

# **THE 1994 CURRENCY CRISIS IN TURKEY**

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## **ABSTRACT**

This paper analyzes the 1994 crisis in Turkey. The period preceding the crisis witnessed a continuous deterioration of macroeconomic fundamentals. However, domestic debt financing of public deficits prevented reserve losses and an increase in inflation rate. It is argued that despite weak fundamentals of the period preceding the crisis, in the absence of policy “mistakes” that played a role of a series of shocks in the second half of 1993, the financial crisis could have been avoided.

**Keywords:** Currency crises, domestic debt financing

## **INTRODUCTION**

In the beginning of 1994, the Turkish economy found itself in a very severe financial crisis which, in turn, hit the real economy. The Turkish lira depreciated by almost 70 percent against the US dollar in the first quarter of 1994. The Central Bank heavily intervened in the foreign exchange market, and as a result, lost more than half of its international reserves. Overnight interest rates jumped to unprecedented levels, such as 700 percent, from a stable pre-crisis level around 70 percent. Economic growth declined by 6 percent. The natural questions that arise are: What are the causes of the

1994 crisis? What are the roles of fundamentals versus self-fulfilling expectations? What lessons can be drawn from the Turkish experience? Main object of this study is to answer these questions.

The period preceding the crisis witnessed a continuous deterioration of macroeconomic fundamentals. Based on this fact, can one conclude that the 1994 crisis was inevitable? We show that neither foreign exchange reserves nor interest rates moved in accordance with the predictions of early models of balance of payments crises which give a central role to weak fundamentals. Moreover, premium between the parallel market exchange rate and official rate was steady just before the crisis. In the period preceding the crisis, almost for a five year period, despite a continuous deterioration in fiscal fundamentals, inflation rate remained high but stable. Similar phenomena were observed in other chronic inflation countries, for example in Israel before 1985. Main reason behind this apparent lack of correlation between fiscal fundamentals and inflation is the domestic debt financing of budget deficit.<sup>1</sup> Domestic debt financing not only blurs the correlation between inflation and public deficits but also masks the loss of reserves which has a central role in early models of currency crises.

However, domestic debt financing is not sustainable when real interest rates surpass real economic growth rate and there is no offsetting primary surpluses. The important point is that under these conditions certain actions of both sides of the domestic debt market may trigger a currency crisis. First, despite the demand for domestic debt instruments continues, the supplier of domestic public debt may choose to monetize all or a certain portion of the debt stock. This means that there will be an excess supply of base money which will deplete foreign exchange reserves of the central bank. We dub

this kind of action as a policy “mistake”. It is a policy mistake in the sense that when no corrective fiscal measures are taken, domestic debt finance has to be continued to maintain the level of (low) inflation and (high) reserves attained up to that time. Despite, in the absence of this policy mistake, the demand for domestic debt instruments continues, it pushes economic agents to increase sharply their demand for foreign currency denominated assets causing an upward pressure on exchange rate and inflation rate.

Second, holders of domestic public debt instruments may refuse to hold these assets in their portfolios and instead shift to foreign currency denominated assets. However, this outcome depends on bond-holders’ expectations. There may be a ‘gray zone of fundamentals’, i.e. high domestic debt to GNP ratio, high real domestic interest rates and so forth, where a country not necessarily faces a speculative attack to its currency. However, even government intends to continue to borrow from domestic debt market, due to a reason, for example a crisis elsewhere, there may be an attack to currency which may create a self-fulfilling crisis. In this case, the reason behind a crisis is economic agents’ conjecture that government will not defend currency if they attack. Government’s response, in turn, depends on how price changes if it defends or does not defend, alter its loss function and it is the change in expectations that cause price movements.<sup>2</sup> We argue in what follows that the Turkish episode of 1994 was a case of policy mistake. It has little relation to models of self-fulfilling crises.

In Turkey, since the late 1980s, main financing mechanism of public deficit has been domestic debt. Consequently, the domestic debt to GNP ratio followed an upward trend up to 1994. However, at the end of 1993, policy-makers gave clear signals to the market that they were strongly willing to change the financing mechanism of the deficit.

Short maturity domestic debt auctions were cancelled, and the Treasury started to rely upon Central Bank resources heavily. These were significant policy mistakes. It is argued that despite weak fundamentals of the period preceding the crisis, in the absence of these shocks in the second half of 1993, the financial crisis could have been avoided. This does not mean that fundamentals are not important; on the contrary, they are. They render an economy vulnerable and set the stage for speculation. However, exact timing of the crisis depends upon shocks that play an igniting factor. We further argue that fundamentals in the post-crisis period are, to a great extent, not stronger than the pre-crisis period; nonetheless, no crisis was observed in these years. Taking them as periods of tranquillity, we show that main differences with respect to the crisis period are the absence of two important shocks: Cancellation of domestic public debt auctions and consequent domestic credit expansion of the Central Bank just prior to the burst of the crisis.

The outline of the paper is as follows: In the following section, an ad-hoc exchange rate market pressure index is developed to identify exact timing of the crisis. The third section analyzes economic conditions prevailing in the period preceding the crisis and compares them with recent “tranquil” periods. Section four presents the anatomy of the crisis and final section concludes.

## **II. IDENTIFYING THE CRISIS**

Up to May 1981, there was a fixed exchange rate system in Turkey. At this time, the Central Bank adopted the crawling peg regime in which exchange rates are daily adjusted. In February 1990, Turkey applied to the International Monetary Fund (IMF) for the full convertibility of the Turkish Lira. As of the end of December 1993, the IMF,

in its annual report on exchange arrangements and exchange restrictions, stated that “Turkey follows a flexible exchange rate policy under which the exchange rate for the Turkish lira against the U.S. dollar is determined in the daily fixing sessions held in the Central Bank.” This managed float system is still the current regime prevailing in Turkey.

Under such a system, a central bank can intervene in the foreign exchange market to prevent exchange rate fluctuations that it renders as undesirable. Hence, to measure pressure in the market, in addition to exchange rate changes, one should also consider changes in reserves and interest rates. Using monthly data, an ad-hoc pressure index is calculated as in Eichengreen, Rose and Wyploz (1995), as a weighted average of monthly rates of changes of exchange rate, official reserves and overnight rates. Monthly percentage change of each variable is weighted by the inverse of its variance. Since interbank market is open as of 1987, our data on interest rate are available starting from 1987. The end of the period is December 1997.

Figure 1 shows this index along with its mean and mean plus and minus two standard deviations which are indicated by horizontal lines. Note the uniqueness of the extreme values attained by the index in the 1994.02 - 1994.04 period. This result is robust to the type of weights used. There is one more period during which the value of the index is two standard deviations above the mean regardless of the type of the weight used. This is March 1991 which represents the turmoil in the Turkish financial markets during the Gulf War. November 1989 also appears as a crisis period. However, this result is not robust to types of weights used. Only in one of these periods, namely during the 1994 crisis, monthly rate of increase of exchange rate exceeded its mean plus two

standard deviation level as shown in Figure 2. In what follows we analyze the reasons behind the unique 1994 crisis.

