


**A LEADING-INDICATOR MODEL FOR THE
BANKING CRISES IN TURKEY**

Burcu Kepez



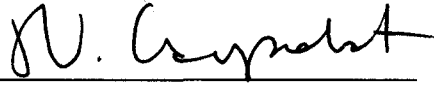
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Department of Economics**

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KABUL ve ONAY

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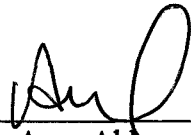
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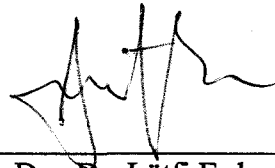
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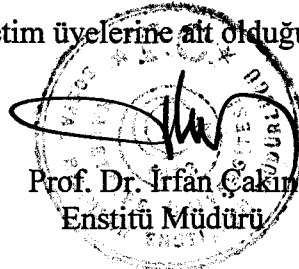


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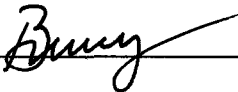
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Burcu Kepez

ÖZET

KEPEZ, Burcu. Türkiye'deki Bankacılık Krizleri İçin Bir Öncü-Gösterge Modeli,
Yüksek Lisans Tezi, Ankara, 2006

Bu tezin amacı, bir öncü-gösterge modeli gerçekleştirmek ve modelin, özellikle Kasım 2000 ve Şubat 2001'de Türkiye ekonomisini vuran kriz döneminde, TMSF tarafından el koyulan bankaların ayırt edici özelliklerini tanıyıp tanımadığını sınamak; bir başka deyişle, modelin öngörü yeteneğini ölçmektir. Tez, bankacılık krizleriyle ilgili mevcut literatürü incelemiş ve 1988 ile 2002 arasındaki zaman diliminde 47 bankanın data setini kullanarak bir Tobit modeli geliştirmeye çalışmıştır. Mevcut literatür ışığında, Tobit model tahmininden elde edilen ampirik sonuçlar, TMSF tarafından el konulan bankalar üzerine özel olarak odaklanarak analiz edildi. Genel bir çerçeveye olanak sağlamak için, temel mali sıkıntı göstergesi (tobit analizindeki bağımlı değişken) olarak alınan "karşılama oranı" şu unsurların birleştirilmesiyle oluşturulmuştur: "öz sermaye + kredi-zarar karşılıkları - takipteki alacaklar" ın toplam varlıklara oranı. Model, "gerçekleşen" ve Tobit modelden elde edilen "tahmin edilen" karşılama oranlarının kıyaslanması yoluyla test edildi ve TMSF tarafından el konulan bankaların tahmin edilmesi konusunda başarı elde edildi.

Anahtar kelimeler: Bankacılık Krizleri, Karşılama Oranı, Öncü-gösterge modeli

ABSTRACT

KEPEZ, Burcu. A Leading-Indicator Model For The Banking Crises In Turkey,
Master's Thesis, Ankara, 2006

The objective of this thesis is to perform a leading-indicator model and test the predictive ability of the model whether it recognizes distinctive features of the banks undertaken by SDIF, especially through the crises period that hit the Turkish economy in November 2000 and February 2001. The thesis examines the existing literature on banking crises and attempts to develop a Tobit model estimation by using a panel data set for 47 banks over the period 1988 and 2002. In the light of the existing literature, empirical results obtained from the Tobit model estimation are analyzed by specifically focusing on the banks taken over by SDIF. To allow for a general framework, the main indicator of distress (the dependent variable in the tobit analysis) is constructed by combining the elements: the ratio of (capital equity + loan-loss reserves - non-performing loans) to total assets: "coverage ratio". The model is tested by comparing the "actual" and the "estimated" coverage ratios obtained from the Tobit model and considerable success in predicting banks undertaken by SDIF is obtained.

Key Words: Banking Crises, Coverage ratio, Leading-indicator model

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INTRODUCTION

The last two decades witnessed an unprecedented increase in the number of financial distress episodes. In 1980s and early 1990s, several countries, including developed economies, developing countries and economies in transition experienced severe banking crises. Glick and Hutchison (1999) found more than 94 episodes of banking sector distress in industrial and developing economies since mid-1970s. Furthermore, the frequency of distresses was rising: 9 crises were marked in 1975-80, 34 during 1991-95 and by 1997, there were 7 new and 29 continuing episodes.

Banking crises are commonplace regardless of development status, but they occur with somewhat greater frequency in developing or emerging market economies than in industrialized countries. Argentina, Chile, Colombia, Indonesia, Jamaica, Mexico, Nigeria, Turkey and Venezuela are just some examples of major crises that follow on the heels of structural problems in their banking sectors.

Mainly through weaknesses in financial structure, political instability, unsustainable macroeconomic policies and global financial conditions, financial sector experiences a large number of defaults in banking crises. Furthermore, functioning of the payment system is put in danger. By undermining confidence in domestic financial institutions, crises cause a decline in domestic savings, lead to a large-scale capital outflow and may force sound banks to close their doors. Finally, banking crises limit the room for maneuver in the conduct of monetary policy and increase the probability of getting into currency and foreign debt crises as well.

Banking crises generally impose significant costs on economies. Great majority of countries suffered from recessions following episodes of banking sector distresses with cumulative output losses averaging around 20% of GDP (Hutchison and McDill, 1999). These costs range widely across countries. The Asian-crisis countries endured recapitalization costs ranging from 10 percent to 60 percent of GDP. The cost of recapitalizing Turkey's banks is likewise expected to be huge.¹

TABLE – 1 COST OF BANKING SECTOR RESTRUCTURING

Cost Of Banking Sector Restructuring ²		
	Crises Periods	Cost of Restructuring/GDP (%)
Turkey	2000-2001	27,70
*State Banks		15,80
*SDIF Banks		11,90
Spain	1977-1985	16,80
Japan	1990-	20,00
Indonesia	1997-	50,00
Malaysia	1997-	20,50
South Korea	1997-	26,50
Mexico	1995	20,00
Argentina	1980-1982	55,30
Brazil	1994-1996	20,00
Czech Republic	1994-1995	12,00

A particularity of these episodes is that they are not restricted to national boundaries, but spread to other countries through contagion, generating large costs both at national levels and for the international financial system.

Such proliferation of large scale banking sector problems has raised widespread concern as banking crises jeopardize financial systems and make markets be unable to channel funds efficiently from savers to people with productive investment opportunities. As a

¹ Goldstein, Morris, (2001)

² Source: Pazarbasioglu, 2003

result of this instability, economic activity contracts sharply, possibly forcing viable firms into bankruptcy.

Thus, the objective of this thesis is to perform a leading-indicator model and test the predictive ability of the model whether it recognizes distinctive features of the banks undertaken by SDIF, especially through the crises period that hit the Turkish economy in November 2000 and February 2001. In other words, whether the model predicts the banks taken over by SDIF will be tested.

The thesis begins with macro and micro approaches that have contributed to the design of “Early Warning System” for banking crises. Apart from these approaches, methodologies of rating agencies in assessing banks’ financial strengths are highlighted. As the last part of literature survey, evolution of the crises that hit the Turkish economy in November 2000 and February 2001 is discussed to give a wider perspective about the banks taken over by SDIF. Structural problems of Turkish banking sector are also analyzed in detail. Lastly, empirical results obtained from Tobit model estimation (for 47 banks through 1988 and 2002) are presented by specifically focusing on the SDIF banks. The dependent variable in the Tobit analysis is “coverage ratio”. With the explanatory variables of the panel data set, considerable success in predicting banks undertaken by SDIF is obtained. After the econometric model is performed, the thesis concludes.

I - MACRO AND MICRO APPROACHES

In the last few decades, empirical literature on systemic banking crises has grown substantially with the proliferation of large scale banking sector problems around the world. Although the literature on bank failures and banking crises is extensive, there seems to be two broad streams in the empirical literature: “Micro” and “Macro” camps. The “macro” approach uses macroeconomic variables as well as some institutional variables (usually proxied by dummies) to explain and ultimately predict systemic banking crises. These studies typically focus on a large sample of countries, some of which are known to have banking crises during a certain period. The “micro” approach typically focuses on banks’ balance sheet data to forecast the failure of individual institutions.

1. MACRO APPROACH

The definition of a financial crisis and the determination of the period in which one begins is a matter of judgement and debate. According to the macro approach, there is even no general consensus on what constitutes a systemic crisis. Researchers instead tend to rely on judgments of observers with expertise about countries’ banking systems.

According to Demirguc-Kunt and Detragiache (1998a), for an episode to be classified as a full-fledged crisis, at least one of the following four conditions has to hold:

1. The ratio of non-performing assets to total assets in the banking system exceed 10%,
2. The cost of the rescue operation is at least 2% of GDP,

3. The episode has involved a large-scale nationalization of banks,
4. Extensive bank runs have taken place or emergency measures such as deposit freezes, prolonged bank holidays or generalized deposit guarantees have been enacted by the government.

Kaminsky and Reinhart (1996) mark the beginning of a banking crisis by an event that indicates either: (i) bank runs that lead to closure, merging or takeover of one or more financial institutions by public sector (Argentina 1980 and 1994, Philippines 1981, Thailand 1983, Turkey 1991, Uruguay 1981 and Venezuela 1993); (ii) (if there are no runs) closure, merging, takeover or large-scale government assistance of an important financial institution (or group of institutions), that mark the start of a string of similar outcomes for other financial institutions (Chile 1982, Colombia 1992, Denmark 1987, Finland 1991, Indonesia 1992, Mexico 1992, Norway 1988, Peru 1983, Spain 1978, Sweden 1991, Thailand 1991 and Uruguay 1971).

1.1. Signaling Approach

In macroeconomic context, one group of study is based on “signaling approach” devised by Kaminsky and Reinhart (1996). This paper is a fundamental reference for the study of early warning indicators of banking and currency crises. (Gaytan and Johnson, 2002)

The methodology compares information on indicators in periods of tranquility with identified periods of crisis. Variables are selected from a set of candidates drawn from the theoretical literature of financial crises. When these variables attain certain levels,

they signal possible problems in the financial system. The threshold level for each indicator is chosen in a way to minimize the risk of false signals and the risk of missing crises.

Formally, an indicator, x^j , is said to “signal” an impending crisis if this indicator crosses some threshold value \bar{x}^j . It is important to define what is considered to be the cut-off threshold value, which strikes a balance between false alarms (type II errors) and the risk of missing crises (type I errors). The “optimal” threshold for each indicator is typically set so as to minimize the noise-to-signal ratio, w , defined as:

$$w = b(\bar{x}^j) / (1 - a(\bar{x}^j)) \quad (1)$$

where

$a(\bar{x}^j)$ = probability of type I error associated with threshold \bar{x}^j .

$b(\bar{x}^j)$ = probability of type II error associated with the threshold \bar{x}^j .

A type I error occurs when the null hypothesis is mistakenly rejected and a type II error occurs when the null hypothesis is mistakenly accepted. Under the null hypothesis that there will be a crisis, it is appropriate to minimize equation (1).

Candidate variables employed in the explanation of banking crises are an index of production, real exchange rate, terms of trade and foreign exchange reserves of central bank, stock price index, banking credit to private sector (in real terms), the money multiplier, M2 over the monetary base (M2/M0), real interest rates on deposits and deposits at commercial banks. Banking crises are found to be preceded by economic

recessions (weaker industrial production and higher real interest rates), decline in terms of trade, stock market crash and real exchange rate appreciation. Financial liberalization is also found to be a threatening factor to destabilize the financial sector as a whole through a sharp expansion in the money multiplier, lending booms or real interest rates. The paper also attempts to determine linkages between banking and currency crises and concludes that while banking crises precede and help to explain the occurrence of currency crises, the converse link does not seem to exist.

According to Komulainen and Lukkarila (2003), major advantage of the signaling method is the evaluation of each indicator's individual predictive power, which provides easily understandable results for policy purposes. However, explanatory variables, as well as the probability of a crisis, are defined as a step function. Thus, the model fails to distinguish whether the value of a variable barely or greatly exceeds the threshold. Finally, standard statistical tests are –as the step function takes zero when the indicator variable is below the threshold and one when it is above the threshold– inapplicable to the signaling approach. A further drawback of the model is that it does not permit studying the severity of banking crises. (Gaytan and Johnson, 2002)

1.2. Limited Dependent Model Approach

Another group of study in the macro camp is “Limited Dependent Model Approach” which employs regression techniques to estimate the relationship between potential indicators and identified discrete outcomes such as banking crises. Specifically, qualitative and quantitative information on the occurrence of such events is used to

construct a dependent variable, which can take a limited number of discrete values³. Regression analysis is then used to capture the effect of movements in the indicators on the probability of the event.⁴

Eichengreen and Rose (1998) analyze the impact of external conditions (industrial-country interest rates and output growth) on banking crises using a panel of macroeconomic data for more than 100 developing countries from 1975 to 1992 in a multivariate probit framework. Probit regressions are estimated with maximum likelihood method. Definition of “banking crisis” is made according to the study of Caprio and Klingebiel (CK-1996)⁵. Eichengreen and Rose start by dividing the sample into country-year observations with banking crises (as identified by C-K; however, by using only the first year of a banking crisis if it is more than one year in length), then construct two-sided, three year “exclusion windows” around each crisis to avoid double counting. These procedures yield a total of 39 banking crises.⁶

Key variables pointed out by the analysis are variables “international” in nature (ratio of international reserves to imports, ratio of external debt to GDP, the current account as a share of GDP and the degree of exchange rate over-valuation), domestic macroeconomic indicators (government budget surplus or deficit expressed as a

³ Sometimes, authors use binomial -rather than multinomial- models, where the value of the dependent variable is either 1, when the event occurs, or 0, when it does not.

⁴ An advantage of this methodology is that it is possible to perform the usual inference based on statistical tests. (Gaytan and Johnson, 2002)

⁵ An episode is generally categorized as a crisis if there is evidence that most or all of banking system capital is eroded. Smaller, borderline crises, where only a subset of financial intermediaries is affected, require a heavier dose of judgement. Specifically, CK divide crises into systemic and non-systemic (i.e. smaller, borderline) events and find 79 systematic and 29 non-systematic episodes with an average length of 4.5 years for the former and 3.4 years for the latter.

⁶ In addition, there are 1600 observations which are not crises and do not fall into the exclusion window; they are used as control samples for tranquil observations.

percentage of GDP, domestic credit growth and the growth rate of GDP per capita) and external variables (the growth rate of real GDP in the OECD countries and 'Northern' interest rates⁷). The results highlight that the Northern interest rate is significantly related with banking crises in developing countries. The business cycle of the OECD countries also has an important contribution to the probability of crises. The overvaluation of the exchange rate is also significant and it is considered to set the stage for financial problems. On the other hand, the results seem to be insensitive to the effects of external debt burdens and domestic financial structures.

Demirguc-Kunt and Detragiache (1998a) study the determinants of systemic banking crises in a sample of 65 developing and developed countries in 1981-94 by employing a multivariate logit model^{8,9}. The set of explanatory variables includes the rate of growth of real GDP, terms of trade, real short-term interest rate, inflation, rate of depreciation of the exchange rate¹⁰, ratio of M2 to foreign exchange reserves¹¹, government surplus as a percentage of GDP, ratio of bank cash and reserves to bank assets¹², a dummy variable taking one in countries/years in which an explicit deposit insurance scheme is in place and zero otherwise. The results indicate that macroeconomic environment is an important determinant of banking sector fragility, specifically; the likelihood of crises

⁷ 'Northern' interest rate variable is constructed as a weighted average of short-term rates for the U.S., Germany, Japan, France, the U.K and Switzerland; the weights are proportional to the fractions of debt denominated in the relevant currencies.

⁸ DKD does not make a distinction between systemic and non-systemic crises. As mentioned before, for an episode to be classified as a crisis, non-performing assets as a share of total financial assets in the banking system must exceed 10%; the cost of a rescue operation must be at least 2% of GDP; banking sector problems must result in a large-scale nationalization of banks, extensive bank runs must have taken place and/or emergency measures (deposit freezes, prolonged bank holidays, generalized deposit guarantees) must have been enacted.

⁹ Banking crisis variable is a function of a vector of n explanatory variables $X(i,t)$. $P(i,t)$ denotes a dummy variable that takes one when a banking crisis occurs in country I at time t and zero otherwise.

¹⁰ tests the hypothesis whether banking crises are driven by an excessive foreign exchange risk either in the banking system or among bank borrowers

¹¹ tests whether systemic banking sector problems are related with sudden capital outflows

¹² captures the liquidity of the banking system

increases with growth slowdowns or when inflation is high and when interest rates are high. The probability of crises is also higher when market discipline (which attributes to the presence of deposit insurance and institutional development) is inadequate.

Additionally, their 1998 follow-up study considers the role of financial liberalization and finds that recent liberalization (as proxied by the removal of interest-rate controls) further increases the likelihood of a banking crisis where institutional quality ¹³ is inferior.

In Demirguc-Kunt and Detragiache (2000a), they introduce additional aspects of deposit insurance schemes (about their funding, coverage, etc.). Again, they conclude that explicit deposit insurance tends to increase banking fragility more where interest rates are deregulated and the institutional environment is weak. They also find that deposit insurance has a more adverse effect when the coverage offered to depositors is extensive and when the scheme is funded or run by the government rather than the private sector.

Eichengreen and Arteta (2000) analyze banking crises using a panel of macroeconomic and financial data for 75 developing countries from the mid-1970s to 1998. The study mainly focuses on the crisis definition of Caprio and Klingebiel (1999). According to this approach, an episode is generally categorized as a crisis if there is evidence that most or all of banking-system capital is eroded. The approach includes episodes from mid-1970s to 1998 and divides crises into systemic and non-systemic (i.e. smaller, borderline)

¹³ Institutional quality is proxied by the indexes of law and order, bureaucratic delay, quality of enforcement, quality of bureaucracy and degree of corruption.

events. Particularly, the study focuses on the “systemic crisis” concept and constructs a two-sided, three-year exclusion window around each crisis to capture the observed persistence of banking crises. Thus, if a crisis lasts more than one year, only the year of its onset is considered and the subsequent observations are disregarded. This yields 78 crisis episodes and 2248 non-crisis observations. All probit regressions are estimated with maximum likelihood. The key conclusion of Eichengreen and Arteta in the light of macroeconomic¹⁴ and external¹⁵ factors is that rapid domestic credit growth, large bank liabilities relative to reserves and deposit rate decontrols are among the robust causes of banking crises in emerging market economies.

2. MICRO APPROACH:

The “micro” camp focuses on banks’ balance sheet data to forecast the failure of individual institutions.

2.1. CAMELS Rating System

The CAMEL rating system, originally derived from on-site examinations, was introduced as a uniform system of rating by Federal agencies in the United States in

¹⁴ Macroeconomic variables: total external debt/GNP; gross international reserves/months of imports; current account balance/GNP; real exchange rate overvaluation which is defined as the deviation from time-averaged country-specific real exchange rate (i.e. $\log(\text{price level}) / (\text{US price level} * \text{nominal exchange rate with US\$}) * 100$); budget balance/GNP, defined as balanced budget divided by GNP (both are in current local currency) * 100; domestic credit growth, defined as the first difference of the log of net domestic credit (in current local currency) * 100; per-capita output growth, defined as the first difference of the log of per-capita GNP (in 1995 US\$) * 100; M2/reserves

¹⁵ External Factors: northern interest rates, defined as the weighted average of short-term rates for the US, Germany, Japan, France, the UK and Switzerland (the weights are proportional to the fractions of debt denominated in the relevant currencies); Northern output growth, defined as the first difference of the log of real OECD output growth (GNP in constant US\$)

1979. Under this system, each banking institution is evaluated on the basis of five critical dimensions relating to its operations and performance. These are capital adequacy (C), asset quality (A), management (M), earnings (E) and liquidity (L) which are seen to reflect the financial performance, financial condition, operating soundness and regulatory compliance of banking institutions. On 01.01.1997, in an effort to make the rating system more risk-focused, the CAMEL rating system was amended and a sixth component relating to sensitivity to market risk (S) was included to the CAMEL rating. The new "S" component focuses on sensitivity to market risk such as the risk arising from changes in interest rates.

In this system, a composite rating is assigned as an abridgement of the component ratings. The composite rating index is taken as the prime indicator of a bank's current financial condition and the score of individual performance for each institution is compared relative to other institutions. Overall, the CAMELS rating has five levels: (1) basically sound in every respect; (2) fundamentally sound but with modest weaknesses; (3) financial, operational or compliance weaknesses that cause supervisory concern; (4) serious financial weaknesses that could impair future viability and (5) critical financial weaknesses that render the probability of near-term failure extremely high (Gunther and Moore, 2003). According to Gaytan and Johnson (2002), although supervisory reports based on the CAMELS system include overall assessments of macro-legal environments in which banks operate, they are not forward looking. Rather, they are designed to assess the condition of an institution in a point of time and they generally provide ex-post indications of problems existing in banking institutions (Sahajwala and Bergh, 2000)

Atle Berg and Hexeberg (1994) consider the experiences during the Norwegian banking crisis and evaluate the performance of a set of possible early warning indicators. In order to describe different aspects of banks' conditions, the CAMEL banking supervision system is used¹⁶. As a preliminary exercise, average values of indicators for a set of problem banks within a specified time horizon are computed and these values are compared with the average values of banks that have never become problematic. The difference between problem and non-problem banks is found to be more distinct the shorter the time lead become. For the 0-4 months' lead, all the capital adequacy and earning indicators reveal significant differences.

