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**BANKING SECTOR FRAGILITY AND TURKEY'S
2000–01 FINANCIAL CRISIS**

**Fatih ÖZATAY
Güven SAK**

**RESEARCH DEPARTMENT
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Banking Sector Fragility and Turkey's 2000–01 Financial Crisis*

Fatih ÖZATAY
Central Bank of Turkey and Ankara University

Güven SAK
Central Bank of Turkey and Ankara University

The Turkish economy was hit by two crises in the last decade. The first one, which attracted surprisingly limited international interest, occurred at the beginning of 1994, at which time there was a managed float.¹ The second crisis, preceded by financial turmoil, erupted in the second half of November 2000 in the midst of a stabilization program based on the exchange rate. In response to the turmoil, a new letter of intent was presented to the International Monetary Fund (IMF) by the government, which calmed market pressure. However, at the end of December average interest rates—both the overnight and secondary market bond rates—were almost four times higher than levels at the beginning of November and more than five times higher than the preannounced (at the outset of the 2000-02 program) year-end depreciation rate of the lira. This unsustainable situation ended on February 19, 2001, when Prime Minister Bülent Ecevit announced that there was a severe political crisis (without naming a specific cause), which had ignited an equally serious economic crisis in the highly sensitive markets. The markets were already jittery due to what had happened at the end of the preceding year. On that February day, overnight rates jumped to unprecedented levels of 6,200 percent in uncompounded terms. Three days later the exchange rate system collapsed, and Turkey declared that it was going to implement a floating exchange rate system.

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¹ Özatay (2000), which analyzes the 1994 crisis, argues that despite the weak fundamentals of the period preceding the crisis, it could have been avoided. Turkey could have escaped the turmoil had there not been policy mistakes—mistakes that played a role in a series of shocks in the second half of 1993.

The crisis of 2000–01, which was more severe than that of 1994, raises a multitude of questions. What were the reasons behind the events of 2000–01? Why did the crisis erupt in the midst of the IMF-supported stabilization program? What are the lessons that can be drawn? By answering these questions, this paper concludes that the root cause of the crisis was the combination of a fragile banking sector and a set of triggering factors that made this fragility crystal clear.

The banking sector's weakness is noted in other studies of the recent Turkish crises. Akyüz and Boratav point to shortcomings in the design of the 2000–02 stabilization program and the inadequacy of crisis management policies.² They emphasize the dependence of the banking sector's earnings on high-yielding Treasury bills, thus rendering this sector highly vulnerable to disinflation. They further argue that since much of the fiscal adjustment was predicated on declines in nominal and real interest rates, the program was not compatible with this feature of the banking system. Alper focuses on the events that occurred at the end of 2000.³ He argues that three factors were responsible for the crisis: the inability of the Turkish government to maintain the stream of good news and sustain capital inflows; not enough backing for the IMF program; and the "no sterilization" rule of the program, which led to interest rate undershooting in the first phase of the 2000 program. The banking sector's fragility is a major theme of the analysis presented in Alper's work.

Unlike the two studies mentioned above, this paper analyzes the structural characteristics of the Turkish banking system and provides a precise definition for banking sector fragility in the context of Turkey right before the crisis. This paper demonstrates that pressure in the markets increased at the end of 2000. It shows that although the macroeconomic fundamentals were rather weak in 2000, the prerequisites of the first-generation crisis models were absent (see table 1 for descriptions of crisis model features). The role of self-fulfilling prophecies is discussed, and an analysis of the performance of the economy in the aftermath of the crisis is presented.

Was the principal cause of the Turkish crisis a prospective deficit associated with implicit bailout guarantees to a failing banking system? Or was the root cause of the problem financial fragility in the banking sector in the sense of a third-generation crisis model? This paper analyzes the banking sector structure in the period preceding the crisis and provides strong evidence that points to the weakness of the banking sector. Furthermore, this paper identifies two types of dichotomy in the banking sector: between private and state banks and within the private banks.

² Akyüz and Boratav (2001).

³ Alper (2001).

Table 1. Salient Features of Crisis Models

<i>Crisis model</i>	<i>Features</i>
First generation	<ul style="list-style-type: none">a. Controlled exchange rate.b. Loose fiscal policy, budget deficits are financed by printing money.c. Investors act on an unsustainable situation due to inconsistency between macroeconomic policies and the exchange rate regime.d. Efficient markets are assumed, and the regulatory and institutional structures of financial markets are not considered.e. No output decline in the post crisis period.f. Leading indicators available; gradual decline in reserves and gradual increase in the interest rate differential.g. Natural collapse, given the policy framework; government is the culprit.
Second generation	<ul style="list-style-type: none">a. Controlled exchange rate.b. Macroeconomic policies and the exchange rate regime are not necessarily inconsistent, but some domestic concerns (unemployment and so on) on the part of policymakers may lead them to change the existing policy framework.c. Despite sound monetary and fiscal policies, investor pessimism and the resultant portfolio shift from domestic currency-denominated assets to foreign currency bring an end to the exchange rate regime.d. Efficient markets are assumed; the regulatory and institutional structures of financial markets are not considered; balance sheets do not necessarily matter.e. Faster growth potential after the collapse.f. No leading indicators available.g. No natural collapse; speculators are the culprits.
Third generation	<ul style="list-style-type: none">a. Controlled exchange rate.b. Macroeconomic policies and the exchange rate regime are not necessarily inconsistent.c. Despite sound monetary and fiscal policies, investor pessimism regarding financial soundness of banks and corporate sector lead to a portfolio shift from domestic currency-denominated assets to foreign currency that brings an end to the exchange rate regime.d. Informationally inefficient markets are assumed; weak regulatory and institutional structures are considered for the country, allowing risk accumulation in bank and corporate sector balance sheets; balance sheets do matter.e. Slower growth potential after the collapse due to damage done in banking and corporate sector balance sheets.f. No leading indicators available; possible to follow accumulation of risks in balance sheets, but change in risk perception of investors is hard to specify.g. No natural collapse.

Source: Authors' notes.

What were the major distinctions between 1999 and 2000?

- As opposed to the managed floating exchange rate system of 1999, there was a pre-announced crawling peg system in 2000.
- The current account registered a record high level of deficit in 2000.
- Given a weak banking system, delays in reforming the banking sector increased tensions in the markets in the second half of 2000.
- A takeover of some of the private banks, starting in October 2000—and, at the same time, sensational criminal investigations of some bankers—made it clear that the banking system was not homogenous, but rather dichotomized as “good” and “bad” banks. This intensified rumors about which banker or bank was next in the line for investigation. As a result, in the second half of November 2000 good banks closed their credit lines to bad banks. This paper argues that the first two differences listed above were not sufficient to trigger the crisis. The main igniting factors were the delays in reforming the banking sector and the actions that caused the dichotomy in the banking sector to come to the surface.

Identifying the Crisis

In February 1990 Turkey applied to the IMF for full convertibility of the lira. Up to January 2000, a managed floating exchange rate system was operative. At the end of 1999, Turkey signed a standby agreement with the IMF and started to implement a stabilization program, a pillar of which was a pre-announced, crawling peg exchange rate regime. The novelty of this exchange rate regime was that both the exit strategy and date of exit were known publicly at the very beginning of the program. It was announced at the agreement's signing that after eighteen months the exchange rate would be allowed to fluctuate in a continuously widening band. However, after a sky-high overnight rate (as high as 6,200 percent in uncompounded terms) and a huge decline in the foreign exchange reserves of the Central Bank of Turkey, on February 22, 2001 (just four months before the exit day) the exchange rate system collapsed and the central bank declared that it would allow the lira to float freely. By this announcement, the dollar rate jumped from a level of 685,000 liras to 958,000 liras in one day.

Figure 1 shows the pressure in the markets based on an ad hoc exchange market pressure index, along with its mean and mean plus two standard deviations, which are indicated by horizontal lines. As advocated by Eichengreen, Rose, and Wyplosz as well as Sachs, Tornell, and Velasco, this pressure index is a weighted average of monthly rates of changes of exchange rate, (the negative of) official reserves, and overnight rates for the January 1990 to December 2001 period.⁴ The monthly percentage change of each variable is weighted by the inverse of its variance. There are two instances at which the index exceeds its mean plus two standard deviations: the first one is the February to April 1994 period and the second is the February to April 2001 period. This result is robust to the types of weight used. Figure 1 does not indicate the first attack against the lira, which occurred at the end of November 2000, since the central bank's defense of the lira was successful at that time. However, as a result of this attack, the central bank lost almost 20 percent of its foreign exchange reserves, while the average overnight rate jumped to 873 percent, again in uncompounded terms. To highlight the severity of this attack, the evolution of the individual items of the market pressure index is provided in figures 2 to 4. Figure 2 presents the dollar-lira rate from the first working day of 1999 to the last working day of 2001. Figure 3 shows the evolution of the weighted average overnight rates in the same period. Finally, the time path for the weekly foreign exchange reserves of the central bank is demonstrated in figure 4.

Fundamentals and Self-Fulfilling Prophecies

The first- and second-generation models of currency crises may shed some light on the 2000–01 crisis but cannot fully explain what happened. For example, on the one hand, in the period preceding the crisis, the public sector borrowing requirement was very high. This brings to mind a first-generation type crisis. On the other hand, the public sector borrowing requirement was mainly financed by issuing domestic debt rather than by inflation tax, which is at the core of such models. Moreover, corrective fiscal measures had already been taken. On the one hand, high levels of short-term public debt and a weak banking sector might have set the stage for a self-fulfilling attack, inducing speculators to anticipate that the government would not dare to increase interest rates to defend the currency. On the other hand, despite corrective measures the fundamentals were weak, output contracted sharply, and the fiscal policy was not expansionary in the aftermath of the crisis, contrary to what the second-generation models envisage.

⁴ Eichengreen, Rose, and Wyplosz (1995); Sachs, Tornell, and Velasco (1996a).

First-Generation Type Crisis?

Early models of balance of payment crises, following Krugman as well as Flood and Garber, emphasize continuous deterioration of macroeconomic fundamentals—which depletes international reserves of central banks—as the main cause of currency collapses.⁵ This generally materializes through reliance upon seigniorage revenue to finance public sector deficits. There comes a point in time when a rational economic agent will realize that a gradual depletion of international reserves is an indicator that the prevailing exchange rate regime will not survive. This anticipation triggers a sudden speculative attack on the currency to prevent excessive capital losses. The collapse of the exchange rate system is inevitable due to its incompatibility with loose monetary policy. Table 2 provides information on how consolidated budget deficits were financed in the 1995–2001 period.⁶ As table 2 indicates, the Central Bank of Turkey's lending was zero since 1997. Moreover, in the same period base money creation was entirely through foreign exchange reserve buildup, except during the 1998 Russian crisis. Table 3 documents the evolution of the three main items of the central bank's balance sheet (namely net domestic assets, net foreign assets, and base money), along with the bank's reserves. Hence the central bank's resources did not finance the budget deficits in the period preceding the crisis. That is, the central element of the first-generation models was not on the stage. Two additional points should be noted. First, during the period analyzed, only in 1999–2000 was net foreign borrowing positive. Second, domestic debt maturity was considerably increased again in these last two years (see table 4). These two phenomena do not fit in a scenario where economic conditions are continuously deteriorating and the risk is continuously rising.