\*\*\*FIGURES 1 AND 2

### **III. THE ROLE OF FUNDAMENTALS**

Early models of balance of payments crises, following Krugman (1979) and Flood and Garber (1984), emphasize continuous deterioration of fundamentals which deplete foreign reserves of central banks as the main cause of currency collapses. This generally materializes through reliance upon seigniorage revenues to finance public sector deficits. A moment comes and rational economic agents, knowing this gradual depletion of reserves, correctly anticipate that prevailing exchange rate regime will not survive.<sup>3</sup> This anticipation triggers a sudden speculative attack on the currency to prevent excessive capital losses. According to this line of research, expansionary fiscal and monetary policies, current account deficits, real overvaluation of the currency should lead a currency crisis. Note that these indicators of weak fundamentals also play an important role in recent models that emphasize the role of self-fulfilling crises. As stated elsewhere, main characteristics of early models are that there should be a gradual depletion of foreign exchange reserves and again a gradual rise in interest differentials due to increased depreciation expectations in the period preceding a currency crisis.<sup>4</sup> We, therefore, first look at the evolution of these two indicators in the period preceding the crisis.

### **III.1 Was the crisis expected long-before its occurrence?**

Figure 3 shows weekly values for foreign exchange reserves of the Central Bank in the 1993 - 1994 period. Reserves were steady up to December 1993. The level for the first week of December was 7.2 billion US dollars which was a record high level. At the end of December, reserves fell to 6.3 billion US dollars, almost the level it attained in the beginning of 1993. At the end of the second week of April 1994, the reserve level was at a minimum of 3.0 billion US dollars. Hence, the reserve fall was not gradual rather sudden. Moreover, it was coupled with the depreciation of the Lira. The important point to note is that both of them occurred after two important shocks given by economic policy-makers which we will analyze in the fourth and fifth sections.

\*\*\*FIGURE 3

Annualized interest rate differentials in the same period are shown in Figure 4. It is the monthly difference of the Turkish Treasury three month bill rate and the U.S. Treasury bill rate with same maturity. The striking fact is that the interest rate differential was also steady just prior to the crisis, contrary to the predictions of the speculative attack models. Moreover, the differential jumped in the crisis period. Hence, developments both in reserves and interest differentials just before the crisis do not fit to predictions of traditional models.

\*\*\*FIGURES 4 AND 5

Agenor, Bhandari and Flood (1992) emphasize the importance of deviations of official rates from parallel market rates for the developing countries. Figure 5 shows parallel market premium in the 1992.01 - 1994.05 period. On average, this premium was 0.76

percent for 1992 and 0.97 percent in 1993. Up to October 1993, the premium followed a steady path, then it started to increase, albeit mildly at the beginning. The December 1993 value was 2.1 percent, then it sharply increased in the first three months of 1994, that is the crisis period. Had the crisis been expected long before, this premium should have gradually been increased. Hence, this is another indicator that the 1994 crisis was sudden, to a large extent, unexpected.

### **III.2 Economic conditions in the period preceding the crisis**

Early models give a special importance to weak fundamentals to explain currency crises. More recent models also emphasize the importance of fundamentals.<sup>5</sup> In this section, we analyze the behavior of important macroeconomic indicators in the period preceding the crisis. We concentrate on indicators that are found among early warning indicators of crises.<sup>6</sup>

Table 1 shows that both the public sector deficit and domestic debt stock to GNP ratios reached unprecedented (high) levels in 1993. Real cost of domestic borrowing was also high and followed an upward trend since 1991. The 1991-1993 period also witnessed primary and operational budget deficits. The natural question that arises is whether such a fiscal laxity necessarily ends-up with a currency crisis. \*\*Eichgreen, Rose, and Wyploz (1995), using the data of OECD countries for the post-war period, investigate whether crisis episodes are preceded, among others, by fiscal laxity. They state that they do not detect any link between lack of fiscal discipline and exchange market turbulence. Frankel and Rose (1996), by using annual observations for the 1971 - 1992 period for 105 countries, analyze 117 different crashes. They report that



“neither current account nor government budget deficits appear to play an important role in a typical crash.” Sachs, Tornell and Velasco (1996a) examine financial events following the devaluation of the Mexican peso for a set of twenty emerging markets. They state that “as important as a country’s fiscal stance may be in theory, however, it is important to notice that irresponsible fiscal behaviour was not among the central causes of recent troubles.” Do these observations mean that there is not any correlation between wrong fiscal fundamentals and a currency crisis? Sachs et. al. (1996a) emphasize that countries with better fiscal performance had the chance to escape from any crisis. As one of the plausible interpretations of their results, Eichengreen et. al. (1995) state that only money-financed deficits may matter. In the fourth section, we will return to this point which is extremely important in understanding the causes of the Turkish crisis.

\*\*\*TABLE 1

Table 2 provides the balance of payments data. Throughout the 1990s, the highest current account deficit was materialized in 1993. Two points should be noted. First, in the 1990 - 1993 period, no upward trend in current account deficit was observed. Moreover, both in 1991 and 1992, current account was almost balanced. This does not mean that the level reached in 1993 is unimportant. Contrary, it was a negative signal which calls for adjustment. Second, sustainability of current account literature stresses that, in the steady state, current account deficit should be less than average growth rate of an economy times its net international debt as a share of GDP. Calvo and Végh (1997) take maximum level of indebtedness as 80 percent of GDP, above which capital markets are reluctant to further extend credit to developing countries. Multiplying 80 percent by the average growth rate of the Turkish economy in the 1969 - 1993 period

which is 4.66 percent, gives 3.7 percent which is higher than the current account deficit of 1993. Hence, albeit being high, the current account deficit was still at a manageable level without necessarily igniting the deep 1994 crisis. Net capital inflow, almost 35 percent of which was short-term, was also at a very high level in 1993.

### \*\*\*TABLE 2

Table 2 gives average real exchange rate figures, as well. These figures are calculated by the State Planning Organization for a basket of currencies with weights 0.75 for the U.S. dollars and 0.25 for the DM. An increase in the index denotes real appreciation and the 1982-1989 average value for the index is 85.9. Hence, the pre-crisis period witnessed a real appreciation. Comparing the value for 1993 with the 1982-1989 average, this real appreciation appears to be almost 9 percent.<sup>7</sup> However, note further that, starting from 1990 up to 1994, the Turkish Lira depreciated in real terms, albeit mildly. Based on these findings, we can say that the Lira was overvalued in the pre-crisis period; nonetheless, this overvaluation was not extreme and moreover some corrective mechanism had already been in play since 1990.

### \*\*\*TABLE 3

What about the liquidity of government? When the liquidity of government decreases, the probability of a crisis increases.<sup>8</sup> Sachs, Tornell and Velasco (1996b) emphasize that even if fundamentals are wrong, a speculative crisis is less likely to occur when the government is liquid. The liquidity of government is not adequately measured by simply comparing foreign exchange reserves of central bank with monetary base. Considering the fact that, during a crisis period, central bank will find itself as a lender of last resort for banks, reserves should be compared with liquid liabilities of the banking sector as a

whole. We take M2Y as total liquid liabilities of the banking sector. It is the sum of currency in circulation, domestic currency denominated deposits, and foreign currency denominated deposits of commercial banks. As a second measure of liquid liabilities, we added short term public debt to M2Y and named this variable as M2YB. Table 3 provides data for these ratios. First note that both M2Y and M2YB as a ratio to foreign exchange reserves of the Central Bank are high. Sachs et. al. (1996b) report that a similar ratio took a value of 7 in Mexico in mid-1994 and 10 just before the crisis. Calvo (1994) notes that the ratio was in the range of 2-3 for Argentina, Chile, Colombia and Uruguay. Hence, from this perspective the value of 6 for Turkey for the end of 1993 can be judged high. However, note also that in sharp contrast to what happened in Mexico in 1994, both of the ratios had been declining since 1992.<sup>9</sup> Table 3 also provides data for M2YB to total foreign exchange reserves ratio. Total foreign exchange reserves are obtained by adding the reserves of the banking sector to that of the Central Bank. This ratio was also declining and moreover was much lower than the M2YB to official reserves ratio.