Secondly, the study assumes that the conditional distribution for an event in which a bank seeks financial assistance is logistic. The probability of being a problem bank is assumed to be

$$P(y) = a_0 + \sum_i a_i * x_i$$

where $y = 1$ signifies a no-problem bank and $y = 0$ signifies the emergence of a bank problem. As a result, CAP3 (total loans/equity capital), CAP4 (total loans/capital) and ASS1 (commercial and industrial loans/risk assets) are found to be relevant.

Kaya (2001) demonstrates a CAMELS rating system for Turkish banks and finds that all components of "CAMELS" deteriorated in 2000 compared to 1997. She also

¹⁶ To represent "capital adequacy", CAP1= risk assets/equity capital, CAP2= risk assets/capital, CAP3= total loans/equity capital, CAP4= total loans/capital are used. To represent "asset quality", ASS1= commercial and industrial loans/risk assets, ASS2= risk assets/total sources of funds are used. To represent "management competence", MAN1= interest sensitive funds/total assets, MAN2= three-year growth in total loans (in percent) are used. To represent "earnings", EAR1= loss provisions/net operating income, EAR2= operating expenses/total operating income, EAR3= non-interest operating expenses/net operating income are used. No "liquidity indicators are used.

compares 1997 and 2000 performances of banks by using Wilcoxon Matched Pairs test and finds an overall deterioration from 1997 to 2000. Next, she divides the banks into two groups (SDIF and non-SDIF) and again applies Wilcoxon Matched Pairs test to the groups. The deterioration for the SDIF banks is found to be much clearer.

Kaya also asks whether there is a relation between 1997 CAMELS rating of banks and the probability to be undertaken by SDIF within 1998-2001 by using a probit regression.¹⁷ According to the regression results, decreasing CAMELS ratings of the banks increase their probability of being undertaken by SDIF in the next periods.

Using a logit model, Logan (2001) examines balance sheet characteristics of small and medium-sized UK banks prior to crisis periods to identify distinctive features of failure within a large set of variables measuring the potential for a bank to make losses (namely credit losses¹⁸, liquidity risk¹⁹, balance sheet concentration risk²⁰ and miscellaneous risk²¹) and to withstand adverse shocks²².

¹⁷ The dependent variable takes 1 for a SDIF bank and 0 for a non-SDIF bank and 1997 CAMELS grades of banks are used as explanatory variables.

¹⁸ Loan growth in Q2 of Year t (LGYear) (For example, LG91 is the growth in loans in 1991-Q2), total assets growth (TAYear) (For example, TA91 is the growth in total assets in 1991-Q2), level of provisions as a share of total assets (POA), risk-weighted assets to unweighted assets (RWTTA).

¹⁹ Ratio of private sector loans to total assets (LOA), percentage of a bank's deposits placed by other UK banks (BAD) and liquidity mismatch (STED) (which is captured by the difference between short-term assets and liabilities)

²⁰ Dependence on claims of relatively few individuals or associated customers, that is ten largest exposures as a percentage of total assets (LE), net interest income earned over the past year expressed as a percentage of total income earned over the past year (NII) and the size of ten large deposits expressed as a percentage of total deposits (DEPC).

²¹ Number of years the bank has been authorized to accept deposits under the Banking Act 1979 (AGE), natural logarithm of the sterling value of the bank's total assets (SIZE), the target ratio that the banking supervisors set for the bank (TAR)

²² Total income earned over the past year expressed as a percentage of total net capital (ITCR), profits (pre tax and the subtraction of provisions) earned over the past year expressed as a percentage of total assets (PROFPR), profits (net of tax and provisions) earned over the past year expressed as a percentage of total assets (PROF), the risk assets ratio minus the target ratio set by the banking supervisors within the bank at the time (expressed in percentage points) (XRAR), the risk assets ratio minus the target ratio expressed as a percentage of the target ratio (XRARP), total liabilities minus total net capital expressed as

A bank is classified as “failed” if it underwent any of the following events between 01.07.1991 and 30.06.1994:

- I. it entered administration;
- II. it entered liquidation;
- III. it received liquidity support from the Bank of England;
- IV. it had its authorization revoked by the Bank of England for reasons that could potentially be predicted by the balance sheet
- V. it voluntarily surrendered its authorization, except when motivated by corporate restructuring (typically following takeover) or by a strategic review of the benefits of a banking license (because the entity no longer needed to receive deposits to conduct its consumer credit or lending activity).

The dependent variable is constructed as a binary variable. It takes 1 if the bank failed in the predetermined period and 0 if it continued its activities for the whole period. Logan undertakes a cross-sectional study, using data constructed in 1991 Q2. The analysis has two regressions; while the first one focuses on the general specification of the regression, the second shows the parsimonious form which excludes statistically insignificant variables with the objective of maximizing AIC.

Loan growth in 1991 Q2 (LG91) outperforms all other measures of credit risk in regression-1. Furthermore, the liquidity mismatch (STED) variable is the dominant measure of liquidity. The post-tax (and provisions) return on total assets (PROF) is the

a percentage of total net capital (LEV) and a dummy variable which takes 1 if the bank is owned by a large parent and 0 if not. (PAR).

most relevant variable among other earnings variables. The leverage ratio (LEV) is the dominant measure of capital.

In terms of statistical significance, the most important leading indicator in the regression-2 of the analysis is loan growth in 1991 Q2 (LG91). Bank failure is also found to be positively related with the dependence on net interest income (NII). The other measure of risk found to be statistically significant is the liquidity mismatch between short-term assets and liabilities (STED). Two of the three variables that attempt to measure a bank's overall ability to resist shocks are statistically significant. The sign of the profitability variable (PROF) is in line with expectations: lower profitability is associated with failure. The sign of the large parent dummy is as expected, suggesting that small and medium-sized banks are more likely to fail if they are not owned by large corporates.

2.2. Objection To Traditional Indicators

Rojas-Suarez (2001) asks whether using CAMELS variables assesses the risk of financial institutions in developing countries. She argues that commonly used indicators of banking problems in industrial countries perform poorly in signaling problems in emerging markets because of severe deficiencies in accounting and regulatory frameworks which limit the meaning of traditional ratios. Moreover, bank ratios become less effective when liquid markets for bank share, subordinated debt, other bank liabilities and assets are not available to validate the real worth of a bank as opposed to its accounting value.

The study proposes an alternative set of indicators that can provide a better ranking and serve as indicators for early warning of financial problems and questions whether the traditional or alternative indicators provide more information about the strength of a bank in emerging markets²³. Alternative indicators proposed are: implicit interest rate paid on deposits²⁴ (ratio of bank's interest payments to total deposits), spread between lending and deposit rate²⁵ (ratio of interest received to total loans minus ratio of interest payments to total deposits), rate of loan growth²⁶ and growth of interbank debt²⁷. According to Rojas-Suarez, in contrast to the interpretation of banks' spreads in industrial countries, low spread between lending and deposit rate in emerging markets do not always indicate an increase in efficiency. Instead, low spread often reflects the unlimited risk-taking behavior of weaker banks. Furthermore, signaling an increase in risk-taking activities, banks that ended in crisis, on average, have higher deposit rates than banks that remained solvent. In addition, problem banks expand loans rapidly than solvent banks and have less access to funds from the interbank market.

The traditional indicators tested include capitalization²⁸ (risk-weighted capital-asset ratio), change in equity prices²⁹, ratio of net profits total income³⁰, ratio of operating costs to total assets³¹ and ratio of liquid assets to total deposits³².

²³ This paper uses the "signaling approach" in which an indicator exceeding a specified threshold provides a signal that should alert analysts and supervisors about the weakening of bank performance.

²⁴ Indicator gives a signal if it is greater than system mean (calculated separately for each period) plus 1 standard deviation.

²⁵ Indicator gives a signal if it is less than system mean (calculated separately for each period) plus 1 standard deviation.

²⁶ Indicator gives a signal if it is (a) Above banking system mean, evaluated for the entire period, by 1 standard deviation. (b) Above banking system mean, evaluated for the tranquil period, by 1 standard deviation.

²⁷ Indicator gives a signal if it is negative by at least 20 percent in two quarters.

²⁸ Indicator gives a signal if it is less than 8 percent for at least 2 consecutive quarters.

²⁹ Indicator gives a signal if it declines more than 10 percent persisting for at least two consecutive quarters.

Banking crisis is defined as actual intervention by the authorities, either to close a bank, to recapitalize it using public resources or to provide strong liquid support. The first step consists of determining whether each indicator behaves significantly differently in banks that have experienced a crisis relative to the non-crisis banks. To test whether such difference in behaviors occurs, Rojas-Suarez investigates whether the means of the variables differ significantly for banks that failed. To do this, she uses t-tests to look for the difference in the two groups of banks.

As a second step to assess the appropriateness of the alternative set of indicators proposed in the paper, she uses signaling approach of Kaminsky and Reinhart (1999). In this approach, an indicator that exceeds a specified threshold provides a signal and alerts rating agencies, analysts and supervisors about the weakening of a bank's performance. An indicator is considered "good" when it emits a signal that is followed (within 12 months) by a problem in the bank in question or when no signal is emitted and no problems follow. Likewise, an indicator is considered "bad" when its emission of a signal is not followed by bank problems or when no signal is issued and problems follow. She tests the performance of these indicators for four episodes of banking crises: Mexico 1994-95, Venezuela 1994, Colombia 1982-86 and Asia 1997 and concludes that the alternative indicators significantly outperform the traditional indicators in predicting banking problems for all the episodes analyzed.

³⁰ Indicator gives a signal if it is (a) below banking system mean, evaluated for the entire period, by 1 standard deviation. (b) below banking system mean, evaluated for the tranquil period, by 1 standard deviation.

³¹ Indicator gives a signal if it is (a) above banking system mean, evaluated for the entire period, by 1 standard deviation. (b) above banking system mean, evaluated for the tranquil period, by 1 standard deviation.

³² Indicator gives a signal if it is (a) below banking system mean, evaluated for the entire period, by 1 standard deviation. (b) below banking system mean, evaluated for the tranquil period, by 1 standard deviation.

2.3. Bank Assessment Methodologies Of Rating Agencies

2.3.1. Description Of Rating Notes: Moody's, Fitch And Standard & Poor's³³

Banking sector, controlling financial intermediation between savers and borrowers, has a dominant position in emerging financial markets. Furthermore, banks generally dominate other areas of financial activity in their home markets, such as share brokerage, fund management, leasing companies and insurance. Moody's believes that techniques of credit analysis are transferable across geographic regions and banking systems at different stages of development. Its analysts assign same type of credit ratings in emerging markets as they do everywhere in the world, but the relative importance that factors play in analyses differs in emerging markets and developed economies.

Moody's main ratings are "Debt³⁴ and Deposit Ratings" and "Bank Financial Strength Ratings (FSRs)". Debt and Deposit Ratings measure a bank's repayment ability; that is, they measure the probability that a bank will default on its debt obligations over their life and the expected monetary loss caused by such a default. In contrast, FSRs, which were introduced in 1994, measure a bank's stand alone financial strength without reference to either sovereign transfer risk or implicit / explicit support from third parties. Debt and deposit ratings range from Aaa to C for long-term debt and deposits^{35,36} and

³³ Credit ratings of some Turkish banks are given in Appendix-1 (Page 84-88)

³⁴ Debt refers to bonds or notes

³⁵ Rating levels other than Aaa, Ca and C employ modifiers. So Aa1 is higher than Aa2, which is higher than Aa3.

³⁶ Ratings of Baa3 and above are investment grade.

Prime-1 to Not Prime for short term³⁷. FSRs range from A to E. '+' modifier may be attached to grades below A level³⁸ (Moody's, 1999; Moody's Rating Definitions on Moody's website: www.moody.com).

Before rating banks in a country, Moody's assigns country ceilings to all foreign currency bonds and deposits of banks in that country. This ceiling is not the same thing as a government bond rating, although in practice, the two are nearly always considered at the same level. A government rating is a rating assigned to specific bonds issued by the government of a country: e.g., the Central Bank of Tunisia, the Federative Republic of Brazil (Moody's, 1999).

According to Fitch Ratings' analysts, bank-rating approach in an international perspective has to be in a way that they should understand the business of a bank in question (and the risks inherent to this business), the objectives of its management, the environment it operates in and the likely future development of its business (Fitch Ratings, 2004).

"Support Ratings" are the product of Fitch's assessment of a potential supporter's (either a sovereign state's or an institutional owner's) propensity to support a bank if it runs into difficulties. Its ability to support is set by the potential supporter's own Fitch Long-term Debt Rating, both in foreign currency and, where appropriate, in local currency. Support ratings are directly linked to long-term debt ratings; for each bank

³⁷ All ratings other than Not Prime are investment grade.

³⁸ The terms 'investment grade' and 'sub-investment grade' are not applied to FSRs.

rated, a long-term debt-rating floor is set for a bank³⁹. Support ratings range from 1 to 5, implying that “1: there is an extremely high probability of external support” and “5: although possible, external support cannot be relied upon”⁴⁰. It is assumed that “senior debt (secured and unsecured), including insured and uninsured deposits (retail, wholesale and interbank); obligations arising from derivatives transactions and from legally enforceable guarantees and indemnities, letters of credit, acceptances and avals; trade receivables and obligations arising from court judgements” are supported whereas “preference/preferred shares or stock; hybrid capital (tier 1 and “upper” tier 2), including Reserve Capital Instruments (RCIs) and variations upon RCIs; and common/ordinary equity capital” are not supported (Fitch Rating Definitions; www.fitchratings.com).

“Individual Ratings” are designed to assess a bank’s appetite for and management of risk and they represent Fitch’s view on the likelihood that a bank fails and requires support to prevent itself from default. In assigning an individual rating to a bank, the credit committee bases its decision on profitability, balance sheet integrity (including capitalization), franchise, management, operating environment, consistency, as well as size (in terms of a bank’s equity capital) and diversification (in terms of involvement in a variety of activities in different economic and/or geographical sectors) of a bank. Individual ratings range from A (implying a very strong bank) to E (indicating a bank with serious problems).

³⁹ But its intrinsic credit quality is not assessed. This is the function of the Individual rating.

⁴⁰ The probability of support rating 1 indicates a minimum of Long-term rating floor of 'A-'; 2 indicates a minimum of Long-term rating floor of 'BBB-'; 3 indicates a minimum of Long-term rating floor of 'BB-'; 4 indicates a minimum of Long-term rating floor of 'B'; 5 indicates a Long-term rating floor no higher than 'B-'

In addition to Support and Individual ratings, Fitch assigns Long-term and Short-term credit ratings. The function of such ratings is to answer the question: “If I lend money to this bank via this instrument, how certain is it that I will be repaid in a timely fashion?”. Accordingly, “Investment grade” ratings⁴¹ indicate a relatively low probability of default, while those in “speculative” or “non-investment grade” categories⁴² either signal a higher probability of default or (in the ‘D’ category) default has already occurred.^{43,44}

International Short and Long-term ratings may be assigned to both foreign currency and local currency debt issues. Foreign currency ratings are subject to “country ceilings” and Local currency ratings assigned to banks are subject to “sovereign ceilings”, that is, sovereign state’s local currency rating is generally the highest rating of any entity in its jurisdiction. However, banks with particular strengths may on occasion exceed it. (Fitch Rating Definitions, www.fitchratings.com).

A credit rating is Standard and Poor's opinion for general creditworthiness of an obligor or the creditworthiness of an obligor with respect to a particular debt security or other financial obligation, based on relevant risk factors. Analysts do not limit themselves to traditional financial variables; the reputation of a bank may not have a great impact on its future financial performance and its ability to repay its obligations (Standard and Poor’s, 2004c).

⁴¹ Long-term “AAA” – “BBB-” categories and Short-term “F1” – “F3”

⁴² Long-term “BB+” – “D” and Short-term “B” – “D”

⁴³ The modifiers “+” or “-” may be appended to a rating to denote relative status within major rating categories. Such suffixes are not added to the ‘AAA’ Long-term rating category, to categories below ‘CCC’, or to Short-term ratings other than ‘F1’.

⁴⁴ Rating Outlook: An Outlook indicates the direction a rating is likely to move over a one to two-year period. Outlooks may be positive, stable or negative. Occasionally, Fitch Ratings may be unable to identify the fundamental trend. In these cases, the Rating Outlook may be described as evolving.

“Issue-Specific Credit Rating” of Standard and Poor’s is an opinion for the creditworthiness of an obligor with respect to a specific financial obligation, a specific class of financial obligations or a specific financial program. This opinion may reflect the creditworthiness of guarantors, insurers or other forms of credit enhancement on the obligation and takes into account the currency in which the obligation is denominated. Issue-specific credit ratings are shaped by considering the possibility of payment⁴⁵, nature of the obligation and the protection afforded by the obligation in case of bankruptcy or reorganization under laws of bankruptcy and other laws affecting creditors’ rights.

“Issuer Credit Rating” of Standard and Poor’s is an opinion of an obligor’s overall financial capacity (its creditworthiness) to pay its financial obligations. This opinion focuses on the obligor’s capacity and willingness to meet its financial commitments as they come due. Corporate credit ratings and sovereign credit ratings are all forms of issuer credit ratings.

Issue and issuer credit ratings use identical symbols and these definitions resemble to each other. Both the issuer and issue rating definitions are expressed in terms of default risk, which refers to the capacity and willingness of the obligor to meet its financial commitments on time, in accordance with the terms of the obligation.

Long-term credit ratings are divided into several categories, ranging from AAA, reflecting the strongest credit quality, to D (or SD), reflecting the lowest. Obligations

⁴⁵ That is the capacity and willingness of the obligor to meet its financial commitment on an obligation in accordance with the terms of the obligation

rated AAA, AA, A and BBB are regarded as investment grade whereas BB, CCC, CC and C have significant speculative characteristics⁴⁶. Long-term ratings from AA to CCC may be modified by a plus or minus sign to show relative standing within the major rating categories.

A short-term credit rating is an assessment of an issuer's credit quality with respect to an instrument considered short term in the relevant market. Short-term ratings are A-1⁴⁷, A-2, A-3, B, C and D (or SD) (S&P Rating Definitions; www.standardandpoors.com).

With respect to issuer credit ratings, failure to pay a financial obligation leads to a rating of either D or SD. Ordinarily, an issuer's distress leads to a general default and the rating is D. SD (selective default) is assigned when an issuer can be expected to default selectively, i.e., continue to pay certain issues or classes of obligations while not paying others.

Standard and Poor's issues credit ratings both in terms of local and foreign currency. Whereas local currency credit ratings reflect an obligor's overall capacity to generate sufficient local currency resources to meet its financial obligations, foreign currency credit ratings focus on an obligor's overall capacity to meet its foreign-currency-denominated financial obligations. Both for local and foreign currency credit ratings, Standard & Poor's global scale are based on the obligor's individual credit characteristics, including the influence of country or economic risk factors. However, only foreign currency credit ratings include transfer and other risks (such as the

⁴⁶ An obligation rated D is in payment default.

⁴⁷ A-1 can be modified by (+) to indicate that the obligor's capacity to meet its financial commitment on these obligations are extremely strong.

likelihood of foreign-exchange controls and the imposition of other restrictions on the repayment of foreign debt) related to sovereign actions that may directly affect access to the foreign exchange needed for timely servicing of the rated obligation (Standard and Poor's, 2004c).

2.3.2. Significant Topics In Assessments Of Rating Agencies

In forming an analytical rating approach, analysts principally consider same issues, but the relative importance that factors play in analyses differs in emerging markets and developed economies. Significant topics that form the basis of assessments are: "Operating Environment, Ownership and Governance, Franchise Value, Earning Power, Risk Profile, Capital Analysis, Management Priorities and Strategies" (Moody's, 1999; Fitch Ratings, 2004; Standard and Poor's, 2004a).

2.3.2.1 Bank's Operating Environment

According to Moody's analysts, banks' market environment is the most important reason why emerging-market banks as a class receive lower ratings than those in developed economies. The first stage of the operating environment analysis is the assessment of the factors including prospects for the country's political situation, economic growth, exchange rate stability and inflationary trends. As a next stage, analysts look at the diversity and depth of the economy; whether the economy contains a large number of healthy enterprises covering wide range of economic activities is evaluated. In particular, analysts evaluate the structure of the banking sector, relative

size of various banks, individual market shares, their ability to influence prices, concentration of market and recent consolidation trends. As financial markets become more diverse and mature, changing structure of the banking system brings new players to the market. As for rating agencies, how individual banks' competitive position will be affected by the development of financial markets is important. (Fitch Ratings, 2004; Moody's, 1999)

Transparency is another crucial issue in emerging-market banking systems. Less transparency directly leads to more banking problems because banks in that market have to base their business decisions on incomplete or incorrect information and therefore, they are more prone to wrong decisions. At the level of individual banks, analysts ask whether banks report in line with international accounting standards, including disclosure of impaired loans, market value of securities and fair value of unquoted investments. (Fitch Ratings, 2004)

Audit process is a crucial concept in protecting the integrity of a bank's financial reporting. It is the responsibility of a bank's audit committee (or equivalent) to monitor the work of external and internal auditors and at the same time to ensure that the company's audit is conducted independently and objectively (Fitch Ratings, 2004).

Understanding the legal system is another important element in emerging market bank analysis. A legal system which is unpredictable, unenforceable, incomplete and open to corruption diminishes the effectiveness of all aspects of society (Moody's, 1999). Analysts ask for the ability of regulators to ascertain the soundness of banks in the

system and their capacity and willingness to intervene to prevent problems developing into crises.