It is evident from figures 3 and 4 that neither the increases in interest rate nor the reserve fall were gradual, but rather were sudden. The overnight rate was highly volatile throughout the first eleven months of 2000, in sharp contrast to what had happened in the year before, and no upward trend was observed in 2000. At best, it can be said that overnight rates fluctuated around a constant mean of 40 percent, reaching 82 percent on November 15 and 873 percent on December 1. The evolution of the price of the Turkish Treasury thirty-year eurobond, which was issued on January 11, 2000, with an initial

⁵ Krugman (1979) and Flood and Garber (1984).

⁶ The consolidated budget is a part of the public sector. In addition to the consolidated budget, the public sector covers state economic enterprises, special funds, and municipalities. Note that consolidated budget deficits have accounted for an important part of the public sector deficits since the early 1980s.

price of \$98.45, is also illuminating in this respect. The downward trend in price began as late as September 6, after reaching a maximum level of \$108.7 (see figure 5).

Table 2: Financing of the Consolidated Budget Deficit, 1995-2001^a
Percent of GNP

	1995	1996	1997	1998	1999	2000	2001
Public sector borrowing requirement	5.0	8.6	7.7	9.4	15.6	12.5	15.9
Consolidated budget borrowing requirement	3.7	8.5	7.6	7.1	11.6	10.2	17.9 ^b
Net domestic borrowing	3.6	7.1	8.5	8.6	12.4	7.4	12.9
Net foreign borrowing	-1.0	-0.9	-1.5	-1.9	0.6	2.1	-2.5
Central Bank advances	1.2	1.5	0.0	0.0	0.0	0.0	0.0
Other ^c	0.0	0.7	0.6	0.5	-1.4	0.6	7.4 ^b

Source: Turkish Treasury, various issues of Main Economic Indicators.

a. Consolidated budget is a part of the public sector. In addition to the consolidated budget, public sector covers state economic enterprises, special funds, and municipalities.

b. Includes interest liability of the Treasury to the state-owned banks that is partly rolled over.

c. Includes such "financing" items as deferred payments.

Table 3: Balance Sheet of the Central Bank, End-of Period Values, 1995-2001

	Net domestic assets ^a (trillions of lira)	Net foreign assets ^b (trillions of lira)	Base money ^c (trillions of lira)	Reserves ^d (millions of dollars)
1995	323	-6	317	12,391
1996	335	275	610	16,273
1997	142	988	1,130	18,419
June 1998	-1,778	3,331	1,553	26,377
1998	625	1,486	2,111	19,721
June 1999	-899	3,526	2,627	21,521
1999	-938	4,818	3,880	23,177
June 2000	-1,741	6,372	4,631	24,547
October 2000	-1,815	6,710	4,895	23,545
2000	2,485	3,303	5,788	22,172
2001	20,475	-12,672	7,803	18,787

Source: Central Bank of Turkey, Electronic Data Delivery System, www.tcmb.gov.tr.

a. Net domestic assets equals credit to public sector + government securities + credit to banking sector – public sector deposits + other.

b. Net foreign assets equals foreign assets – foreign exchange liabilities to nonresidents – foreign exchange liabilities to banking sector.

c. Base money equals net domestic assets + net foreign assets.

d. International reserves.

A similar, sudden movement for reserves was also observed. The record high level for foreign exchange reserves was \$26.4 billion at the end of June 1998. The impact of the Russian crisis drove down reserves to \$19.7 billion at the end of the same year. After that the reserves followed an upward trend to the end of 1999, reaching a level of \$23.2 billion. This trend was replaced by a fluctuation around a level of \$24 billion in the second half of 2000, which in turn was halted by the eruption of Turkey's financial turmoil. Just two days before the turmoil erupted, that is on November 17, 2000, the reserve level was \$24.4 billion, which was almost equal to the maximum level observed since before

the Russian crisis.⁷ Hence in the periods preceding the crisis, prerequisites of the first-generation models were absent. Namely, the public sector borrowing requirement was never met through the central bank's resources, and no evidence existed that the crisis had been expected.

Table 4: Main Fiscal and Economic Indicators, 1995-2001

Percent of GNP, except as indicated

	1995	1996	1997	1998	1999	2000	2001
Public sector borrowing requirement (PSBR)	5.0	8.6	7.7	9.4	15.6	12.5	15.9
Duty losses of state banks	2.2	4.2	5.2	7.5	13.3	12.0	0.0
PSBR + Duty losses of state banks	7.2	12.8	12.9	16.9	28.9	24.5	15.9
Primary surplus	2.1	1.3	0.0	2.1	-1.9	3.8	6.7
Consolidated budget deficit	3.7	8.5	7.6	7.1	11.6	10.2	17.9
Consolidated budget interest payments	7.4	10.0	7.7	11.5	13.7	16.3	22.9
Domestic	6.1	8.9	6.7	10.5	12.6	15.0	20.9
Foreign	1.3	1.1	1.0	1.0	1.1	1.3	2.0
Public debt ^a	37.6	40.3	40.5	41.3	51.8	53.4	99.6
Domestic	14.6	18.5	20.2	21.7	29.3	29.0	68.1
Foreign	23.0	21.8	20.3	19.6	22.5	24.4	31.5
Short-term public debt	8.0	10.2	8.1	10.9	4.1	2.1	11.1
Treasury auction borrowing rate, average (percent)	124.2	132.2	107.4	115.5	104.6	38.2	99.6
Consumer inflation (percent)							
Average	89.0	80.2	85.7	84.6	64.9	54.9	54.4
End-year	76.0	79.8	99.1	69.7	68.8	39.0	68.5
GNP growth rate (percent)	8.0	7.1	8.3	3.9	-6.1	6.3	-8.5
Average maturity of borrowing in auctions (days)	188.0	186.6	393.5	235.1	502.3	426.8	146.3

Source: Turkish Treasury, various issues of Main Economic Indicators; Central Bank of Turkey, Electronic Data Delivery System, www.tcmb.gov.tr.

a. Debt stock figures are for the end of the year. Foreign debt is converted to domestic currency by means of the average annual exchange rate. Foreign debt stock for 2001 is for the third quarter.

This does not change the fact that the fiscal fundamentals, examined in isolation, were indeed weak. However, one should note that the IMF-supported program aimed—and indeed succeeded, to some extent—at providing an end to the then unsustainable fiscal policy. The program did this by mainly reversing the upward trends in the real interest rate on government securities, public sector borrowing requirement, and domestic debt stock. Moreover, an important amount of primary surplus was registered in 2000 (see table 4). As evident in almost all economic dimensions, the 1999 fiscal performance was the worst in the 1995–2001 period. Then, why did the crisis erupt at the end of 2000, instead of in 1999?

⁷ For the evolution of daily international reserves, see table 12.

Clearly, an analysis of fiscal indicators will not provide answers on the timing of the crisis. This should come as no surprise, since fiscal laxity does not necessarily end with a currency crisis. Eichengreen, Rose, and Wyplosz, using data from the Organization for Economic Cooperation and Development (OECD) countries for the postwar period, state that they do not detect any link between lack of fiscal discipline and exchange market turbulence.⁸ Frankel and Rose, using annual observations for the 1971–92 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.”⁹ Sachs, Tornell, and Velasco examine financial events following the devaluation of the Mexican peso for a set of twenty emerging markets. They state, “as important as a country’s fiscal stance may be in theory, however, it is important to notice that irresponsible fiscal behavior was not among the central causes of recent troubles.”¹⁰ Do these observations suggest that there is no correlation between poor fiscal fundamentals and a currency crisis? Sachs and others emphasize that countries with better fiscal performance had the chance to escape from any crisis.¹¹ Eichengreen and others state (as one of the plausible interpretations of their results) that only money-financed deficits may matter.¹² This is the crucial point, as demonstrated above, since the 1997 deficits were not financed by the central bank’s resources.

Looking at table 5, it is evident that the lira was in an overvaluation trend against a basket of currencies from 1995. As of the end of September 2000, the real appreciation relative to 1995 was 14 percent, while for year-end 2000 it was 18 percent. Sachs, Tornell, and Velasco as well as Frankel and Rose demonstrate that one of the predictors of currency crises is real appreciation of domestic currency.¹³ Note first, however, that at the start of the program it was publicly announced that the crawling peg system would be replaced in July 2001 by a relatively flexible exchange rate system, with increasing flexibility as time passed.¹⁴ Second, the growth rate of the Turkish economy was, on average, very high in the 1995–97 period (that is, 7.8 percent), when half of the real appreciation was realized. The average growth rate of the 1995–2000 period was 4.6 percent. Hence the standard Balassa-Samuelson effect might be one of the reasons for the real appreciation.

⁸ Eichengreen, Rose, and Wyplosz (1995).

⁹ Frankel and Rose (1996, p. 365).

¹⁰ Sachs, Tornell, and Velasco (1996a, p. 180).

¹¹ Sachs, Tornell, and Velasco (1996a).

¹² Eichengreen, Rose, and Wyplosz (1995).

¹³ Sachs, Tornell, and Velasco (1996a); Frankel and Rose (1996).

¹⁴ However, there are some skeptical views on this exit strategy. For a discussion of the role of the exit strategy in the crisis, see the meeting summary of “NBER Program on Exchange Rate Crises in Emerging Markets: Turkey,” held on July 18, 2001, www.nber.org/crisis/turkey.report.html.

Table 5: Balance of Payments and Real Exchange Rate, 1995-2001

Percent of GNP

	1995	1996	1997	1998	1999	2000	2001
Current account balance	-1.4	-1.3	-1.4	1.0	-0.7	-4.9	2.4
Net capital inflows	2.7	3.0	3.7	-0.4	2.5	4.7	-9.8
Short-term	2.2	1.5	0.0	0.7	0.4	2.0	-7.9
Direct investment	0.5	0.3	0.3	0.3	0.1	0.1	1.9
Portfolio investment	0.1	0.3	0.9	-3.4	1.8	0.5	-3.1
Other long-term	-0.1	0.9	2.5	1.9	0.2	2.1	-0.8
Real exchange rate ^a	96.9	100.0	110.5	107.8	108.7	118.2	107.0

Source: Central Bank of Turkey, Electronic Data Delivery System, www.tcmb.gov.tr.

a. Year-end values, 1995 average equals 100. An increase denotes real appreciation. Value for September 2000 is 114.0.

