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MORAL HAZARD, CORPORATE
GOVERNANCE, AND BANK FAILURE: EVIDENCE
FROM THE 2000-2001 TURKISH CRISES

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Abstract

This paper analyzes the role of moral hazard and corporate governance structures in bank failures within the context of the 2000-2001 currency and financial crises experienced in Turkey. The findings suggest that poor performers with lower earnings potential and managerial quality, and hence lower franchise value, were more likely to respond to moral hazard incentives provided by the regulatory failures and full coverage deposit insurance system. The findings also suggest that ownership and control variables are significantly related to the probability of failure. Privately owned Turkish commercial banks were more likely to fail. Moreover, among the privately owned Turkish commercial banks, the existence of family involvement on the board increased the probability of failure.

ملخص

تحلل هذه الورقة دور هياكل المخاطر الافتراضية وحوكمة الشركات في إخفاقات البنوك وذلك في سياق الأزمات المالية والخاصة بالعملات التي مرت بها تركيا بين عامي 2000 و 2001. و توصي النتائج بأن من يتسم أداؤهم الضعيف وإمكاناتهم الربحية والإدارية بالضعف، ومن ثم قيمة إمتياز أقل، هم أكثر عرضة للإستجابة إلي حوافز المخاطر الافتراضية التي تتيحها الإخفاقات التنظيمية وكذا نظام التأمين الشامل علي الودائع. كما توصي النتائج بالعلاقة ذات البال بين متغيرات الملكية والرقابة من جهة وإحتمالات الإخفاق من جهة أخرى. وكانت البنوك التجارية التركبية الخاصة هي الأكثر عرضة للإخفاق. أضف إلي ذلك، فإن وجود العامل الأسري في مجالس إدارات البنوك التركبية الخاصة يزيد من إحتمالية الإخفاق.

1. Introduction

The nature and the relative effectiveness of respective corporate control mechanisms that exist in banking firms are argued to be different from those in non-financial corporations due to a number of factors: the regulations that result in an ineffective market for corporate control as a disciplinary mechanism, the moral hazard problems due to the existence of (implicit and explicit) deposit insurance and limited product market competition in the banking sector (Prowse, 1995; Levine, 2004). However, as noted by Adams and Mehran (2003), to date little research exists on the governance of the banking firms. The existing research tends to concentrate on the US and few other developed countries.¹ In the case of emerging markets, there is even less literature most of which largely focuses on the Asian countries' experiences in the post crisis period.²

Concerning the relationship between corporate governance mechanisms and performance in the banking industry, a recent contribution is by Caprio et al. (2007) where ultimate owners of bank capital and the degree of voting and cash flow rights concentration are documented for a large cross-section of countries. They report that banks are generally not widely held; but they are rather family owned or state controlled banks. They find that larger cash flow rights by the controlling owner enhance bank valuations while weak shareholder protection laws lower bank valuations. Moreover, greater cash flow rights mitigate the negative impact of weak protection laws on valuations. Hence, the findings suggest that the ownership structure is an important mechanism for governing banks. Concerning the board structure and performance relationship, Adams and Mehran (2005) report a positive relationship between board size and firm performance in the US banking industry. The study, however, did not find a significant relationship between the proportion of outsiders on the board and performance. Sierra et al. (2006), in contrast, find evidence that the relative strength of the board of directors is positively associated with firm performance and negatively associated with executive compensation in the US bank holding companies.³ Busta (2007) studies these relationships for a number of European banks. While she finds no significant impact of board size on performance — measured by market to book value of equity — she finds a significant relationship between the degree of board independence and performance. More interestingly the direction of the relationship seems to be affected by the legal tradition of the country — in the continental European countries the relationship is found to be positive while in the UK the opposite is true.

Byrd et al. (2001) analyze the impact of governance structure on firm survival in the context of Savings & Loan crisis in the US. They find that firms with a high proportion of independent directors on the board and better compensated CEOs have higher probability of survival. Laeven and Levine (2007) analyze the impact of ownership structure, managerial shareholdings, and national laws and regulations on bank risk taking a wide sample of countries from developed and developing countries. They find that large owners with considerable cash flow rights increase bank risk taking but management structure, and laws and regulations affect this relationship. The findings lead them to question the view that banks do not respond to private governance mechanisms, and at the same time underline the need for analyzing how a bank's ownership and management structure interact with legal and

¹ See, for instance, Pi and Timme (1993), Adams and Mehran (2003, 2005) and Sierra et al. (2006) on the US; Horiuchi and Shimizu (2001), Andersen and Campbell (2004), Konishi and Yasuda (2004), Kim et al. (2007) and Dinc (2006) on Japan; and Crespi et al. (2004) on Spain.

² See, for instance, Choe and Lee (2003), Choi and Hasan (2005) and Pathan et al. (2006).

³ The variable measuring the strength of the board is a composite variable computed from seven individual variables as proxies for board independence and effectiveness.

regulatory environment. The recent banking crises in emerging markets have also contributed to the recently increasing academic interest towards the role of ownership and governance structures on distress and failure in financial institutions. Bongini et al. (2001) find that in addition to traditional financial data, ownership data also helps predict distress and closure of financial institutions from five crisis affected East Asian countries. They find that foreign ownership decreases the probability of financial distress. Connections with industrial groups or influential families, in contrast, are found to increase the probability of distress suggesting that regulators are allowed selective prior forbearance from prudential regulations.