2.3.2.2 Ownership and Governance

Analysts are particularly interested in corporate governance when analyzing emerging market banks. Whereas strong and committed shareholders positively influence their banks' ratings (because such shareholders see banks as their strategic investment and would likely support their bank in a crisis), shareholders whose objective is to fund their businesses have a negative impact on the ratings of their banks. In respect to this, Moody's analysts evaluate the extent of credits channelized to the interests of the affiliates (Moody's, 1999). Furthermore, an independent, active and committed board of directors is an essential element of a robust corporate governance framework. Boards should work with management in harmony and devote themselves to quality and efficiency (Fitch Ratings, 2004).

If a bank is a member of a large group, Standard and Poor's tries to determine whether the group is willing to or legally capable of supporting the bank, if necessary. At the same time, if other group members are weaker than the bank, it must be determined to what extent income is diverted to them or loans are made to related parties on an uneconomic basis (Standard and Poor's, 2004b).

Public ownership may also be detrimental. The question for analysts is whether banks in question are in profitable business areas. According to Moody's, privatization generally

leads to higher ratings both for debt/deposits and for financial strength. Private shareholders tend to demand higher rates of return than governments and this forces management to focus on profitability and efficiency (Moody's 1999).

2.3.2.3 Franchise Value

A bank's franchise value, which is the key driver of a bank's financial strength, is its ability to generate earnings over the long term. A bank's franchise can be conceptualized as the present value of all its future income streams. In crude terms, a strong franchise may be described as the ability to make lots of money over the long term (Moody's, 1999). Key concepts in the assessment of bank-related franchise are efficiency, market position and strategy. A low cost base enables banks to be efficient enough to restructure its operations and take account of long-term shifts in market price and maintain profitability even if increased competition reduces gross earnings. However, even when a bank is efficient, its earnings will decline if its main lines of business become unprofitable or if it fails to take advantage of new opportunities. Thus, banks which are able to build strong positions in new areas of activities will see their earnings protected over the long term (Moody's, 1999).

2.3.2.4 Earning Power and Profitability

Earning power is the most concrete expression of the value of a bank's franchise and the effectiveness of its managers because strong earnings enable a bank to invest in new products and technology, to provide a return to shareholders and to cover credit or

market losses without impairing capital. However, banks in emerging markets are expected to have a stronger capital structure in addition to strong earnings. Strong capital protects banks in crises and earnings provide investment and development (Moody's, 2002a).

Moody's analysts assess a variety of ratios to get an overview of a bank's earning power. They are pre-provision return on average assets⁴⁸, net interest margin⁴⁹, cost to income ratio⁵⁰, provision % pre-provision income⁵¹, return on equity (ROE)⁵², return on assets (ROA)⁵³, interest income % average interest earning assets⁵⁴, interest expense % average interest bearing liabilities⁵⁵, net spread⁵⁶ and staffing & branch ratios⁵⁷ (Moody's, 1999; Moody's, 2002a).

Fitch looks at the historical trend of a bank's earnings performance, stability and quality of its earnings and its capacity to generate profits. The analysts compare significant performance indicators of a bank with those of its peers. In this context, they look at the

⁴⁸ It is sometimes known as recurring earnings power of a bank- its ability to generate revenue from its balance sheet. (recurring earnings power = pre-provision income % average total assets)

⁴⁹ NIM: net interest and dividend income divided by average earning assets. NIM is a sub-set of pre-provision return on assets, focusing only on the interest/dividend earning part of the balance sheet.

⁵⁰ C/I: non-interest expenses divided by interest and non-interest income. This ratio (known as bank's overhead ratio or operating efficiency) answers the question, "How much a bank has to spend to generate a unit of revenue?"

⁵¹ The lower the ratio, the better is the coverage for potential future provisioning requirements.

⁵² ROE: net profit after taxes / equity capital; Moody's is mainly interested in return on equity from the perspective of a bank's ability to generate capital internally. A high ROE enables a bank to increase its equity without relying on shareholders or the stock market. Strong internal capital generation enables a bank to grow its balance sheet, invest for the future and within reason, participate in mergers and acquisitions. In rapidly changing markets, it is essential if a bank is to retain market position.

⁵³ ROA: earnings before interest, taxes, depreciation and amortization / assets. It provides information on how efficiently a bank is being run because it indicates how much profits are generated on average by each unit (in USD; YTL, etc) of asset.

⁵⁴ Interest earning assets: central bank + due from banks + government securities + trading securities + investment securities + net loans

⁵⁵ Interest bearing liabilities: customer deposits + due to banks + borrowings + subordinated debt capital

⁵⁶ Net spread =(Interest income % avg. earning assets) – (Interest expense % avg. interest bearing liabilities)

⁵⁷ such as customers' deposits per branch, operating profit per employee

trends in net interest revenue⁵⁸, non-interest income⁵⁹, non-interest expenses⁶⁰, provisioning levels⁶¹ and exceptional income and expenditure items, as well as developments in taxation charges (Fitch Ratings, 1999).

2.3.2.5 Risk Profile and Management

A bank's risk profile is the product of its management strategies against risk sources stemming from its asset-liability policies, liquidity, market conditions and operational issues (Moody's, 1999; Fitch Ratings, 2004).

An important factor in the analysis of asset quality is how management assesses and measures asset quality and which indicators are viewed to capture true credit concentration and problem asset levels. While evaluating credit risk, analysts evaluate banks' position by looking past⁶², today⁶³ and future⁶⁴ (Moody's, 1999).

⁵⁸ including the evolution of interest spreads in each business line, trends in lending volumes and evolution of funding costs

⁵⁹ including more stable revenues in the form of commissions and inherently more volatile trading revenues

⁶⁰ breaking down personnel and other expenses and comparing the expense level not only with total income but also where possible with earning assets, to the number of branches (in the case of retail banking) and to the number of employees

⁶¹ together with the capacity of the bank's earnings to absorb provisions

⁶² Ratio of non-performing loans (NPL) to gross loans is estimated to learn whether a bank habitually lends money to people who do not pay it back. Provisions constituted against NPL are also overviewed.

⁶³ NPL is compared with the sum of loan loss provisions and equity. If the ratio exceeds 100% and if the bank had to write off all of its NPL, it would be insolvent. Thus, this ratio is known as "dead bank ratio".

⁶⁴ Analysts assess the bank's ability to survive problems in the future. The main ratio for this analysis is pre-provision profit (PPP) to net loans. This ratio asks what percentage of its currently performing loans can be written off without the bank having to make a charge on reserves and equity. Secondly, ratio of reserves and equity to net loans asks what percentage of the currently performing loan portfolio can be written off without being insolvent. Moody's favorite forward-looking asset quality ratio is non-performing assets plus performing loans 90 days past due as a percentage of tangible common equity and reserves (All suspect credit exposures can be added to the numerator.). A bank's portfolio for future credit costs is stressed by this way.

In assessing true level of loan losses and provisions, Standard and Poor's reviews data for the past five years and evaluates the ratios of loan-loss provisions/customer loans, non-performing assets/customer loans and levels of non-performing assets. Furthermore, the analysts look beyond the regulatory definitions of problem loans to determine the level of assets for which the bank is exposed to a heightened level of credit risk (Standard and Poor's, 2004b; 2005). While analyzing banks' loan loss provisions, Standard and Poor's studies the length of time an unpaid loan can continue before being declared delinquent. When provision is established for delinquent loans and how long it exists before the loan is charged off are also important. (Standard and Poor's, 2004a).

While analyzing asset-liability policies, Standard and Poor's addresses a crucial issue: Whether the bank is aggressive in that it is deliberately running large maturity mismatches, interest rate risk (deposit-credit interest rate determination) and foreign exchange risk (Moody's, 1998). Analysts also pay attention to managements' record of reacting to changing circumstances. A bank that takes an interest rate or currency position and maintains the exposure regardless of subsequent events is viewed more negatively than one that quickly liquidates or closes open positions when markets move adversely (Standard and Poor's, 2004a).

Banks usually fail because they are illiquid, not because they are insolvent. Thus, Moody's analysts focus on banks' ability to fund themselves under stress. Specifically,

they pay great attention to the cash capital position of the bank⁶⁵, presence of strong core deposits⁶⁶, core deposits % loans⁶⁷ and liquid assets⁶⁸ % total assets. Another significant issue is parent companies' liquidity position, given regulators' power to control dividends. Double leverage ratio, which is calculated as equity investments in subsidiaries as a percentage of common equity, provides a useful tool to assess parent companies' debt burden and financial flexibility. Furthermore, Moody's pays great attention to the presence of particularly large deposits whose withdrawal may cause a problem and the presence of short term cross border funds (Moody's, 1998, 2002a, 2002b, 2003, 2005). In liquidity analysis, Standard and Poor's focuses on nature and sources of banks' funds⁶⁹. From this point of view, retail deposit-funded banks (with a large and diversified customer base offering a variety of products through branch networks) are advantageous compared to wholesale banks (which raise funds from the capital markets) from the stability of their funds (Standard and Poor's, 2004b).

As an insurance policy against being unable to cover a shortage of cash flow, most banks hold portfolios of marketable securities, which can be sold quickly for cash. It is, however, important to assess how marketable a bank's marketable securities portfolio is and whether such securities are sufficiently liquid in crisis times. Finally, banks should have a clear contingency plan in case they run into difficulties, specifying who is responsible for the management of liquidity in a crisis, which actions are to be taken and what arrangements exist with lenders of last resort (Fitch Ratings, 2004).

⁶⁵ CCP determines if a bank's long term funding is sufficient to finance its illiquid assets.

⁶⁶ Total deposits in domestic offices minus deposits greater than \$100,000; core deposits represent a significant source of stable funding for banks.

⁶⁷ This ratio can give a rough measure of picture of the relative balance of these two balance sheet items.

⁶⁸ Cash & central bank + due from banks + government securities + trading securities + other liquid assets

⁶⁹ They mainly look at customer deposits/funding base, total loans/customer deposits, customer loans (net)/assets, total loans/customer deposits + long term funds.

Market risk can be severe in emerging markets - exchange rate movements, interest rate hikes and stock market peaks & troughs are more pronounced in emerging markets than developed economies. In analyzing market risk, Fitch examines all trading risks across a bank's entire business. Its' analysts examine general strategies of banks in regard to their trading activities: whether a bank is a significant position taker or if its trading activities are mainly related to client business or hedging transactions. Then, they analyze trading books by product and market by focusing on the measurement of risk (Through Value at Risk - VAR, stress scenarios, etc.), volatility of revenues and bottomline profitability (Fitch Ratings, 2004).

Operational risk has historically been defined as all other risks other than market, credit and liquidity risk. In the context of Basel II, however, the Basel Committee has adopted a narrower definition of operational risk: "The risk of loss resulting from inadequate or failed internal processes, people and systems or external events". This definition includes legal risk but excludes strategic and reputation risk (Fitch Ratings, 2004).

2.3.2.6 Capital Analysis

Regulators have worldwide adopted Basle risk-based capital⁷⁰ rule as a threshold (minimum 8%) in order to augment capital structures of undercapitalized banks. On 31.01.2002, Banking Regulatory and Supervisory Authority (BRSA) of Turkey issued a regulation and established the methodology of calculation of capital adequacy ratios for banks both on a consolidated and on an unconsolidated basis to ensure that they

⁷⁰ BIS capital adequacy ratio = Shareholders' equity / (total risk weighted assets + amount subject to market risk). *100. According to the ratio, the ratio should not fall below 8% on consolidated basis.

maintained adequate amount of capital against existing and potential losses. The ratio of own funds to risk-weighted assets, non-cash loans and obligations will be minimum 8%. Similar to generally accepted EU principles, the category of own funds consists of two elements: core capital (Tier-1 capital)⁷¹ and supplementary capital (Tier-2 capital)⁷². However, in Fitch's opinion, regulatory capital adequacy ratio sometimes may not be adequate for banks operating in a volatile and highly risky environment; free capital is a more important issue (Fitch Ratings, 2002).

Since many Turkish banks have significant investments in permanent assets and/or have high levels of revaluation reserves in the capital structure, Fitch believes that free capital is the most important analytical tool in determining capital adequacy. If a bank's great amount of capital base is tied up in long-term participations or fixed assets, it will not have enough "free" (i.e. immediately available) capital with which to absorb unreserved losses. Free capital is defined as shareholders' equity less investment in fixed assets, equity participations, affiliates and associated companies. The remaining equity represents the capital available to lever a bank's ordinary banking business (Fitch Ratings, 2004).

Fitch analyzed free capital ratios of private commercial banks in Turkey in September 2001. As seen in the chart, while equity as a percentage of assets appears to be

⁷¹ Core capital (Tier I) consists of paid-up capital, legal reserves, optional reserves, reserves against probable losses, net profit for the period and previous years' profit. Any losses for those periods are deducted from the capital base.

⁷² Supplementary capital (Tier II) consists of general provisions for loans, the bank's fixed asset revaluation fund, provisions for the revaluation of fixed assets of investments in subsidiaries, affiliates, and other participations, subordinated debt and provisions held for probable losses and securities value increase (revaluation fund).

adequate, the sector's free capital ratios are substantially small and reflect the low level of financial flexibility in the system (Fitch Ratings, 2002).

TABLE – 2 CAPITAL STRUCTURE OF TURKISH PRIVATE COMMERCIAL BANKS (USD mln)

Total Private Banks	September 01	June 01	March 01	December 00
Shareholders' Equity	5.507	6.121	7.365	10.289
Less				
Equity Participations	821	937	1.311	2.352
Affiliates	1.691	1.892	1.923	2.708
Premises and Equipment	1.560	1.779	1.817	2.600
Free Capital	1.435	1.513	2.314	2.629
Less				
Additional Reserves to Reach 100% Coverage of NPL	519	526	400	427
Adjusted Free Capital	916	987	1.914	2.202
Total Assets	56.394	59.359	60.804	73.588
Equity/Assets (%)	9,77	10,31	12,11	13,98
Free Capital/Assets (%)	2,54	2,55	3,81	3,57
Adjusted Free Capital/Assets (%)	1,62	1,66	3,15	2,99
Revaluation Reserves/Equity (%)	22	29	27	35

Although Moody's analysts favor earning power; that is although regulatory capital is seen to be a less indicator of bank financial strength than earning power, in relative terms, capital is more important in emerging markets than in developed economies because emerging markets have more frequent occasions that banks fall back on their final line of defense before insolvency: capital (Moody's, 1999). Moody's also appreciates "internal capital allocation"⁷³ thinking that internal capital allocation is more

⁷³ assigning portions of capital against lines of business

likely to lead banks having appropriate capital ratios because managers are forced to make a very detailed assessment of their true capital needs. Furthermore, Moody's considers tier-1 capital, free capital (%) shareholders' equity, dividend payout⁷⁴ (%) and leverage ratios because banks which are "well capitalized" tend to enjoy benefits of easy access to capital markets whereas others face considerable regulatory scrutiny and potentially significant regulatory restrictions that limit their operational flexibility (Moody's, 1999).

After all necessary information is compiled, Standard and Poor's examines banks' capital structures in both domestic and international contexts. The analysts employ risk-adjusted capital adequacy analysis as well as more traditional balance sheet measures⁷⁵. With regard to international comparisons, adjustments are made in the light of different accounting and finance practices in order to make ratios as comparable as possible (Standard and Poor's; 2004a, 2004b).

2.3.2.7 Management Strategies and Management Quality

Management quality is important not only to avoid losses through loose lending and loose internal controls, but also to formulate coherent and realistic business plans. Looking from this perspective, Moody's analysts evaluate management quality⁷⁶ and strategies of banks. Furthermore, agreements with foreign investors and mergers &

⁷⁴ Dividend payout: dividends (%) net income

⁷⁵ Internal capital generation / prior year's equity, regulatory total capital ratio, adjusted total equity / adjusted assets, adjusted total equity / adjusted assets+securitizations, adjusted total equity +loan loss reserves / customer loans, common dividend payout ratio (Standard and Poor's, 2005)

⁷⁶ Whether managers have appropriate experience, how strong internal controls are and whether the bank is run by a cohesive team is assessed.

acquisitions are followed so as to realize in which way market positions of banks are effected.

As a part of its assessment, Fitch looks at organizational structures of banks, independence of professional managers from major shareholders and management's track record to date, in terms of building up solid business decisions, maintaining operating efficiency and strengthening market position (Fitch Ratings, 2004).

3. INTEGRATION OF MACRO AND MICRO CAMPS

Gonzalez-Hermosillo (1999) attempts to contribute to the literature of banking crises by developing an integrated form of the "micro" and "macro" camps⁷⁷. To capture the impact of these different effects, Gonzales-Hermosillo selects the explanatory variables in order to be proxies for: banking fragility⁷⁸, market risk⁷⁹, credit risk⁸⁰, liquidity risk⁸¹, moral hazard⁸², macroeconomic conditions^{83,84}. To allow for a general framework, banking distress is constructed by combining the elements: the ratio of capital equity and loan reserves minus non-performing loans to total assets (coverage

⁷⁷ The author analyzes the experiences of banking distress in Southwest U.S. (1985/1992), Northeast U.S. (1986/1993), California (1986/1993), Mexico (1992/1995), Columbia (1980/1988).

⁷⁸ Ratio of non-performing loans to total assets, ratio of non-performing loans to total loans, ratio of equity capital to total assets, ratio of equity capital plus loan reserves to total assets

⁷⁹ The variables proxying market risk are likely to vary depending on the specific circumstances of each region. The ratio of unsecuritized loans to total assets is used only in Mexico for example. (Gonzalez-Hermosillo, 1999)

⁸⁰ Ratio of loans to total assets, average yield on loans, differences between loan yield and deposit interest rate

⁸¹ The variables include ratio of various types of deposits to total assets and average interest rate paid on deposits.

⁸² Ratio of insider loans to total assets and ratio of interest income on loans, fees and leases to total assets

⁸³ Short term real interest rate and various variables representative of specific circumstances of each distress

⁸⁴ Some additional bank-specific variables (measuring of profitability, cost efficiency, contagion and herding) are also included to explore their potential role in explaining bank failures and distress.

ratio).⁸⁵ A bank is considered to be in distress if its coverage ratio is lower than a certain threshold. This ratio can take negative values, however, as it approaches zero, the bank resources become insufficient to cover non-performing loans⁸⁶.

The author estimates the “probability of banking distress” using fixed-effects logit framework. The dependent variable takes 1 if the bank is in distress $t+1$ and zero otherwise.

It is found that banking distress, as measured by deterioration in banks’ coverage ratios is consistently evident prior to actual failure. Banking systems investigated through this measure of distress show clear signs of deterioration prior to the actual crises.

The results reveal that both macroeconomic and microeconomic factors are important in determining banks’ fragility. The variables built on different measures of market, credit and liquidity risk (and including proxies for moral hazard) seem to perform reasonably well in most cases. Furthermore, the introduction of macroeconomic and regional variables significantly improves the predictive power of the models. The models generally have high Chi-square statistics suggesting that the joint explanatory power of the variables chosen is adequate.

⁸⁵ Focusing on the coverage ratio as the main indicator of distress is advantageous: It allows for the possibility that two banks with an equally high ratio of NPLs to assets may be in a different standing if one has set aside reserves to cover for a significant amount of problem loans, or if it has a higher level of equity capital (Gonzales-Hermosillo, 1999).

⁸⁶ In the case of U.S. banks, the coverage ratio threshold was set at zero so that banks were considered to be in “distress” when their coverage ratios were zero or negative because their own resources in capital equity and reserves for problem loans would be insufficient to cover non-performing loans.

Ahumada and Budnevich (2001) explore different measures of financial fragility within Chilean financial system. Since Chile is among the group of countries having a stable financial system since mid-1980s and has managed to avoid banking crises, as defined for example in Kaminsky and Reinhart (1996), it is not possible to base the estimation of probabilities of failure or survival of banking institutions on early warning system. Rather, the authors present a reduced-form equation to determine the ratio of non-performing loans to loan portfolio, as an indicator of fragility arising from credit risk and interbank spreads, as a measure of financial fragility coming from liquidity risk.⁸⁷

The list of regressors include macroeconomic variables such as twelve-month variation on a seasonally adjusted monthly index of economic activity, market interest rate that captures intertemporal substitution and wealth (namely, the real lending rate for 90 to 365 days), real exchange rate reported by the Central Bank of Chile and bank-specific variables such as capital (capital plus reserves, divided by total assets), efficiency (managerial expenditure divided by total assets and productive assets divided by costly liabilities), liquidity (portfolio liquid assets plus central bank paper, divided by costly liabilities), earnings (operating margin divided by total assets) and loan growth (twelve-month logarithmic difference in total loans).

For each variable, a reduced-form regression is estimated in a panel data set. The model is represented by:

⁸⁷ This indicator is constructed as the difference between the real interest rate charged among banks for short-term daily liquidity loans and the interest rate for overnight deposits in domestic currency at the central bank.

$$y_{it} = \alpha_i + \rho y_{it-1} + \beta' x_{it} + \varepsilon_{it} \quad i=1, \dots, N \quad \tau=1, \dots, T$$

where x_{it} is a vector of explanatory variables, y_{it} is the dependent variable (the ratio of non-performing loans to total loans or the interbank spread), N is the number of banks and T is the number of months covered by the estimation.

The results suggest that bank-specific variables are important in explaining the future behavior of non-performing loans. Whereas an increase in the level of capital, liquidity and efficiency is found to decrease banking fragility in terms of credit risk and reduce the percentage of non-performing loans, increases in the market interest rate and loan growth deteriorate loan quality and increase fragility. Although a rapid increase in profit margins may look positive in the short run because of reflecting loose credit policy, it may be a source of increased fragility later.