A key to understand most recent currency crises is the weakness of the banking sector.<sup>10</sup> A weak banking sector may prevent policy-makers to take necessary measures such as increasing interest rates to defend their currencies. Economic agents being aware of this reluctance may attack to domestic currency. Hence, a self-fulfilling crisis may start. Table 3 provides information on the strength of the Turkish banking sector in the 1990s. As stressed elsewhere, rapid credit expansion can be taken as a proxy for the weakness of the banking sector. Main reason is that banks have imperfect information regarding the creditworthiness of borrowers. Rapid credit expansion may exacerbate problems stemming from imperfect information. Hence,

non-performing loans can increase in bank portfolios. Table 3 shows that credit extended by commercial banks as a ratio to GNP was in an increasing trend just before the crisis. In a two year time, this ratio increased by 8.3 percent. Real credit growth figures tell a similar story.

Table 3 reports some financial deepening ratios in the first two columns. In the period preceding the crisis, both the M2Y and M2YB to GNP ratios were trendless. Hence, it can be said that bank weakness did not increase in the pre-crisis period due to the deepening of the domestic financial system. Nonetheless, capital account liberalization in 1990 might have increased tensions in the financial system. Though adequate data are not available, from press coverage it is known that foreign exchange exposure of the banking system increased prior to the crisis. Capital account liberalization provides banks with the opportunity to borrow in foreign currency and lend in domestic currency. This scheme increased the vulnerability of the banking sector.<sup>11</sup> To measure this effect, we used a proxy that is the share of total foreign exchange liabilities of the banking sector to non-residents in their total liabilities. This ratio sharply increased in the period preceding the 1994 crisis.

Let us summarize main points: In the period preceding the crisis, fiscal stance was poor, current account deficit was high, the Lira was overvalued, the government was illiquid according to international standards, and the banking sector was relatively weak. However, it should be mentioned that economic fundamentals of the post crisis period are not better than those of the period preceding the crisis. We now compare macroeconomic indicators of the period preceding the crisis (1992 -1993) with that of the post-crisis period (1996-1997).

### **III.3 Comparison of the pre-crisis period with the “tranquil” 1996-1997 period**

After the 1994 crisis, Turkey signed a stand-by agreement with the IMF in June 1994. However, this stabilization attempt was halted in the mid 1995 before general elections. Since then some of macro-economic indicators deteriorated even more while others mildly improved. In this section we argue that economic conditions as of the end of 1997 are more or less similar to those of the pre-crisis period.

The last two rows of Tables 1-3 provide average figures for the 1992-1993 and 1996 - 1997 periods. As far as primary surplus is concerned, the 1992-1993 period clearly outperforms the post-crisis period. Note however that both of the primary deficit in 1993 and primary surplus in 1997 were both very small. Operational deficit figures lead to a similar conclusion. However, another important indicator of insolvency, that is the average real cost of domestic borrowing to public sector, tells a different story. It was almost two times higher in the 1996-1997 period than the pre-crisis period. Despite primary surpluses, this is mainly why the domestic debt stock to GNP ratio was higher in the second period. Another reason is that the public sector found itself as net external debt payer after the crisis. The share of short term debt was almost doubled in the 1996-1997 period. In the post-crisis period, the public sector borrowing requirement reduced by two percentage points, but it was still at very high levels.

To compare these two periods further, we also conducted a solvency analysis based on Hamilton and Flavin (1986) and Wilcox (1989).<sup>12</sup> The government is solvent if present-value borrowing constraint, which is derived from government budget deficit identity, is not violated. For this to hold, two conditions must be satisfied. First, discounted real domestic debt stock should be stationary. Second, mean of discounted

real domestic debt must be zero. We checked the first condition by using monthly data for the 1985 -1997 period by Dickey-Fuller unit-root tests. Based on the results provided in the first panel of Table 4, one can conclude that fiscal policy was sustainable at the end of neither 1993 nor 1997. We further tested whether the “practical solvency criterion” of Buiters and Patel (1992) was violated. This criterion states that the undiscounted debt to GDP ratio cannot have a positive stochastic or deterministic trend. Using quarterly data for the 1984.I – 1997.IV period, we also performed Dickey-Fuller tests for this variable. The results given in the second panel of Table 4 again indicate insolvency for both of the last quarters of 1993 and 1997.

\*\*\*TABLE 4

Based on these findings, it can be mentioned that fiscal indicators of the tranquil period are not significantly better than those of the 1992-1993 period. Same conclusion also applies for the balance of payments. Note that average current account deficit is higher while overvaluation is lower in the 1996 -1997 period. Short-term capital inflows increased in the second period. Regarding financial deepening ratios, post-crisis values indicate a sharp increase. Similarly, the credit to GNP ratio and real credit growth rate are significantly higher in the 1996 -1997 period as an average and also in 1997 alone. The shares of foreign liabilities of the banking sector in their total liabilities are almost equal in these periods. Hence, it can be said that indicators of our “tranquil” period point to even a weaker banking sector. The “tranquil” period outperforms the first in the governments’ liquidity dimension: the M2YB to official reserves ratio is considerably lower in the second period. Note, however, that when one considers the liquidity of the whole banking sector, that is looking at the M2YB to total reserves ratio, no difference between the two periods is observed.

Hence, there are two periods with more or less similar conditions. However, a crisis occurred in the first one rather than in the second one. Why? The answer to this question mainly lies in the way public sector deficits are financed. We now turn to this issue.

#### **IV. ANATOMY OF THE 1994 CRISIS**

Table 5 provides information on how public deficits were financed in the 1992-1997 period. Quarterly values that show the ratio of each financing item to that quarters' of GNP for the 1993-1994 period are also given in the table. The striking fact is the radical change in the way public sector borrowing requirement was met in the period preceding the crisis. Through the end of 1993 and in the first quarter of 1994, resource to the Central Bank advances enormously increased. At the same time, domestic debt financing as a ratio to GNP continuously declined and became negative in the last quarter of 1993 and the first quarter of 1994. Was this a reflection of a change in the expectations of domestic debt holders? Or, was it a deliberate choice of the government?

#### **\*\*\*TABLE 5**

In the 1989-1993 period, annual inflation rate fluctuated around 65 percent with a standard deviation of 5.2 percent which is calculated from monthly data. That is, there was a substantial inertia in the inflation rate. Note that the same period witnessed a more than doubling of the public sector borrowing requirement (Table 1). How could have the inflation rate remained almost constant when fiscal stance was seriously deteriorating? A prolonged and stable high inflation process is not unique to Turkey. It was also observed, for example, in Israel. Blanchard and Fischer (1989, chapter 10)

and Bruno and Fischer (1990) among others discuss reasons behind this apparent lack of correlation between fiscal fundamentals and inflation. The answer to above posed question lies in the way public sector borrowing requirement is met. If budget deficit is financed by domestic (excluding the central bank) borrowing, then there will not necessarily be an increase in base money. This prevents an increase in inflation rate; hence the absence of a significant correlation between inflation rate and public sector borrowing requirement.