The previous review highlights the importance of the legal and the institutional context in the analysis of ownership impact and corporate governance characteristics on performance and risk taking in banking firms. The findings, at the same time, underline the need for industry and country specific case studies to help expand the literature on governance structures and performance. Accordingly the main objective of this study is to analyze the impact of ownership and corporate governance structures on risk taking for Turkish commercial banks. The study empirically examines the role of the moral hazard and ownership and corporate governance structures in banking failures within the context of the financial and currency crises experienced in November 2000 and February 2001 in Turkey.

Since the late 1980s banks in Turkey had increasingly concentrated on financing government borrowing requirements which yielded high income streams in an environment characterized by macroeconomic instability and an underdeveloped regulatory and supervisory infrastructure. In the two crises the financial sector's capital was effectively eroded and the authorities had to intervene in more than half of the privately owned Turkish commercial banks. The banking failures have helped raise various questions about the role of governance failures and moral hazard in the Turkish banking failures. Although the concerns about the potential moral hazard problems created by the underdeveloped regulatory and supervisory structures and the related party lending associated with the holding company structures have been regularly stated by the authorities and the private sector participants in Turkey, these issues have never been empirically analyzed in the context of the recent Turkish crises.

The results show that Turkish banks with lower level of efficiency, taken as proxy for franchise value, responded more to the moral hazard incentives provided by the full coverage deposit insurance system that existed at the time. Ownership structures are also found to be important determinants of banking failures with foreign banks being less likely to fail. The study also documents that an overwhelming majority of privately-owned Turkish commercial banks were owned by families or industrial groups owned by families. In these banks, there was also a very high incidence of family involvement on the board of directors. The existence of family members on the board is found to increase the likelihood of failure. There is also some evidence of the existence of too-big-to-fail policies being operative.

The recent policy agenda of the reforms in Turkey mainly aimed at bringing to light the Turkish regulations and practices on corporate governance with the international regulations and practices. The findings of this study can help inform both the corporate sector and the policy makers whether the proposed or undertaken reforms will have the positive impact on banking performance and stability as presumed. At the same time, the study contributes to the literature on the financial and banking crises in emerging markets by studying the Turkish case which had received not only limited academic interest but had also been analyzed mainly from a macro perspective.

The rest of the paper is organized as follows. Section 2 provides a brief overview of the Turkish banking sector. The developments prior to, during, and after the crises of 2000 and 2001 are summarized in order to provide a context to the study and also to help develop hypotheses to be tested empirically. The hypotheses are put forward in Section 3 and the

empirical analyses are presented in Section 4. The summary and discussion of findings conclude the study.

2. The Turkish Banking Sector

2.1 The Sector Prior to the Crises

The existence of holding company structures and a financing system organized around a holding company with a group-owned bank can be viewed as the defining aspects of the Turkish corporate structure.⁴ The holding companies are also the largest owners in the Turkish listed firms and they are ultimately controlled by individual family members through pyramidal and cascaded ownership structures (Yurtoglu, 2000). The underlying reason for the prevalence of holding companies and the associated financing system is the inward looking industrialization strategy followed prior to the 1980s which promoted the growth of big industrial conglomerates and an increase in the banks set up or owned by those groups. With limited owned funds, opening a bank was the most cost-effective way of raising finance. In addition, it promoted the groups' influence and prestige in financial markets (Akguc, 1989).

Since the introduction of the financial liberalization process in 1980, the Turkish banking sector has grown rapidly and transformed itself: The industry has considerably improved its technological and human capital, and has expanded the scope of products offered. The entry of foreign banks, albeit at a limited scale, has been effective in this modernization process (Pehlivan, 1996). Initially, the sector achieved substantial efficiency gains due to the liberalization efforts (Zaim, 1995, Isik and Hassan, 2003). A steady decrease in the concentration ratios was associated with the growth of the sector. Although this might suggest increasing competition, the banking sector continued to exhibit properties of monopolistic competition (Gunalp and Celik, 2006).

Starting in the late 1980s and especially in the 1990s the ability of the sector to undertake asset transformation function has deteriorated because of growing macroeconomic instability and high public deficits. The increase in interest rates following their liberalization combined with increased macroeconomic instability led banks to increasingly concentrate on financing the government's borrowing requirements due to the high profits available through acquisition and trading of government debt securities. In addition, interlocking relations between banks and industrial groups and the over-exposure of banks to affiliated companies prevailed.⁵ Large state-owned banks, on the other hand, continued to dominate the system. They became 'a proxy treasury' lending to the government and the state owned enterprises and an apparatus of the Treasury and the Central Bank in implementing macroeconomic policies. Due to the government's failure to compensate these banks for their so-called 'duty losses' — the losses they incurred as a result of quasi-fiscal operations performed on behalf of the government — they started to threaten the banking system stability through borrowing excessively from other banks and creating unfair competition for deposits especially in the late 1990s.

