming and the public sector fails to adjust to this situation. Although by no means likely, this assumption demonstrates the need for additional foreign financing coupled with fiscal policy adjustments to restore consistency with a growth-oriented debt strategy. The alternatives are either a slowdown in output growth if the public sector does adjust to reduced external financing or macroeconomic instability if it does not.

This book suggests that if Turkey makes the recommended fiscal adjustments, it can indeed sustain high output growth within the limits set by external creditworthiness. Further internal adjustments are required to remain consistent with current macroeconomic targets. Once these adjustments are made, however, further external tightening seems both unnecessary and potentially damaging to Turkey's prospects for growth.

General Conclusions

Advocating a growth-oriented debt strategy does not, of course, imply a simple-minded belief in the possibility of growing out of debt through borrowing. In such a view, a country could borrow, invest the proceeds, and thereby grow so fast that the debt-output ratio would actually fall, the additional borrowing notwithstanding. Simple arithmetic shows that this requires such a high marginal productivity of capital that it is not possible in practice.[4]

Turkey has demonstrated the possibility of a growth-oriented debt strategy by maintaining growth rates substantially higher than those of post-1982 Latin American countries without increasing its debt-output ratio much more than they did. Moreover, Turkey accomplished this with intelligent economic policy rather than luck, which means that if other countries adopt Turkey's policies, they can expect similar economic achievements. The high cost of reduced output under the Latin American debt strategies is simply unnecessary.

Notes

Introduction

1. The highly indebted group referred to is classified in *World Economic Outlook* as countries with recent debt servicing problems. It is not the same as that publication's fifteen heavily indebted countries, although the patterns of debt accumulation and growth are similar in both groups.

2. See Smith and Cuddington (1985) for an analysis of the determinants of capital flight that supports this view.

Chapter 1

1. To avoid double counting, y should equal the value of domestic output (GDP), not GNP, which subtracts interest payments over foreign debt. To avoid proliferating notation, we nevertheless use y.

Chapter 2

1. The link between net central bank liabilities to the private sector and base money is discussed at greater length in Anand and van Wijnbergen (1989); Anand, Rocha, and van Wijnbergen (1988); and, in particular, Rocha (1991).

2. The dependent variables were divided by their geometric mean and the logarithmic and semilogarithmic forms were estimated using ordinary least squares. The estimate using the semilogarithmic specification had a lower residual variance. See Maddala (1977) on the interpretation of this particular procedure as a Box-Cox test.

3. In 1977 the central bank improved the collection and computation of monetary data. The new series have been published in the central bank's *Quarterly Bulletin* since that time.

Chapter 3

1. Net private savings are private after-tax savings minus private investment.

2. Changes in deficits require changes in real interest rates to induce a surplus of private savings only if private savings do not rise automatically in response to tax cuts. Such an automatic offset may occur if the private sector recognizes that a cut in taxes without a matching cut in expenditure simply raises the taxes it will pay in the future. In this case a tax cut does not affect private consumption. Thus deficits would have a one-for-one effect on private savings and no effect on either real interest rates or the external balance. This is known as debt neutrality. The empirical evidence presented in Chhibber and van Wijnbergen (1988) strongly rejects the assumption of debt neutrality for Turkey.

3. See the appendix to this chapter for documentation on the interest rates and tax wedges that have been used to derive the lending rate figures.

Chapter 4

1. In the rest of this chapter, debt refers to the total foreign debt net of the foreign assets of the public and private sectors. For this purpose, the net foreign assets of the commercial banks, the central bank, and other financial institutions are subtracted from the gross foreign debt of the public and private sectors. Table 4-1 does not, however, use this net measure to maintain comparability with the data provided for other debtor countries.

2. These countries are referred to here as the highly indebted countries. They are not the same as the group of fifteen heavily indebted countries in IMF (various years). Debt accumulation and current account deficits, however, follow similar patterns in both groups.

3. The real value of the debt in foreign goods equals B^*/P^*. Both the dollar value of the debt, B^*, and the dollar-based foreign price index, P^*, are affected by fluctuations in cross-currency exchange rates. Thus if the share of debt denominated in the appreciating currency exceeds that country's share of the basket underlying the foreign price index used to deflate the debt, the cross-currency exchange rate effects on P^* will not offset those effects on B^*.