Estimations for the interbank spread suggests that macroeconomic variables play a more important role in explaining liquidity risk. It is clear that an improvement in economic activity decreases the overall spread charged among banks.

II – MAIN MACROECONOMIC DEVELOPMENTS AND NOVEMBER 2000 AND FEBRUARY 2001 CRISES

1. MACROECONOMIC DEVELOPMENTS IGNITING THE CRISES

According to Yeldan, 2001, 90s were a lost decade for Turkey. The rate of growth fluctuated severely as the economy was trapped in mini cycles of growth-crisis-stabilization and artificial growth. Inflation rates hovered around the plateau of 65-70 % during the first part of the decade and at around 80-90 % during the second half. Nominal rates of interest sailed at values exceeding 100 % almost throughout the whole decade, as the Central Bank was committed to a controlled peg regime to combat inflationary pass-through and (generally) to a contractionary monetary policy. The borrowing requirement of the government was surmounted as the stock of domestic debt escalated rapidly and the cost of debt servicing rose to unprecedented levels. Interest cost on domestic debt, which was 2.4 of GNP in 1990, claimed almost all of the public disposable income by the end of the decade (Yeldan, 2001).

At the end of 1999, the state of the Turkish economy looked rather bleak. That year GNP growth rate was -6,1 %, annual wholesale price inflation had reached to 70% and the budget deficit had risen to unsustainable levels, while average weighted cost of borrowing to Treasury was 106% per annum. The economic structure, which endured double-digit inflation and was interrupted by short periods of triple digit inflation for the past thirty years, appeared to be fast reaching to an unsustainable point. The next step seemed to be a transition to hyperinflation (Egilmez, 2001).

In December 1999, Turkey initiated an extensive disinflation program which was backed and supervised by the International Monetary Fund (IMF). The “three-year disinflation program” was essentially an exchange rate-based stabilization program supplemented by structural reforms and fiscal adjustment. The program had three pillars: (1) fiscal discipline encompassing both the central government budget and the rest of the public sector, (2) implementation of structural reforms and especially, acceleration in privatization, (3) determination of exchange rates under a pre-announced crawling peg arrangement⁸⁸. The fundamental aims of this framework were the reduction of inflation and attainment of sustainable economic growth.

The budgetary side of the program principally involved an increase in tax revenues to achieve a higher primary surplus with the goal of reducing Treasury's domestic debt burden. This approach would be supported through the partial substitution of external debt for domestic debt and in this manner, the financing gap would be plugged by both higher tax revenues and additional external borrowing.

The substitution of greater taxation, in conjunction with fresh external loans instead of domestic borrowing would lower Treasury's domestic borrowing requirement and permit greater funds to be channeled to other agents in the economy, while foreign

⁸⁸ Compared to previously implemented exchange rate-based stabilization programs, Turkey's disinflation program had a pre-announced exit strategy. Following the first 18 months of the program, with a pre-announced exchange rate path, a progressively widening band around the path would be introduced to achieve a smooth transition to flexible exchange rate system.

exchange inflows would preclude a liquidity squeeze in markets (Egilmez, 2001). However, it was afterwards understood that the disinflation program chose to rest the domestic liquidity creation mechanism on unsustainable short-term capital flows, which is excessively volatile and erratic by nature. The strategy of "deficit financing based on short-term foreign borrowing" made the banking system more vulnerable against foreign exchange and interest risks (Ertugrul and Yeldan, 2001)⁸⁹.

The program limited the monetary expansion to changes in the net foreign assets (NFA) position of the Central Bank and set a ceiling on the net domestic assets (NDA). This was set at -1,200 trillion TL (roughly US\$ 2 billion)⁹⁰ and was a performance criterion under the IMF stand-by arrangement. The implication of the rule necessitated the following entity: Monetary Base = Net Foreign Assets + Net Domestic Assets

According to this rule, the liquidity generation mechanism available to Central Bank practically entailed a regime of "semi-currency board" in monetary operations. Within this mechanism, the most important element to sustain the liquidity needs of the economy would depend on the proper continuation of foreign credit flows into the system. In other words, main monetary policy tool was the adoption of the exchange rate as a nominal anchor (Ertugrul and Yeldan, 2001).

⁸⁹ Basic characteristics of Turkish financial system before and through the November and February crises are presented in Tables 3.1, 3.2, 3.3 and 3.4

⁹⁰ It was further announced that the Central Bank would be allowed to change its NDA position within a band of +/- 5 % of the monetary base, to be revised at three-month intervals.

The expansion of the monetary base was ultimately linked to foreign exchange inflows; thus, the Central Bank was committed to the strict rule of no-sterilization throughout the program. In this manner, it was expected that liquidity available in the economy would be managed by interest signals; rising domestic interest rates would invite foreign inflows allowing for monetary expansion and excess liquidity, in turn would be signaled through lower rates of interest, letting foreign capital outflows to bounce again on the equilibrium level of liquidity in domestic financial markets⁹¹ (Ertugrul and Yeldan, 2001).

Putting all these together and making a note that capital flows wouldn't be sterilized led to a widespread understanding that daily liquidity requirements of the financial system wouldn't be a priority and the liquidity in the economy was basically determined by the support of international community and the existence of speculative short-term capital flows (Alper, 2001).

The positive market sentiment greeting the announcement of the new economic program led to a capital inflow and increased liquidity. Interest rates went down, lowering the future burden of interest payments on the debt stock and default risk. The Treasury auction-borrowing rate reduced from an average of 106% per annum at the end of 1999 to 37% per annum by January 2000. Average overnight interest rates in the interbank market fell from 66.6% in December 1999 to 34.1% in January 2000 (Alper, 2001).

⁹¹ Yet with the eruption of the crises of November 2000 and February 2001, it was clear that the basic foundations of the liquidity creation mechanism were at fault.

One other factor causing the rapid decline and the "undershooting" of the interest rates is the aggressive positioning of some banks in expectation of falling interest rates. Endowed with such expectations, these banks purchased "excessive amount" of government securities, causing the auction price of the government securities to climb further and the interest rates to go down.

The dramatic decline in interest rates, irrespective of the causes, heralded a dangerous development in the anti-inflation struggle. An old dilemma had resurfaced: A decline in interest rates led to a lower debt service burden, but the Central Bank's anti-inflation policy would be damaged. The Central Bank should not have permitted this under normal circumstances. However, the perception of interest cost in the public's and the politicians' mind put a veil over the possible negative consequences of such a swift decline. The Central Bank simply followed this trend (Egilmez, 2001).

The transition from an annual average yield of 106% to 36.4% in the first month of the program brought important problems in the fight against inflation. The reduction in nominal and real interest rates reduced the return to savings, causing the delayed consumption desire to pick up immediately. Furthermore, commercial bank profitability due to holding government securities went down, causing banks to switch to alternative loans such as consumer credits (Figure 1.8, Page 106). Such aggressive positioning led to a boom in consumer credits in the first 12 months of the disinflation program. Pent-up consumption demand finally spilled into the economy with alacrity. Savings were channeled towards consumption with the support of low interest rates

offered by banks. The result was a slower than expected convergence of inflation to targeted levels because of vigorous aggregate demand. Annual inflation fell from 69% to sub-40% (Egilmez, 2001).

Other crucial problems threatening the economic program were the rising current account and trade deficits due to the use of exchange rate as a nominal anchor. The external imbalance had risen beyond expectations: During 2000, the current account balance showed a deficit of USD 9,8 billion and a trade deficit of USD 22,4 billion.

Annual economic growth purred along 6.5-7%. In this manner -6.1% growth rate of 1999 was cured through renewed positive growth. On the budgetary front, the primary surplus was heading towards an all time record high. Thus, the inflationary pressure of budget deficit was slowly disappearing.

Banks moved to close their open foreign exchange positions towards the end of October for regulatory and balance sheet purposes. This move created greater foreign exchange demand and a liquidity squeeze, putting pressure on Turkish Lira interest rates and causing interest rates to rise somewhat. This development was expected and widely acknowledged because banks engaged in this ritual every year.

However, new regulations⁹² aimed to correct the shortcomings of past regulations in the banking sector suddenly picked up pace in the same period. This new development

⁹² Some of the new regulations: New loan loss classification, loan loss provisioning and collateral valuation rules were put in place, loan concentration exposure limits were tightened, connected lending

pushed banks to purchase foreign exchange in a speedy and abrupt manner to close their positions.

The rise in interest rates distressed banks which were carrying large Treasury security portfolios funded by short-term repurchase agreements. These banks were forced to fund Treasury securities via REPOs and began to register large losses. The spread of rumors, at this juncture, about the transfer of certain banks to the Savings Deposit Insurance Fund (SDIF) led to a cancellation of credit lines between banks. The additional liquidity squeeze due to these developments forced distressed banks to borrow at even higher interest rates. The swift rise in interest rates led to a sharp decline in transaction volume in the secondary market for Treasury securities. Foreign parties, who had initially simply sought to balance their books for the year-end, now realized that matters had moved in a more serious direction and accelerated their exit from the Turkish market by swiftly selling their security portfolios. This trend put further upward pressure on interest rates. The rise in interest rates and the acceleration of this trend led to the dispersal of leverage created by banks abroad. Foreign banks which were essentially partners of some Turkish banks in these funds began to empty their positions. Under these circumstances, the funding of these Treasury securities had to be borne solely by local banks. Interest rates rose even further.

rules were defined; bank shareholders and managers were to become personally liable for the mismanagement and the abuse of bank resources. FX exposure rules were tightened; new rules regulated FX exposure and capital adequacy ratios based on consolidated statements were established. Tax rules were changed to promote adequate loan loss provisioning, facilitate bank and corporate mergers and transfers of distressed assets and promote deposits of longer maturities through differentiated taxes (Korkmaz, 2002).

The Central Bank, which had until then resisted to provide liquidity to the markets and maintained its net domestic assets target, intervened in the market by providing extra liquidity at the cost of exceeding its target for net domestic assets. However, this was too little too late⁹³. IMF extended a (US\$ 7.5 billion) supplementary reserve facility to Turkey and the Central Bank stopped providing liquidity to the markets. Indeed, liquidity demand declined with the removal of the aforementioned distressed bank from the markets and its transfer to the SDIF (Egilmez, 2001).

The result of this series of events was the collapse of Demirbank, which had invested heavily in government securities with the expectation that interest rates were going to continue their descent. As presented in the Figure 1.2 (Page 100), Demirbank was in a highly leveraged position; it was heavily concentrated in government debt instruments and acting as a market maker. The ratio of government debt instruments portfolio to total assets for Demirbank was about twice the size of other banks. Furthermore, the bank was carrying its government debt instruments portfolio mainly through overnight borrowing from other banks, as indicated in the Figure 1.3 (Page 101) (Ozatay and Sak, 2001). As interest rates skyrocketed, the value of Demirbank's securities portfolio fell and the bank found it impossible to raise funds from the interbank market⁹⁴. The credit lines were cut off and this jeopardized the viability of the bank. At the time of its takeover by the SDIF, Demirbank was the ninth largest bank in Turkey and its insolvency had a significantly negative effect on the foreign investors'

⁹³ Furthermore, the Central Bank made a resolution of difficulties faced by Demirbank more difficult by lending funds at an interest rate of 210%.

⁹⁴ Demirbank was carrying a large long-term government debt instruments portfolio by financing its activities through mostly overnight borrowing from other banks. The ratio of bank REPOs to total REPOs for Demirbank rose from 29.02 in 1997 to 48.31 in the fourth quarter of 2000.

confidence in the Turkish economy and the disinflation program. However, it should also be noted that unlike most of the other banks that failed during the crisis, the extent of excessively risky or illegal activity seems to be very limited in Demirbank. Its failure seems to be almost completely a result of the capital flight and the lack of liquidity in the markets (Damar, 2004).

On the way to this point, overnight interest rate was an average of 72.4% in November and 223.8% in December. The Treasury cancelled one auction in December without revealing the offer yields. The average annual compounded yield of three auctions held in January was 63.3%.

According to Ertugrul and Yeldan, 2001, implementation of the program itself increased the financial fragility of the domestic market. The crisis conditions emerged mainly as a result of the increasing fragility in the financial system. This fragility, in turn, was generated by uncontrolled, excessively volatile and speculative capital flows. Debt financed public deficit and rapid acceleration of private expenditures escalated inflows of short-term foreign capital and severely increased the vulnerability of the shallow banking system. As a result, the ratio of short-term foreign debt to Central Bank's international reserves rose secularly throughout the program⁹⁵.

The combined effect of an easy deficit financing policy, together with its liquidity creating mechanism allowing for no sterilization, made many commercial banks shift

⁹⁵ This ratio is regarded as one of the crucial leading indicators of external fragility. As presented in Figure 1.5 (Page 103), Turkish financial system has been operating under the "danger zone" (According to Kaminsky, Lizondo, Reinhart, 1998, 60% is seen as a critical threshold.) during the implementation of the disinflation program.

their asset management policies toward bond financing activities (Ertugrul and Yeldan, 2001). As presented in Figure 1.2 (Page 100), the share of GDI in total assets persisted in high levels before the crisis years.

Egilmez, 2001 sums up the reasons for the November crisis under five headings:

1) Beyond expected deterioration of the current account balance due to exchange rate's chosen as nominal anchor and the introduction of remedial policies coming too little too late. 2) The delay exhibited by the government in implementing various structural reforms and political uncertainty; 3) The overly quick and harsh imposition of regulations on the banking sector and the trepidation this created in the sector; 4) The abrupt increase in non-performing loans of banks⁹⁶ combined with the delays in banking reform; 5) The trend by foreign capital to leave Turkey after witnessing structural weaknesses in banking sector.

By the middle of December 2000, the announcement of a new financial package from the IMF stopped the flight of capital and a resemblance of stability had returned. However, there was no confidence to the disinflation program and uncertainty about the economy continued. The average interest rates, both the overnight rate and the secondary market bond rate, were almost four times higher than their levels at the beginning of November and more than five times higher than the pre-announced year-end depreciation rate of the lira. This unsustainable situation ended on the 19.02. 2001, when the Prime Minister announced that there was a severe political distress, which ignited a crisis in the highly alerted markets due to what had happened at the

⁹⁶ which raised doubts about the quality of both information disclosure and rule enforcement

end of the preceding year. On that day, the overnight rates skyrocketed to unprecedented levels of 6200% in un compounded terms⁹⁷. The Central Bank had no choice but to abandon the peg. Three days later, the exchange rate system collapsed and Turkey declared that it was going to implement a floating exchange rate system from that time onwards. By this announcement, the dollar rate jumped from a level of 685 thousand liras to 958 thousand liras within a day; that's, the currency lost a third of its value within a day⁹⁸ (Ozatay and Sak, 2001).

In fact, the seeds of the two crises were sewed by the increasing fragility of the banking sector. This fragility, in turn, was generated by the uncontrolled and excessively volatile capital flows with an exceeding speculative component created by the disinflation program (Ertugrul and Yeldan, 2001). In the next section how this increased fragility in the banking sector together with the structural problems of the Turkish banks caused a systematic banking crisis in Turkey will be analyzed.

2. STRUCTURAL PROBLEMS OF THE TURKISH BANKING SECTOR

By 1990s, there was a significant decline in the financial intermediation function of Turkish banking sector. Macroeconomic volatility, high public sector deficits, systemic distortions created by the state banks and the weakness in regulatory and supervisory issues were main causes of decline in financial intermediation. Within this period, the share of total credits in commercial banks' balance sheet declined from

⁹⁷ see Figure 1.1 Overnight Interest Rates on page 99.

⁹⁸ see Figure 1.4 Exchange Rates (USD/TL) on page 102.

45% to 30% whereas the sum of the share of the securities on and off-balance sheet portfolio increased from 13% to 25% (Korkmaz, 2002).

The increase in public sector deficit and its' financing with high real interest rates from domestic financial markets have crowded out private sector operations. Furthermore, Turkey opened its' markets to capital flows due to its foreign capital needs to finance rising fiscal deficits in late 1980s before establishing adequate regulatory framework. The arbitrage opportunities due to high domestic real interest rates made it attractive for banks to borrow abroad and finance public sector deficits. Through the use of net open position and borrowing from abroad at much lower interest rates without hedging exchange rate risk, banks made money and used it to buy government bonds. In fact, there was a limit on such positions but they hide their positions by their affiliates established in offshore centers (Korkmaz, 2002).

According to Kaplan, 2002, banks' short positions in foreign currency rose from 12,6 billion USD in 1999 to a tremendous level of 22,2 billion USD in October 2000 because of the short-term foreign capital inflow-based deficit financing policy of the government accompanied by high real interest rates (Figure 1.6, Page 104).

In the period preceding the crisis, open foreign exchange position was a structural feature of the Turkish banking system. This phenomenon is related with a long history of high inflation and the inability of domestic banks to borrow long term in their own currency. 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 an opposite trend. The latter made the system more vulnerable to sudden reversals (Ozatay and Sak, 2001).

In addition to open positions of banks, domestic trading in government paper in the form of "REPOs" became another major banking activity. Banks began to use REPOs as a retail instrument to carry government debt instruments portfolios (Figure 1.7, Page 105). However, all of the interest rate risk stayed in the bank selling REPO contracts. The maturity of REPOs was much shorter than the maturity of lira deposits which was around 3 months in 1999. In fact, the high ratio of REPOs to Turkish lira deposits is an indicator of banks' inability to borrow long term in domestic currency. As the expanding REPO position was associated with a maturity mismatch between assets and liabilities, the balance sheets of Turkish banks became more vulnerable to short term interest rate increases. According to the balance sheet nature of these banks, liabilities were of a short-term nature while maturities of assets are longer (Ozatay and Sak, 2001).

In the context of the Turkish disinflation episode, debt financed public deficit and rapid acceleration of private expenditures escalated inflows of short term foreign capital and severely increased the vulnerability of the shallow banking system. As a result, the ratio of short-term foreign debt to Central Bank's international reserves rose secularly throughout the program. This ratio is regarded as one of the leading indicators of external fragility. It could be argued that the value of 60 % for this ratio is considered as a critical threshold from the point of view of international speculation. It is

alarming to note that in Turkish case, this particular ratio has never fallen below the 100 % since the liberalization of capital account in 1989. Thus, Turkish financial system has constantly been operating over the "danger zone" for the past twelve years as far as this indicator is concerned (Ertugrul and Yeldan, 2002). As presented in Figure 1.5 (Page 103), during the implementation of the disinflation program this ratio rose up to 112 % in June 2000, and to 144 % percent by December 2000.

Another distinguishing feature was the structure of the loan portfolios of banks. Figure 1.9 (Page 107) presents the ratio of non-performing loans to total loans in the sector. The share of non-performing loans in the total loans began to increase immensely and the abrupt increase in non-performing loans raised doubts about the quality of both information disclosure and rule enforcement. Combined with the delays in banking reform, the discrepancy in figures blurred the picture regarding the health of private commercial banks immensely⁹⁹ (Ozatay and Sak, 2001).

Despite the fact that both private and state banks had accumulated risks on the road to crisis, the nature of the problem was different. On the asset side, the increasing size of "duty loss" accumulation and the need to finance it by short-term domestic bank liabilities were the source of the problem for the state banks. With the growing government debt instruments outstanding and the increasing financing needs of the Treasury, some activities were financed by the government through loans taken from state banks after 1992. Instead of repaying the principal and the interest accrued, the Treasury allowed non-performing loans to be treated as performing loans by the state

⁹⁹ Due to the growing number of banks taken under the control of the SDIF, the ratio reached to tremendous levels in December 1999.

banks. Also, the Treasury was directly controlling these banks since they were state economic enterprises. Furthermore, it was also the banking supervision authority at that period. This conflict of interest might have been one of the most important factors that led to duty loss accumulation. The share of duty loss accumulated reached more than 30% of total assets (Ozatay and Sak, 2001).

On the liability side, heavy reliance on foreign exchange denominated deposits of residents was a distinguishing risk for the Turkish commercial banks. The ratio of lira to foreign exchange liabilities was low and moreover decreasing for commercial banks¹⁰⁰. This made them more vulnerable to international liquidity problems. While the state banks were more open to interest rate risk, private ones were more prone to exchange risk. This is why November 2000 crisis hit the state banks hardest and the effect of the currency collapse in February 2001 was just the reverse (Ozatay and Sak, 2001).

¹⁰⁰ The maturity of foreign Exchange deposits was also short as in the case of lira deposits.

III – TOBIT MODEL ESTIMATION RESULTS:

In this part, empirical results obtained from the tobit model estimation for 47 banks^{101,102} over the period 1988 and 2002 is analyzed by specifically focusing on the banks taken over by the SDIF. The thesis uses the “Bankalarımız” data set published by the Banks Association of Turkey on its web page¹⁰³. The first section of the chapter explains definition of data used in this empirical investigation. The second section presents the regression results of the tobit model. The dependent variable in the Tobit analysis is “coverage ratio”. Appendix-2 (Page 89-91) gives detailed information about the banks transferred to SDIF. The graphs in Appendix-3 (Page 92-96) show the actual and the estimated coverage ratios obtained from the Tobit model. With the use of the graphs, we will test the tobit model for its predictive correctness.