As the authorities failed to improve the supervisory and regulatory frameworks, the sector was increasingly exposed to interest and foreign exchange risks, and suffered from low asset

⁴ See Ararat and Ugur (2003) for a review of Turkish corporate governance framework.

⁵ The case of Interbank, previously owned by the Cukurova Group is illustrative: "Moody's, says Cukurova, forced Interbank ... to build up 'a large exposure in excess of prudential regulations' to connected companies during the 1994 crisis. Cukurova sold Interbank to another holding company last year, but Moody's says the problem persisted: 'Exposure to Cukurova was reduced, but replaced by exposure to the new owner. These two accounts totaled over 37 percent of the balance sheet at the end of 1996 and sit on the bank's books as medium- to long-term facilities funded by short term deposits'" (Financial Times, 12 December 1997, 2). Interbank was taken over by the Fund in 1999.

quality in addition to insufficient capital bases. An institutional set up through which the Treasury, the Central Bank and the Capital Markets Board were jointly authorized to carry out the supervision and the regulation of the system allowed for conflicts of interest among these institutions and the political interference in their activities. Most importantly, as argued by Ozkan (2005), with privately owned banks holding substantial amounts of government debt securities and state owned banks providing quasi-fiscal functions, in the face of continuously increasing public sector borrowing requirements regulatory forbearance resulted.⁶

The system experienced its first major financial crisis in 1994. The introduction of capital account liberalization measures starting in 1989 and leading to the convertibility of the lira in April 1990 marked a new phase in Turkey's combination of macroeconomic instability and financial sector opening. A policy decision of utilizing domestic borrowing as the dominant method of financing public deficits combined with low international interest rates and a strong lira motivated commercial banks to borrow heavily from abroad in order to lend domestically to both the private and public sectors taking advantage of substantial arbitrage possibilities in the early 1990s. The downgrading of Turkey's credit rating by international agencies and ongoing attempts of the Treasury to reduce the interest cost of deficit financing resulted in a run on the lira and a surge of currency substitution in January 1994. A new stabilization package was introduced in April. By this time, the depreciation of the lira reached over 200 percent on an annual basis. Three small banks were closed and a full coverage deposit insurance system was introduced in order to restore financial market stability.

2.2 The Crises of 2000 and 2001

After a quick and short lived recovery from the crisis, in the second half of the 1990s macroeconomic fundamentals started to deteriorate further and the fragility of the banking system deepened. A new government took office in June 1999 and an exchange rate-based stabilization program backed by the IMF was introduced in December 1999. The program aimed at controlling inflation, correcting macroeconomic fundamentals and strengthening the fragile financial system.

Prior to the initiation of the program, right after taking office, the new government passed a new banking law with a view to improving the regulatory and supervisory standards. It created a new bank regulatory and supervisory agency working under a supposedly independent Bank Regulation and Supervision Board. The joint authority of the Treasury and the Central Bank to regulate and supervise the banking sector was transferred to the Board and in September 2000 Banking Regulation and Supervision Agency (BRSA) became fully operational. Just before signing the standby agreement, Savings Deposit Insurance Fund (the Fund) took control of five commercial banks bringing the total number of banks under the fund ownership to eight⁷. It was not an unexpected event in the sense that it was an open secret that there were 10-15 banks with fragile structures receiving covered help from the authorities in recent years.

While interest rates declined initially with the introduction of the program, inflationary expectations proved to be more resilient. Interest rates started to increase towards the end of 2000 when rising current account deficits combined with the deteriorating confidence in the

⁶Private bankers often criticized state-owned banks for distorting the market. It was stated that "their accountability is clouded by the fact that their legal owner, the Treasury, is both their regulator and biggest borrower." Financial Times, 12 December 1997, 2

⁷These were Esbank, Egebank, Sumerbank, Yurtbank and Yasarbank. The five banks altogether accounted for 5.2 percent of the total assets of the banking sector at the end of 1998.

program limited the capital inflows. In October two more banks with weak financial positions were taken over by the Fund. Increasing interest rates meant depressed profitability for banks, especially for those with a substantial portfolio of government debt securities as they had serious maturity mismatch problems. In addition, many banks were carrying substantial foreign exchange risks. Strong pressures on overnight interest and government borrowing rates developed in late November when these banks lost access to international funds. The markets settled down only after the provision of additional funds by the IMF and the announcement of some emergency measures by the government in early December. Demirbank, a medium sized bank in the center of the liquidity crisis, was taken over by the Fund.

Although capital outflows reversed and interest rates declined, inflation rates remained high. In late January interest rates started to rise again and hence the fiscal situation became unsustainable. In February a political incidence sparked a major attack on the lira. The Treasury could not raise enough funds to meet redemptions falling due and interest rates shot up to record high levels. Two publicly-owned banks failed to meet their interbank obligations. Finally, the government decided on February 22 to float the Turkish lira. The lira embarked upon a free fall losing almost 30 percent during the day. In April a new program was announced, and in May the IMF approved augmentation of the stand-by arrangement.