4. This is true except for 1986, when exports actually fell in dollar terms, mostly because of developments in the Middle East. Exports more than recovered in 1987, however, so the increase in the debt-export ratio in 1986 was probably transitory.

5. Another factor is the commercial policy that largely avoided the bias against exports that characterizes so many countries.

6. The decomposition is based on accounting identities. The debt-output ratio is defined as $\tilde{b}^* = (B^*/P^*)\cdot e/y$; $e = E\cdot P^*/P$, where e is the real exchange rate, B^* is the dollar value of foreign debt, P^* is the dollar-based, export-weighted price index of foreign goods, and E is the nominal exchange rate of the Turkish lira against the dollar. P is a Turkish price index. Increases in the debt-output ratio, $\tilde{b}^* = b^*e/y$, can be traced to the following components:

$\dot{\tilde{b}}^* = -\text{nic}\tilde{\text{as}} + (r^* - n)\tilde{b}^* + \hat{e}\tilde{b}^*$, where a "·" over a variable indicates changes, a "^" indicates percentage changes, and a "~" indicates that a variable is expressed as a share of GNP. The term nicãs is the ratio of the current account surplus to GNP, r^* is the average real interest rate on foreign debt, and n is the real growth rate of GNP.

7. The real value of the external debt in foreign goods is defined as B^*/P^*. P^* is a dollar-based, trade-weighted index of foreign prices; it is the geometric average of the dollar-based wholesale price index (WPI) in Turkey's six principal export markets outside the Middle East, with their respective 1980 share of Turkish exports as weights (rescaled to add up to 1).

8. The weights are rescaled to add up to 1.

9. That is, $b^* = B^*/P^*$, and $b^*e/y = B^*E/Py$, where e is the real, and E the nominal, exchange rate (E in terms of the dollar and e in terms of an export-weighted basket of foreign competitors' prices). P is the Turkish price index, based on the CPI, y is real GNP, and P^* is a dollar-based, trade-weighted index of foreign prices. The actual debt is a geometric average of the dollar-based WPI in the six principal export markets outside the Middle East, with their respective 1980 share of Turkish exports as weights (rescaled so that they add up to 1).

10. The real exchange rate is defined as the relative price of a basket of foreign goods compared with Turkish goods: $e = (EP^*)/P$, where e is the real exchange rate and E the nominal exchange rate of the Turkish lira against the dollar. P is a price index based on Turkish lira and the CPI (with 1980 as the base year). P^* is a dollar-based, trade-weighted index of foreign prices. It is a geometric average of the dollar-based WPI indexes in the six major export markets outside the Middle East, with their respective 1980 share of Turkish exports as weights (rescaled so that they add up to 1): $\log(P^*) = \sum_i a_i \log(P_i/E_i)$. P_i is the local currency-based WPI in country i, and E_i is the exchange rate of the local currency against the dollar, and a_i is the weight of country i in Turkey's exports in the base year 1980. The weights are rescaled so that they add up to 1. To conform with the domestic price indexes used, 1980 weights are taken, which also have 1980 as the base year. All prices and exchange rates are measured at the end of the period, since they are used to adjust the end-of-period stocks of debt.

11. This definition eliminates cross-currency fluctuations both from the definition of nominal rate and from the measure of foreign inflation used to convert nominal into real rates. For a formal definition, see chapter 1.

12. This is true even if the real interest rate is corrected for the cross-currency exchange rate effects. This corrected real interest rate is, in fact, the appropriate concept; since the cross-currency exchange rate effects of the past few years were almost certainly one-time events, incorporating them in this analysis would skew the importance of real interest rates and the debt dynamics term in the future.

13. If only the government borrows and lends abroad, the noninterest current account surplus reflects the public sector's total transfer of resources to the rest of the world. This implies that the private sector as a whole, including the banking system, accumulates capital and claims only on the government

but has no net liabilities abroad. If, however, the private sector also borrows abroad, then the noninterest current account includes the private sector's net resource transfer to or from abroad as well. The noninterest current account surplus therefore must be adjusted to isolate the net resource transfer of the public sector. This is done by subtracting the net resource transfer of the private sector to the rest of the world from the noninterest current account surplus.

14. The numbers refer to the real rate on six-month Treasury bills. See table 5-8.

Chapter 5

1. These numbers do not include the interest expenses on the domestic and foreign debt of state enterprises.

2. A billion is 1,000 million.

3. This is the case, for instance, with the reserves held against the foreign exchange deposits in Turkish banks. Likewise, some of the foreign assets of the central bank, such as credit extended to other countries (mostly Iraq) in exchange for future oil payments, and the central bank's stock of gold are not counted as official reserves.