Was the record high level of current account deficit the major reason behind the crisis? The literature on the sustainability of current account balance stresses that in steady state the current account deficit should be less than the average growth rate of the economy times its net international debt as a share of gross domestic product (GDP). Calvo and Végh suggest that a maximum level of indebtedness is 80 percent of GDP, above which capital markets are reluctant to further extend credit to developing countries.¹⁵ Multiplying 80 percent by the average growth rate of the Turkish economy in the 1969–2000 period (4.4 percent) results in 3.5 percent, which is lower than the ratio of current account deficit to GDP registered in 2000. Hence based on this measure, the current account deficit was high. However, note that the deficit was a one-off. In the preceding two years the current account was almost balanced. In addition, five other key points should be noted. First, long before the end of 2000, the government had announced that it was going to tighten its 2001 budget to reduce the current account deficit. Second, one of the underlying reasons for the high deficit was real appreciation of the lira. As discussed above, Turkey was planning to pass to a more flexible exchange rate regime in July 2001. Third, a major cause of the deficit was the rise in crude petroleum prices. Fourth, the U.S. dollar value of Turkish exports declined due to the appreciation of U.S. dollar against major European currencies, as Europe is a main trading partner of Turkey. Fifth, among others, Sachs, Tornell, and Velasco, along with Frankel and Rose, find that the current account is a poor predictor of currency crises.¹⁶

To summarize, in the five-year period preceding the crisis, the macroeconomic fundamentals of the last two years of the period were the worst. However, despite a record high level of current account deficit for 2000 and real appreciation of the lira, almost all of

¹⁵ Calvo and Végh (1999).¹⁶ Sachs, Tornell, and Velasco (1996a); Frankel and Rose (1996).

the indicators displayed a positive stance in 2000 compared to 1999. This positive stance may be attributed to the IMF- supported stabilization program. Again, one must ask why the crisis erupted at the end of 2000 and not in 1999. The absence of the leading indicators of a first-generation type crisis, coupled with the vulnerability of the economy (despite an improving stance in macroeconomic fundamentals), suggests the possibility of a self-fulfilling crisis.

Second-Generation Type Crisis?

One of the main reasons the Turkish 2000–01 crisis is an interesting case study is that the high public sector borrowing requirement was mainly financed by the issuance of domestic debt in the period preceding the crisis. This financing mechanism, by limiting excess money supply, prevented both a jump in the rate of inflation to higher levels and a continuous depletion in international reserves, leading to a first-generation type crisis. As is well documented elsewhere, domestic borrowing masks foreign exchange losses. The most important point, however, is that if the real interest rate exceeds the real growth rate of the economy and there is no offsetting primary surplus, then domestic debt financing is not stable. Sooner or later this process will come to an end, but the timing depends on actions of the debt market's main actors, rendering the economy open to self-fulfilling attacks.

One can imagine a situation where a government aims to implement a stabilization plan, but, for example, postpones the plan due to a forthcoming election and continues domestic debt financing. Or the country already may be implementing a stabilization plan that addresses fiscal imbalances, but the initial level of the deficit is at such a high level that it may only be feasible to realize the fiscal discipline gradually, which means that debt financing should continue. Based on fundamentals, there is no natural collapse and hence such an economy does not deserve a first-generation type crisis. In the absence of speculative attacks, the prevailing exchange rate system can survive. However, second-generation models argue that exchange rate systems can collapse, because of the attack of speculators who anticipate that the government would abstain from taking necessary measures to defend the currency against an attack. A high public debt or high unemployment may lead to such anticipations.

Does the scenario described above fit the Turkish case? Although it is difficult to answer this question based on what happened in the post crisis period, an answer can still be provided. There should not be an output decline in the aftermath of a crisis. As Krugman

puts it, “if a speculative attack drives a currency off its peg, this does not imply a negative shock to employment and output. Indeed, in this case the contrary should be true: because the policy constraint of a peg is removed, the result is actually positive for short-run macro- economics.”¹⁷ Evidently, this did not happen in Turkey. The economy sharply contracted by 8.5 percent in 2001, after 6 percent growth in 2000. In a similar vein, Flood and Marion note that second-generation crisis models require that in the post crisis period there should be expansionary policies that validate anticipations of speculators.¹⁸ However, post crisis policies in Turkey were not expansionary. On the contrary, in May 2001 the Turkish authorities signed a new standby agreement with the IMF, and the primary budget balance registered a record high level of surplus (see table 4).

The discussion in this paper so far reduces the possibility of a second-generation currency crisis, thus necessitating a discussion of other explanations. Was the principal cause of the Turkish crisis a prospective deficit—in this case an additional deficit on top of the existing one—associated with implicit bailout guarantees to a failing banking system? Or was the root cause of the problem financial fragility in the banking sector in the sense of a third-generation model? Note that third-generation models give special importance to self-fulfilling prophecies, just as do second-generation models. Due to triggering events capital flows out of the country, domestic currency depreciates, and either the banking or the corporate sector—or both—collapse, pushing the economy into a deep recession. The collapse in the banking or the corporate sector (or both) is due to financial weakness in balance sheets.

Banking Sector

There is plenty of evidence regarding risk accumulation in Turkish commercial bank balance sheets. It has been shown in this paper that in the period preceding the crisis, the nature of risk accumulation in the banking system was not homogeneous throughout the system. Two different types of dichotomy were observed: first, the dichotomy between private and state banks, and second, the dichotomy within the private banking industry.

Banking Sector Vulnerability

During a crisis period, a central bank will find itself a lender of last resort for banks and hence its foreign exchange reserves should be compared with liquid liabilities of the banking sector. This is especially important during an exchange rate-based stabilization

¹⁷ Krugman (2001, pp. 6–7).

¹⁸ Flood and Marion (2000).

program. Sachs, Tornell, and Velasco emphasize that even if fundamentals are wrong, a speculative crisis is less likely to occur when there is no problem with international liquidity.¹⁹ This paper uses two alternative definitions of total liquid liabilities of the banking sector. The first one is M2YR, which is the sum of currency in circulation, domestic currency-denominated deposits, foreign currency-denominated deposits, and repurchase agreements (repos) of commercial banks.²⁰ In the second definition, M1YRS, instead of all deposits regardless of their maturity, only deposits with maturity less than or equal to one month are considered. Two alternative reserve definitions are used. The first one is the official reserves, whereas the second one is the sum of the official reserves and the reserves of the commercial banks.

The first four rows of table 6 provide data for alternative definitions of the ratio of total liquid liabilities of the banking sector to foreign exchange reserves. No matter which definition is used, the conclusion remains the same. Liquidity ratios were stable up until November 2000 and only a slight deterioration materialized before February 2001. Moreover, the magnitudes of alternative ratios are small compared to those of crisis countries. For example, Sachs and others report that a similar ratio took a value of 7 in Mexico in mid-1994 and a value of 10 just before the Mexican crisis.²¹ Calvo notes that the ratio was in the range of 2 to 3 for noncrisis countries such as Argentina, Chile, Colombia, and Uruguay.²² Chang and Velasco argue that the Asian-5 countries—Indonesia, Korea, Malaysia, the Philippines, and Thailand—had a problem of international illiquidity when the Southeast Asian crisis started.²³ The ratio of M2 to reserves was stable at high levels (or increasing) in each of these countries except Thailand, which was a special case, as demonstrated by Chang and Velasco. According to their calculations, the ratio of M2 to reserves was 6.5 in Korea as well as Indonesia, and 4.5 in the Philippines. They also note that the same ratio was about 3.4 in the then noncrisis countries Argentina and Brazil.

¹⁹ Sachs, Tornell, and Velasco (1996a).

²⁰ In Turkey repos are widely used by commercial banks as a retail instrument for government debt instrument portfolios. Average maturity of repos is rather short, usually less than a month. Their importance in the liability structure of banks is discussed below.

²¹ Sachs, Tornell, and Velasco (1996b).

²² Calvo (1994).

²³ Chang and Velasco (1998a).

Table 6. Banking Sector Short-Term Liabilities as a Multiple of International Reserves and the Evaluation of Credit Stock

	1995	1996	1997	1998	1999	2000 ^a	2000	2001
M1YRS / Central Bank reserves ^b	1.85	1.76	1.81	1.75	1.49	1.87	2.22	1.78
M1YRS / Total reserves ^c	1.04	1.21	1.28	1.21	1.05	1.28	1.46	1.04
M2YR / Central Bank reserves ^d	3.57	3.48	3.39	3.64	3.53	3.69	4.16	3.98
M2YR / Total reserves	2.01	2.39	2.40	2.52	2.47	2.52	2.73	2.32
Credit / GNP (percent)	20.4	23.9	26.2	20.8	20.7	21.0	21.1	18.2
Real credit growth (percent)	18.6	24.6	7.7	-14.7	-13.6	17.4	17.4	-28.2
Consumer credit / Total credit (percent)	3.7	4.4	5.6	6.3	6.2	17.5	17.4	7.1

Source: Central Bank of Turkey, Electronic Data Delivery System, www.tcmb.gov.tr.

a. Values for end of September 2000.

b. M1YRS = M1 + repos + foreign currency demand deposits + domestic and foreign currency saving deposits with maturity one month or less.

c. Total reserves = central bank reserves + reserves of commercial banks.

d. M2YR = M2 + foreign currency deposits + repos.

Table 6 also provides data on the ratio of total loans of the banking sector to GNP, as well as the real growth rate of the loan portfolio. These indicators are sometimes used as proxies for the banking sector's credit quality. It is argued that rapid credit growth is a signal of increasing credit risk for the banks. It is clear from these data that credit growth in Turkey in 2000 was rather high. However, note that a similar phenomenon was also observed in the noncrisis years, especially in the 1995–97 period. Neither the liquidity ratios nor the credit growth figures justify a crisis. The values they attain are not significantly different than in the noncrisis periods. This necessitates a closer look at the banking sector and the Turkish policy experience after 1999.

This paper now turns to the evolution of more direct measures regarding the risk exposure of domestic commercial banks. Table 7 presents various indicators of the risk exposure of the banking sector in the December 1995– September 2001 period. The figures are reported in three groups, as indicators for the credit risk, foreign exchange risk, and interest rate risk. All of these indicators clearly show that the vulnerability of the banking sector to capital reversals increased throughout 2000.

The ratio of nonperforming loans to total loans started to increase in 1998. Table 7 gives figures for the whole banking system, taking public, private, Saving Deposits Insurance Fund (SDIF)-controlled, and foreign banks together. Due to the growing number of banks taken under the control of the SDIF, this ratio reached 10.7 percent in December 1999.²⁴ This increase in nonperforming loans of the banks taken under SDIF control raised doubts about the quality of both information disclosure and rule

²⁴ Table 11 lists banks taken over by the SDIF.

enforcement. Combined with the delays in banking reform, this discrepancy in figures immensely blurred the picture regarding the health of the private commercial banks. It was understood that the nonperforming loan ratio increases radically whenever a bank is taken under the control of the SDIF. This point is seen more clearly when the nonperforming loans of the SDIF-controlled banks are analyzed (see table 8).