2.3 Post-crisis Developments

The Fund-controlled and publicly-owned banks with high liquidity needs were affected badly due to the interest rate increases during the first crisis and the sector, particularly the private commercial banks, experienced foreign exchange losses in the following crisis. In May 2001 a banking restructuring program was introduced. It had four major components: restructuring publicly-owned banks; resolution of the banks under the Fund; improving the capital bases and limiting the market risks of private banks; improving the supervision and regulation, and the competitiveness in the sector. The Fund intervened in a total of 20 commercial banks between 1999 and 2002 which resulted in a substantial burden on the Treasury. Appendix 1 lists the names of banks in which the Fund intervened and the dates of intervention between 1997 and 2003.⁸

The number of Turkish banks decreased significantly in a short period of time while concentration levels increased as a result of mergers and acquisitions (M&As) and removal of financially weak banks from the system.⁹ Simultaneously, foreign interest and investment in the industry increased. Some of the pre-existing foreign banks increased their commitment in the system and new foreign banks entered the system by acquiring controlling shares in Turkish banks. Over a very short period of time the share of foreign banks in the Turkish banking sector increased considerably starting from a negligible level.¹⁰

An important aspect of the restructuring program has been the recognition of the role of the underdeveloped regulatory and supervisory infrastructure and corporate governance failures, in addition to the macroeconomic instability, in the fragilities in the corporate and financial sectors, and the crises experienced. Capital Markets Board of Turkey defined corporate

⁸ It was reported that the burden of failed banks on the Treasury amounted to \$42.7 billion (Turkish Daily News, August 24, 2004).

⁹ The number of commercial banks decreased to 33 at the end of 2006 from 62 at the end of 1999. The level of concentration in the sector, on the other hand, increased to 63 percent at the end of 2006 from 46 percent at the end of 1999, measured according to top five banks' share of total banking sector assets (Banks Association of Turkey, Banks in Turkey, various issues).

¹⁰ According to a study by Banking Regulation and Supervision Agency-BRSA, as of April 2007, the share of foreign banks in the total banking sector reached 22 percent. If the foreign investors' share of the float in the stock exchange listed banks is included in the analysis, this figure reaches 39 percent (BRSA, 2007).

governance principles in 2003, and amended them in 2005. The principles aimed at reforming and harmonizing Turkish capital markets according to international standards. Parallel to the overall governance reforms in the country which were made possible by the macroeconomic stability achieved in the aftermath of the crises (Ugur and Ararat, 2006), new regulations were introduced in order to improve risk management and corporate governance practices in the banking system. A limited deposits insurance system was introduced in 2004, replacing the previously introduced full coverage insurance system. Governance of publicly-owned banks was reformed and independent boards of directors appointed for them. A new Banking Act was enacted by the parliament in 2005, and the BRSA published new regulations on the corporate governance principles in 2006 (BRSA, 2006).

3. Hypotheses Development

The first question we try to address empirically is the role of moral hazard problems created by the full coverage deposit insurance system and the regulatory and supervisory failures. Deposit insurance eliminates the incentives for depositors to monitor bank risk and hence encourages banks to substitute deposits for equity and to maintain portfolios with greater risk than they otherwise would (Wheelock and Wilson, 1995). However, the responsiveness to these incentives is expected to differ at bank level. High franchise value is expected to mitigate moral hazard problems by increasing the cost of financial distress. It is empirically shown that banks with high franchise values assume less risk (See, for example, Keeley (1990) for the US and Konishi and Yasuda (2004) for Japan). Capitalization levels can also proxy for the banks' responsiveness to risk taking incentives. Berger and DeYoung (1997) report that decreases in banks' capital ratios are followed by increases in non-performing loans for banks with low capital ratios.

Similarly, the efficiency performance of banks is expected to affect risk taking. Regarding the effect of efficiency, Kwan and Eisenbeis (1997) note that the effect of efficiency on risk taking is an empirical issue. On the one hand, an efficient bank will have more scope to assume additional risk relative to an inefficient bank. On the other hand, an efficient firm may control itself against excessive risk taking in order to protect its market value which is expected to be higher due to higher efficiency. They empirically find that inefficiency positively affects risk-taking which supports the moral hazard hypothesis that "poor performers are more vulnerable to risk-taking than high performance banking organizations." (Kwan and Eisenbeis, 1997). A closely related line of research at the same time studies inefficiency as a determinant of financial institutions' failure, as it captures managerial quality and earnings capacity. For the US, Wheelock and Wilson (1995, 2000) report that inefficiency increases the risk of failure for banks while Cebenoyan et al. (1993) report that inefficiency increases the probability of regulatory closure for S&Ls.

Accordingly, we expect to find that inefficiency increases the likelihood of failure. On the one hand, Turkish banks with low efficiency were not able to successfully handle the riskier portfolios that many ended up owning in an unstable and changing macro environment. On the other hand, banks with lower earning powers and lower franchise values could have been more prone to moral hazard incentives and hence failure. Although we are primarily interested in the predictive power of the efficiency performance variable as a proxy for the franchise value and managerial quality, in the empirical analysis below we also employ capital levels to test if banks with low capitalization respond more to the moral hazard incentives.

The period prior to the crisis is characterized by increased macroeconomic instability and a deteriorating regulatory framework. In such an environment the likelihood of a bank to fail may be affected by how established the bank is. On the one hand, new entrants were expected to be more sensitive than incumbents to adverse environmental conditions (DeYoung, 2003).