4. All asset stocks are measured at the end of the period. The appropriate money concept is the net liabilities of the central bank to the private sector. Unadjusted base money corresponds to this concept in the absence of central bank lending to either commercial banks or the nonbank private sector. In the presence of such loans, however, base money must be adjusted downward to the extent of the loans. Broader concepts of money, such as M1 and M2, are not appropriate because a substantial part of the inflation tax on deposits is either channeled to the private sector through loans funded by these deposits or used to cover the high costs of intermediation that are typically associated with high inflation (Hanson and Rocha 1987). That part therefore does not accrue to the public sector. Adjusting M2 for the part that is passed to the private sector in the form of bank loans is, in fact, equivalent to using base money.

5. In addition to these adjustments to the definition of base money, interest payments on required reserves of Turkish lira, as were paid before 1986, reduce the revenue from money creation, while interest on rediscounts provides an additional source of revenue for the central bank. Such interest payments on the components of base money, however, are components of above-the-line costs. See Rocha (1991) for the definitions of inflation tax revenue.

6. $M_t' = M_t - \mathrm{RED}_t + \mathrm{ID}_t$, where M' is adjusted base money, RED are the central bank's rediscounts to the private sector, and ID are the import deposits in the central bank.

7. This may be an overstatement because part of the central bank's rediscounts may have been to the state enterprises.

8. Seigniorage gains due to output growth, expressed as a share of GNP, are defined as $[M_{t-1}(1 + \hat{p}_t)\hat{y}_t]/y_t$, where y_t is real GNP and the other variables are defined as above. This definition implies an output elasticity in the demand for money that is equal to 1.

9. In Turkey long-run inflation elasticities estimated from quarterly data for 1977–86 range between −0.2 (currency) and −0.4 (time deposits). However, inflation elasticities increase substantially at high rates of inflation, and inflation tax revenue eventually reaches a maximum.

10. This is true only during the transition to lower rates of inflation. In steady state, total seigniorage revenue is positively related to the inflation rate as long as inflation elasticity of money demand remains below 1 in absolute terms.

11. Reserve requirement ratios were progressively increased during the 1970s. Between 1972 and 1977, the ratios increased from 25 to 35 percent for demand deposits and from 20 to 30 percent for time deposits.

12. Until 1983 the difference between the statutory and the effective reserve requirement ratios was large mainly because the compliance with central bank regulations was low. Moreover, a six-week lag existed between computation and maintenance. Long lags and inflation reduced the effective ratio because of the growth of the deposit base.

13. The peak in 1984 occurred because of the strong growth of time deposits (117 percent compared with CPI inflation of 49.7 percent). This increase is not fully visible in the ratios of average stocks to GNP.

14. Before 1981 nominal interest rates were controlled and kept below inflation. Between 1981 and 1983, nominal rates were liberalized and administered by a bank cartel. In 1983, the monetary authorities resumed control of nominal interest rates and increased them in line with inflation. In July 1987 the interest rates on one-year time deposits and large-denomination certificates of deposit were liberalized. In February 1988 the government imposed a high ceiling on the one-year deposit: 65 percent.

15. High reserve requirements were not the only factor pushing lending rates up in Turkey. The financial transaction tax and the surcharge for the Resource Utilization Support Fund also raised the cost of funds for borrowers from banks.

16. Calculating the precise distribution of the inflation tax burden for each year would involve taking into account the small but positive interest rate paid on demand deposits, the relation of the interest paid on time deposits to the market rates in that particular year, and the interest paid on reserves by the central bank. This exercise would still support the conclusion that most of the burden of the inflation tax in Turkey fell on borrowers from commercial banks.

17. The monetary authorities and the banks estimate that the share of government securities held by pension funds and insurance companies was negligible; mutual funds, which do hold bonds, began operating in Turkey only in mid-1987.

18. For an analysis of the effects of repurchase agreements on the demand of firms for money in the United States, see Garcia and Pak (1979).

19. A similar phenomenon is likely to occur in the case of mutual funds.

20. The predictions were generated using an econometrically estimated equation for the demand of individuals for sight deposits (see chapter 2).