Table 7: Ratios of the Commercial Banking Sector, 1995-2001^a

Percent, except as indicated

	1995	1996	1997	1998	1999	2000 ^b	2000 ^c	2000 ^d	2000	2001 ^e
Nonperforming loans / total loans	2.8	2.2	2.4	7.2	10.7	9.8	9.7	9.3	11.6	18.6
Permanent assets / total assets	7.6	7.3	6.7	8.0	9.4	9.4	11.1	13.4	14.8	18.4
FX assets / FX liabilities ^f	90.6	93.6	89.6	84.9	79.4	74.3	73.0	71.6	75.9	81.0
FX liabilities - FX assets (billion \$)										
Excluding off balance sheet	3.0	2.5	5.0	8.4	13.2	17.2	19.2	20.9	17.4	12.4
Including off balance sheet	0.6	1.2	1.9	2.9	2.9	5.7	5.6	5.8	5.5	0.7
Liquid FX assets / FX liabilities	44.8	44.6	41.0	39.5	40.0	36.6	35.2	34.4	35.9	38.3
Liquid assets / Total sources ^g	46.7	44.0	41.1	39.9	42.6	42.4	41.0	38.3	37.9	51.4
Assets / Liabilities										
(with 3 months or shorter maturities)	n.a.	n.a.	45.8	45.7	46.3	40.8	41.8	43.9	39.9	43.9
Share of deposits with 6 months or greater maturity in total deposits	26.1	26.6	24.7	22.9	28.2	19.8	18.7	19.3	15.1	11.6
Repos / (Liabilities + repos) ^h	5.1	8.1	12.8	10.4	9.6	12.0	11.4	10.9	11.3	6.1

Source: Central Bank of Turkey; Banks Association of Turkey.

n.a. Not available.

a. End of period figures.

b. Values for end of March 2000.

c. Values for end of June 2000.

d. Values for end of September 2000.

e. Values for end of September 2001.

f. FX denotes "foreign currency denominated".

g. Total sources = deposits + nondeposit funds.

h. Repos had been recorded off the balance sheet since 2002.

Table 8. Ratio of Nonperforming Loans to Loan Portfolio

Percent

Bank	Date of takeover by the SDIF ^a				
		1997	1998	1999	2000
Sümerbank	December 21,1999	0,28	1,58	296,70	911,90
Egebank	December 21,1999	0,56	2,35	211,11	205,30
Esbank	December 21,1999	3,02	1,52	50,48	118,80
Yurtbank	December 21,1999	0,22	5,66	1723,40	7554,60
Yasarbank	December 21,1999	0,30	0,41	63,53	87,20
Etibank	October 27,2000	0,95	0,67	0,00	14,13
Bank Kapital	October 27,2000	0,95	6,25	6,76	1115,10
Demirbank	December 06,2000	0,58	1,74	1,52	5,44

Source: Banks Association of Turkey and Banking Regulation and Supervision Authority.

a. SDIF = Savings Deposits Insurance Fund.

In the period preceding the crisis, an open foreign exchange position was a structural feature of the Turkish banking system. This phenomenon is related to a long history of high inflation and the inability of domestic banks to borrow long term in their own currency, as is discussed for developing countries in general by Goldfajn and Rigobon.²⁵ Three different measures of currency risk are presented in table 7, namely, the ratio of foreign currency–denominated assets to foreign currency–denominated liabilities, the open foreign exchange position of the balance sheet, and the aggregated balance sheet, including off balance sheet items. They all point to a significant increase in the foreign exchange risk. While the total open foreign exchange position of the banking system was following an upward trend on the road to the crisis, the ratio of liquid foreign exchange–denominated assets to total foreign exchange–denominated liabilities was following the opposite trend. The latter made the system more vulnerable to sudden reversals.

Maturity mismatch is another structural feature of the banking system in Turkey, due to the inability of domestic banks to borrow long term in the domestic currency. The ratios of assets to liabilities with matching maturities are reported in table 7. The figures show that the liabilities are more of a short-term nature, while the maturities of assets are longer. For example, for one unit of three-month liability, there is a 0.5 unit of three-month asset at the end of 1999. The picture becomes even worse when repos are taken into account. Note also the declining trend in the average maturity of total deposits, especially in 2000.

Banking Sector Dichotomy: Private versus State Banks

Despite the fact that both private and state banks had accumulated risks on the road to the crisis, the nature of their respective problems was different. On the asset side, the increasing size of duty loss accumulation of the state banks and the need to finance duty loss by short-term domestic bank liabilities were the source of the problem.²⁶ On the liability side, the ratio of lira to foreign exchange liabilities shows one major difference between the two groups. The ratio was much lower and, moreover, was decreasing for private banks. While the state banks were more open to interest rate risk, private ones were more prone to exchange rate risk. This is why the November 2000 crisis hit the state

²⁵ Goldfajn and Rigobon (2000).

²⁶ After 1992 growing government debt instruments outstanding and the increasing financing needs of the Treasury led the government to finance some activities through loans taken from state banks. Instead of repaying the principal and the interest accrued, the Treasury allowed these nonperforming loans to be treated as performing loans by the state banks. The Treasury was directly controlling these banks, since they were state economic enterprises. In addition the Treasury, at that period, was also the banking supervision authority. This conflict of interest might have been one of the most important factors that led to duty loss accumulation. See table 4 for the importance of duty losses relative to other fiscal indicators.

banks hardest and the effect of the currency collapse in February 2001 hit private banks.

Table 9 gives a comparison of the balance sheet structures of private and state banks. In the case of the former, those that were taken under SDIF control in any of the periods reported are not taken into account. The figures are adjusted to include repos in the balance sheets. There are two major interest-earning assets in the Turkish banking system: commercial loans and government debt instruments. At the end of 1999, for example, when Turkey launched its exchange rate-based stabilization program, the share of the government debt instruments portfolio in private commercial bank balance sheets was even greater than the loan portfolio. The quality of the government debt instruments portfolio is directly related to the expectations regarding debt sustainability. This feature was increasing the vulnerability of bank balance sheets to concerns about the rollover possibility of the outstanding government debt instruments. Note that the situation in Turkey is not directly comparable with the “bad” private loan problems of East Asian commercial banks. In the case of the health of the Turkish private banking industry, smooth debt rollover is much more important. This issue needs to be understood to follow the factors triggering the crisis in November 2000. It is also important in discussing the balance sheet effects after the currency collapse.

Table 9: Structural Characteristics of Private and State Banks, 1997-2001^a

	Bank	1997	1998	1999	2000 ^b	2000 ^c	2000 ^d	2000 ^e	2001 ^f	2001 ^g
Loan / GDI ^h	Private	113.72	119.28	82.52	93.26	102.49	111.39	130.70	139.00	144.97
	State	86.24	87.86	66.27	n.a.	n.a.	n.a.	59.22	n.a.	n.a.
Repos / lira deposits	Private	123.36	83.27	106.61	95.23	93.73	105.41	53.48	23.62	25.37
	State	22.49	19.07	13.64	30.29	28.67	29.50	27.27	55.36	41.52
FX / lira deposits	Private	212.20	201.63	274.65	285.07	279.99	299.90	209.24	205.37	237.54
	State	46.37	35.61	26.49	31.66	32.42	33.13	29.37	37.12	37.12
Share of FX loans	Private	14.01	13.97	15.91	16.28	16.51	17.10	19.84	20.02	19.55
	State	3.07	3.18	2.30	2.13	2.78	2.85	2.54	3.36	2.78
Share of interest earning assets	Private	67.80	63.66	63.22	60.79	61.88	60.92	58.05	53.95	52.73
	State	36.63	35.34	28.85	n.a.	n.a.	n.a.	31.88	n.a.	n.a.
Share of accumulated duty losses	State	27.07	27.59	32.01	n.a.	n.a.	n.a.	30.68	n.a.	n.a.
Share of net worth	Private	9.13	9.87	11.29	12.16	12.83	13.85	12.39	11.25	9.65
	State	5.38	3.85	3.80	3.78	3.50	3.20	2.69	3.78	3.50

Source: Central Bank of Turkey.

n.a. Not available.

a. End of period data.

b. Values for end of March 2000.

c. Values for end of June 2000.

d. Values for end of September 2000.

e. Values for end of December 2000.

f. Values for end of March 2001.

g. Values for end of June 2001.

h. GDI = Government debt instruments.

The ratio of loan portfolio to government debt instrument portfolio is systematically lower in the case of state banks, due to the smaller size of their commercial loan portfolios. Moreover, from 1997 to 2000, this ratio continued to decline. The ratio of interest earning assets to total assets shows that the size of the commercial loan portfolios of state banks was rather small. Notice that the ratio for state banks is about half of the ratio for private banks. The reason for this discrepancy lies in the share of loans granted to the Treasury by state banks and later treated as a duty loss by the Treasury. The share of duty loss accumulated reached more than 30 percent of total assets.

A liability feature of private commercial bank balance sheets is that it reflects the banks' inability to borrow long term in domestic currency. The high ratio of repos to Turkish lira deposits is an indication of this. Banks used repos as a retail instrument to carry government debt instrument portfolios indirectly. However, all of the interest rate risk remains with the bank selling the repo contracts. The maturity of repos was much shorter than the maturity of lira deposits, which was around three months in 1999. While the ratio was on a declining trend for private banks after the November crisis, a reverse trend is observed for state banks. This amounts to saying that before the November 2000 crisis, state banks could borrow at relatively longer maturities. With the interest rate hike after November, the growing ratio of repos to lira deposits raised the cost of funds to state banks enormously, requiring immediate action by the Treasury or bank regulators, or both, starting from May 2001.

Another distinguishing feature of the private banks was their heavy reliance on the foreign exchange-denominated deposits of residents. The ratio of foreign exchange to lira deposits captures this feature. However, the maturity of foreign exchange deposits was also short, as in the case of lira deposits. Heavy reliance of private banks on foreign exchange deposits made them more vulnerable to international illiquidity crisis. In the period preceding the crisis, private banks relied more on foreign exchange loans from international banks. This was an additional factor that rendered them more vulnerable to capital reversals.

Banking Sector Dichotomy: Private Banks

This paper now turns to the heterogeneity of the private domestic commercial banking system. Regarding the banking crisis in Turkey, Eichengreen argues that the problem was with "a number of mid-sized banks [that] had taken highly-leveraged positions in

anticipation of continued declines in interest rates.”²⁷ It is true that the events leading to the actual crisis in November started with a mid- size bank, Demirbank, which had taken a highly leveraged position. The problem was the very risky mode of carrying a government debt instrument portfolio, which dates back to 1995 and became more acute over time. This risky mode of financing could also be found in the balance sheets of all private banks, as noted earlier. However, in the case of Demirbank this risky mode of financing led to enormous risk accumulation in its balance sheet when compared to the rest of the system. In this sense Demirbank could be taken as a prime example of commercial banks carrying large government debt instrument portfolios. Demirbank was heavily concentrated in the government debt instrument business and was acting as a market maker to defend its position.