1. DEFINITION OF DATA

Definition of a financial crisis and determination of the period in which one begins is a matter of judgment and debate. Instead, researchers tend to rely on the judgments of observers with expertise about countries’ banking systems. According to Demirguc-

¹⁰¹ Adabank A.S., Akbank T.A.S, Alternatif Bank A.S., Anadolubank A.S., Arap Turk Bankası A.S., Bayındırbank A.S., Bank Ekspres A.S., Bank Kapital Turk A.S., Birlesik Turk Korfez Bankası A.S., BNP-Ak-Dresdner Bank A.S., Demirbank T.A.S., Denizbank A.S., Egebank A.S., Ege Giyim Sanayicileri Bankası A.S. (EGS Bank), Eskisehir Bank T.A.S. (Esbank), Etibank A.S., Finansbank A.S., HSBC Bank A.S., İktisat Bankası T.A.S., Interbank A.S., Kentbank A.S., Kocbank A.S., Milli Aydın Bankası T.A.S. (Tarisbank), MNG Bank A.S., Osmanlı Bankası A.S., Oyak Bank A.S., Pamukbank T.A.S., Sitebank A.S., Sumerbank A.S., Sekerbank T.A.S., Tekstil Bankası A.S., Toprakbank A.S., Turk Ekonomi Bankası A.S., Turk Dış Ticaret Bankası A.S. (Dısbank), Turk Ticaret Bankası A.S., Turk Tutunculer Bankası A.S. (Yasarbank), Turkishbank A.S., Turkiye Cumhuriyeti Ziraat Bankası A.S., Turkiye Emlak Bankası A.S., Turkiye Garanti Bankası A.S., Turkiye Halk Bankası A.S., Turkiye İmar Bankası T.A.S., Turkiye İs Bankası T.A.S., Turkiye Vakıflar Bankası T.A.O., Ulusalbank T.A.S., Yapı ve Kredi Bankası A.S., Yurt Ticaret ve Kredi Bankası A.S. (Yurtbank)

¹⁰² Detailed information about the legal basis for banks transferred to SDIF is given in Appendix-2 (Page 79-81)

¹⁰³ which is also stored in CDs.

Kunt and Detragiache, for an episode to be classified as a full-fledged crisis, at least one of the following four conditions has to hold:

1. The ratio of non-performing assets to total assets in the banking system exceeds 10%,^{104,105}
2. The cost of the rescue operation is at least 2% of GDP,
3. The episode has involved a large-scale nationalization of banks,
4. Extensive bank runs have taken place or emergency measures such as deposit freezes, prolonged bank holidays, or generalized deposit guarantees have been enacted by the government.

From the informal examination of the broad characteristics of banks that failed vs. those that did not fail in the episode of Turkish banking distress (2001-2002), it appears that a notable increase in the level of non-performing loans shortly preceded the distress. Figure 1.9 (Page 107) presents the ratio of non-performing loans to total loans in the sector. The share of non-performing loans in total loans began to increase immensely and the abrupt increase in non-performing loans of banks raised doubts about the quality of both information disclosure and rule of enforcement. Combined with the delays in banking reform, the discrepancy in figures blurred the picture regarding the health of the private commercial banks immensely¹⁰⁶. (Ozatay and Sak, 2001).

¹⁰⁴ Crisis banks or crisis periods based on a certain threshold of non-performing loans have also been used in Gonzales-Hermosillo, Pazarbasioglu and Billings (1997), where Mexican fragile banks appear to be those with non-performing loans more than 6-8 % of total loans and in Rojas-Suarez (1998) where crisis banks are those whose non-performing loans to total loans are greater than the average for the system as a whole during tranquil periods plus two standard deviations.

¹⁰⁵ We can see in Figure 1.9 (Page 107) that the ratio of non-performing loans to total loans in the Turkish banking system exceeded 10% between 1999 and 2001.

¹⁰⁶ Due to the growing number of banks taken under the control of the SDIF, the ratio reached to tremendous levels in December 1999

To allow for a general framework, the main indicator of distress is constructed in the light of Gonzales-Hermosillo (1999) by combining the elements: ratio of (capital equity + loan-loss reserves - non-performing loans) to total assets: **coverage ratio**

Focusing on the coverage ratio as the main indicator of distress has several advantages. It allows for the possibility that two banks with an equally high ratio of non-performing loans to total loans would be in a different standing if one has set aside reserves to cover the problem loan level or if it has a higher level of equity capital. As the coverage ratio declines and approaches to zero, banks' own resources in the form of equity capital and loan reserves become increasingly insufficient to cover for non-performing loans. As it happens, a bank would be increasingly more fragile and likely to be in distress (Gonzalez-Hermosillo, 1999). A bank is considered to be in "distress" if its coverage ratio is lower than a certain threshold. In the case of US banks, the threshold for coverage ratio is set at zero so that banks are considered to be in "distress" when their coverage ratios are zero or negative because their own resources in capital equity and reserves for problem loans might be insufficient to cover non-performing loans (Gonzales-Hermosillo, 1999).

In order to determine the factors responsible for the crisis, this thesis uses five economic variables. These indicators are classified into four major groups: Liquidity, asset quality, capital analysis and profitability. Table 3 lists these variables:

TABLE – 4: LIST OF VARIABLES USED IN THE TOBIT MODEL ESTIMATION

Dependent variable: COVERAGE RATIO
COV: $(\text{Equity capital} + \text{Loan-loss reserves} - \text{Non-performing loans}) / \text{Total assets}$
Explanatory variable for LIQUIDITY:
LASL: $\text{Liquid assets} / \text{Short-term liabilities}$
Explanatory variable for ASSET QUALITY:
PPL: $\text{Pre-provision profits} / \text{Total loans}$
Explanatory variables for CAPITAL ANALYSIS:
CAR: $\text{Regulatory capital adequacy ratio} = \text{Shareholders' equity} / (\text{Total risk-weighted assets} + \text{Amount subject to market risk}) * 100$
FCA: $\text{Free capital} / \text{Total assets}$
Explanatory variable for EARNING POWER and PROFITABILITY:
ROE: $\text{Net profit after taxes} / \text{Equity capital}$

Liquidity strategy is one of the crucial factors shaping the risk profile of a bank. Banks usually fail because they are illiquid; thus, the thesis focuses on the “liquid assets ratio” (LASL: liquid assets / short term liabilities) to analyze how a bank funds itself under stress.

An important factor in the analysis of asset quality is which indicators management views as best to represent the bank’s ability to withstand a deterioration of asset quality in the future. According to Moody’s’ credit analysts, the most important part of asset quality is to assess banks’ ability to survive loan-loss problems in the future. In most cases, loan losses are in the first instance to charge against profits, not capital, so the first ratio to look at is pre-provision profits to total loans (PPL). This ratio asks the question, “What percentage of a bank’s currently performing loans can be written off

without having to make a charge on reserves and equity?" This is a crucial ratio. A bank which can not cover its annual loan losses may not be insolvent, but after two or three years of net losses, it will start to lose reputation and market position and may cease to be a going concern (Moody's, 1999).

On 31.01.2002, Banking Regulatory and Supervisory Authority (BRSA) of Turkey established the methodology of calculation of capital adequacy ratios for banks both on a consolidated and on an unconsolidated basis to ensure that they maintain adequate amount of capital against existing and potential losses. The ratio of shareholders' equity to (total risk weighted assets + amount subject to market risk) will be minimum 8%. Thus, regulatory capital adequacy ratio (CAR) is analyzed in the model.

However, in Fitch's opinion, regulatory capital adequacy ratio sometimes may not be adequate for banks operating in a highly volatile and risky environment; rather, free capital is more crucial (Fitch Ratings, 2002). Since many Turkish banks have significant investments in permanent assets and/or have high levels of revaluation reserves in their capital structures, Fitch believes that free capital is the most important analytical tool in determining capital adequacy. If a bank's great amount of capital base is tied up in long-term participations or fixed assets, it will not have enough "free" (i.e. immediately available) capital with which to absorb unreserved losses. Free capital is defined as shareholders' equity less investment in fixed assets, equity participations, affiliates and associated companies. The remaining equity represents the capital available to lever a bank's ordinary banking business (Fitch Ratings, 2004). The thesis uses free capital / total assets ratio (FCA) to focus on the capital structure of banks.

Earning power - profitability is one of the concrete expressions of the effectiveness of banks' managers because strong earnings enable banks to cover credit or market losses without impairing capital. Credit analysts are mainly interested in "return on equity"¹⁰⁷ (ROE) to point out a bank's ability to generate capital internally. A high return on equity enables a bank to increase its equity without relying on shareholders or the stock market. Strong internal capital generation enables a bank to grow its balance sheet and invest for future.

At first, I included "the ratio of foreign assets to foreign liabilities" to assess banks aggressively running large foreign exchange risk and "the ratio of securities to total assets" to analyze whether security portfolios of banks would be sufficiently liquid in case of crises. However, this brought multicollinearity problem to the model and severely decreased the significancy of variables. As a result, I excluded these two variables from the estimation.

2. EMPIRICAL RESULTS

The Tobit model, known as Tobin's Probit, is a censored normal regression model. Some observations on the dependent variable, y , are censored. In this approach, the model parameters, β and σ are estimated by using maximum likelihood estimation method. The "coverage ratio" is the dependent variable used in the Tobit estimation. Values of the coverage ratio are censored by values between -4 and 1. Therefore, coverage ratio values are censored with an upper and a lower limit.

¹⁰⁷ ROE: the ratio of net profit after taxes to equity capital

Estimating coverage ratio with Tobit model¹⁰⁸ is more advantageous than Probit and Logit analyses. In Probit and Logit models, since there are only two outcomes, failure or non-failure, information about the size of coverage ratio is not reflected in results. In fact, regulators are concerned about the size of coverage ratio. Any lower coverage ratio creates more anxiety among creditors and a higher level of instability in domestic capital markets than a higher coverage ratio. Unfortunately, binary coverage values do not capture such information that is given and available in data. So, this thesis aims to use available information regarding the size of coverage ratio in bank failure estimates.

Dependent Variable:

Coverage Ratio = (equity capital + loan-loss reserves - non-performing loans) / total assets

ORDINARY LEAST SQUARES REGRESSION	
Dependent Variable: Coverage ratio	
Weighting Variable: One	
Mean: -154.38	
Standard Deviation: 361.46	
Model Size:	Observations: 705
	Parameters: 6
	Degress of Freedom: 699
Residuals:	Sum of Squares: 35236152.98
	Standard Deviation: 224.52
Fit:	R-squared: 0.6169
	Adjusted R-squared: 0.61
Model Test:	F(5,699): 225.14
	Probability Value: 0.0000
Diagnostic:	Log-L: -4814.19
	Restricted (b=0) Log-L: -5152.41
	Log Amemiya Pr. Cr.: 10.84
	Akaike Info Cr.: 13.67
Autocorrelation:	Durbin-Watson Statistic: 1.99
	Rho: 0.38

¹⁰⁸ See Judge (1988) and Gur (1998) for further details.

Variable	Coefficient	Std Error	t-ratio	prb t >X	Mean of X
LASL: Liquid assets / Short-term liabilities	0,0205	0,0051	4.037	0,0001	-30,0765
PPL: Pre-provision profits / Total loans	0,0749	0,0114	6.597	0,0000	-187,0564
CAR:Regulatory capital adequacy ratio	0,1187	0,0222	6.337	0,0000	-484,6080
FCA Free Capital / Total assets	0,0889	0,0025	3.506	0,0005	-25,921
ROE: Net profit after taxes / Equity capital	0,3238	0,0203	15.954	0,0000	-157,6791
Constant	-32,4033	16,3944	-1.976	0,0481	

Normal exit from iterations. Exit status=0.

To estimate model parameters, first OLS is run on all 705 observations. Note that since the conditional function is highly nonlinear, the OLS estimates are inconsistent estimators and they would be biased toward zero compared to the MLE¹⁰⁹. Because of that, censored regression is estimated.

LIMITED DEPENDENT VARIABLE MODEL - CENSORED	
Maximum Likelihood Estimates	
Dependent Variable	Coverage Ratio
Weighting Variable	One
Number of Observations	705
Iterations Completed	13
Log Likelihood Function	-994,60
Threshold Values for the Model	Upper:1
	Lower:4

¹⁰⁹ Instead, maximum likelihood estimation of the censored regression is suggested as a consistent estimator of the parameters β and σ (Gur, 1998).

Variable	Coefficient	Std Error	t-ratio	prb t > X	Mean of X
LASL: Liquid assets / Short-term liabilities	0,0011	0,0002	4,647	0,0000	-30,0765
PPL: Pre-provision profits / Total loans	0,0053	0,0005	9,969	0,0000	-187,056
CAR:Regulatory capital adequacy ratio	0,0037	0,0008	4,221	0,0000	-484,6079
FCA Free Capital / Total assets	0,0005	0,0001	3,872	0,0001	-25,921
ROE: Net profit after taxes / Equity capital	0,0202	0,001	20,345	0,0000	-157,679
Constant	-0,028	0,0559	-0,502	0,616	
Disturbance Standard Deviation					
Sigma	1,0654	0,3248	32,809	0,0000	

t-tests:

$H_0: \beta_i = 0$ (we will reject the null hypothesis if $|t| > t_c$)

Under 1% critical level $t_c = 2.576$ for 699 d.f.

All the coefficients obtained from the censored regression are statistically significant at even 1% level. The coefficient signs are as expected.

First of all, liquid assets / short-term liabilities (LASL) is positively related with the coverage ratio, thus it has a negative impact on the probability of bank failure. We can explain this result by the fact that the term “liquid assets” is the ability of a bank to realize cash at negligible cost.

The sign of pre-provision profits to total loans (PPL) is positive indicating the bank’s ability to survive problems about asset quality in the future; thus the variable is said to decrease failure probability.

Regulators, worldwide, have adopted Basle risk-based capital adequacy ratio as a threshold to augment the capital structure of undercapitalized banks. CAR is found to be significant in the model and it has positive coefficient sign indicating that it clearly reduces the probability of bank failure stemming from low coverage ratio.

Since many Turkish banks have significant investments in permanent assets and/or high levels of revaluation reserves in their capital structure, Fitch considers free capital ratio as the most important tool in determining capital adequacy. If the entirety of a bank's capital base is tied up in long-term participations or fixed assets, it will not have any "free" capital with which to absorb unreserved losses (Fitch Ratings, 2004). Unsurprisingly, free capital / total assets ratio (FCA) shows positive sign and it is statistically significant. This is because low level of free capital in the sector decreases the flexibility of banks, thus limits their ability to deal with risks.

Lastly, the ratio of net profit after taxes to equity capital (ROE) is found to be significant and its sign is positive as expected. It is negatively related with the failure stemming from low coverage ratio because this ratio implies a bank's ability to generate capital internally. Low level of ROE clearly shows the fragility of a bank.

The graphs showing Tobit estimates of coverage ratios and actual coverage ratios are presented in Appendix-3 (Page 92-96). It is very crucial for us that the estimated values follow the actual values at least one period in advance for the banks taken over by SDIF.

Five banks (Bank Kapital, Egebank, Ulusalbank, Yasarbank (Tütüncüler Bankası), Yurtbank), which were taken over by SDIF on different times, were merged into Sumerbank on 26.01.2001¹¹⁰. The merged Sumerbank was sold to Oyak Group on 09.08.2001. Merger of Sumerbank and Oyakbank was approved on 11.01.2002. From this time, the merged bank is operating as Oyakbank. High success ratio (at least one year in advance) was achieved in estimation of relative size of coverage ratios for these banks that merged to Oyakbank, except Ulusalbank. The legal basis for Ulusalbank to be transferred to SDIF was that the board of managers did not take precautionary actions to protect the financial body of the bank and did not oblige to regulations related to liquidity. As a result, the assets of Ulusalbank became insufficient to cover its obligations in terms of maturity and liquidity and the continuation of its activities was thought to threaten the rights of depositors¹¹¹. Although the figures for the fitted values blurred before the crisis, the actual ratios became indistinct and unclear before fitted ones. As a result, the model could not predict the actual coverage ratio in advance for Ulusalbank.

Interbank¹¹² and Esbank¹¹³ (Eskisehir Bankası) were merged into Bayındırbank on 15.04.2001. These banks were taken over mainly because some of the shareholders, (directly or indirectly, individually or with other shareholders) holding these banks' management and control, were found to make use of resources for their own interests and illegally transferred credits to their firms. Such misuse jeopardized the secure functioning of these banks. Both banks were taken over by SDIF in 1999. Before 1999,

¹¹⁰ Ulusalbank was merged with Sumerbank on 17.04.2001.

¹¹¹ Banks' Act No. 4389 - Article 14/3

¹¹² The legal basis was the Abrogated Banks Act No. 3182

¹¹³ The legal basis was the Banks' Act No. 4389 – Articles 14/3 and 14/4.

the fitted values were in negative levels and they absolutely signaled their transfer. But after 1998, while actual values became negative and the banks began to be controlled by SDIF, fitted values recovered and moved to positive levels. Unfortunately, the model could not succeed in predicting the failure of Esbank and Interbank.

Banking and deposit taking licenses of İktisat Bankası were revoked on 07.12.2001 and on 28.12.2001 for Kentbank and Etibank. Upon the resolution adopted in the General Assembly Meeting on 04.04.2002, the liquidation decision initiated and these banks were merged under Bayındırbank. Bayındırbank, which was transferred to SDIF on 09.07.2001, was restructured as a bridge bank to perform asset management function. The ratios predicted the relative size of the coverage ratios at least two years in advance.

Banking and deposit taking licenses of EGS Bank were revoked as of 18.01.2002 and the licenses of Toprakbank were revoked on 30.11.2001. These banks were merged into the Bayındırbank on these days. The model successfully predicted the coverage ratios with two-years lead-time for Toprakbank and EGS Bank.

Milli Aydın Bankası (Tarisbank) was sold to Zorlu Group on 09.07.2001. The share-transfer agreement regarding the acquisition of Denizbank A.S. was signed on 21.10.2002. Actual share transfer was completed as of 25.10.2002. The merger of Tarisbank with Denizbank A.S. was approved on 19.12.2002 and it was finalized on 27.12.2003. The model predicted the failure of Milli Aydın Bankası (Tarisbank) with two years in advance.

Pamukbank, which was taken over by SDIF on 19.06.2002, was transferred to Türkiye Halk Bankası A.S. on 12.11.2004 in accordance with the “Transfer of Pamukbank T.A.S. to Türkiye Halk Bankası A.S. and the Act No. 5230”. According to the model, Pamukbank should have been transferred to SDIF in 2000. After 2000, the predicted value for the coverage ratio recovered (jumped to 0,109). Consequently, the model failed to predict the actual coverage ratio in advance.

Bank Ekspres was transferred to SDIF on 12.12.1998. It was sold to Tekfen Holding on 30.06.2001. The transfer was approved by BRSA on 26.10.2001. From this time, the bank is operating as Tekfenbank A.S. According to the model, Bank Ekspres should have been transferred to SDIF in 1997. After 1997, predicted value for the coverage ratio recovered (jumped to 0,180 in 1998). Although, the fitted values moved down to negative levels in 1999, they could not predict the actual ones in advance.

Demirbank, which was taken over by SDIF on 06.12.2000, was sold to HSBC on 20.09.2001. The approval of the transfer was made on 30.10.2001. As presented in the Figure 1.2 (page 100), the ratio of government debt instruments portfolio to total assets for Demirbank was about twice the size of other banks. Furthermore, the bank was carrying its government debt instruments portfolio mainly through overnight borrowing from other banks (Ozatay and Sak, 2001). As interest rates shot up, the value of Demirbank' s securities portfolio fell and the bank found it impossible to raise funds from the interbank market. Credit lines were cut off and this jeopardized the viability of the bank. The failure in predicting the actual values for Demirbank

seems to be because of having to excluding the explanatory variable about securities portfolio

Sitebank was transferred to SDIF on 09.07.2001. A share transfer agreement was signed with Novabank on 20.12.2001. The transfer procedure was carried out on 25.01.2002. The model predicts the relative size of the coverage ratio two years in advance.

Turkbank was taken under liquidation process within the scope of “Article 18 of the Banks Act. No. 346” of BRSA. The license of Turkbank to perform banking activities and accept deposits was revoked upon the decision of BRSA on 01.07.2001 and the transfer of the bank was decided to be realized. Upon the resolution of the extraordinary general meeting held on 09.09.2002 and registered on 14.09.2002, the transfer transactions of the bank continues. The ratio predicted the relative size of the coverage ratio two years in advance.

Imar Bank’s management and control was transferred to SDIF according to the banks’ Act No. 4389 – Article 16/1. The license of Imar Bank to perform banking activities and accept deposits was revoked by the board of BRSA on 03.07.2003 and the management was transferred to SDIF. According to the predicted values, the bank should have been transferred to SDIF in 2001. However, after 2001, fitted values recovered (jumped to 0,062) and failed to predict the actual coverage ratios in advance. The data examined for the Imar Bank shows earlier signs of distress. However, not all banks which become

distressed are necessarily intervened. Intervention is a one-time event and its timing is largely is largely determined by the regulators¹¹⁴.

¹¹⁴ Sometimes, it may depend on political issues.

CONCLUSION

The objective of this thesis is to perform a leading-indicator model and test the predictive ability of the model whether it recognizes distinctive features of the banks undertaken by SDIF, especially through the crises period that hit the Turkish economy in November 2000 and February 2001. The thesis examines the existing literature on banking crises and attempts to develop a Tobit model estimation by using a panel data set for 47 banks over the period 1988 and 2002.

The thesis begins with macro and micro approaches that have contributed to the design of “Early Warning System” for banking crises. Apart from these approaches, methodologies of rating agencies in assessing banks’ financial strengths are highlighted. As the last part of literature survey, evolution of the crises that hit the Turkish economy in November 2000 and February 2001 is discussed to give a wider perspective about the banks taken over by SDIF. Structural problems of Turkish banking sector are also analyzed in detail.