21. Other costs include additional instability in the demand for money and in the financial system.

22. In February 1988 the interest rates were lowered from 7 percent to 5.5 percent on dollar reserves and from 3.3 percent to 2 percent on deutsche mark reserves.

23. Inflation tax is not levied on reserves that earn market rates of interest. The inflation premium in nominal interest rates reimburses reserve holders for the extra nominal balances they have to accumulate to keep the real stock constant. They do not have to reduce expenditure below income to do this, and no inflation tax is paid.

24. A revenue-sharing certificate gives its holder the right to participate in the revenue generated by a public good (for example, a bridge) for a specific number of years.

25. This point became even more obvious after mid-1986, when the banks were required to place their stock of public deposits in government securities. This is in addition to the ordinary liquidity requirements (28 percent of deposits, of which 23 percent was in government securities) and the reserve requirements (14 percent of deposits). Therefore, government deposits are now fully transferred back to the public sector.

26. The real stocks of domestic debt may also decrease even when the real interest rate is positive if the government redeems the maturing stock by creating additional money, using external debt, or by running a surplus on its primary (noninterest) account.

27. The bulk of the auctioned securities is based on discounts with maturities of three, six, nine, and twelve months. The Treasury tried to lengthen the average maturity of the new issues by offering long-term, coupon-based securities of eighteen, twenty, and thirty-six months, but the sales of these long-term securities remained low.

28. This measure includes the cost of state enterprises' borrowing from commercial banks.

29. The banks carry government securities on an accrued-interest basis. The accrued value of their stock of securities was estimated to be 85 percent of face value in early 1987. Thus the ratio of the estimated face value of bank holdings over total face value was 75 percent in December 1986 and 66 percent in June 1987.

30. The effective tax rate is obtained by dividing income taxes by before-tax profits in the consolidated income statement of banks for 1986. The effective tax rate is much lower than the statutory rate (46 percent).

31. Of course, nonprime lending rates were even higher—about 90 percent during 1985–86. Profit maximization will never produce portfolios consisting entirely of securities. To take advantage of the tax-free status of government securities the banks must generate a positive taxable income. Therefore, they must lend a share of their deposits.

32. The average cost of funds is the average noncompounded interest rate (percent a year) on sight and time deposits. The effective cost of funds to the bank is also higher after the interest rates on deposits are compounded.

33. Measuring the ratio of the stock of assets to GNP and the revenue from the inflation tax involves correcting for differences between prices at the beginning of the period and the average.

34. Capital losses on the external public sector debt are excluded even though they constitute a real increase in public sector liabilities. They are unlikely, however, to recur in the future. This is certainly the case with cross-currency fluctuations; although large movements in the exchange rate are impossible to predict accurately, the consensus is that the dollar has bottomed out. The assumption that no real depreciation occurs for certain cross-currency rates may be more contentious; the consequences of alternative situations are explored in chapter 7.

35. An additional consideration should be the effect of differential reserve requirements on monetary control. With uniform reserve requirements, shifts between deposits do not influence the demand for base money. A portfolio shift between demand and time deposits, however, will influence the demand for base money if the difference between the reserve requirement ratios applicable to each type of deposit is significant. This would complicate monetary policy considerably.

36. The December-to-December inflation rate is probably a misleading indicator of the underlying core inflation rate for 1987. Extensive adjustments in the level of public sector prices caused a 12 percent shift in the price level in December 1987 alone.

Chapter 6

1. Almost the entire increase in private investment was in housing.

2. The domestic equivalent of a foreign interest rate i^* thus becomes $[(1 + i_t^*)E_{t+1}/E_t] - 1$.

3. The average borrowing rate was lower because the rates on selective credit and on credit for prime borrowers were lower.

4. Infrastructure includes irrigation, power, transportation and communications, education, health, and housing.

5. This lack of involvement could, of course, arise from the difference in interest rates, but other savings instruments that offer high real rates are available.

6. In the run, the spread between lending rates and deposit rates is kept constant. A 5 percent cut in borrowing rates thus implies a 5 percent cut in lending rates.