The sharp differences between Demirbank and private banks are reported in table 10. First, for Demirbank, the ratio of government debt instrument portfolio to total assets was about twice the size of other private banks. Unlike other private banks, this bank was not active in traditional banking business of collecting deposits and distributing loans.

Second, Demirbank was carrying its government debt instrument portfolio mainly through short-term repos. The ratio of repos to total government debt instrument portfolio was around 70 percent at year-end 1999 and 2000. While financing the government debt instrument portfolio—mainly by very short-term repos—the share of long-term government debt instruments in its total portfolio was also very high. This share jumped rather sharply just before the November 2000 crisis, increasing the vulnerability of the bank to an upward movement in interest rates.

Third, Demirbank was carrying a large, long-term, government debt instrument portfolio by financing its activities mostly through overnight borrowing from other banks, as table 10 demonstrates by the ratio of bank repos to total repos. Put differently, the fact that banks are more informed investors had made Demirbank more vulnerable. A potential cut of this short-term credit line would have jeopardized the viability of Demirbank. Indeed, this was what happened in November 2000.

Fourth, the ratio of foreign exchange to lira liabilities was lower in the case of Demirbank, as most of its activities were financed by lira repos. However, the sharp increase in this ratio at the beginning of 2000 and its sharp decline in the fourth quarter

²⁷ Eichengreen (2001, footnote 8).

require further elaboration. The rise in the ratio of long-term government debt instruments to total government debt instruments juxtaposed this development. This seems to be related to the fact that structured financing products started to be used by the domestic banking system in general—and by Demirbank in particular. In the case of structured loans, Turkish lira-denominated government debt instruments were used as collateral against foreign borrowing, and were accounted for as long-term government debt instruments in the balance sheets. With increasing financing difficulties, Demirbank seems to have resorted to foreign exchange borrowing by using domestic currency-denominated government debt instruments as collateral. In the case of structured loan agreements, there is a prespecified stop-loss level of government debt instruments' interest rates to start the automatic sale of the collateral portfolio. This feature of structured loans was instrumental in the massive sell-off in the debt market, accompanied by a massive demand for foreign exchange, in November 2000—right after the financing difficulties of Demirbank. The latter feature gave the crisis a systemic character. In the end, difficulties at a single, midsize bank turned into a crisis for the whole debt market. The situation then exploded into a crisis for the whole domestic banking system, since government debt instrument portfolios were an important interest earning asset in domestic bank balance sheets.

Table 10: Dichotomy in the Private Banking Sector: Demirbank versus Others^a

		1997	1998	1999	2000 ^b	2000 ^c	2000 ^d	2000 ^e	2001 ^f	2001 ^g
Total GDI ^h / Total assets	Sector	31.72	29.03	34.64	31.45	30.56	28.82	25.16	22.57	21.52
	Demirbank	58.54	57.09	65.12	58.33	54.68	63.53	67.50	74.98	67.63
Repos / GDI + Repos	Sector	60.24	48.51	38.66	37.51	38.06	40.94	33.04	17.73	20.75
	Demirbank	68.30	57.16	69.48	66.40	59.10	64.81	70.69	52.60	19.57
Bank Repos / Total Repos	Sector	20.64	22.51	19.09	14.93	28.57	21.08	5.48	0.24	6.62
	Demirbank	29.02	24.08	41.97	32.49	33.25	23.93	48.31	0.15	20.73
Share of interest earning assets	Sector	67.80	63.66	63.22	60.79	61.88	60.92	58.05	53.95	52.73
	Demirbank	77.44	72.86	79.57	73.57	78.14	85.34	93.21	98.06	84.60
Long-term GDI / GDI	Sector	9.95	8.37	18.43	20.30	25.12	36.62	44.98	62.63	69.26
	Demirbank	23.49	27.15	27.15	28.83	36.41	45.33	12.79	22.38	27.43
FX / lira liabilities	Sector	135.48	155.11	194.23	213.31	213.21	219.72	219.47	262.14	279.32
	Demirbank	43.59	109.89	69.41	88.14	112.63	73.78	36.91	53.08	91.62

Source: Central Bank of Turkey.

a. End of period values.

b. Values for end of March 2000.

c. Values for end of June 2000.

d. Values for end of September 2000.

e. Values for end of December 2000.

f. Values for end of March 2001.

g. Values for end of June 2001.

h. GDI—Government debt instruments.

Third-Generation Type Crisis?

This paper concludes that the Turkish financial system, which was dominated by banks, was vulnerable to spikes in both the exchange rate and the interest rate that a sudden capital reversal could cause. Moreover, this weakness sharply increased in 2000.

Turkey's banking sector problem was basically a result of the mechanism chosen to finance a very high public sector borrowing requirement. First, this led to an increase in government debt instruments, especially in the balance sheets of private banks. Second, it caused a significant deterioration in state-owned banks by accumulating duty losses. Risk accumulation in bank balance sheets, in order to carry the domestic debt stock, is an important element of crisis dynamics. Due to excessive risks accumulated in their balance sheets, credit lines were cut off to some banks that were specifically acting as market makers in the government debt instruments market (and hence accumulating larger than average GDI portfolios). Thus the banking sector problem turned into a debt rollover problem, increasing interest rates. The rise in interest rates changed the nature of the problem into a debt sustainability issue directly making rollover impossible. This happened despite the continuing fiscal discipline policy under an IMF-supported program.

At the core of some variants of the third-generation crisis models there is the vulnerability of the financial system.²⁸ Despite similarities, the Turkish crisis has some features that do not fit third-generation models, most notable being the high budget deficit, which was mainly financed by domestic debt. This feature renders useless one of the prescriptions of the variant of a third-generation model introduced by Krugman.²⁹ Krugman stresses the corporate sector balance sheet implications of a currency crisis, and the model he presents suggests fiscal expansion as one of the remedies to overcome the high exchange rate–low output equilibrium of the post crisis period. This is hardly a solution in an economy where the main concern of the economic agents was the sustainability of domestic public debt, as at least in the first ten months of 2001 in Turkey.

Burnside, Eichenbaum, and Rebelo argue that a principal cause of the 1997 Asian crisis was large, prospective deficits associated with implicit bailout guarantees to failing banking systems.³⁰ Economic agents expect that these future deficits are going to be financed by money creation, which leads to a collapse of the fixed exchange rate regimes. The Turkish case also has some similarities with prospective deficits models.

²⁸ For example, see Chang and Velasco (1998b).

²⁹ Krugman (1999a and 1999b).

³⁰ Burnside, Eichenbaum, and Rebelo (2001).

Triggering Factors

What were the factors igniting the crisis, and what were the responses of commercial banks to these factors? The role of these triggering factors in the severe dichotomizations of the banking sector, which led to credit line cuts, is examined below, emphasizing that this dichotomy did not materialize overnight. There was already enough risk accumulated in bank balance sheets. The igniting factors worked as a catalyst, bringing this dichotomy to a severe conclusion, with credit line cuts as banks stopped trading with each other. Delays in structural reforms, especially the inability to design a transparent and viable banking reform strategy at the outset—and the unsystematic as well as piecemeal nature of the SDIF intervention in “bad” banks—exacerbated the problem.

Structural Reforms Delayed

Structural reforms constituted an important part of the standby agreement signed with the IMF. These reforms were collected under six headings in the letter of intent: Pension Reform; Reform in Agriculture Sector, Tax Policy and Administration, Fiscal Management and Transparency, Privatization and the Capital Market, Strengthening the Banking Sector, and Banking Regulation. Hence the issue of banking reform was already considered in principle right at the outset of the agreement.

The main problems were in the last three areas. Under the fiscal management and transparency heading, the government promised to close sixty-one budgetary funds to broaden the effective coverage of the budget in 2000, whereas only twenty-seven of these funds were actually closed. The markets paid special attention to the privatization of the telecom sector. The discussions on this privatization began as early as 1990, but several laws passed by the parliament since then were then rejected by the Supreme Court. The IMF insisted on passing a new law to enable Turk Telecom to act as a private entity by making it subject to the Turkish commercial code and establish a regulatory body for this sector. There were sharp differences of opinion between the members of the government on this issue, and as a result the law was not drafted. Finally, the board of the Banking Regulation and Supervision Agency should have been named by the end of March 2000 so it would have been in full operation by the end of August. This task was accomplished on August 31, after a five-month delay, increasing concerns about the government’s intentions regarding manipulating the board and causing a credibility loss.

In addition to delays in implementation, the program’s lack of political and

administrative leadership also contributed to uncertainty. The details of the program did not become public knowledge in a systematic manner. Especially in terms of banking reform, this lack of public knowledge was detrimental, contributing to severe dichotomy in the banking system and leading to credit line cuts. The announcement that the banking system had a problem, without any detailed and systematic program to show how the authorities were thinking of solving the problem and with long periods of inaction exacerbated the problem of heterogeneity in the banking sector, leading to a halt in trading.

SDIF Takeovers and Unending Court Cases

Just before the 2000–02 program was put into action, five banks were taken over by the SDIF, on December 21, 1999. This action did not alleviate the banking system's problems. Two more banks were taken over by the SDIF on October 27, 2000. These last two takeovers materialized only a month after the Banking Regulation and Supervision Agency board was named. The last four months of 2000 were especially hard times for some bankers. In September 2000, police initiated a criminal investigation—code name “Hurricane”—and started to arrest the owners and executives of five of these seven banks (see table 11). News about the arrested bankers, accompanied by videotapes and photographs of their arrest, were covered extensively by the media. This news was not limited to the financial section of newspapers or business programming on television. Rather, the news made the front page and primetime. The media's intense coverage of the arrests on this operation intensified rumors about who was going to be arrested next. Bankers acquired the nickname “tun nelers,” the idea behind which was the same as the “tunneling” concept used by Johnson and others regarding newly privatized enterprises in post communist countries.³¹

All of these developments strengthened the idea that there was an immense problem in the private banking industry, and that the program to tackle the issue was not completed. The extensive press coverage of arrested bankers itself contributed to the uncertainty regarding the future of the banking industry. It also raised doubts about the possible costs that would be incurred very shortly. Considering the cost of banking reform to the public purse and the use of government debt instruments to recapitalize banks, concerns about future debt sustainability increased. These concerns intensified on the road

³¹ Johnson and others (2000). The term tunneling, as used by Turkish media, refers to related lending much above regulatory limits and favorable treatment of companies that are owned by the owners of the banks.

to the crisis. And the environment also contributed to severe polarization in the banking system between allegedly good and allegedly bad banks.

