IMPACT OF OWNERSHIP STRUCTURE ON DEFAULT RISK: A CASE OF BANKING SECTOR OF PAKISTAN

Khadija Ashfaq*, Zahid Irshad Younas*, Bilal Mehmood

Abstract

This study empirically investigates the impact of ownership structure on default risk of banks by using the panel data of commercial banks of Pakistan over the period of 2005-2011. The study considers two dimensions of ownership structure: categories of owners and ownership concentration. The study further splits the categories of owners into seven categories (managers/directors, families/individuals, foreigners, public owners, banks, non-banking financial institutions, and non-financial institutions), having different risk taking incentives. Controlling for various factors, the results of the study reveal that the ownership structure is significantly related with default risk of banks. On the whole, higher equity stake families/individuals are associated with a decrease in default risk of banks. Also, the involvement of public owners and foreign owners in ownership structure seem to increase the default risk of banks. All other categories do not have significant relation with default risk of banks. Finally, the findings of the study suggest that high ownership concentration is associated with high default risk in banks.

Keywords: Ownership Structure, Default Risk, Commercial Banks, Concentrated Ownership

* *GC University Lahore, Pakistan*
E-mail: khadijaishfaq@gmail.com
** *Accounting and Finance Department of Economics, GC University Lahore, Pakistan*
E-mail: zahid1132_gcu@yahoomail.com
*** *Department of Economics, GC University Lahore, Pakistan*
E-mail: digital.economist@gmail.com

1. Introduction

Financial sector is a mainstay of an economy and is significantly linked with economic growth of the country. Financial stability of an economy relies heavily on the strength of banking sector along with other factors. The disruption in the banking sector is caused by both macroeconomic factors and microeconomic factors. These macroeconomic factors include inefficient corporate governance mechanism, insufficient disclosures, regulatory failures and improper supervisory measures. While at micro level information asymmetries, asset liability mismatch, excessive leverage and herd behavior of investors increase the risk level of individual bank which ultimately leads to the banking crisis[46]. So, it is necessary to address the issue of risk taking behavior of banks for financial stability and minimization of banking crises especially in developing economies where regulatory environment is weak.

The banking crises in last three decades have led to substantial losses both in developed and developing countries. These nonstop banking crises spotlight the volatile nature of banks and the propensity of banks to take undue risks. The effect of these crises may be minimized by improving the macro level regulatory environment controlling risk taking behavior of banks. However, to control risk taking behavior of banks, it is necessary to assess the sources of risk. Although several national and international agencies are focused on regulations to bring down the risk in banking, however, less attention is paid to work out the underlying issues that could affect bank risk taking. There are many factors which may influence the risk of banks: franchise value of bank, stability of ownership structure, corporate governance mechanism etc (Konishi and Yasuda, 2004). The ownership structure is the main pillar of corporate governance mechanism, which may contribute to risk taking of banks. The Basel Committee in its report emphasized the ownership structure as a key internal mechanism of corporate governance for regulatory reforms in financial sector.

Ownership structure is described not only as a division of equity with reference to right to vote of shareholders and their share in equity but also by the specification of the equity owners. Banking industry has passed through many changes in last few decades. These shifts in banking industry have

[46] Simkovic (2009);Kindleberger and Aliber (2005);Gordy and Howells (2006)

resulted in change in ownership structure along with other changes. But in previous decades, there was no reduction in corporate scandals because of corrupt incentive schemes and incompetent ownership structures. That's why; to find most effective ownership structure has become very important as it exerts influence on the quality of bank regulation and control, banks portfolio composition and the transparency of banks records.

Ownership structure has been assumed to influence firm performance for many years. Adam Smith (1776) identifies that private companies (management and ownership in a single hand) are more efficient than joint-stock companies (management and ownership in separate hands) as the managers would not take care of 'other people's money' with 'same anxious vigilance' as their own money[47]. Similarly, Berle and Means (1932) asserted that with the evolution of corporations, various organizations are owned by scattered shareholders and controlled by managers which resulted in agency problems and thus ultimately affect the firm performance.