On the other hand, regulatory failures coupled with the possibility of easy profits available through acquiring and trading government debt securities may have motivated a certain breed of bankers to enter the sector. The new entrants may have had a preference for higher risk strategies or other motives such as transferring financial resources to connected parties in a short period of time. In other words, the system may have been suffering from adverse selection problems — in that only bad risks were attracted to the sector. Claims that in periods prior to the crises regulators failed to deny banking licenses to unsuitable potential entrants — due to political interference and that this constituted one of the factors contributing to the crises — are common with sector participants. Therefore we expect that a bank's age to be negatively related to the likelihood of failure.

The control or ownership structure of the banks is expected to affect the banks' responsiveness to these incentives. Foreign bank subsidiaries are expected to have better management skills and are less likely to be affected by negative local economic conditions as they may easily raise funds on international capital markets and have access to parent organizations' funds. State-owned banks, on the other hand, are expected to operate differently than privately owned banks due to the political interventions in their lending decisions. Especially due to the quasi-fiscal role that they played in the Turkish case, the authorities could have been reluctant to intervene in these banks. Among the privately-owned Turkish commercial banks, the ones controlled by families or industrial groups were more likely to fail given their concentrated loan portfolios due to lending to the affiliated companies and their possibly low quality asset portfolios. As a result we expect to find that foreign banks were less likely to fail while banks controlled by families or industrial groups were more likely to fail.

4. Methodology

4.1 Methodology and Sample

We use logistic regression analysis for predicting the probability of bank failure. Our definition of failure is de jure failure and/or intervention (closure) by the Fund. The data availability does not allow us to analyze the two related states separately: financial distress and closure by the authorities. Hence the empirical findings should be interpreted accordingly. We estimate the probability of a bank failing between 1999 and 2003, inclusively, by using a number of independent variables selected in view of the hypotheses developed in the previous section.

Our sample includes all the commercial banks that were in operation at the end of 1998. The bank level financial statements data are from the Banks in Turkey (1998) a publication by the Banks Association of Turkey. As of end-1998, there were 38 privately-owned, 18 foreign-owned, and four state-owned commercial banks in Turkey.¹¹ As can be seen in the Table 1 in the Appendix, interventions in banks was concentrated between end-1999 and mid-2001. Hence end-of 1998's financial statements data was used to calculate the efficiency measures and to generate the other independent variables.

We employ two alternative samples in the logistic regressions. We first use the entire sample of banks while controlling for ownership. In subsequent analyses we use the sub-sample of privately owned Turkish banks in order to test the two hypotheses on this group of banks: whether new entrants were more likely to fail and whether family involvement in the management increased the likelihood of failure.

¹¹ SDIF intervened in Turkbank in November 1997 which remained under SDIF's control until the end of 1998. Hence while we included it in the DEA analysis, it was excluded in the logit analysis.

4.2 Variable Descriptions

4.2.1 Measurement of Efficiency

Productive efficiency of an organizational unit means its success in transforming resources into outputs. In frontier efficiency methods, measurement of technical efficiency of a unit involves specification of the locus of efficient units: a ‘frontier’, and measurement of the distance between the observed input(s)-output(s) combination for a specific unit and that frontier. We prefer the non-parametric frontier efficiency approach in view of the limited number of observations, and employ Data Envelopment Analysis (DEA). The DEA involves the solution of a linear programming problem to fit a non-stochastic, non-parametric production frontier based on the actual input output observations in the sample. Efficiency is measured by the ratio of weighted outputs to weighted inputs.¹² Considering the identification and measurement of inputs and outputs, we follow the intermediation approach which assumes that banks collect funds — deposits and purchase funds — and intermediate these funds into loans and other assets. It concerns the overall costs of banking, and is preferable when analyzing the economic viability of banks (Ferrier and Lovell, 1990). We employ three inputs and three outputs: The inputs are total deposits, total interest expense, and total non-interest expense.¹³ Total loans, interest income, and non-interest income make up the outputs.¹⁴ The sample includes all the commercial banks that were in operation at the end of 1998.

4.2.2 Ownership and Control Variables

To measure the role of ownership and control in bank risk taking we employed various proxies in addition to the dummy variables indicating the type of controlling owner as state, private Turkish or foreign. **State-owned** is an indicator variable for state ownership. The value of 1 indicates that the bank is controlled by the state. **Foreign-owned** is an indicator variable for foreign ownership. The value of 1 indicates that the bank is controlled by foreigners.

Age is the age of the bank in years. It is defined as the number of years between the year of founding the bank or the year of the last ownership change if the bank has undergone ownership change, and 2000.

Family controlled is an indicator variable that is 1 if the bank is controlled by a family or an industrial group. To determine the type of controlling owners, we used historical data available mainly by the Turkish Banks Association in addition to banks’ own web-sites. **Family on the Board** is another alternative indicator variable controlling for the involvement of the family in bank management. It is equal to 1 if there is a family member on the board of directors. Annual reports (of year 2000 or 2001) of the surviving banks are used to access the Board information. For the failed banks, the directors on the board in the year of intervention are checked to determine the participation of family members on the board. Journalistic news stories on banks where interventions took place and the court case stories about their executive management teams and board of directors are used to identify the members of the boards.