7. Other components of expenditure must be cut or alternative means of financing found; each carries its own cost.

Chapter 7

1. The current discounted value of income minus expenditure equals $(Y - C - I)/(r^* - n)$ if real interest rates and growth rates are constant. Y is national income before foreign interest payments; C and I aggregate consumption and investment expenditure; r^* the average real interest rate on foreign debt; and n the real growth rate of the economy. $Y - C - I$ equals the noninterest

current account surplus. Assuming that this expression should not fall short of the initial debt, the following must hold:

$$(Y - C - I)/(r^* - n) > b^*$$

or

$$\text{nicas} > (r^* - n)\, b^*.$$

Expressing nicas and b^* as shares of GNP gives the expression discussed in the text:

$$\text{nicas} > (r^* - n)\, \tilde{b}^*.$$

Strictly speaking, this formula is valid only if output growth rates and the real interest rate are likely to remain roughly constant.

2. Weighted by their share of Turkey's exports.

3. Interest payments (as a percentage of GNP) $= r^* \cdot \tilde{b}^* = 6 \times 0.51 = 3$ (percent of GNP), where r^* = the real interest rate on the foreign debt and $\tilde{b}^*$ = the debt-output ratio. Therefore, if the current account equals -2.5 percent of GNP, the noninterest current account surplus equals $-2.5 + 3 = 0.5$ percent of GNP.

4. A simple version of this framework is described in Anand and van Wijnbergen (1989). The current version incorporates external debt considerations and implications of the financial structure for inflation tax revenues. See chapter 2 and Anand, Rocha, and van Wijnbergen (1988).

5. This is the deficit reduction required to keep the 1986 fiscal deficit consistent with a 20 percent inflation target.

6. With capital mobility, the anticipated real depreciation would probably drive domestic real rates higher than foreign real rates by the rate of real depreciation. This would clearly exacerbate the fiscal impact of real exchange rate depreciation.

7. The output of Turkey's trading partners is projected to be 3.5 percent. This is an export-weighted average of growth rates assumed in World Bank (1987) for countries of the OECD and the Middle East. Econometric evidence presented in chapter 1 shows the income elasticity of Turkish exports to be about 2, which explains the 7 percent real growth rate for exports.

8. Of course, by virtue of its design, the debt-resource ratio would not increase after such a policy. The debt-export ratio would decrease enough to offset, at the weights chosen, the increasing debt-output ratio exactly.

9. The current account deficit includes only real interest payments; a zero current account deficit thus corresponds to a deficit at positive world inflation rates and positive foreign debt. World inflation is the rate of change in the dollar-based foreign price index used to calculate the real exchange rate.

Chapter 8

1. Net external debt equals gross debt minus the foreign assets of the banking system, including the central bank.

2. The noninterest current account deficit equals the increase in net foreign

debt (funds received from foreigners) minus interest payments made to foreigners. It thus equals the net resource transfer received from the rest of the world and is a more fundamental measure of external (im)balance than the current account.

3. An across-the-board cut in expenditure implies that 60 percent of the cut comes out of public investment (which is the share of public investment in total government expenditure).

4. This would require that the additional output made possible by the extra borrowing would exceed not only the interest rate but also the principal. Thus the gross marginal productivity would have to exceed one plus the interest rate rather than just the interest rate plus the rate of depreciation, which is required by profitability. Such projects are unlikely to be large enough to be of macroeconomic importance.

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The World Bank

Policymakers in developing countries who try to reduce external debt are engaged in a complicated balancing act. Domestic spending programs could be curtailed to free up funds for the repayment of debt. If less money is invested in industry and infrastructure, however, the growth of industrial output—essential to a healthy economy—could be compromised.

The challenge is to determine the set of policies that will maintain solvency and creditworthiness while allowing for investment and economic growth. Governments, with the support of international financial institutions, must decide such issues as how much debt can be sustained, what internal policies will foster solvency, and what exchange rate will best encourage exports.

Turkey's external debt is high, yet it has fared better economically than most highly indebted countries. This book examines the policies followed by Turkey to navigate its way through a debt crisis. The authors show that Turkey's drive to increase exports made it more competitive in the world market, and the concomitant depreciation of the real exchange rate increased its creditworthiness. They conclude that policymakers in other highly indebted countries could learn much from Turkey's experience.

At the time this book was written, Sweder van Wijnbergen and Roberto Rocha were with the Technical Department of the World Bank's Regional Office for Europe, the Middle East, and North Africa; Ritu Anand was with the Bank's Country Economics Department; and Ajay Chhibber was with the Bank's Research Advisory Staff.

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External Debt, Fiscal Policy, and Sustainable Growth in Turkey

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