The banking sector of Pakistan has undergone many reforms in the past few decades. In recent years, many transformations also took place in terms of consolidation and diversification. Almost 40 transactions of mergers and acquisitions have been accomplished in Pakistani banking sector in the last ten years. Although the banking sector of Pakistan is continuously expanding, the non performing loans are also increasing. This is the indication of increase in credit risk of banks. Like other sectors, block-holder ownership is prevalent in banking sector. Around seventy percent ownership of all the banks is in the hands of their top five shareholders. Thus, the risk of expropriation by the controlling owner at the cost of minority shareholders seems to be a major problem. The ownership concentration in banking sector is increasing in recent years. Also the foreign ownership and institutional ownership is increasing, whereas, family ownership and public ownership is decreasing. So, there is a need to study the impact of these changes in ownership categories and ownership concentration on performance of banks. It is also very relevant to determine the most effective ownership structure in the banks of Pakistan. In Pakistan, corporate governance reforms began after the inception of Code of Corporate Governance 2002. Hence the ownership pattern is required under the Code of Corporate Governance. That's why there is limited work done on the ownership pattern in Pakistan.

The objective of the study is to investigate the impact of ownership structure on default risk of banks, in perspective of banking sector of Pakistan. For this purpose, the study uses two dimensions of ownership i.e. categories of ownership and concentration of ownership. The study further categorize the ownership structure into seven different categories of ownership like individual ownership, managerial ownership, foreign ownership, public ownership, banks ownership, non banking financial institutions ownership and non financial institutions ownership. To capture the default risk of banks, this study uses the Z-score (Boyd and Graham, 1986) and ZP-score (Goyeau and Tarazi, 1992).

1.1 Hypotheses

On the basis of previous studies, following hypotheses are generated in alternative form:

H1: There is a relationship between category of ownership and default risk of banks.

H2: There is a relationship between ownership concentration and default risk of banks.

In order to observe the relationship, this study uses the data of commercial banks of Pakistan over the period 2005-2011. The study concludes that ownership concentration and some categories of ownership like family ownership, foreign ownership and public ownership has significant impact on default risk of banks. Overall, the results of this study are consistent with some earlier studies' findings.

The remainder of paper is structured as follows. In section 2, we present the brief review of some relevant studies. In section 3, we describe the data, variables, model and research methodology. In section 4, we discuss the empirical results of this study. Section 5 concludes the paper.

2. Literature Review

According to previous literature, agency problems and risk-taking behavior in any organization are depending on the nature of the owners. The agency problem is first identified by Jensen and Meckling (1976). Their study shows that shareholders having diversified portfolio of investment are interested in higher risk taking for a higher expected return whereas managers tend to take less risk for their private benefits and to protect their positions. Another study of Saunders et al. (1990) examines the relationship between ownership structure and risk-taking incentives of banks. Their study finds a positive relationship between managerial ownership and risk taking. Existing research also analyzes the relation between ownership concentration and bank's performance. The findings of Shleifer and Vishny (1986) suggest that ownership concentration may improve the performance of firm by increasing monitoring and reducing the free rider problem. Conversely, Shleifer and Vishny (1997) explain that concentrated shareholders sometimes expropriate minority shareholders by

[47] Adam Smith (1776), An Inquiry into the Nature and Causes of the Wealth of Nations, P317.

exercising their control rights to get private benefits. Another study of Burkart et al. (1997) show that concentrated ownership adversely affects the performance of firm if managerial ingenuity is inhibited by excessive monitoring of concentrated owners.

Many other studies have been conducted to examine the relation between ownership structure and risk in developed economies but scanty of literature is available for emerging economies. For example Pound (1988) investigates the impact of institutional ownership on risk taking ability. He suggests that institutional investors increase the risk taking ability of banks because of exercise control at lower cost, greater voting power and their portfolio of investment is diversified. Leaven (1999) suggests that company owned banks and family owned banks take greater risk; whereas, foreign owned banks take lesser risk. Choi and Hasan (2005) explore the effect of foreign ownership on risk taking behavior of banks. Their study shows that foreign ownership proportion is negatively related with risk of banks. Iannotta et al. (2007) studies the impact of ownership structure on risk of 181 banks of fifteen European countries, spanned over the period 1999 to 2004. They suggest that State Owned Banks has higher asset risk and higher probability of default, whereas, concentrated ownership have lower asset risk and lower probability of default.

The findings of Kim et al. (2007) suggest that there is positive relation between concentrated ownership and bank risk in less restrictive regulatory environment. Zeitun and Tian (2007) examine the impact of ownership structure on firm's default risk in Jordan. They propose that the presence of foreign owners and government owners reduce the probability of default, however, the concentrated ownership increases the default risk. Marco and Fernández (2008) show that concentrated ownership have negative impact on risk in large and medium size banks, whereas, concentrated ownership have positive impact on risk in small size banks. Empirically, Detragiache et al. (2008) find that foreign banks do cream-skimming in poor countries, because of higher cost of monitoring soft information of non transparent firms, than that of domestic banks.