¹² See Coelli et al. (1998) for an introduction to the frontier efficiency methods, and Berger and Mester (1997) for an extensive review of applications of these methods in measuring the efficiency of financial institutions.

¹³ Total interest expense contains interest on deposits, interest on non-deposit funds and other interest expenses, and non-interest expense includes fees and commissions paid, losses from foreign exchange and capital market transactions, personnel expenses, taxes and duties, rental expenses, depreciation and other expenses.

¹⁴ Interest income includes interest on loans, interest on securities, interest on deposits in banks and on interbank funds sold, and residual sources, and non-interest income includes fees and commissions received, income from foreign exchange and capital market transactions and residual sources.

4.2.3 Other (control) Variables

We also include a number of traditional CAMEL-type financial variables that are commonly used in empirical models estimating risk or probability of failure.¹⁵ However, considering the fact that the efficiency measure employed in the analysis is a comprehensive measure of performance, we limit the number of financial variables included as controls.

Total assets: Larger banks are assumed to have more flexibility in financial markets and are better able to diversify credit risk (Cole and Gunther, 1995). Accordingly, larger banks are expected to be less prone to experiencing financial distress. Additionally size may affect the authorities' decision making process in that large financial institutions may be considered as too-big-to-fail (Bongini et al., 2001). Accordingly we expect to find a negative relationship between this variable and the probability of failure.

Past asset growth: Rapidly growing banks are thought more likely to accumulate low-quality asset portfolios (Abrams and Huang, 1987). Accordingly we expect to find a positive relationship between the rate of growth and the risk of bank failure.

Liquidity: Liquid assets allow banks to meet unexpected deposit withdrawals and hence we expect liquidity to be negatively related to the likelihood of bank failure.

The list of variables together with their detailed descriptions and data sources are provided in Table 1.

5. Empirical Results

5.1 Descriptive Statistics

Tables 2 and 3 present summary statistics for the entire sample as well as two subgroups: ownership specific, and failed and surviving. Efficiency rates significantly differ according to the type of ownership. State owned banks seem to achieve the highest technical efficiency levels while privately owned Turkish banks the lowest.¹⁶ State-owned banks are also significantly larger than the other two types. Foreign banks have the highest level of liquidity followed by privately owned banks.

As expected, surviving banks achieve statistically significant higher efficiency levels compared to failed banks. At the same time, surviving banks have significantly higher levels of liquidity compared to failed banks. Although, as expected, failed banks have higher past growth rates, lower capital to assets ratios, and smaller size than surviving banks, the differences between the two groups are not significant with respect to these variables.

The summary data indicate that out of the 23 failed banks analyzed here, 21 banks belonged to the privately owned Turkish banks category. In other words, the highest failure incidence rate is observed among the privately-owned group (53.8%). Among privately-owned Turkish banks, about 87 percent is controlled by families or industrial groups controlled by families. For the same group of banks, in about 80 percent of the cases, there is at least one family member on the board.

5.2 Probability of Failure: Binary Logistic Regression Model

Table 4 displays the estimated coefficients and the related statistics from alternative logistic regression specifications that predict the probability of a bank failing utilizing alternative sets of explanatory variables. Regressions in column 1 and column 2 employ the full sample of

¹⁵ See, for instance, Bongini et al. (2001), Molina (2002), and Arena (2007) for empirical analysis of determinants of bank failures in emerging country contexts.

¹⁶ There are only four large size state-owned Turkish banks in our sample and hence this might explain the high efficiency estimates obtained.

observations and include indicator variables to control for ownership. Results presented in column 1 show that there is a significantly negative relationship between efficiency and probability of failure. Lower earnings potential and managerial quality, and hence franchise value, seem to be increasing the probability of failure. Not having enough liquidity is another significant determinant of failure. Foreign-owned banks compared to Turkish private banks are less likely to fail. Past asset growth rate, as a proxy for asset quality, is not significantly related to the probability of failure. We fail to find a significant impact of size on the probability of failure although the sign of the coefficient for size is as expected. Regression in column 2 replaces efficiency with capital ratio to test if banks with low capitalization respond more to moral hazard incentives and hence are more likely to fail. However, we fail to find any significant relationship to the bank failure. The other explanatory variables behave in similar ways in this alternative specification except for asset size variable which turns out to be significantly and negatively related to the probability of bank failure providing support to the too-big-to-fail argument.

The following regressions reported in columns 3 and 4 utilize the sub-sample of privately-owned Turkish banks only. We include the variable age to test if the new entrants, or less established banks, were more likely to fail. The direction of the relationship is opposite to what we expected although it lacks statistical significance.¹⁷ In order to test the effect of family control on the probability of failure, we use the family controlled indicator variable which takes 1 for the banks controlled by families or industrial groups controlled by families. Although the direction of the relationship is as expected, it lacks statistical significance (column 3). The following specification (column 4) alternatively includes the family on board indicator variable which takes 1 for the banks of which boards include at least one family member. We find that banks where family members are involved on the board are more likely to fail.