In early models of balance of payments crises, it is gradual depletion of reserves which eventually leads an economy to currency crisis. Main reason behind gradual depletion of reserves is the special way by which public deficits are financed; that is by domestic credit expansion. This excess supply of base money increases demand for foreign currency; hence, the gradual depletion of reserves. However, gradual depletion of reserves can be prevented by changing financing mechanism. Domestic borrowing not only blurs the correlation between inflation rate and public deficit but also masks foreign exchange losses.<sup>13</sup> The important point, however, is that if real interest rate is positive and there is primary deficit, domestic debt financing is not stable. This process will sooner or later come to an end, but the timing depends upon actions of main actors of domestic debt market. First, despite the demand for domestic debt continues, government (supplier of debt) can change its financing mechanism. It can shift to tax financing, or rely on monetization or simply renege on its debt. Second, in this case, even there is no change in the attitude of the supplier, bond demanders can, due to whatever reason, no more desire to hold government securities.

This second type of action can create a self-fulfilling attack. One can imagine a situation where government tries to borrow from domestic debt market, that is



changing the financing mechanism is not its intention. Now, suppose that there is a 'gray zone of fundamentals', i.e. high domestic debt to GNP ratio, high real domestic interest rates and so forth, where in the absence of some external shocks (sunspots) a country not necessarily faces a speculative attack to its currency. However, even the government intends to continue to borrow from domestic debt market, due to some reason, for example a crisis elsewhere, speculators may attack to currency by anticipating that government will not defend its currency. Calvo (1996) develops a model in the spirit of Krugman (1979). The important difference in his model is that fiscal deficits are solely financed by domestic debt. Based on this model, he shows that masking the loss of reserves by issuing domestic debt either eventually generates high inflation or brings forward the balance of payments crisis. He further shows that the outcome strongly depends on bond-holders' expectations.

This did not happen in Turkey. The lead did not come from bond holders. That is, bond holders did not precipitate an attack to the currency with the anticipation that the government would not defend the currency. Instead, despite the demand for government bonds continue, the government explicitly changed its financing mechanism which led the country to face a crisis. Note also that self-fulfilling crises models require that in the post-crisis period there should be expansionary policies that validate anticipations of speculators.<sup>14</sup> However, post crisis policies in Turkey were not expansionary. On the contrary, in May 1994 the Turkish authorities signed a stand-by agreement by the IMF. One can also observe the tightening of monetary policy in Table 5 and the developments of overnight interest rates which are discussed below. Hence, the 1994 Turkish crisis was not a case of a self-fulfilling attack. Rather, it was a policy mistake in the sense that the government should have continued domestic debt finance

to maintain the levels of reserves and inflation rate attained at that time. However, by giving such shocks it precipitated an attack to its currency. Indeed, with the burst of the crisis, the government attempted to finance its deficit by domestic borrowing, but it was too late. We now turn to the details of the crisis period.

In March 1993, the president Mr. Özal passed away. The parliament elected Mr. Demirel, the prime minister, as the new president of the country. Mrs. Çiller replaced Mr. Demirel and became the new prime minister. The new prime minister often stated that one of the most important short-term economic policy aims was to lower interest rates. After the prime ministerial change, the government declared that it was going to pass an annexed budget and also a law (consolidation law) that would permit to cancel the accumulated debt of the Treasury to the Central Bank from the parliament. In Turkey, at that time, the Treasury could borrow from the Central Bank up to 15 percent of budget expenditures by paying almost no interest rate to the Central Bank. This facility is called short-term advances to the Treasury. These two actions, if materialized, would have eased the restriction put by the Central Bank law on the Central Bank finance of budget deficit. These statements and the declaration caused the governor and two vice-governors of the central bank to resign in early August.

In line with the statements of the prime minister, the government tried to administer interest rates which were in the order of 90 percent at that time. The Treasury auctioned government papers on every Wednesday until the end of 1993. In November 1993, there were four auctions, and the Treasury cancelled three of them. In December, four of the five auctions were cancelled. Earlier than these cancellations, in September and October, when auctions for one year bonds are excluded, the Treasury only accepted 19 percent of the subscription offers (Table 6).

### \*\*\*TABLE 6

Since domestic borrowing was disregarded as a financing tool, the government had to rely heavily upon the Central Bank resources. In parallel with its declaration, the government passed two laws in the Parliament. Firstly, in August 1993, the accumulated debt of the Treasury to the Central Bank due to the short term advance facility was cancelled. Secondly, an annexed budget was approved by the Parliament. Consolidation of the accumulated debt and the annex budget allowed the Treasury to borrow almost twice of the original amount. In the last three months of 1993, the amount used by the Treasury reached 2 billion US dollars equivalent of the Turkish lira, almost 30 percent of the foreign exchange reserves of the Central Bank. In the first 21 days of 1993, almost 53 percent of the limit for 1994 (approximately 1.8 billion U.S dollars, almost another 30 percent equivalent of the reserves) were used (Table 7). As a result, most of the base money created by the Central Bank were directed as credit to the public sector. In this turbulent environment, the government made another mistake. At that time, the government securities were exempt from taxes. Through the end of 1993, the government declared that it was going to introduce a 5 percent income tax on government securities, which had been nil throughout 1993.

### \*\*\*TABLE 7

An important point to note is that there was not any reduction in the demand for government securities at least up to November 1993. Moreover the amount of offers in September was the second highest in real terms throughout 1993. In the last two months of 1993, a reduction in the demand was realized (Figure 6)<sup>15</sup>. However, note the timing of the reduction; it materialized after resignations of the Central Bank

officials, approval of two laws, reluctance of the government to sell short-maturity debt in September and October auctions, start of governments' reliance to the Central Bank advances in early October, and discussions on taxation of government papers.

\*\*\*FIGURE 6

Trying to administer the interest rate and the maturity structure of the government debt and the heavy injection of liquidity to the economy immediately affected the exchange rate. While, on average, the exchange rate in the market was 1 percent higher than that of the official rate in 1993, the margin between the market rate and the official rate started to widen by the beginning of 1994. On the 14<sup>th</sup> of January, this margin increased to 5.4 percent, on the following trading day, further to 8.9 percent. Two days later, the margin was 22.9 percent and the Lira was depreciated against the dollar by 19 percent. The Lira/US dollar exchange rate was 18400 at that time. The turbulence in the exchange rate market continued till the mid of April. On the 6<sup>th</sup> of April, the exchange rate reached 38000. In parallel with the sharp real depreciation of the Lira, official international reserves were rapidly diminished.<sup>16</sup>

In parallel with the desire of the government to reduce interest rates, although there was an explicit rush to foreign currency, the Central Bank did not increase the interbank money market rates till the 20<sup>th</sup> of January. Up to that time, the maximum overnight rate was 70 percent. Overnight rates were sharply increased afterwards. For example, on the 11<sup>th</sup> of March, the overnight rate jumped to a record level: 700 percent in simple terms (Figure 7).<sup>17</sup>

\*\*\*FIGURE 7

These developments caused a failure in the government securities market. Literally, the government securities market disappeared. The Treasury was not able to finance itself through domestic borrowing up to the end of May 1994. Note the sharp increase in Figure 6, in real demand for government bonds in June 1994. Another point to note is that although total regular number of auctions in the first two months should be nine, it opened eleven auctions in January and seven in February. Hence, having used more than fifty percent of its short term advance facility from the Bank and due to the turbulence in the financial markets, the Treasury did want to change its behavior. To make this point more explicit, let us take an example. The Treasury cancelled the auction for the three month bills on the 10<sup>th</sup> of November. In this auction, the maximum rate of interest rate asked by the participants was 73.3 percent in simple annual terms. At the beginning of 1994, the auction system was changed. The Treasury began to auction government papers by fixing the maximum interest rate. On February 2, 1994, for three month bills, the maximum rate fixed was 99.4 percent again in simple annual terms. However, "market" participants did not want to play the game any more. The quantity demanded was only TL 142 billion (approximately 8 million US dollars)!