In the light of the existing literature, empirical results obtained from the Tobit model estimation are analyzed by specifically focusing on the banks taken over by SDIF. To allow for a general framework, the main indicator of distress (the dependent variable in the tobit analysis) is constructed in the light of Gonzales-Hermosillo (1999) by combining the elements: the ratio of (capital equity + loan-loss reserves - non-performing loans) to total assets: “coverage ratio”. With the explanatory variables of the panel data set, considerable success in predicting banks undertaken by SDIF is obtained.

The model is also tested by comparing the “actual” and the “estimated” coverage ratios obtained from the Tobit model.

For Egebank, Yurtbank, Yasarbank (Tutunculer Bankası), Bank Kapital, Etibank, Sumerbank, Kentbank, Iktisat Bankası, EGS Bank, Toprakbank, Milli Aydın Bankası (Tarisbank), Bayındırbank, Sitebank and Turkbank, the model successfully estimated the actual coverage ratios at least one year in advance.

According to the model, Bank Ekspres should have transferred to SDIF in 1997. After 1997, predicted value for the coverage ratio recovered (jumped to 0,180 in 1998). Although, the fitted values moved down to negative levels in 1999, they could not predict the actual ones in advance.

According to the model, Pamukbank should have transferred to SDIF in 2000. After 2000, the predicted value for the coverage ratio recovered (jumped to 0,109). Consequently, the model failed to predict the actual coverage ratio in advance.

According to the predicted values, the Imar Bankası should have been transferred to SDIF in 2001. However, after 2001, the predicted value of the coverage ratio recovers (jumped to 0,062) and fails to predict the actual coverage ratio one-year lead time. The data examined for the Imar Bank showed earlier signs of distress. However, not all banks which became distressed are necessarily intervened. Intervention is a one-time event and its timing is largely determined by the regulators.

Finally, the model cannot succeed in predicting the failure of Ulusalbank, Esbank (Eskisehir Bankası) and Interbank. Furthermore, the failure in predicting the actual values for Demirbank seems to be because of having to omitting the explanatory variable about securities portfolio.



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www.tbb.org.tr

www.tmsf.org.tr

APPENDICES

APPENDIX - 1. CREDIT RATINGS OF SOME TURKISH BANKS¹

AKBANK			
INSTITUTION	DESCRIPTION	RATING	OUTLOOK
MOODY'S	Long term FC deposit rating	B1	
	Short term FC deposits	Not Prime	
	Long term LC deposit rating	A3	
	Short term LC deposits	Prime-2	
	Financial Strength	D+	Positive
FITCH	Foreign Currency Short Term	B	
	Foreign Currency Long Term	BB-	Positive
	Individual	C	
	Support	4	
	Local Currency Short Term	B	
	Local Currency Long Term	BB+	Positive
	National Ratings (Tur)	AA	Stable

Source: Akbank

¹ Source: Web pages of banks (given in references)

TURKIYE IS BANKASI			
INSTITUTION	DESCRIPTION	RATING	OUTLOOK
MOODY'S	Long term FC deposit rating	B1	Stable
	Short term FC deposits	Not Prime	Stable
	Long term LC deposit rating	A3	Stable
	Short term LC deposits	Prime-2	Stable
	Financial Strength	D	Positive
FITCH	Foreign Currency Short Term	B	
	Foreign Currency Long Term	BB-	Positive
	Individual Support	C 4	
	Local Currency Short Term	B	
	Local Currency Long Term	BB	Positive
	National Ratings (Tur)	AA-	Stable
S&P	Short Term Credit	B	
	Long Term Credit	BB-	
	Certificate of Deposits LT	BB-	
	Certificate of Deposits ST	B	
	Outlook		Positive

Source: Turkiye Is Bankası

KOCBANK			
INSTITUTION	DESCRIPTION	RATING	OUTLOOK
MOODY'S	Long term FC deposit rating	B1	Stable
	Short term FC deposits	Not Prime	Stable
	Long term LC deposit rating		
	Short term LC deposits		
	Financial Strength	D	Negative
FITCH	Foreign Currency Short Term	B	Stable
	Foreign Currency Long Term	BB-	Stable
	Individual	D	Stable
	Support	3	Stable
	Local Currency Short Term	B	
	Local Currency Long Term	BB+	Positive
	National Ratings (Tur)	AA	Stable
S&P	Long term FC	BB-	Positive
	Short term FC	B	Stable

Source: Kocbank

GARANTI BANKASI			
INSTITUTION	DESCRIPTION	RATING	OUTLOOK
MOODY'S	Long term FC deposit rating	B1	Stable
	Short term FC deposits	Not Prime	
	Long term LC deposit rating	A3	
	Short term LC deposits	Prime-2	
	Financial Strength	D+	Positive
FITCH	Foreign Currency Short Term	B	
	Foreign Currency Long Term	BB-	Positive
	Individual Support	C/D 4	
	Local Currency Short Term	B	
	Local Currency Long Term	BB-	Positive
	National Ratings (Tur)	A+	Stable
	S&P	Long Term Foreign Currency	BB-

Source: Türkiye Garanti Bankası

YAPI ve KREDİ BANKASI			
INSTITUTION	DESCRIPTION	RATING	OUTLOOK
MOODY'S	Long term FC deposit rating	B1	
	Short term FC deposits	Not Prime	
	Long term LC deposit rating	Baa1	
	Short term LC deposits	Prime-2	
	Financial Strength	E+	
	Outlook		Positive
FITCH	Foreign Currency Short Term	B	Stable
	Foreign Currency Long Term	BB-	Stable
	Individual	D/E	
	Support	3	
	Local Currency Short Term	B	Stable
	Local Currency Long Term	BB+	Stable
	National Ratings (Tur)	AA	Stable
Source: Yapı Kredi Bankası			

APPENDIX - 2. BANKS TRANSFERRED TO SDIF / BANKS, MANAGEMENT AND SUPERVISION OF WHICH ARE TAKEN OVER BY SDIF²

Banks Transferred to SDIF / Banks, Management and Supervision of Which are Taken Over by SDIF		
Banks	Date of Transfer to SDIF	Current Status
Banks Merged		
Egebank A.S.	21.12.1999	Merged with Sumerbank on January 26, 2001.
Yurtbank A.S.	21.12.1999	Merged with Sumerbank on January 26, 2001.
Yaşarbank A.S. (Tütüncüler Bankası)	21.12.1999	Merged with Sumerbank on January 26, 2001.
Bank Kapital T.A.S.	27.10.2000	Merged with Sumerbank on January 26, 2001.
Ulusal Bank T.A.S.	28.02.2001	Merged with Sumerbank on April 17, 2001.
Interbank A.S.	07.01.1999	Merged with Etibank on April 15, 2001.
Eskişehir Bankası T.A.S. (Esbank)	21.12.1999	Merged with Etibank on April 15, 2001.
İktisat Bankası T.A.S.	15.03.2001	Banking and deposit taking license was revoked on 07.12.2001 and the liquidation process initiated. Upon the resolution adopted in the General Assembly Meeting on 04.05.2002, the liquidation decision was revoked and the Bank was merged into Bayındirbank.
Kentbank A.S.	09.07.2001	Banking and deposit taking license was revoked as of 28.12.2001 and the liquidation process initiated. Upon the resolution adopted in the General Assembly Meeting on 04.05.2002, the liquidation decision was revoked and the Bank was merged into Bayındirbank.
Etibank A.S.	27.10.2001	Banking and deposit taking license was revoked as of 18.01.2002 and the liquidation process initiated. Upon the resolution adopted in the General Assembly Meeting on 04.05.2002, the liquidation decision was revoked and the Bank was merged into Bayındirbank.
EGS Bank A.S.	09.07.2001	Banking and deposit taking license was revoked as of 18.01.2002 and the liquidation process initiated. Upon the resolution adopted in the General Assembly Meeting on 04.05.2002, the liquidation decision was revoked and the Bank was merged into Bayındirbank as of the same date.
Toprakbank A.S.	30.11.2001	Banking and deposit taking license of the bank was revoked on 30.09.2002 and it was merged into Bayındirbank as of the same date.
Pamukbank A.S.	19.06.2002	In accordance with the "The transfer of Pamukbank Turk Anonim Şirketi to Türkiye Halk Bankası Anonim Şirketi and the Act Concerning Making Changes in Some Acts No. 5230", it was transferred to Türkiye Halk Bankası A.S on 12.11.2004.

² Source: SDIF Annual Report 2004

Banks Sold	
Bank Ekspres A.S.	Sold to the Tekfen Holding on 30.06.2001. The transfer was approved by BRSA on October 26, 2001. Operating as Tekfenbank A.Ş.
Demirbank T.A.Ş.	Sold to HSBC on 20.09.2001. Approval of the transfer was made on 30.10.2001.
Sümerbank A.S.	Merged Sümerbank was sold to the OYAK Group on 09.08.2001. Merger of Sümerbank and Oyakbank was approved on 11.01.2002. Operating as Oyakbank.
Sitebank A.S.	A share transfer agreement was signed with Novabank on 20.12.2001. The transfer procedure was carried out on 25.01.2002.
Milli Aydın Bankası A.Ş. (Tarişbank)	The share transfer agreement regarding the acquisition of Denizbank A.S. was signed on 21.10.2002. Actual share transfer was completed as of 25.10.2002. The merger of Tarişbank with Denizbank A.Ş. was approved by BRSA on 19.12.2002 and it was finalized on 27.12.2003.
Banks Under Liquidation Process (within the scope of Article 18 of the Banks Act)	
Türk Ticaret Bankası A.S. (Türkbank) ³	Türkbank was taken under liquidation process within the scope of "Article 18 of the Banks Act. No. 346" of BRSA. The license of Türkbank to perform banking activities and accept deposits was revoked upon the decision of BRSA on 01.07.2001 and within the scope of "Article 18 of the Banks Act", the transfer of the bank was decided to be realized. Upon the resolution of the extraordinary general meeting held on 09.09.2002 and registered on 14.09.2002, the transfer transactions of the bank continues.

³ The majority holding of the bank was taken up by the SDIF.

Banks; management and control transferred to SDIF (within the scope of Article 16 of the Banks Act)	
Imar Bankası T.A.S.	03.07.2003
The license of İmar Bank to perform banking activities and accept deposits was revoked (according to the decision No: 1085) by the board of BRSA on 03.07.2003. According to the Article 14 /3 of the Banks' Act No. 4389, its management and control was transferred to SDIF. Liquidation process has not been initiated yet.	
Banks Remaining Under SDIF	
Bayındırbank A.Ş.	09.07.2001
It is restructured as a bridge bank to perform asset management function.	

Legal Basis of the Bank Transfers / Transfer of the Management and Control of Banks to SDIF		
Abrogated Banks Act No. 3182 Türk Ticaret Bankası Bank Ekspress İnterbank	Article 14/3 of the Banks' Act No. 4389 Yasarbank Demirbank Sitebank Ulusalbank Tarisbank İmar Bankası	Article 16/1 of the Banks' Act No. 4389 İmar Bankası ⁴
		Article 14/3 and 4 of the Banks' Act No. 4389 Egebank Yurtbank Sumerbank Esbank Etibank Bank Kapital İktisat Bankası Bayındırbank Kentbank EGS Bank Toprakbank Pamukbank

⁴ License of İmar Bankası to perform banking activities and accept deposits were revoked pursuant to Article 14/3 of the Banks' Act No. 4389 and the management and control hereof was transferred to the SDIF pursuant to Article 16/1 of the same act.

APPENDIX - 3. ACTUAL AND FITTED COVERAGE RATIOS: TOBIT MODEL

For Egebank, Yurtbank, Yasarbank (Tutunculer Bankası), Bank Kapital, Etibank, Sumerbank, Kentbank, İktisat Bankası, EGS Bank, Toprakbank, Milli Aydın Bankası (Tarisbank), Bayındırbank, Sitebank and Turkbank, the model successfully estimated the actual coverage ratios at least one year in advance.

According to the model, Bank Ekspres should have transferred to SDIF in 1997. After 1997, predicted value for the coverage ratio recovered (jumped to 0,180 in 1998). Although, the fitted values moved down to negative levels in 1999, they could not predict the actual ones in advance.

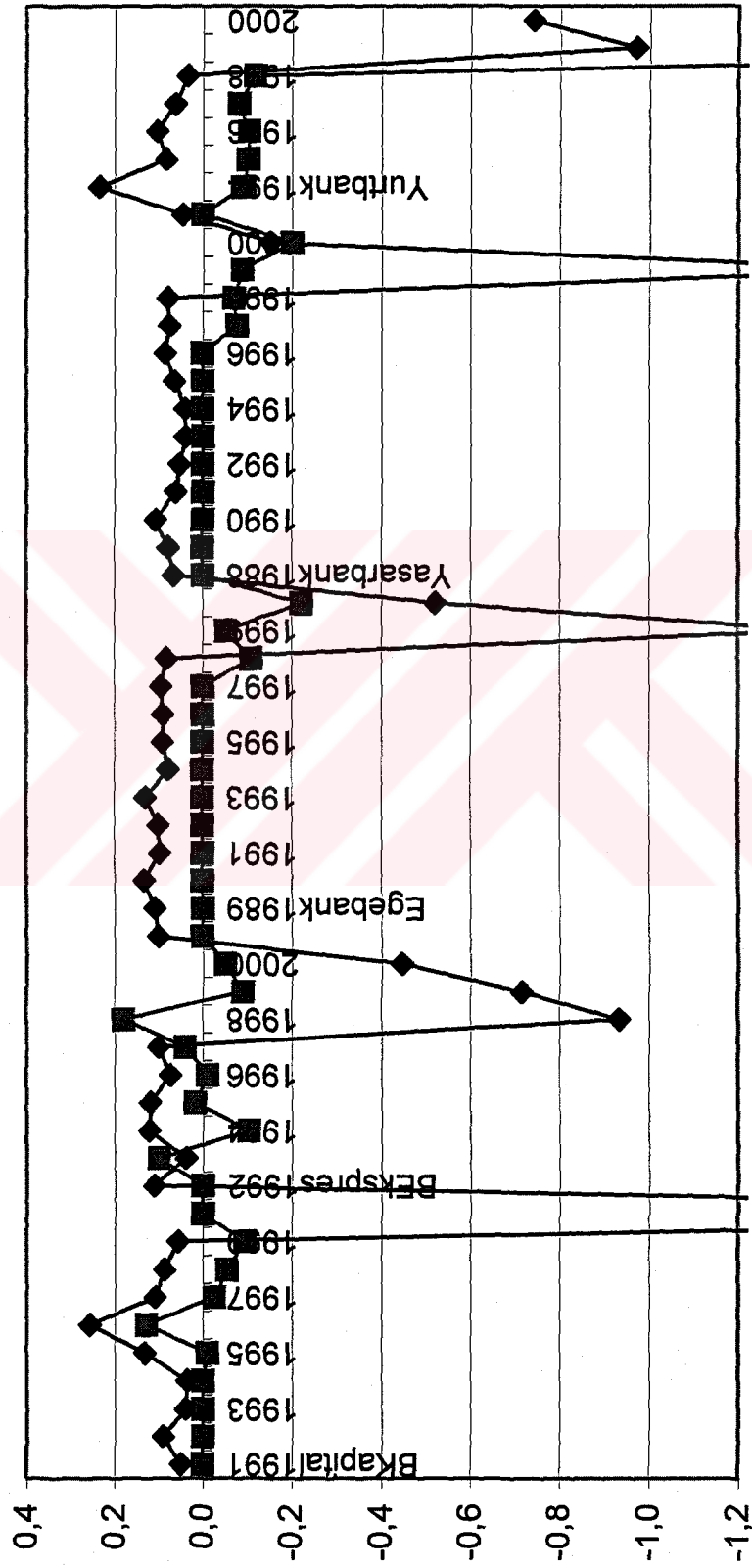
According to the model, Pamukbank should have transferred to SDIF in 2000. After 2000, the predicted value for the coverage ratio recovered (jumped to 0,109). Consequently, the model failed to predict the actual coverage ratio in advance.

According to the predicted values, the İmar Bankası should have been transferred to SDIF in 2001. However, after 2001, the predicted value of the coverage ratio recovers (jumped to 0,062) and fails to predict the actual coverage ratio one-year lead time. The data examined for the İmar Bank showed earlier signs of distress. However, not all banks which became distressed are necessarily intervened. Intervention is a one-time event and its timing is largely determined by the regulators.

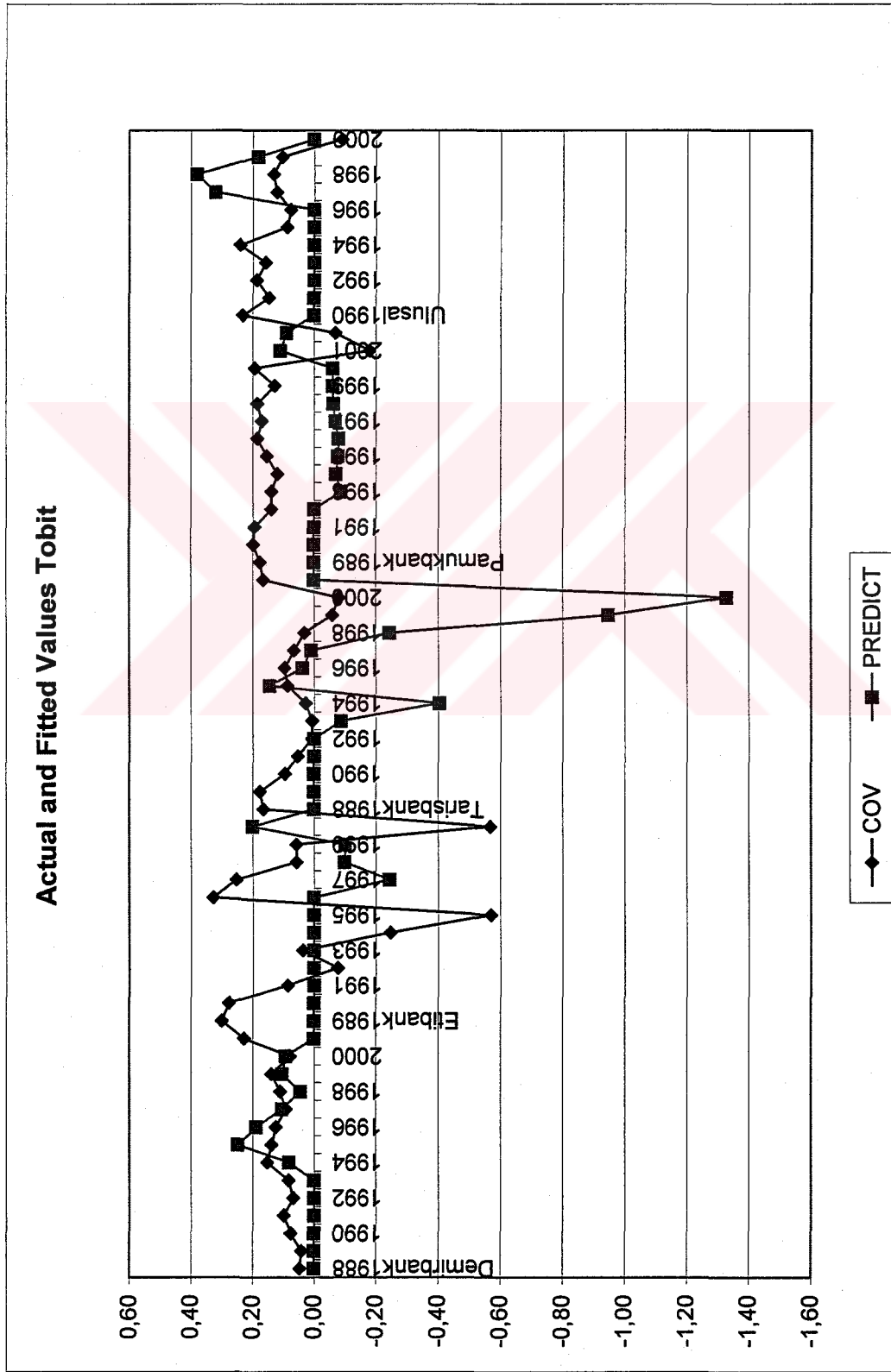
Finally, the model can not succeed in predicting the failure of Ulusalbank, Esbank (Eskisehir Bankası), Interbank and Demirbank.