6. Summary and Concluding Remarks

This study analyzes the role of corporate ownership and moral hazard in bank failures during the 2000-2001 currency and financial crises in Turkey. The findings suggest that poor performers with lower earnings potential and managerial quality, and hence lower franchise value, were more likely to respond to moral hazard incentives created by the regulatory failures and full coverage deposit insurance system. The findings also suggest that ownership and control variables significantly affect the probability of failure. Privately owned Turkish commercial banks were more likely to fail. Moreover, among the privately owned Turkish commercial banks, the existence of family involvement on the board increased the probability of failure.

The findings seem to support the recent policy arguments that consider the ownership and governance structures and the interactions between these and the institutional environment as critical factors affecting the performance and risk taking in financial institutions. The recent reforms in Turkey aiming at improving corporate governance practices have brought about positive responses by some of the leading corporate actors. A number of privately-owned banks have taken positive steps towards improving their governance practices.¹⁸ The

¹⁷ Yamak et al. (2006) employ an ownership change variable that takes the value of 1 if a bank entered the system or experienced an ownership change after 1994 to test similar arguments in a study covering privately-owned Turkish commercial banks but fail to find any significant relationship between this variable and financial fragility over 1997-2000.

¹⁸ Akbank, one of the largest private commercial banks, for example, purchased its founders' shares in June 2005 in order to comply with one-share one-vote principle. Since it was the first company to eliminate dual class shares in Turkey, it received a prize by the Turkish Shareholders Association. Garanti Bank followed suit and in April 2008 decided to buy back founder share certificates. Board Resolution of the Bank dated April 22, 2008

increased international interest in the Turkish banking sector seems to be motivating banks to take corporate governance issues more seriously and to improve their corporate governance practices.¹⁹ We should however note that it is a slow process where a lot needs to be done in the Turkish context. For example, affiliated or internal directors still dominate the boards and family members still sit on the boards of the majority of Turkish banks. Interestingly, it is the case even in some of the leading private commercial banks which underwent mergers or strategic partnership agreements with foreign banks. The impact of the recent changes in corporate governance practices on the performance of the banks, hence, should be an interesting future research area when the process evolves further and data availability problems are resolved.

stated that “In light of the demands of the Bank’s local and foreign investors concerning the cancellation of the Bank’s founder share-certificates (holders of which have a right to 10% of the net profit of the Bank) to eliminate the negative impact the founder shares have over the market value of the Bank’s shares, it has become necessary to cancel the founder share certificates.”

¹⁹ For instance, Denizbank’s CEO and Chairman of the Board of Directors state that the bank’s board structure has been an important factor in contributing to the foreign investors’ positive evaluations of the bank’s IPO in 2004 (COGAT, 2005).

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Table 1: Description of the Variables and Data Sources

Variable name	Description	Source
Efficiency	Pure technical efficiency in 1998.	Own calculations using financial data obtained from Banks in Turkey, 1998, Banks Association of Turkey.
Liquidity	Ratio of liquid assets to total assets. Liquid assets defined as cash, due from banks, interbank deposits sold, securities portfolio and reserve requirements.	Banks in Turkey, 1998, Banks Association of Turkey.
Past asset growth rate	Growth rate of total assets from 1997 to 1998.	Banks in Turkey, 1998, Banks Association of Turkey.
Asset size	Log of total assets.	Banks in Turkey, 1998, Banks Association of Turkey.
Capital	Ratio of (book value of) owners equity to total assets.	Banks in Turkey, 1998, Banks Association of Turkey.
Foreign owned	Dummy variable which takes a value of 1 for foreign owned banks	Banks in Turkey, 1998, Banks Association of Turkey.
State owned	Dummy variable which takes a value of 1 for state owned banks.	Banks in Turkey, 1998, Banks Association of Turkey.
Age	Age of the bank in years. Defined as the number of years between the year of foundation of the bank or the last ownership change if the bank underwent ownership change and 2000.	Turkish Bankers Association's web-site (http://www.tbb.org.tr), Banks in Turkey (various issues), banks' annual reports accessed on their own web-sites or directly from them, and newspaper articles have been used to track the control changes in recent periods.
Family controlled	Dummy variable which takes a value of 1 if the bank is controlled by a family or industrial group controlled by a family in the year of intervention or the year 2000 or 2001 for surviving banks.	Banks annual reports accessed from their own web-sites or directly from them and newspaper articles.
Family on board	Dummy variable which takes a value of 1 if there was a family member on the board in the year of intervention or the year 2000 or 2001 for surviving banks.	Banks annual reports accessed from their own web-sites or directly from them and newspaper articles.

Table 2: Descriptive Statistics for the Financial Variables Used in Analyses: Total Sample and Ownership Specific Classifications

Variable	Total sample	Privately-owned Turkish	Foreign-owned	State-owned
Efficiency	.9420	.9176	.9868	1.0000 ^b
Liquidity	.4657	.4236	.6197	.2602 ^a
Total assets ^c	589251.27	539816.95	52961.31	3216395.75 ^a
Capital to total assets	.0788	.0539	.1509	.0335
Past asset growth rate	1.3188	1.6450	.5720	.9401

^a statistically significant at the 1% level.