Table 11. Banks Taken Over by the SDIF, 1999–2001^a

Bank	Date of the takeover	Share in total assets as of the takeover year	Were any of the owners or the executives arrested?
Sumerbank	December 21, 1999	0.6	Yes, Oct.-Nov. 2000
Egebank	December 21, 1999	0.6	Yes, Oct.-Nov. 2000
Esbank	December 21, 1999	0.8	No
Yasarbank	December 21, 1999	0.5	No
Yurtbank	December 21, 1999	0.6	Yes, Oct.-Nov. 2000
Etibank	October 27,2000	1.2	Yes, Oct.-Nov. 2000
Bank Kapital	October 27,2000	0.3	Yes, Oct.-Nov. 2000
Demirbank	December 06,2000	2.4	No
Ulusalbank	February 28,2001	0.1	No
Iktisat	Marc 15,2001	0.7	No
Bayındırbank	July 10,2001	0.2	No
EGS Bank	July 10,2001	0.5	No
Sitebank	July 10,2001	0.1	No
Kentbank	July 10,2001	1.0	No
Toprakbank	November 30, 2001	1.0	No

Source: Banks Association of Turkey, Banking Regulation and Supervision Authority, and various daily newspapers.
a. SDIF = Savings Deposit Insurance Fund.

Turbulence in November 2000

The banking sector fragility made life very difficult for those banks that had desperately chosen to borrow in short-term maturity and lend to the government in relatively longer terms. Adding to the problem was the fact that state banks were suffering from duty losses. These state banks had been heavily dependent on overnight funds and found themselves in a position where they could not conduct business as usual. Demirbank could not borrow in the overnight market on October 20. So as not to exceed the IMF ceilings on net domestic assets, the Central Bank of Turkey did not lend to Demirbank. This forced Demirbank either to sell part of its government securities portfolio or stop acting as a market maker in the government debt instrument market on the buying side (both of which led to similar market repercussions), causing an increase in secondary market interest rates. This marked the start of the first period in the crisis. The rise in interest rates to the “stop-loss” levels in structured foreign exchange–denominated loans started a new wave of sell-offs of government debt instruments. Consequently, demand for foreign currency increased sharply as lira-denominated government debt instruments were used as collateral for foreign exchange borrowing. Due to this sell-off, secondary market interest rates increased, further raising doubts about debt sustainability and

the stability of the exchange rate–based stabilization program.

This paper divides the first attack period into three phases: November 20–21, November 22–29, and November 30–December 6. Note that this periodization depends on the changes in central bank policy. In the first phase the Central Bank of Turkey did not lend to problematic banks, while in the second one it did the opposite.³² The sharp difference in the evolution of net domestic assets is noted in table 12. Though the domestic credit expansion helped to prevent interest rates from skyrocketing, at the same time, it increased the drain on international reserves. Note, further, that the magnitude of depletion of official reserves was greater than the magnitude of expansion in domestic credit creation, creating a reduction in base money. Hence the second phase witnessed a further rise in interest rates.

Mainly based on the drain on its international reserves and the reluctance of the regulation and supervision agency to address the root of the problem—that is, by taking over the system's bad banks—the Central Bank of Turkey announced on November 30 that it was going to keep its net domestic assets level constant. This marked the beginning of the third phase of the first attack period. Consequently, on that day the overnight rate jumped to 316 percent. This made life harder for state-owned banks, where there was a huge, accumulated interest rate risk potential. The next day's headline news was the middle-of-the-night negotiation with the IMF and the increased possibility of a new credit line. This news notwithstanding, the overnight rate jumped to 873 percent. Despite its announcement, on December 4 the central bank had to lend to a problematic bank to prevent that bank's default. Two days later, that problematic bank, Demirbank, was taken over, and the IMF made it clear that it was going to support the program by opening a new credit line. The new letter of intent was made public on December 18, and four days later the central bank announced its new monetary program. Despite the fact that the former limits put on the central bank's balance sheet by the IMF were changed, the path of the rate of depreciation of Turkish lira was not. Because of the agreement with the IMF, the reserve decline came to an end. Moreover, with the IMF's support facility, official reserves jumped to a level of \$28.2 billion from a low of \$18.3 billion (see figure 4). These events helped to calm the markets.

³² This asymmetric behavior was a matter of controversy. In the first phase Demirbank was the main problem. The reason behind such a policy was that the injection of liquidity would be a fruitless attempt, given the bank's nonviability. Moreover, one of the main pillars of the 2000–02 program was the preannounced crawling peg exchange rate regime. Such a move would have exacerbated the attack. The correct policy should have been to take over Demirbank immediately. However, the takeover did not occur until the late date of December 6. In the meantime, the difficulties of Demirbank turned into a systemic crisis, and the central bank had to change its policy.

Final Eruption: February 19, 2001

A new problem emerged in the aftermath of the November crisis: the inconsistency between the interest rate level and the preannounced rate of depreciation of the Turkish lira. This was related to questions regarding the Treasury's ability to rollover debt, as the major market maker of government debt instruments was no longer in the picture. The upper limit of the annual rate of depreciation of the lira against a basket of euros and dollars was announced as 12 percent in 2001. But throughout the auctions in January 2001, the Treasury was not able to borrow below 57 percent in annual compounded terms. In the first auction of February, the interest rate increased to 70 percent. That was clearly an unsustainable situation. Either the interest rate should have declined to a level compatible with the rate of depreciation or the exchange rate regime should have collapsed.

On February 19, after a National Security Council meeting, the prime minister declared that he and the president were in deep disagreement, without naming a specific cause. He added that the disagreement amounted to a very important political crisis. The prime minister's announcement caused the overnight rate to skyrocket to 2,058 percent on February 20, followed by 4,019 percent on the following day (see table 12). On the date the announcement was made, the banking sector rushed to foreign currency. Since the U.S. markets were closed on that specific date, the banking sector foreign currency demand was not fully met by the central bank, which prevented a loss of \$7.5 billion of reserves.³³ However, the depletion of reserves in the next two days and the interest rate level forced the government to accept the collapse of the crawling peg system on the night of February 21. Following the announcement that the lira would be allowed to float freely, the dollar exchange rate jumped to 958,000 liras from a level of 685,000 liras. The undersecretary of the Treasury and the governor of the central bank resigned, which was followed by the replacement of the economy minister.

³³ On this issue see Central Bank of Turkey (2001, p. 94).

Table 12. Balance Sheet of the Central Bank, Interest and Exchange Rates, November–December 2000 and February 2001

Date	Net domestic assets ^a (trillions of lira)	Net foreign assets ^b (trillions of lira)	Base money ^c (trillions of lira)	Reserves ^d (millions of dollars)	Overnight rate ^e (percent)	Bond rate ^f (percent)	Exchange rate (dollar/lira)
First attack period, 2000							
November 15	-1,828	7,092	5,264	24,161	81.5	40.8	681,799
16	-1,873	7,334	5,461	24,520	73.7	38.5	682,942
17	-1,866	7,273	5,407	24,433	34.4	40.1	683,645
First phase							
November 20	-2,035	7,108	5,073	24,185	45.5	42.1	686,461
21	-1,992	6,959	4,967	23,842	66.5	46.1	687,009
Second phase							
November 22	-362	5,909	5,547	22,263	110.8	52.0	688,360
23	-1,357	5,950	4,593	22,284	85.5	49.4	688,849
24	-498	5,475	4,977	21,583	115.1	53.5	689,042
27	-523	5,258	4,735	21,291	80.5	50.3	689,213
28	233	4,336	4,569	20,080	184.5	67.7	685,762
29	1,162	3,649	4,811	19,161	160.8	79.0	682,883
Third phase							
November 30	1,172	3,348	4,520	18,820	315.9	97.6	682,101
December 1	1,094	3,422	4,516	18,942	873.1	84.1	681,032
4	1,832	2,958	4,790	18,299	782.5	131.4	676,239
5	1,707	2,812	4,519	18,285	363.2	71.3	679,404
6	1,597	3,134	4,731	18,633	182.7	73.9	678,875
7	1,096	3,608	4,704	19,267	119.6	74.7	675,379
8	1,045	3,762	4,807	19,624	94.7	88.9	677,108
Second attack period, 2001							
February 15	-1,754	6,680	4,927	28,217	39.2	61.9	685,998
16	-1,547	6,649	5,102	27,943	40.3	63.4	685,039
19	-1,626	6,708	5,082	28,105	43.7	67.9	683,074
20	-1,300	5,687	4,387	26,739	2,057.7	25,514.7	688,001
February 21	868	3,417	4,286	23,207	4,018.6	150.2	685,391
22	2,070	3,373	5,443	23,267	1,195.3	147.7	957,879
23	1,560	4,198	5,758	22,581	568.0	195.8	1,072,988
26	1,205	4,046	5,251	21,988	102.1	145.3	946,306
27	1,659	3,311	4,970	21,699	100.2	168.7	906,164
28	2,156	2,915	5,071	21,432	100.1	245.3	920,678

Source: Central Bank of Turkey, Electronic Data Delivery System, www.tcmb.gov.tr.

a. Net domestic assets = credit to public sector+government securities+credit to banking sector–public sector deposits+other.

b. Net foreign assets = foreign assets–foreign exchange liabilities to nonresidents–foreign exchange liabilities to banking sector.

c. Base money = net domestic assets + net foreign assets

d. Reserves are international reserves.

e. Overnight rate is the weighted average un compounded rate.

f. Bond rate is the compounded average secondary market rate.

Conclusions

Analyzing the 2000 data in isolation, one would immediately observe poor macroeconomic performance. The public sector borrowing requirement, ratio of public debt to GNP, current account deficit, inflation level, and the ratio of the liabilities of the financial sector to official reserves were all high. Moreover, the lira was appreciated in real terms. However, this analysis would be a misleading picture of the Turkish economy. Turkey started to implement an IMF-supported program at the beginning of 2000. This program addressed macroeconomic imbalances and succeeded (to some extent) in reversing the negative trend. Relative to 1999, there was a sharp decline in both inflation and real interest rates as well as a significant increase in primary surplus. Consequently, the ratio of debt to GNP and the public sector borrowing requirement decreased.

It is true that the rising current account deficit and real appreciation of the lira was a source of increasing concern. However, an important part of the current account deficit was due to external shocks—rising oil prices and appreciation of the U.S. dollar against major European currencies. And, there was a built-in exit strategy from the crawling peg system, which was the main factor behind appreciation. Moreover, the program envisaged a further fiscal tightening for 2001 that would have been one of the remedies for the current account problem.

This paper argues that without a fragile banking system and triggering factors, the high current account deficit and real appreciation of the lira would not have been enough on their own to precipitate the 2000–01 crisis. There was risk accumulation in the banking system in the period preceding the crisis. For example, there was an increase in currency and maturity mismatches as well as a rise in nonperforming loans. Hence the banking system was highly vulnerable to capital reversals. However, risk accumulation was not homogenous throughout the system. There were two different types of dichotomization: private versus state banks and within the private banks. While the state banks were more open to interest rate risk, private ones were more prone to exchange rate risk. Within the private banking system there were some midsize banks that were heavily concentrated in government debt instrument business. Moreover, they were carrying these instruments by borrowing in the extreme short term.