The Turkish government announced a new stabilization package on the 5<sup>th</sup> of April 1994. The package especially relied upon a radical expenditure cut to correct the fiscal fundamentals. A once and for all type wealth tax was also put into action. At the same time, a shock to public prices was given. The stabilization package lacked a very important element: an attempt to solve the funding crisis. The financial crisis ended only after the Treasury was able to re-borrow from the domestic debt market at the end of May, after the stand-by agreement with the IMF. Ironically enough, the rate of interest offered by the Treasury, which had been around 90 percent in the cancelled

auctions, then reached 400 percent. Note that the annual inflation rate was 118 percent at that time.

## **VI. CONCLUSIONS**

In this paper we have analyzed the 1994 crisis of Turkey. We have shown that economic fundamentals were weak just prior to the crisis. However, the crisis was largely unexpected as reflected by steady levels of foreign exchange reserves and interest differentials prior to the crisis. Only soon after two important shocks given to economy, pressures in the exchange market sharply increased and culminated to crisis. First, in the second half of 1993, to prevent a further rise in the cost of servicing the domestic debt, the government cancelled various domestic debt auctions or accepted a small percentage of short maturity offers. Second, it relied heavily upon the Central Bank resources. These shocks triggered a run for foreign currency.

We have argued that prior to the crisis, starting from the late 1980s, heavy reliance on domestic debt finance of continuously increasing budget deficits prevented both an increase in the inflation rate and depletion of reserves. To maintain this outcome, in the absence of corrective measures, domestic debt finance should have been continued. However, continuation of this process depends on actions of both sides of the debt market. In the Turkish case, it was the supplier who changed its behavior.

The main policy lesson that can be drawn is that countries with open economies which mask undesired consequences like high inflation and reserve losses of high public deficits by relying upon domestic borrowing should abstain from changing rules of the game. That is, in the absence of radical stabilization measures, governments of such

countries should do their best to continue debt finance. A failure in fulfilling this condition causes governments to face the inevitable collapse rather early.

## **ENDNOTES**

Thanks are due to Hasan Ersel and the referee for their helpful comments. The usual disclaimer applies.

1. See, Blanchard and Fischer (1989, chapter 10) and Bruno and Fischer (1990) among others.

2. See, for example, Obstfeld (1994) on this issue.

3. The exchange rate regime prior to the collapse is taken as fixed in Krugman and Flood and Garber, but extended to crawling pegs and managed floats as well. For a survey see Agenor, Bhandari, and Flood (1992) and Blackburn and Sola (1993).

4. See for example, Eichengreen, Rose and Wyplosz (1995), Obstfeld (1994), and Sachs, Tornell and Velasco (1996 b).

5. For example, Obstfeld and Rogoff (1995) state that “More recent theories emphasize the importance of economic fundamentals as broadly determining the potential vulnerability of a fixed-rate regime to attack, but incorporate a multiplicity of short-run equilibria so that the exact timing of the attack can depend on sunspots.”

6. See for example Eichengreen, Rose and Wyplosz (1995) and Rose and Frankel (1996).

7. Frankel and Rose (1996) find that real appreciations that exceed 10 percent create problems.

8. See, for example, Calvo and Mendoza (1996) on this point.

9. The underlying reason is that the foreign exchange reserves of the Central Bank were then continuously increasing. This is a result of domestic debt financing of the public sector borrowing requirement. Calvo (1996) notes that relying upon domestic debt finance will insulate international reserves from fiscal disequilibrium prior to the balance of payments crisis.

10. See for example Obstfeld (1996). Sachs, Tornell and Velasco (1996a) especially emphasize this point for emerging markets that faced collapses due to the Tequila effect.

11. Note that in a recent study Chang and Velasco (1998) argue that this factor played a very important role in the 1997- 1998 crises in Asia.

12. We slightly changed the test proposed in Wilcox (1989) by deriving the solvency constraint for domestic debt stock rather than total debt stock. We do not go into details of this test, just summarize the results.

13. As stated above, in the period preceding the 1994 crisis, official reserves did not follow a gradual downward trend as envisaged in early models of currency crises. Moreover, reserves were increased (Figure 3 and Table 2).

14. See, for example, Flood and Marion (1996) on this point.



15. When 1993 average is taken as 100, the September and October values are found as 150.4 and 129.4 respectively. Note that annual averages for 1995, 1996, and 1997 were 144.2, 257.6, and 171.8.

16. See Figures 3 and 5 and the discussion in Section III.1.

17. This graph which is based on daily data has two discontinuities for March 14-15, and May 19-20, May 23-24, 1994 due to religious holidays.

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TABLE 1: Main Fiscal Indicators (% of GNP), Inflation and Growth Rate

	Total	Primary	Operational	Public Debt			Real Rate	Inflation	Growth
	PSBR	Surplus (CB)	Surplus (CB)	Domestic	Foreign	Short Term/Total	of Interest (%)	Rate (%)	Rate (%)
1983	4.9	0.2	0.2	3.0	33.9	n.a	0.6	31.2	4.4
1984	5.4	-2.6	-2.6	3.9	36.1	10.8	-3.2	48.4	7.1
1985	3.6	-0.6	-0.7	4.3	35.2	11.4	3.6	45.0	4.3
1986	3.7	-0.5	-0.9	4.6	39.9	11.5	14.1	34.6	6.8
1987	6.1	-0.4	-0.6	5.8	46.6	12.8	6.6	38.9	9.8
1988	4.8	0.8	0.9	5.7	49.0	9.0	-6.3	75.4	1.5
1989	5.3	0.1	0.1	6.3	35.5	6.0	-2.8	63.3	1.6
1990	7.4	0.4	0.6	6.1	28.4	5.7	-4.6	60.3	9.4
1991	10.2	-1.5	-1.7	6.8	31.7	8.3	8.1	66.0	0.3
1992	10.6	-1.7	-2.0	10.5	31.3	10.0	9.6	70.1	6.4
1993	12.0	-0.5	-1.2	12.8	31.5	8.4	13.0	66.0	8.1
1994	7.9	3.9	2.7	13.9	48.4	13.9	28.2	106.3	-6.1
1995	5.4	3.6	2.9	14.6	38.6	16.5	14.6	93.6	8.0
1996	9.4	1.7	-0.4	18.4	35.7	20.1	30.4	80.4	7.1
1997	9.5	0.3	-0.3	20.0	33.7	16.1	11.8	85.7	8.0
1992-1993 Average	11.3	-1.1	-1.6	11.7	31.4	9.2	11.3	68.1	7.3
1996-1997 Average	9.5	1.0	-0.3	19.2	34.7	18.1	21.1	83.1	7.6

Source: State Planning Organization. PSBR: Total public sector borrowing requirement, CB: Consolidated budget. Total public sector covers consolidated budget, state economic enterprises, special funds and municipalities. Debt figures are for the end of the year.