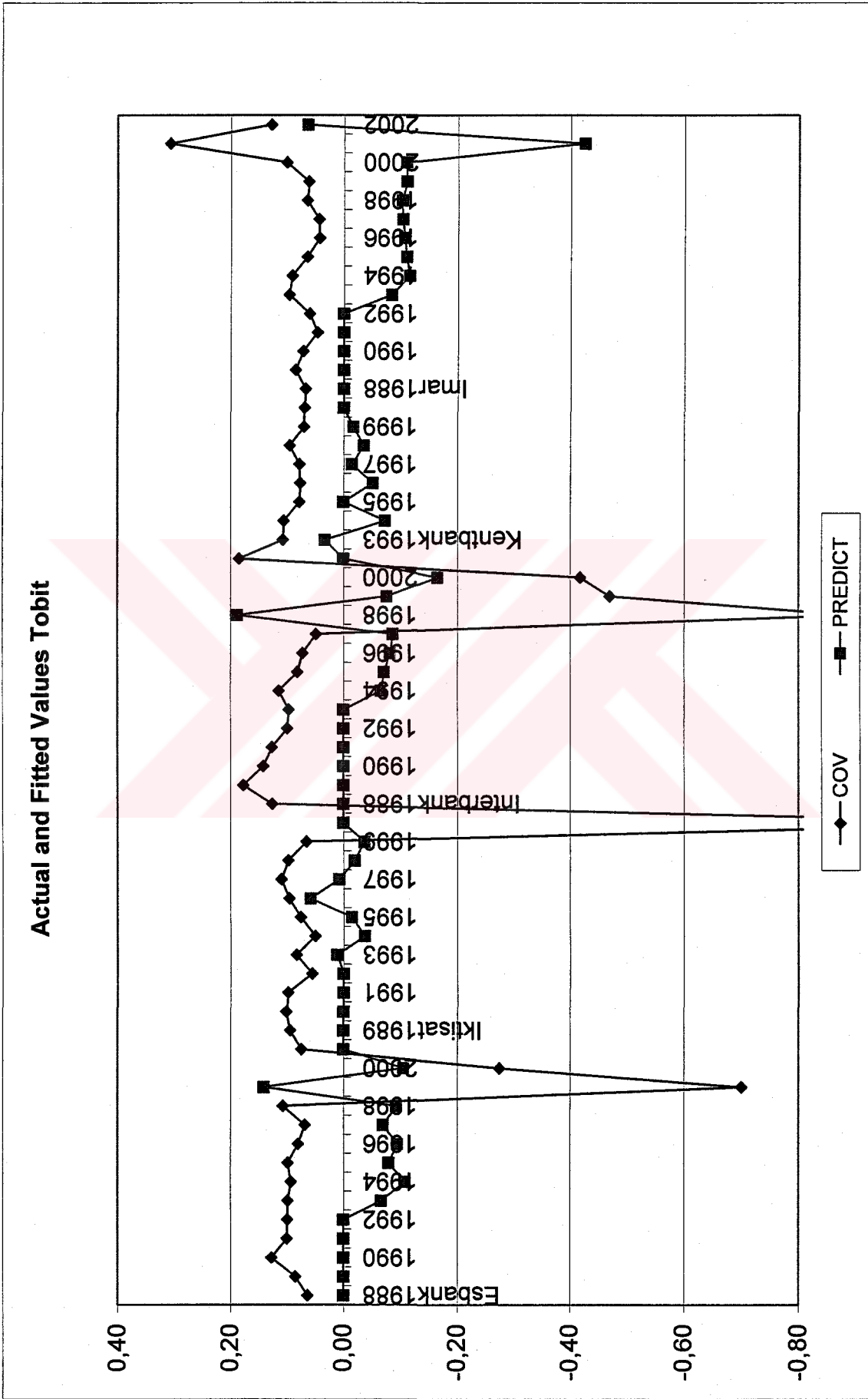
Appendix 3.1

Actual and Fitted Values Tobit

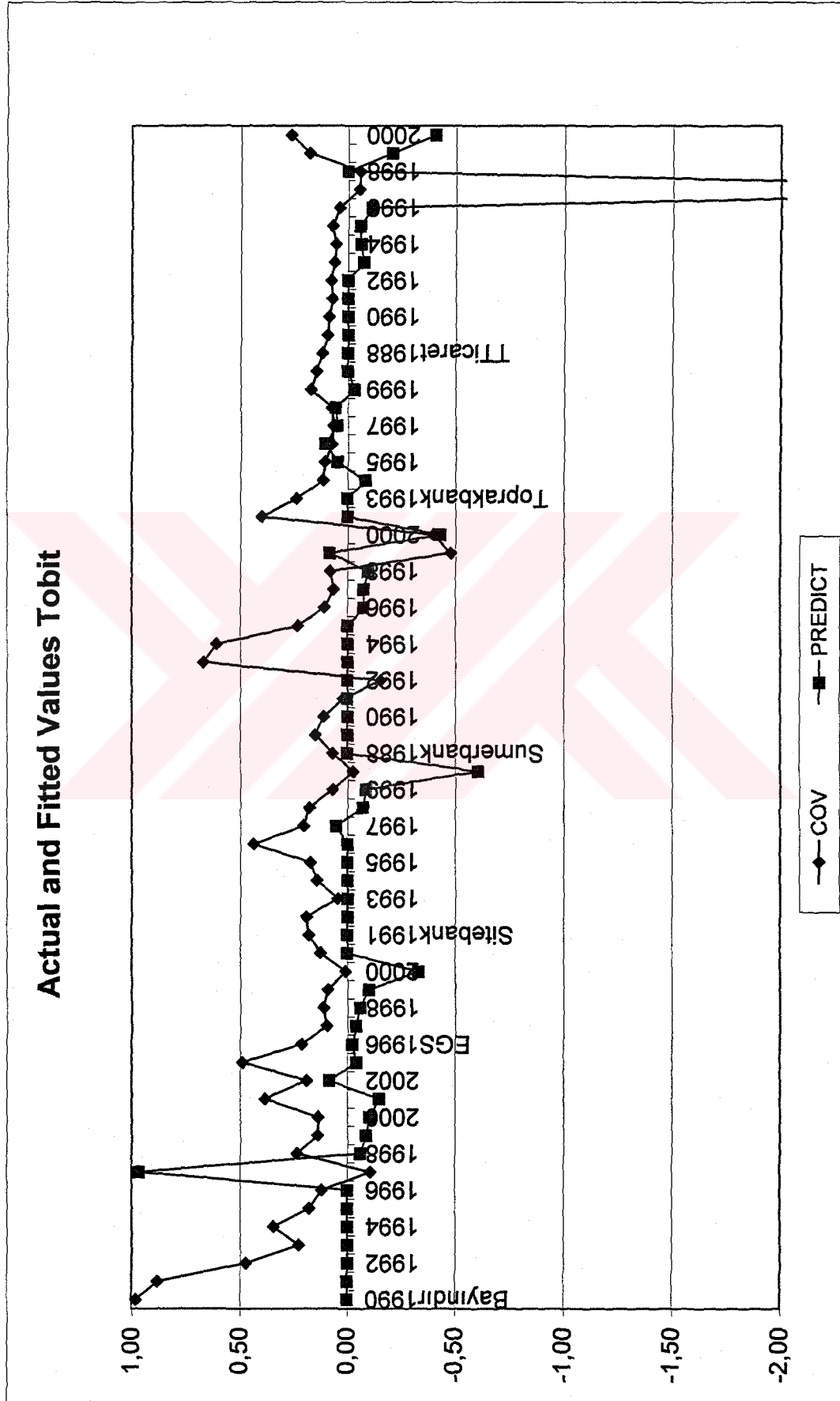


Appendix 3.2





Appendix 3.4



TABLES

TABLE 3.1: DEVELOPMENTS IN THE CONSOLIDATED BUDGET (TRILLIONS TL)*

	1998	1999	2000	
			Realization	Target
Revenues	26.913	28.287	33.756	32.586
Tax Revenues	21.392	22.418	26.527	24.000
Expenditures	35.729	42.419	46.603	46.713
Personnel Exp.	8.973	10.459	9.982	9.900
Investment Exp.	2.053	2.332	2.472	2.352
Interest Exp.	13.050	16.231	20.440	21.132
Transfers to SEEs	371	631	886	595
Other Transfers	8.319	9.375	9.211	8.895
Ratios to GNP				
Budget Balance	-7,2	-10,9	-10,3	
Interest Expenditures	11,7	13,8	16,4	
Non-interest Balance	4,4	2,2	6,1	
Net Domestic Borrowing	8,6	12,6	7,5	
Domestic Debt Stock	21,9	29,3	29,0	
* In real 2000 prices, deflated by the wholesale price index (2000 = 100) Source: State Planning Organization				

TABLE 3.2: FINANCING OF THE CONSOLIDATED BUDGET DEFICIT (% 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	15,5
Consolidated Budget							
Borrowing Requirement	3,7	8,5	7,6	7,1	11,6	10,2	17,4
Net Domestic Borrowing	3,6	7,1	8,5	8,6	12,6	7,5	12,6
Net Foreign Borrowing	-1,0	-0,9	-1,5	-1,9	0,6	2,1	-2,4
Central Bank Advances	1,2	1,5	0,0	0,0	0,0	0,0	0,0
Other**	0,0	0,7	0,6	0,5	-1,4	0,6	7,2
* Public sector covers SEEs, consolidated budget, special funds and municipalities ** such as deferred payments Source: Treasury							

TABLE 3.3: CONSUMER INFLATION, TREASURY AUCTION BORROWING RATE AND GNP GROWTH RATE

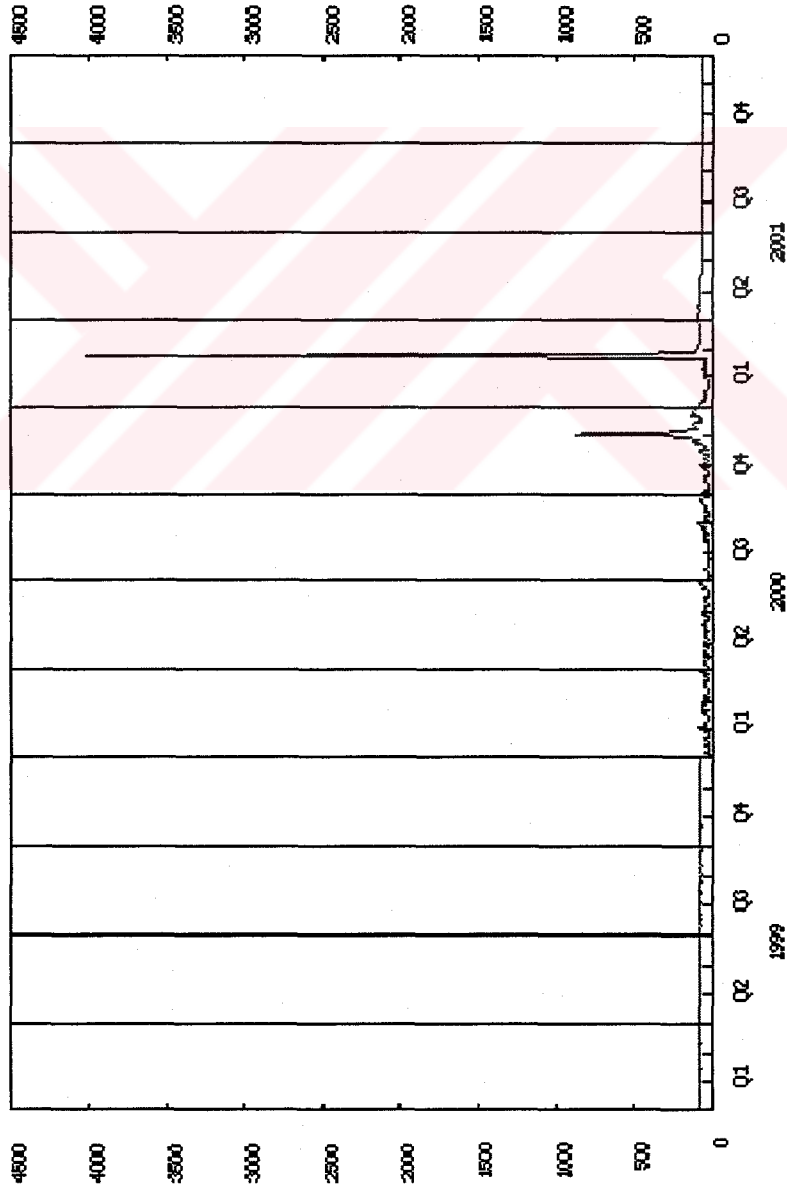
	1995	1996	1997	1998	1999	2000	2001
Consumer Inflation, average	89,0	80,2	85,7	84,6	64,9	54,9	54,4
Consumer Inflation, year-end	76,0	79,8	99,1	69,7	68,8	39,0	68,5
Treasury Auction Borrowing Rate*	124,2	132,2	107,4	115,5	104,4	38,2	99,6
GNP Growth Rate	8,0	7,1	8,3	3,9	-6,1	6,3	-8,5
* average Source: Central Bank of Turkey							

TABLE 3.4: SOME ITEMS OF BALANCE OF PAYMENTS (% OF GNP) AND REAL EXCHANGE RATE

	1995	1996	1997	1998	1999	2000	2001
Current Account Balance	-1,4	-1,3	-1,4	1,0	-0,7	-4,9	1,9
Net Capital inflows	2,7	3,0	3,7	-0,4	2,5	4,7	-8,7
Short term	2,2	1,5	0,0	0,7	0,4	2,0	-7,2
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	-2,4
Other	-0,1	0,9	2,5	1,9	0,2	2,1	-1,0
Real Exchange Rate*	96,9	100,0	110,5	107,8	108,7	118,2	106,5
* Year-end values, 1995 = 100 Source: Central Bank of Turkey							

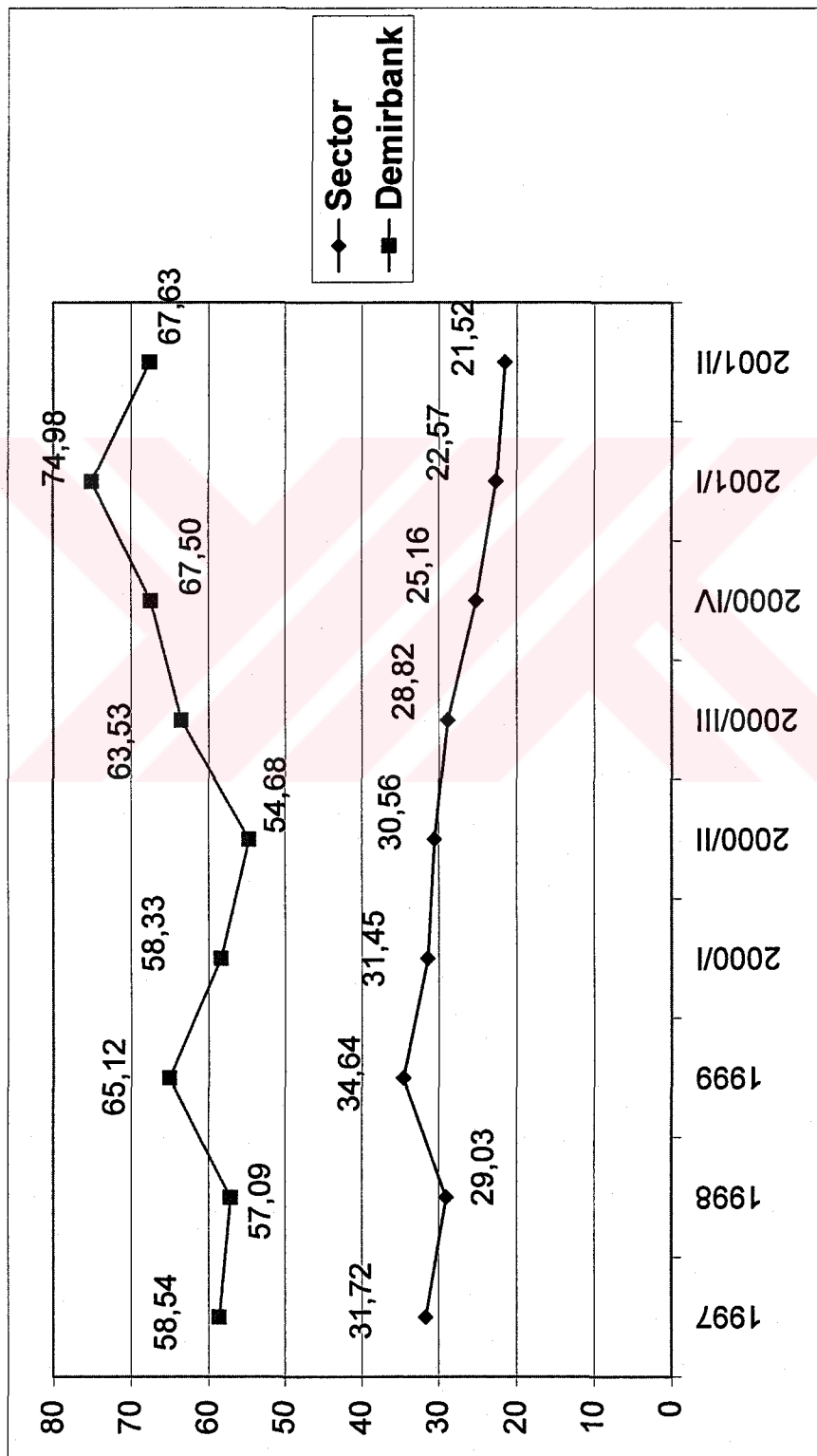
FIGURES

FIGURE 1.1: OVERNIGHT INTEREST RATES*



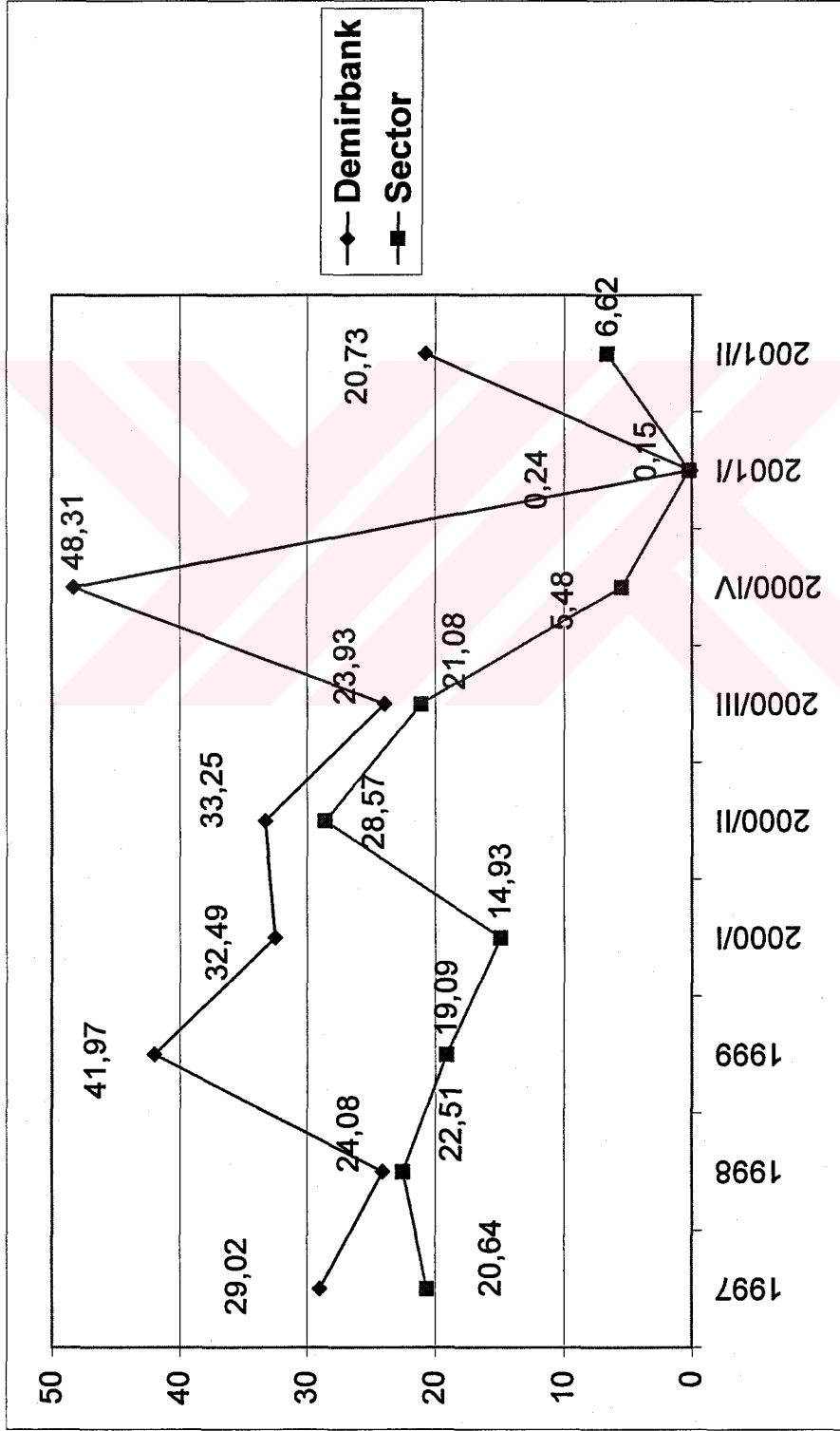
* Simple Interest Rate Weighted Average (%) (Overnight)
Original Frequency. Constant, Original Observation, 01.01.1999-12.31.2001
Source: Central Bank of Turkey

FIGURE 1.2: TOTAL GOVERNMENT DEBT INSTRUMENTS / TOTAL ASSETS (DEMIRBANK VS. SECTOR)