Given the weakness in the banking system, it is no surprise that the crisis triggering factors were closely related to the banking sector and its practice of carrying

government debt instrument portfolios. Main igniting factors were the delays in reforming the banking sector and the actions that caused the dichotomy in the banking sector to come to the surface. This environment made things extremely difficult for those banks that had desperately chosen to borrow in short-term maturity and lend to the government in relatively longer terms. Things were also difficult for state banks, which were suffering from duty losses. These banks that had been heavily dependent on overnight funds found themselves in a position not to be able to do business as usual.

Finally, one should note that the root cause of the banking system fragility was the high public sector borrowing requirement and the way it was financed. There was no close link between rising deficits and inflation, beginning as early as the 1990s. The main reason was that budget deficits were primarily financed through government securities. However, the sustainability of this financing mechanism was conditional on the continuation of demand for government securities. In the absence of a program that would have reduced borrowing requirements, a halt in demand would have forced authorities to monetize and hence would have caused a jump in both the exchange rate and the inflation rate. This led economic policymakers to try to prevent a decline in the demand for government securities. These policies, coupled with the upward trend in banks' government debt instrument portfolios, increased the vulnerability of the banking system. The role of monetary policy in risk accumulation in the period preceding the crisis is a topic for an upcoming paper.

Appendix A: Post crisis Period

Both the Turkish banking system and corporate sector were severely affected by the 2000–01 crisis. The immediate recapitalization needs of the state-owned banks and the banks taken over by the Saving Deposits Insurance Fund led to a jump in the domestic debt stock, which was already too high. Meanwhile, rapid depreciation of the exchange rate had the potential of starting a new inflationary process. Additionally, policymakers lost their credibility. The undersecretary of the Treasury resigned, as did the central bank's governor. To overcome these problems, Turkey announced a new, IMF-supported program in May 2001. The new program had three pillars: fiscal and monetary discipline, structural reforms, and a substantial amount of external financial support.

Table A1: Macroeconomic indicators of the January 2001 - July 2002 period^a

Date	Average exchange rate (lira/dollar)	Average secondary market interest rate (percent)	Average Treasury Borrowing rate (percent)	Eurobond spread (end of period, basis points)	Annual inflation rate (CPI, percent)	Expected year-end inflation rate (CPI, percent)	Annual industrial production growth rate (percent)
January 2001	672,240	60.1	65.0	729	35.9	n.a.	7.5
February	739,889	103.1	122.5	936	33.4	n.a.	-4.9
March	968,299	154.8	193.8	990	37.5	n.a.	-7.6
April	1,209,865	127.0	130.5	864	48.3	n.a.	-9.6
May	1,132,510	85.1	82.0	833	52.4	n.a.	-9.4
June	1,215,605	83.2	88.4	848	56.1	n.a.	-10.1
July	1,320,506	95.2	91.9	1,021	56.3	n.a.	-11.0
August	1,400,947	89.1	92.7	904	57.5	63.7	-10.8
September	1,469,858	87.9	87.6	929	61.8	64.8	-9.2
October	1,600,157	87.7	86.4	884	66.5	68.4	-13.6
November	1,521,208	77.6	79.3	755	67.3	72.0	-14.4
December	1,452,198	72.6	74.1	678	68.5	69.8	-8.1
January 2002	1,369,182	70.8	71.4	641	73.2	47.3	-2.2
February	1,349,975	69.6	70.0	640	73.1	47.5	-5.0
March	1,356,993	65.2	68.5	591	65.1	43.6	19.2
April	1,317,739	56.6	58.7	577	52.7	37.0	14.8
May	1,389,555	57.0	55.3	629	46.2	36.7	11.1
June	1,523,940	69.1	72.3	847	42.6	35.2	7.1
July	1,649,121	75.4	72.6	912	41.3	35.7	12.4

Source: Central Bank of Turkey.

n.a. Not available.

a. Average figures are the monthly averages of daily data. Eurobond spread is the spread between the thirty-year Turkish Treasury eurobond yield and thirty-year U.S. bond yield. Annual figures denote annualized values for the monthly data, that is they are calculated as $[(X(t)/X(t-12)) - 1] * 100$. Expected inflation data come from the biweekly survey of the Central Bank of Turkey.

Based on the 2001–03 program, economic fundamentals continuously improved. However, up to October 2001 the markets' reaction was not in line with fundamentals. The situation was reversed in the October 2001–May 2002 period. The nominal exchange rate, inflation rate, interest rate, and Turkish eurobonds spreads all followed a significant downward trend. With the surge in political uncertainty at the beginning of May 2002, which was perceived by market participants as policy uncertainty, this positive stance began to change (table A-1).

The key to understanding these contrasting phenomena is the high ratio of domestic public debt to GDP and the issue of its sustainability. The imposed fiscal and monetary discipline of the program and the accompanying structural reforms notwithstanding, reducing the debt-to-GDP ratio to manageable levels requires a considerable time period. In the interim period, such an economy is vulnerable to changes in market sentiment, which

increases concerns about the debt sustainability. Such a high level of debt raises the possibility of multiple equilibria. Given the macroeconomic fundamentals, the type of equilibrium in which the economy is in, or approaching, is mainly determined by expectations.³⁴ Negative expectations can lead an economy to a “bad” equilibrium, at which the rates of inflation, interest, and exchange are all high. Positive expectations will yield a “good” equilibrium. Based on this possibility, one should look at both fundamentals and expectations.

Fundamentals and Expectations: May 2001–October 2001

Right after the twin crises, Turkey took key structural reform measures:

- “Bad” banks were taken over by the SDIF and excluded from the banking system.
- The overnight borrowing of these excluded banks was significantly reduced, and some of the banks were recapitalized or merged, or both, while some were actually sold.
- There was a dramatic change in the governance structure of state-owned banks. Accumulated debts of the Treasury to these banks were paid and the state banks were recapitalized.
- A politically independent board of directors was appointed. The board’s mandate was specified as protecting the interests of depositors.
- A new management for these state banks was appointed, and the number of branches and employees were significantly reduced according to an operational restructuring plan.
- In May 2001 the central bank law was changed and the bank gained “tool independence.” The law explicitly stated that the main goal of the bank is price stability.
- In addition to structural reforms, both the fiscal and monetary policies remained on track.

However, excluding a few weeks from prior to the September 11 terrorist attack in the United States and up to mid-October, market expectations were not in line with the

³⁴ See, for example, Calvo (1988).

improvement in fundamentals. The interest rate stayed at a high level. The exchange rate followed an upward trend. The spread of the Turkish Treasury bond stayed at high levels (see table A-1). That is, the Turkish economy was at a bad equilibrium. But why?

There were at least four factors hampering gains in policy credibility: First, some political developments—that is, disputes among the coalition parties regarding some of the structural reforms—increased doubts about the continuation of the program and raised the tensions in the market. Second, as documented in this paper, the financial sector had a significant amount of open foreign exchange position before the crisis—that is, the sharp depreciation of Turkish lira did have an adverse impact on the balance sheets of the entire banking system. Third, there were external shocks, namely, negative developments in Argentina were thought to have the potential for a contagion effect on Turkey. Fourth, the exchange rate regime was radically altered and economic agents were not familiar with a floating exchange rate regime environment.

These developments led to negative expectations by the markets, as the sustainability of public debt was continuously questioned. There was a vicious cycle: despite improving macroeconomic fundamentals, negative expectations were pushing the economy to a bad equilibrium. That bad equilibrium, in turn, was validating negative expectations. In early August the exchange rate volatility started to decline, and this was seen as a positive sign for gains in policy credibility. However, the tragic events of September 11 reversed market sentiment. In just a few days time, interest rates increased by some fifteen percentage points and the Turkish lira depreciated considerably. Once again, the sustainability of the program began to be questioned.

Changing Market Sentiment: October 2001–May 2002

This worsening trend halted as it became evident that Turkey was going to further strengthen the ongoing program by additional structural fiscal measures and a banking sector recapitalization program aiming for a quick recovery of sound banks. Also, there was the additional credit line from the IMF. The government announced its primary surplus target for 2002 as 6.5 percent of GDP. This announcement was found credible by market participants, since it became evident that the ambitious primary budget surplus target of 6.5 per- cent of GNP for 2001 was, in fact, going to be met. In addition, developments in the central bank's balance sheet were in line with the constraints agreed to by the IMF. One should also add to these positive developments the fact that the political disputes among

the coalition parties were finally out of the picture. There were other contributing factors as well, listed below:

- First, the fundamental differences between the Argentine and Turkish economies, such as the exchange rate regimes and the fiscal policies, became more apparent.
- Second, it was understood that the Turkish economy was going to register an important amount of current account surplus.
- Third, banks started to partially roll over their foreign credits.
- Fourth, the economic agents began to get used to the mechanics of the floating exchange rate regime and, since the beginning of August, the central bank's intervention in the foreign exchange market had been almost nil.
- Fifth, the structural reforms in the public sector were continued.
- Sixth, to finalize the restructuring of the financial sector, in February 2002 a recapitalization law was passed. In May 2002 all capital-deficient private banks presented their detailed capital strengthening plans to the Banking Regulation and Supervision Agency.
- Seventh, at the beginning of 2002, a debt management law, designed like a fiscal responsibility act, was enacted by parliament. All these measures helped the market understand that the authorities maintained a disinflation objective.

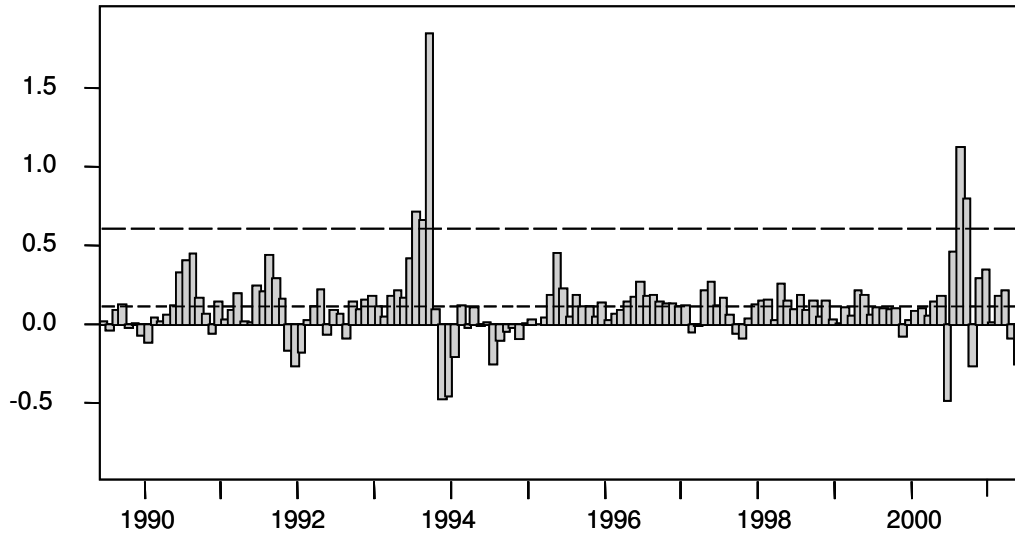
Consequently, the nominal exchange rate followed an almost continuously declining trend from mid-October up to the beginning of May 2002. A similar phenomenon was also observed in the interest rates. In March 2002, for the first time since the eruption of the crisis, the industrial production index showed positive growth. This growth stance continued in the following months, indicating that a significant output recovery process was under way. Inflation that was 68 percent at the end of 2001 started to decline and reached a level of 41 percent in annualized terms in July. Moreover, the gap between the inflationary expectations and the year-end target for 2002 continuously narrowed, also indicating a build-up of confidence and policy credibility. A similar phenomenon was also observed in the Turkish Treasury eurobond spreads (see table A-1).