Real interest rates are obtained from average compounded annual nominal interest rates realized in Treasury auctions. Inflation rate is annual average consumer inflation rate. Growth rate is real GNP growth rate. n.a.: not available.

TABLE 2: Balance of Payments (% of GNP)

	Capital Inflows					Current	Real	
	Total	Short-Term	Direct	Portfolio	Other Long	Account	Change in	Exchange
			Investment	Investment	Term	Balance	Reserves	Rate
1990	2.7	2.0	0.5	0.4	-0.1	-1.7	0.9	100.2
1991	-1.6	-2.0	0.5	0.4	-0.5	0.2	-0.7	98.4
1992	2.3	0.9	0.5	1.5	-0.6	-0.6	0.9	94.6
1993	4.9	1.7	0.3	2.2	0.8	-3.5	0.2	93.6
1994	-3.2	-3.9	0.4	0.9	-0.6	2.0	0.2	75.9
1995	2.7	2.2	0.4	0.1	0.0	-1.4	2.7	87.2
1996	5.3	3.8	0.3	0.3	0.9	-2.9	2.5	86.7
1997	4.7	1.2	0.3	0.8	2.4	-2.4	1.7	86.7
1992-1993 Average	3.6	1.3	0.4	1.8	0.1	-2.1	0.5	94.1
1996-1997 Average	5.0	2.5	0.3	0.6	1.6	-2.7	2.1	86.7

Source: Central Bank Quarterly Bulletins and State Planning Organization Main Economic Indicators.  
 An increase in real exchange rate denotes appreciation. The 1982-1989 average of real exchange rate is 85.9.  
 The weights in the currency basket are 0.75 for the US dollars and 0.25 for DM.

TABLE 3: Financial Indicators (%)

	M2Y / GNP	M2YB / GNP	M2Y / Reserves	M2YB / Reserves	M2YB / Total Reserves	Credit / GNP	Real Credit Growth	Foreign Liabilities / Total Liabilities
1990	23.5	24.9	5.3	5.7	3.5	17.4	9.7	7.1
1991	26.5	29.4	6.7	7.5	3.6	16.8	-10.2	7.0
1992	26.6	30.5	5.6	6.4	3.1	17.7	10.4	10.9
1993	23.7	26.9	5.3	6.0	2.6	18.2	8.7	14.1
1994	30.7	38.6	4.4	5.5	2.8	16.2	-23.0	7.0
1995	30.7	38.8	3.3	4.1	2.5	18.2	29.1	8.5
1996	35.9	46.1	3.1	3.9	2.9	21.8	26.6	10.7
1997	35.6	43.6	2.8	3.4	2.9	25.3	15.5	13.9
1992-1993 Average	25.2	28.7	5.4	6.2	2.9	17.9	9.6	12.5
1996-1997 Average	35.7	44.8	2.9	3.7	2.9	23.5	21.0	12.3

Source: Central Bank Quarterly Bulletins, various issues.

M2Y=M2+foreign exchange deposits, M2YB=M2Y+short term domestic public debt. Reserves are official foreign exchange reserves excluding gold. Total reserves are official reserves plus reserves of commercial banks. Credit is the total amount of credit extended by commercial banks. Foreign liabilities are foreign liabilities of commercial banks to non-residents. Hence, it excludes foreign exchange deposits of the residents.

TABLE 4: Unit Root Tests

A. Discounted Real Domestic Public Debt					
	$\alpha_0$	$\alpha_1$	$\beta$	AR1-1	AR1-12
1985.6 – 1993.12	2.83	2.81*	-2.79	0.83	0.26
1985.6 – 1997.12	2.17	1.44	-1.93	0.96	0.63
B. Domestic Public Debt to GNP Ratio					
	$\alpha_0$	$\alpha_1$	$\beta$	AR1-1	AR1-4
1984.II – 1993.IV	1.53	1.67	-1.60	0.25	0.28
1984.II – 1997.IV	2.04	2.01	-2.18	0.36	0.43

The estimated equation is  $\Delta y_t = \alpha_0 + \alpha_1 t + \beta y_{t-1} + b_1 \Delta y_{t-1} + \dots + b_n \Delta y_{t-n}$ , where  $y$  is the log of the discounted real domestic public debt for Panel A and the domestic public debt to GNP ratio for Panel B.  $\Delta$  is the first difference operator and  $t$  denotes time trend. In columns  $\alpha_0$ ,  $\alpha_1$  and  $\beta$   $t$ -values are shown. AR1-1 is for the first order, AR1-4 is for the fourth order and AR1-12 is for the twelfth order autocorrelation test. The reported values are the  $p$ -values obtained from Breusch-Godfrey serial correlation LM test. No lags of the dependent variables are included ( $n=0$ ) since these tests did not indicate any significant autocorrelation. \* indicates a significant value at the 5 percent significance level.

TABLE 5: Financing of the Consolidated Budget Deficits (% of GNP)

	Net Foreign Borrowing	Central Bank Advances	Net Domestic Borrowing			Total Borrowing Requirement
			One Year Maturity	Less Than One Year Maturity	Total	
1993.I	0.6	1.9	-0.1	8.1	8.0	7.7
II	1.0	1.1	0.9	1.7	2.6	4.9
III	0.4	2.1	1.8	1.4	3.2	4.6
IV	1.9	4.7	2.4	-3.1	-0.7	7.6
1994.I	1.5	10.1	-0.1	-0.3	-0.4	11.3
II	-1.3	-3.7	-1.0	8.4	7.4	-0.8
III	-2.9	0.3	-2.1	7.1	5.0	2.6
IV	-2.2	2.0	-2.7	6.8	4.1	4.7
1992	0.4	1.6	1.4	2.2	3.6	5.4
1993	1.1	2.7	1.5	1.1	2.6	6.3
1994	-1.7	1.3	-1.8	6.3	4.5	3.9
1995	-1.0	1.2	1.1	2.5	3.6	3.7
1996	-0.9	1.5	1.8	5.3	7.1	8.3
1997	-1.5	0.0	5.1	3.5	8.5	7.3
1992-1993 Average	0.7	2.1	1.5	1.6	3.1	5.8
1996-1997 Average	-1.2	0.8	3.4	4.4	7.8	7.8

Source: Central Bank Quarterly Bulletins, various issues.

Net foreign borrowing, total net domestic borrowing, and Central Bank advances do not add up to total borrowing requirement. The reason is that there is another 'financing' item called 'other' which for example includes deferred payments.