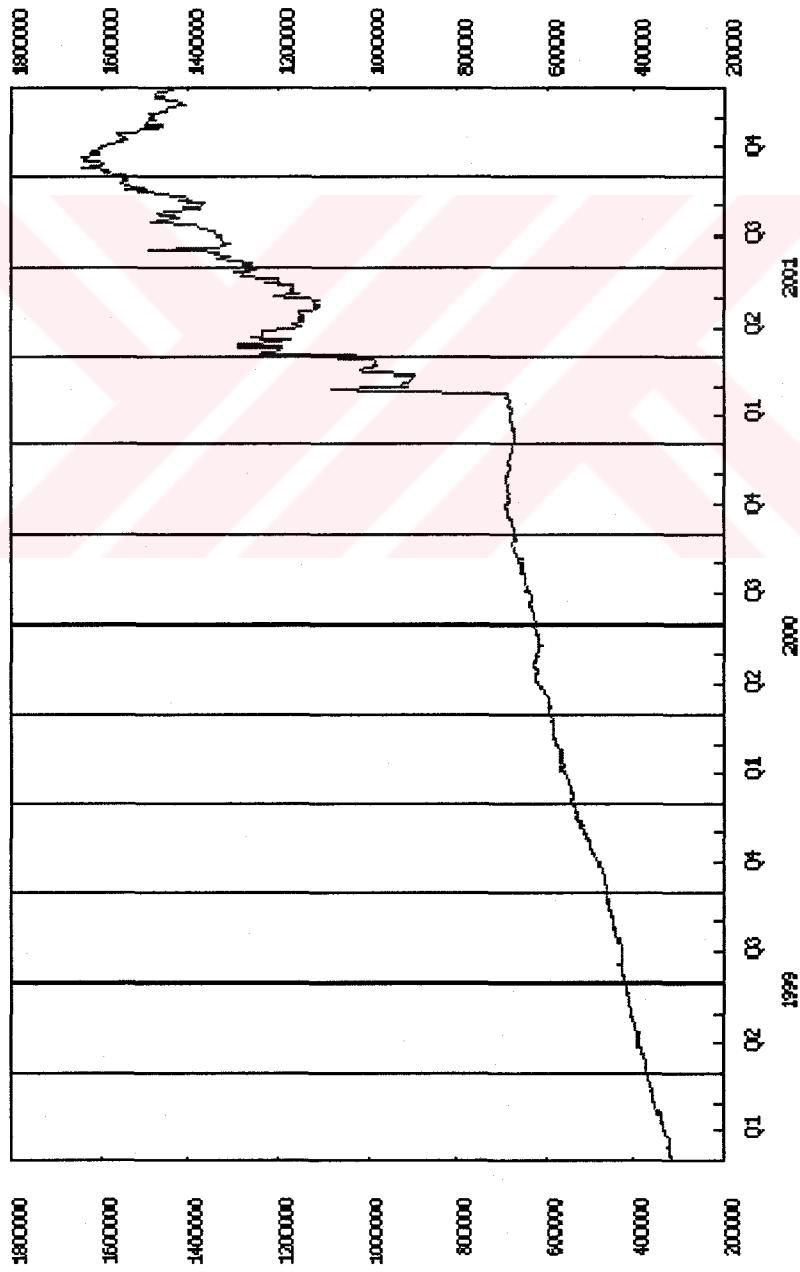
Source: Central Bank of Turkey

FIGURE 1.3 BANK REPOS / TOTAL REPOS (DEMIRBANK* VS. SECTOR)



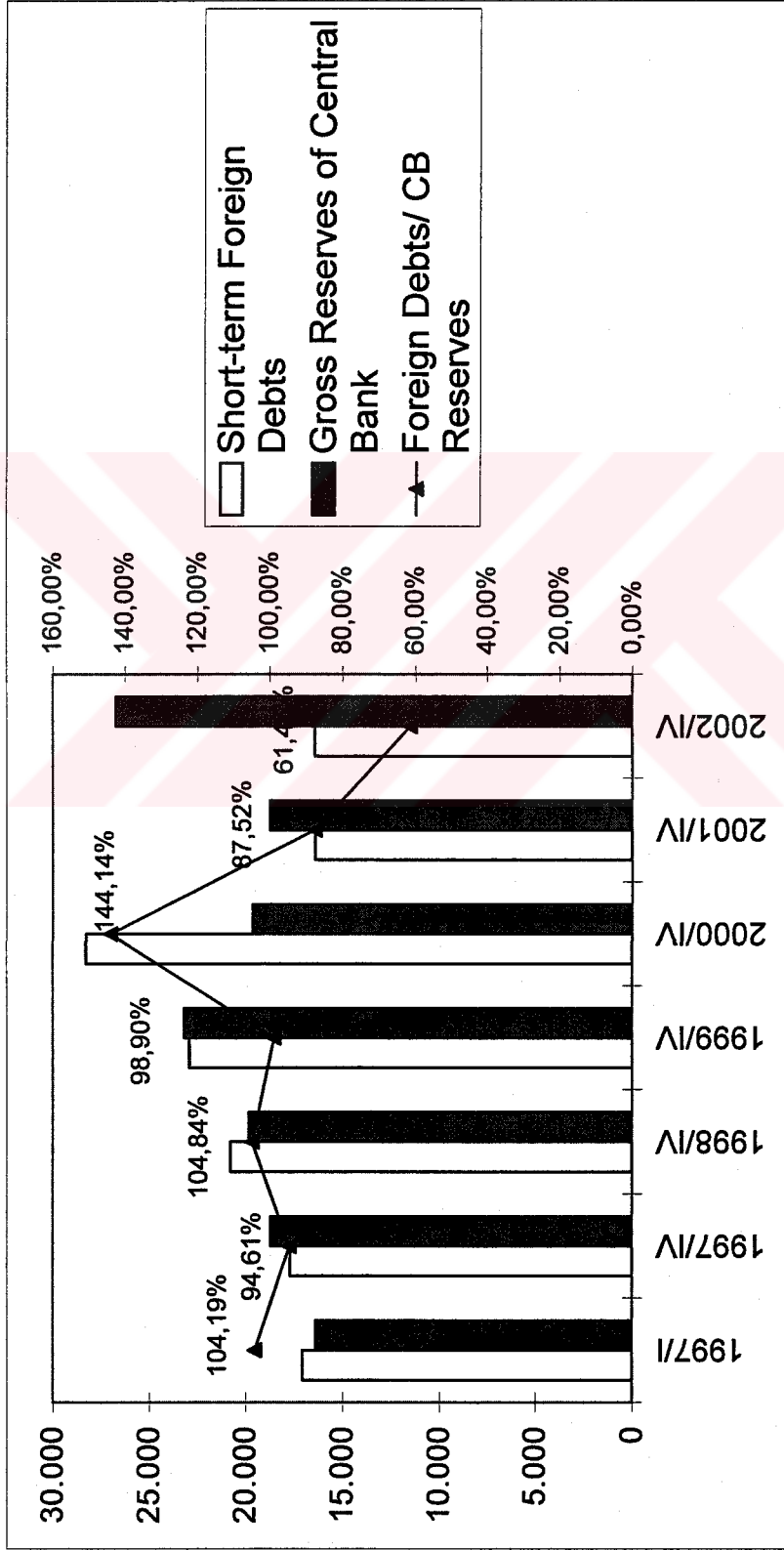
* Demirbank was carrying its government debt instruments portfolio mainly through overnight borrowing from other banks.
Source: Central Bank of Turkey

FIGURE 1.4 EXCHANGE RATES* (USD/TL)



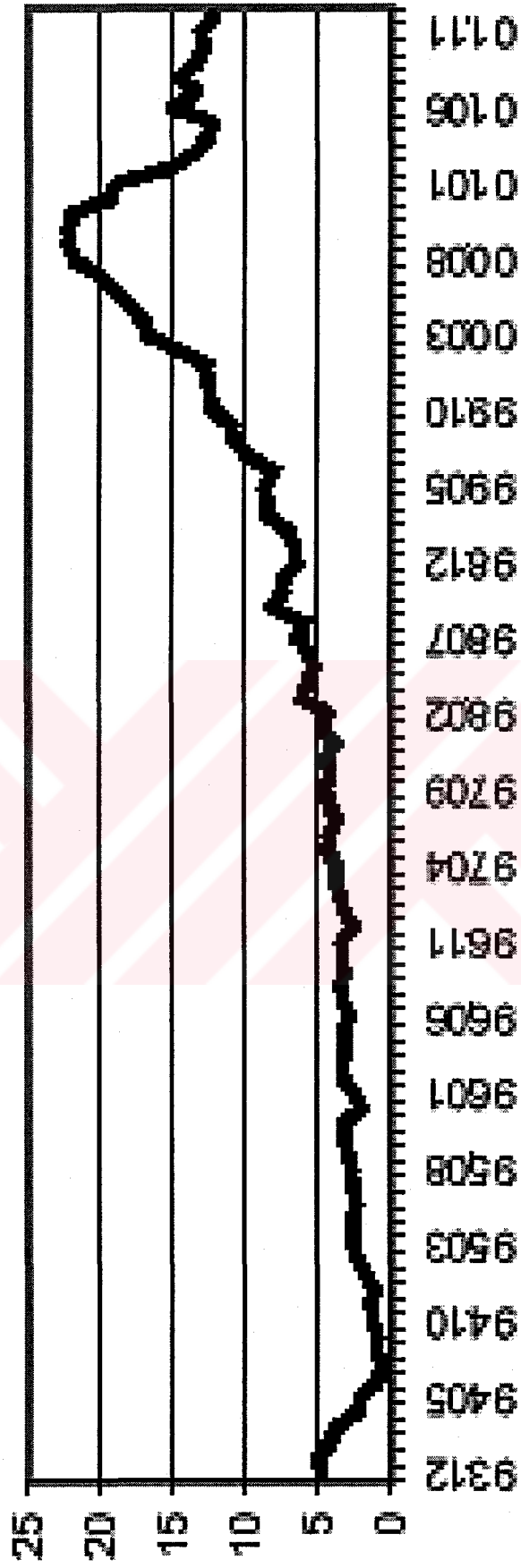
* Original Frequency, Constant, Original Observation, 01.01.1999 – 12.31.2001
Source: Central Bank of Turkey

FIGURE 1.5 SHORT-TERM FOREIGN DEBT AND CENTRAL BANK RESERVES (MILLION USD)



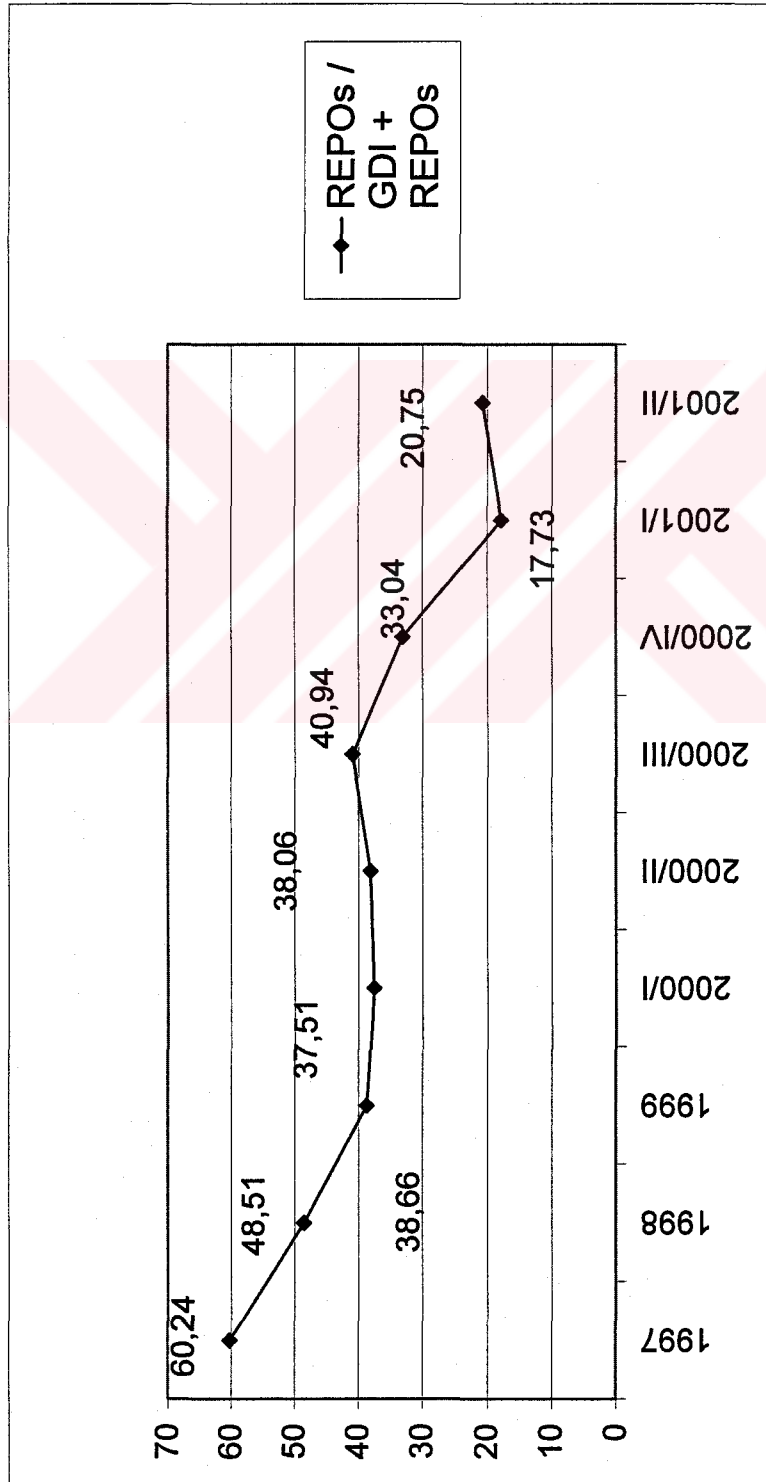
Source: Central Bank of Turkey

FIGURE 1.6 OPEN POSITIONS OF BANKS (BILLION USD)



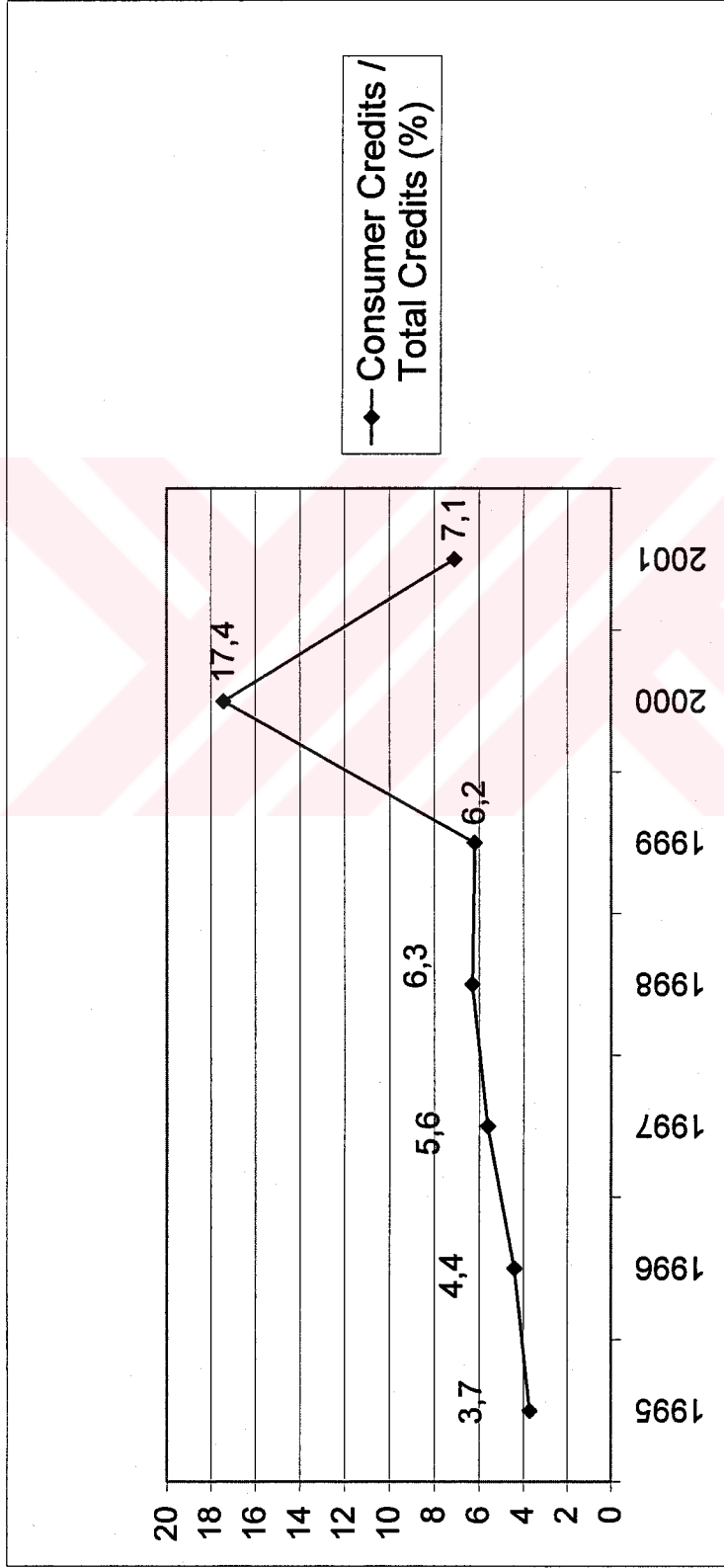
Source: Central Bank of Turkey

FIGURE 1.7 REPOS / GDI + REPOS IN THE SECTOR



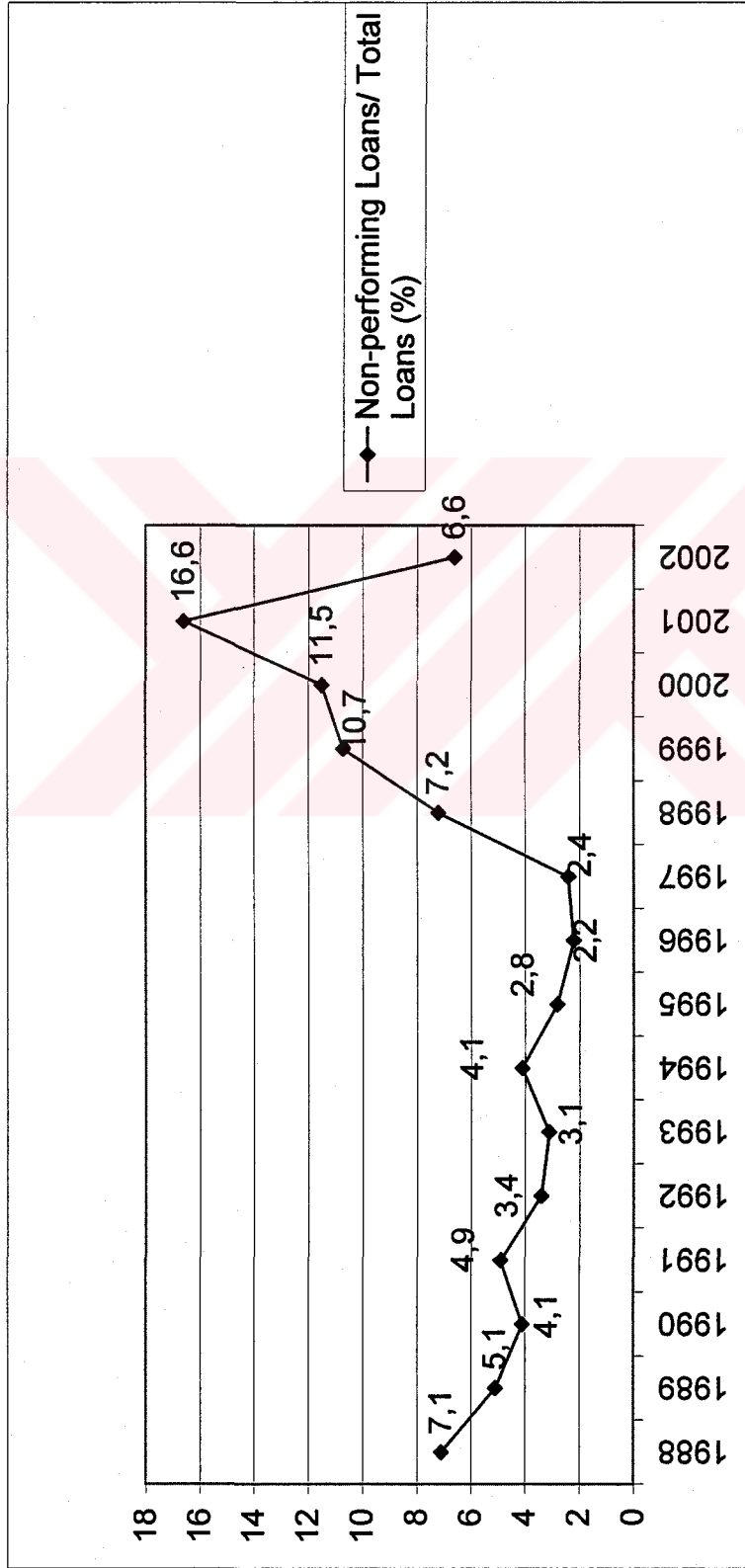
Source: Central Bank of Turkey

FIGURE 1.8 CONSUMER CREDITS / TOTAL CREDITS (%) IN THE BANKING SECTOR



Source: Central Bank of Turkey

FIGURE 1.9 NPL / TOTAL LOANS RATIO IN THE TURKISH BANKING SECTOR



Source: BRSA

ÖZGEÇMİŞ

Kişisel Bilgiler

Adı Soyadı: Burcu KEPEZ

Doğum Yeri ve Tarihi: Silifke, Mersin – 18.08.1981

Eğitim Durumu

Lisans Öğrenimi: Hacettepe Üniversitesi İngilizce İktisat Bölümü

Yüksek Lisans Öğrenimi: Hacettepe Üniversitesi İktisat Anabilim Dalı

Bildiği Yabancı Diller: İngilizce

Bilimsel Faaliyetleri:

İş Deneyimi

Stajlar: TCMB, BOSSA

Projeler:

Çalıştığı Kurumlar: Akbank T.A.Ş. Genel Müdürlük
İş Portföy Yönetimi A.Ş.

İletişim

E-Posta Adresi: burcukepez@yahoo.com

Tarih: 14.06.2006