Political and Policy Uncertainty

From the beginning of May, two negative developments occurred in the political arena. First, the prime minister was hospitalized and there were wide- spread rumors about his health. This was considered lethal to political stability, as it led to the possibility of a meltdown in his party—the party with the largest representation in a three-party coalition government. Second, discussions about the necessary steps that should be taken to meet the Copenhagen criteria—which would start the negotiation process for possible European Union accession—started to undermine the unity of the coalition government. The resulting political uncertainty led to an environment of policy uncertainty. Although there was no change in the fiscal and monetary policy stance, as of the beginning of May 2002, interest rate, exchange rate, and Treasury spreads once again started to deteriorate, demonstrating the importance and the fragility of market expectations once again.

FIGURES

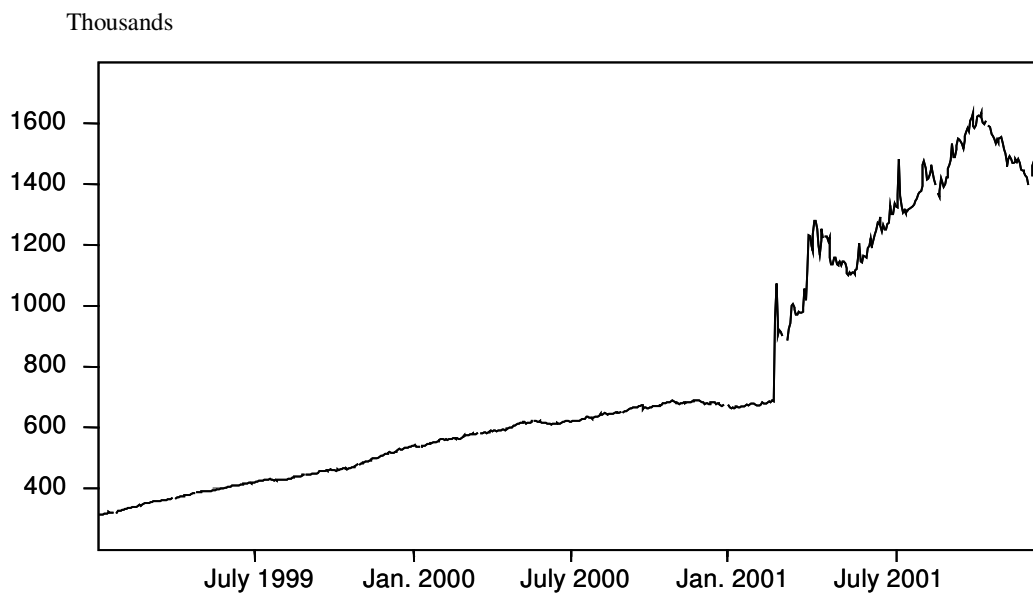
Figure 1. Exchange Market Pressure Index, 1990-2001^a



Source: Authors' own calculations based on data obtained from Central Bank of Turkey, Electronic Data Delivery System, www.tcmb.gov.tr.

a. Dashed lines indicate mean and mean plus two standard deviations.

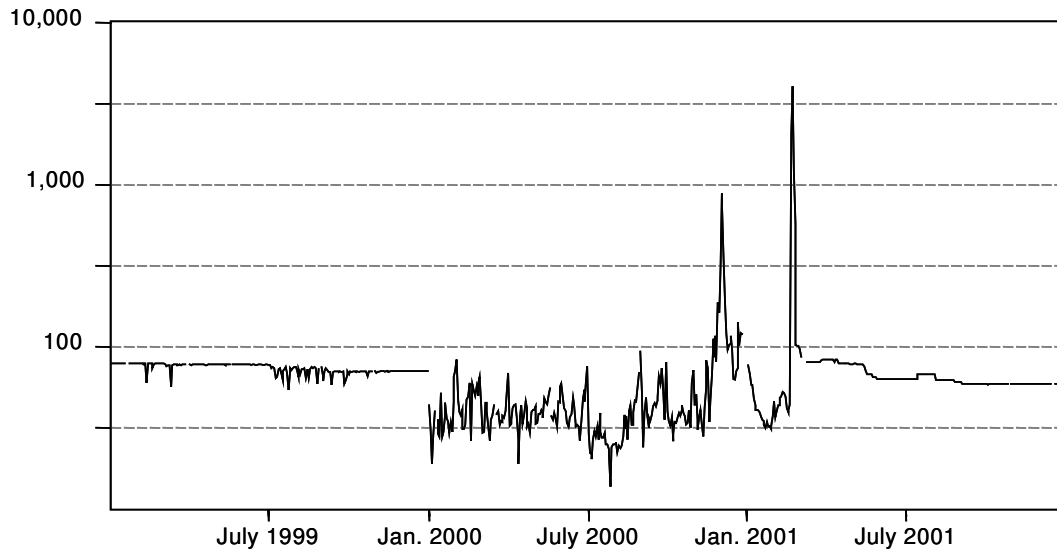
Figure 2. Daily Exchange Rate, Lira-Dollar, 1999-2001



Source: Central Bank of Turkey, Electronic Data Delivery System, www.tcmb.gov.tr

Figure 3. Weighted Average Overnight Rate, Daily Data, 1991–2001

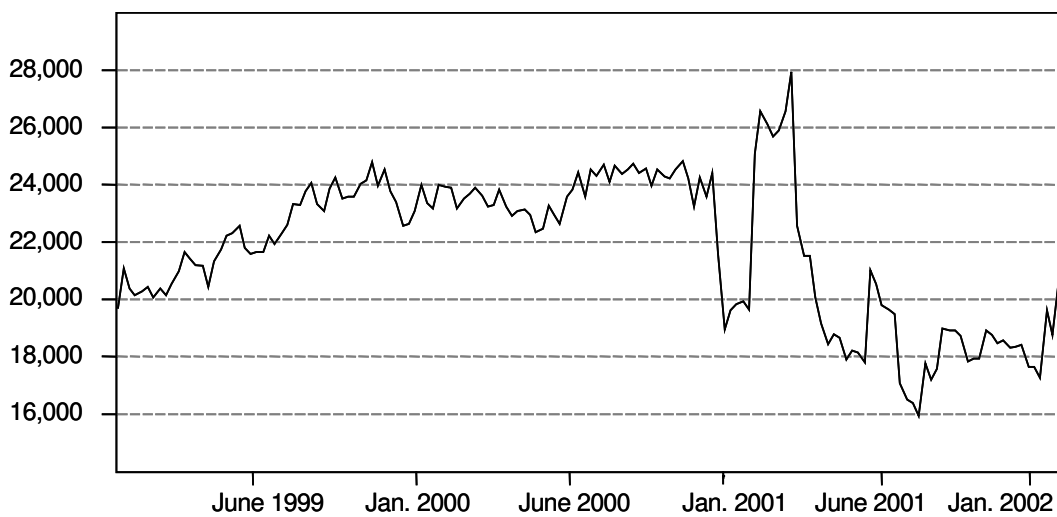
Percent (logarithmic scale, uncompounded)



Source: Central Bank of Turkey, Electronic Data Delivery System, www.tcmb.gov.tr

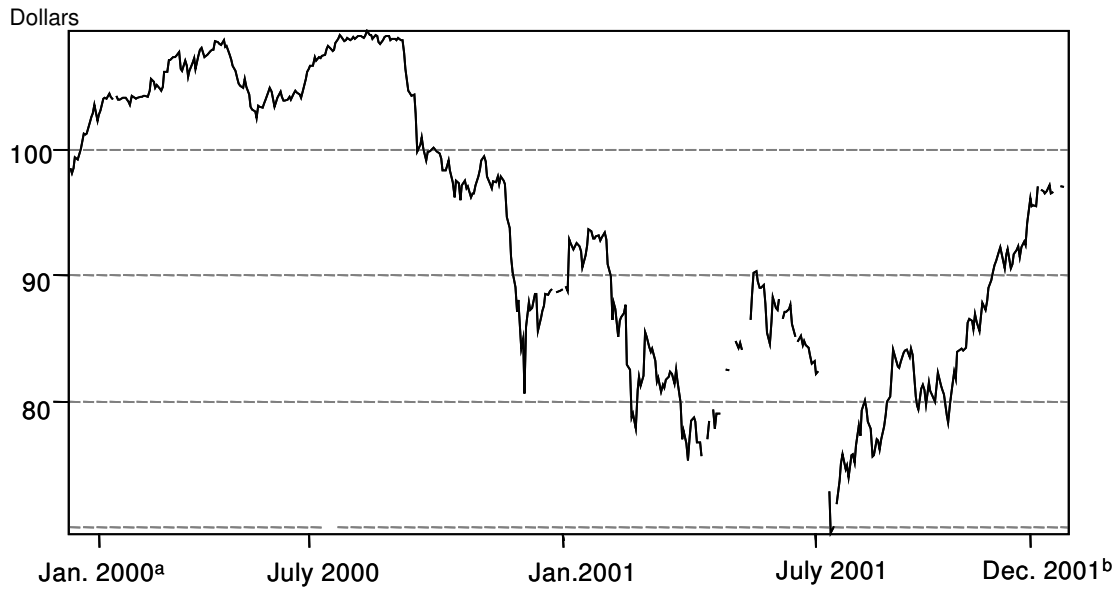
Figure 4. Foreign Exchange Reserves of the Central Bank, Weekly Data, 1999–2001

Billions of dollars



Source: Central Bank of Turkey, Electronic Data Delivery System, www.tcmb.gov.tr

Figure 5. Price of the Turkish Thirty-Year Eurobond, Daily Data, 2000–01



Source: Bloomberg System.
a. As of January 11, 2000.
b. Close of business, December 28, 2001.

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