TABLE 6: Auctions of Treasury Bills and Bonds in 1993 (in Billion TL)

	September	October	November	December
Maturity: 12 months				
Amount of Offers	18730	28866	14942	9743
Amount of Offers Accepted	6290	26159	6582	7957
Acceptance Percentage	33.6	90.6	44.1	81.7
Average Interest Rate (%)	87	86.7	87.9	89.2
Maturity: 9 months				
Amount of Offers	20263	10699	1433	828
Amount of Offers Accepted	3772	3502	701	0
Acceptance Percentage	18.7	32.7	48.9	0
Average Interest Rate (%)	85.9	86.2	87.9	91.3
Maturity: 6 months				
Amount of Offers	16566	10007	2917	1577
Amount of Offers Accepted	1943	1946	0	0
Acceptance Percentage	11.7	19.5	0	0
Average Interest Rate (%)	84.8	82.1	86.7	91.1
Maturity: 3 months				
Amount of Offers	4521	6174	2278	1453
Amount of Offers Accepted	974	1000	0	0
Acceptance Percentage	21.5	16.2	0	0
Average Interest Rate (%)	82.3	79.6	91.8	90.3

Source: The Treasury and the Central Bank.

Notes. In September 1993, there were two auctions for bills with 9-month maturity, and in December 1993, there were two auctions for bills with 6-month maturity. Amounts offered and accepted show the total of these two auctions. Interest rates are annual compounded rates.



TABLE 7: Short-Term Advances Extended by the Central Bank to the Treasury

	Short Term Advances		Reserves	Advances / Reserves
	(Billion TL)	(Million \$)	(Million \$)	(%)
October 1993	8027	604	6853	8.8
November 1993	9469	678	7198	9.4
December 1993	10967	740	6213	11.9
The first week of 1994	10038	659	5886	11.2
The second week of 1994	12726	808	5825	13.9
The third week of 1994	4869	295	5887	5.0

Source: Central Bank Weekly Statements.

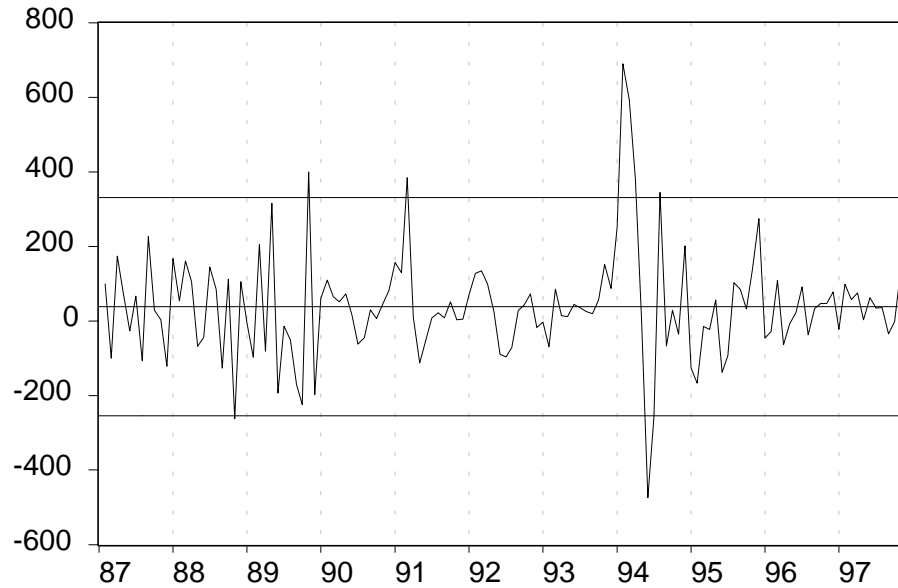


Figure 1. Exchange Market Pressure Index (1987.02=100), Its Mean and Plus and Minus Two Standard Deviations

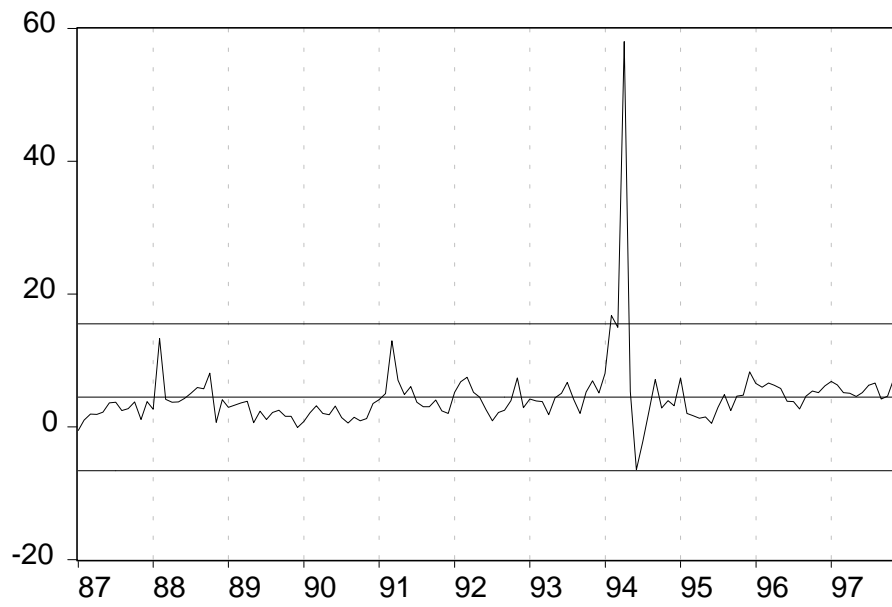


Figure 2. Monthly Rate of Change of the Exchange Rate, Its Mean and Plus and Minus Two Standard Deviations (%)

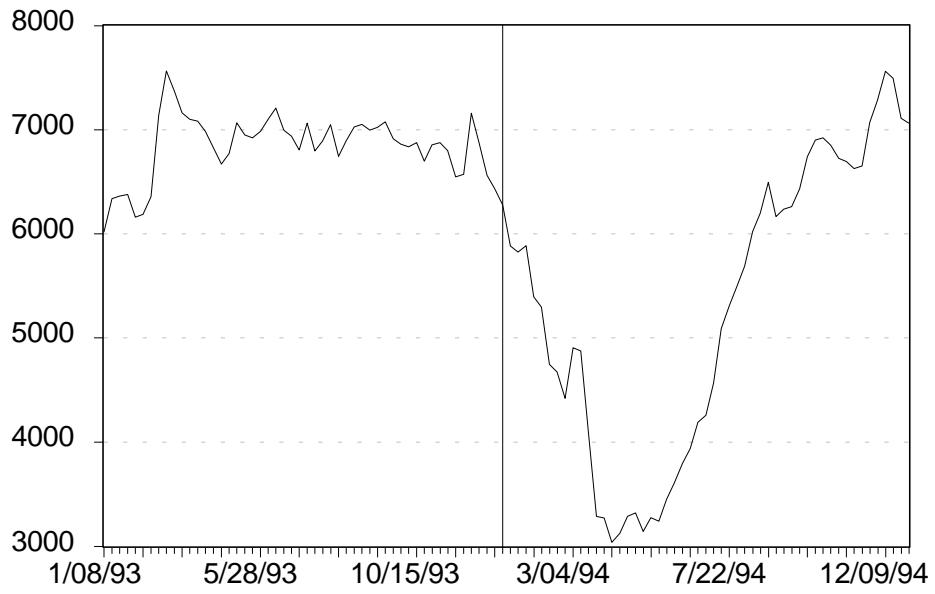


Figure 3. Foreign Exchange Reserves of the Central Bank  
(Million US \$, Weekly Data)