^b statistically significant at the 5% level.

^c billions of TL.

Two banks classified as foreign banks founded in Turkey in Banks in Turkey (1998) — Osmanlı Bankası and Ulusal Bank — are ultimately controlled by the Turkish families/industrial groups. Hence these banks are re-classified accordingly in the empirical analysis.

Table 3: Differences between Failed and Surviving Banks

Panel A: All Banks	Total Sample	Failed	Surviving
Financial Variables			
Efficiency	.9420	.888	.976 ^a
Liquidity	.4657	.375	.524 ^a
Total assets	589251.27	416481.83	699631.75
Capital to total assets	.0788	.043	.102
Past asset growth rate	1.3188	1.830	.983
Ownership Type (number and percentage)			
Privately-owned Turkish	39	21 (53.8%)	18 (46.2%)
Foreign-owned	16	1 (6.3%)	15 (93.8%)
State-owned	4	1 (25.0%)	3 (75.0%)
Panel B: Privately-owned Turkish Banks Only (number and percentage)			
Family controlled	34 (87.2%)	19 (55.9%)	15 (44.1%)
Family on board	31 (79.5%)	19 (61.3%)	12 (38.7%)

^a statistically significant at the 1% level.

^b statistically significant at the 5% level.

Two banks classified as foreign banks founded in Turkey in Banks in Turkey (1998) — Osmanlı Bankası and Ulusal Bank — are ultimately controlled by the Turkish families/industrial groups. Hence these banks are re-classified accordingly in the empirical analysis.

Table 4: Binary Logistic Estimation Results

Variable	1 Total sample	2 Total sample	3 Privately owned Turkish	4 Privately owned Turkish
Efficiency	-11.222 (-2.14) ^b		-13.650 (-2.21) ^b	-11.511 (-1.83) ^c
Capital		-2.207 (-0.59)		
Liquidity	-5.934 (-2.49) ^b	-5.159 (-2.32) ^b	-7.875 (-2.50) ^b	-8.304 (-2.55) ^b
Past asset growth rate	.044 (.26)	.100 (0.71)	.092 (0.41)	.176 (0.50)
Foreign-owned	-3.071 (-1.88) ^c	-4.066 (-2.51) ^b		
State-owned	-3.383 (-0.27)	-6.08 (-0.44)		
Asset size	-1.064 (-1.64) [*]	-1.524 (-2.21) ^b	-1.206 (-1.27)	-1.492 (-1.50)
Age			.036 (1.30)	.039 (1.44)
Family controlled			1.835 (1.25)	
Family on board				2.483 (1.85) ^c
No of observations	58	58	39	39
LR χ^2	28.67	23.03	18.11	20.55
Prob > χ^2	.00	.00	.01	0.00
Overall predictive power	.37	.30	.34	0.38

a statistically significant at the 1% level.

b statistically significant at the 5% level.

c statistically significant at the 10% level.

* Significance level: .101

The dependent variable takes the value of 1 if the bank is failed between 1999 and 2003. A constant term is included in the estimations. z statistics are in parentheses.

Appendix 1: List of Commercial Banks Taken Over by the Fund between 1997 and 2003

Name of the bank	Date of intervention
<i>Publicly- owned Turkish commercial banks</i>	
Türkiye Emlak Bankası A.Ş.*	November, 2000
<i>Privately owned Turkish commercial banks</i>	
Türk Ticaret Bankası A.Ş.	November, 1997
Bank Ekspres A.Ş.	December, 1998
Interbank	January, 1999
Egebank A.Ş.	December, 1999
Eskişehir Bankası T.A.Ş.	December, 1999
Sümerbank A.Ş.	December, 1999
Türkiye Tütüncüler Bankası Yaşarbank A.Ş.	December, 1999
Yurt Ticaret ve Kredi Bankası A.Ş.	December, 1999
Bank Kapital Türk A.Ş.	October, 2000
Etibank	October, 2000
Demirbank T.A.Ş.	December, 2000
Ulusal Bank TAS**	February, 2001
İktisat Bankası T.A.Ş.	March, 2001
Bayındırbank A.Ş.	July, 2001
Kentbank A.Ş.	July, 2001
Sitebank A.Ş.	July, 2001
Milli Aydın Bankası T.A.Ş.	July, 2001
Ege Giyim Sanayicileri Bankası A.Ş.	July, 2001
Toprakbank A.Ş.	November, 2001
Pamukbank T.A.Ş.	June, 2002
Türkiye İmar Bankası T.A.Ş.	July, 2003
Adabank A.Ş.	July, 2003
<i>Foreign owned commercial banks</i>	
Kıbrıs Kredi Bankası Ltd.***	September 2000

*decided to be restructured in 2000 and in 2001 it was absorbed by the two state banks TC Ziraat Bankası A.Ş. and Türkiye Halk Bankası A.Ş.

**Foreign bank founded in Turkey.

***Its license was revoked.

Source: BRSA (2002) and Bankacılık sektörü yeniden yapılandırma programı Gelisme Raporu V. Kasım 2002 and Turkish Bankers Association's web-site.