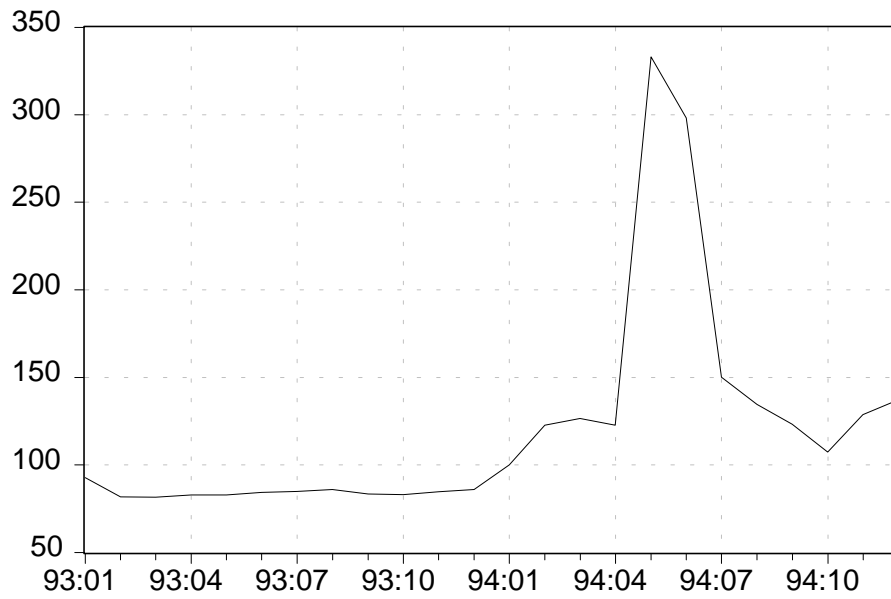


Figure 4. Interest Rate Differential (%)

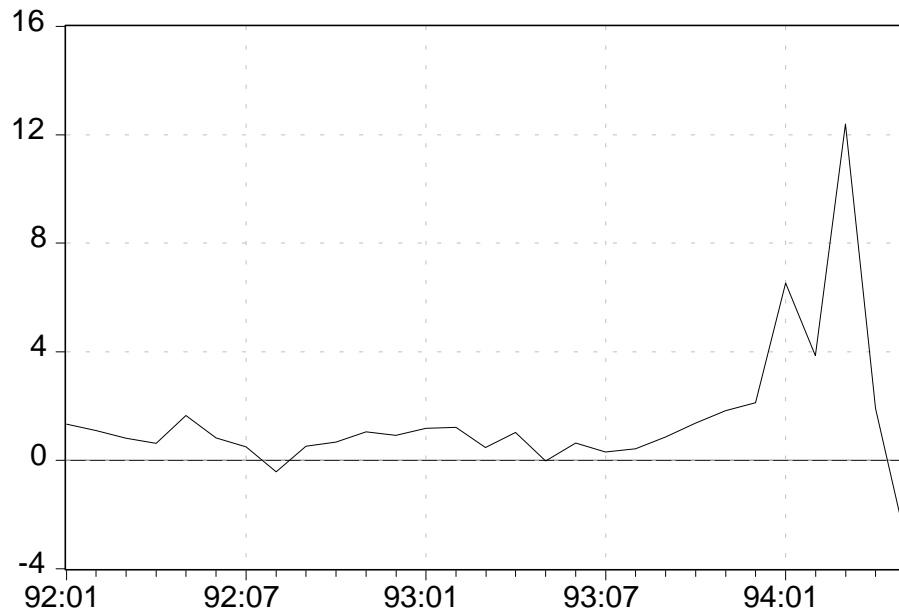


Figure 5. Percentage Difference Between the Market Exchange Rate and the Official Rate

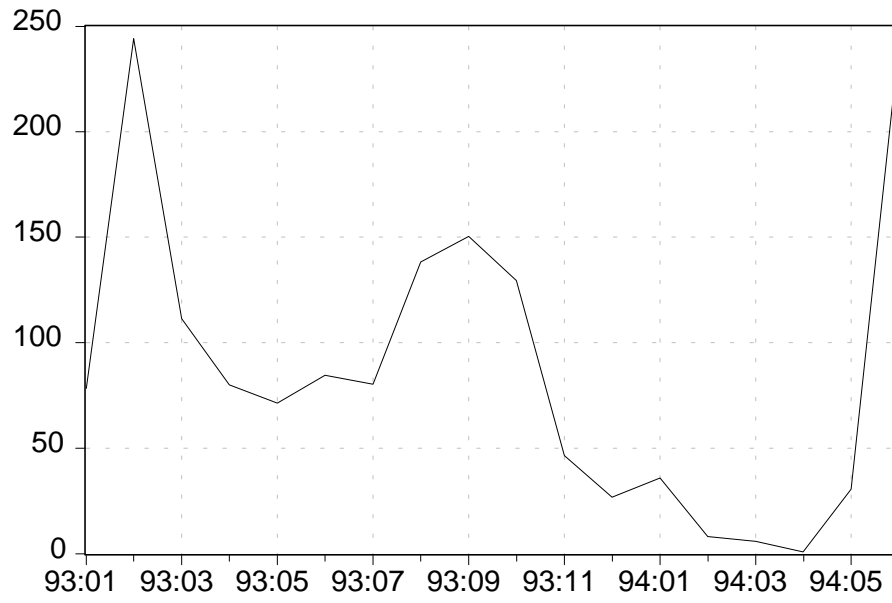


Figure 6. Real Amount of Monthly Offers in the Domestic Debt Auctions (Index, 1993 Average=100)

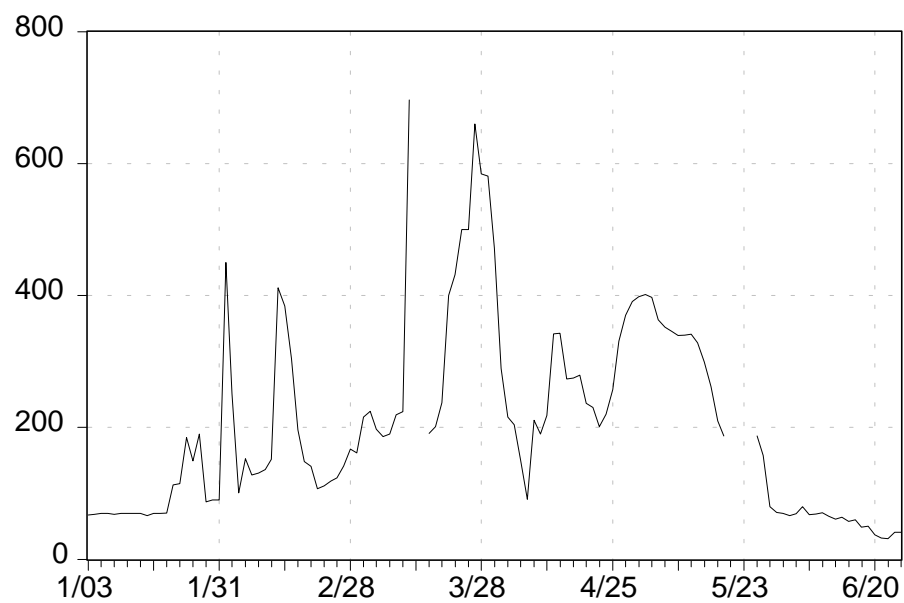


Figure 7. Average Interbank Interest Rates  
(Daily Data, 3.1.1994 - 24.6.1994, In Simple Terms, %)