Working with a sample of 279 banks in 48 countries, Leaven and Levine (2008) find that banks having concentrated ownership are taking higher risk than banks with dispersed ownership because controlling owners have strong incentive to take high risk. Fungáčová and Solanko (2009) suggest that banks with foreign ownership have higher insolvency risk than banks with banks with private domestic ownership, whereas, state owned banks has least insolvency risk. Magalhaes et al. (2010) show that at moderate level of concentration, concentration affects the risk negatively, whereas, at high level of concentration, concentration affects the risk positively. Paligorova (2010) suggests that concentration of ownership is positively relates with risk taking ability of corporations, only if, the controlling owners have well diversified portfolio of investment.

The recent study of Barry et al. (2011) suggests that higher proportion of families and banking institutions in ownership structure leads to less risk taking of banks, whereas, higher proportion of non-financial firms and institutional investors increase the level of risk of banks, in private banks. Another study of Lamy (2012) shows that concentrated ownership has significant positive effect on bank risk. This study further suggests that family ownership and institutional ownership have significant positive impact on risk taking of banks.

In the previous literature on ownership structure, some studies take ownership fraction as a measure of ownership structure (Lamy, 2012; Barry, et al., 2011; Zeitun, 2009). To our knowledge, no such empirical study available in Pakistan to observe the impact of ownership fractions on default risk of banks. Again, there are few studies in literature which use yearly Z-score and yearly ZP-score as measure of default risk (Lepetit and Strobel, 2013; Liu, et al., 2013; Onali, 2012; Fang, et al., 2011) but no such empirical study is available in Pakistan. This study attempts to fill the above mentioned gaps in the literature by deeply investigating the relation between ownership structure and default risk in banking sector of Pakistan over the period of 2005-2012. In addition to it, the study also contributes in existing literature by using yearly Z-score and yearly ZP-score as a measure of risk for the first time in Pakistan. Thus, this study seems to be a contribution in existing literature on ownership structure and risk taking behavior of banks.

3. Methodology

3.1 Data collection and sample definition

We obtain the annual data used in this study from the audited fiancial statements and annual reports of individual banks. We use a sample consisting of an unbalanced panel of annual report data from 2005 to 2011 for the commercial banks of Pakistan. In this study, we consider the proportionate share held by following categories of ownership: managers/directors, individuals/families, foreign investors, government, banks, non banking financial institutions and non financial intitutions. First we consider all types of bank available in Pakistan. 58 banks are identified from website of State Bank of Pakistan. Then for homogeneity purpose (ensure that all sample banks have same profit maximization objective), we only consider

commercial banks to check the impact of ownership structure on default risk of banks. We also exclude all those banks with less than two consecutive years of time-series observations or having no change in ownership during the period of study. Thus the final sample of study is comprised of 23 commercial banks.

3.2 Default risk variables

To measure the default risk of banks, two variables are used in this study. The first variable which is used as a measure of default risk is "Z-Score"[48], proposed by Boyd and Graham (1986). Z-Score is inversely related with default risk of banks. The second variable is "ZP-Score"[49] suggested by Goyeau and Tarazi (1992) along with its two additive components: ZP1 and ZP2. ZP1[50] is a measure of portfolio risk of banks, and ZP2[51] is a measure of leverage risk of banks. ZP-Score is also an inverse measure of default risk of banks.

3.3 Ownership variables

Ownership structure is an independent variable in this study. Here, we take two aspects of ownership: categories of owners and concentration of ownership. As the aim of our study is to examine how equity held by various types of shareholders influence the default risk of banks, we should take as many categories of owners as possible. The categories of owners are measured as proportionate share held by each category in individual bank. There are seven categories of owners which are included in our study: (1) managers/directors (Managers), (2) individuals/families (Family), (3) foreign investors (Foreign)[52], (4) government (Public)[53], (5) banks (Bank), (6) non banking financial institutions (NBFI)[54], and (7) non financial institutions (NFI)[55].

Two variables are constructed to measure the ownership concentration in individual bank which is another aspect of ownership structure. First we use the cumulative percentage of shares held by largest five shareholders in each bank (TOP5). We also employ the Herfindahl index of ownership concentration, sum of squared percentage of shares held by largest five shareholders in each bank (HINDEX). Descriptive statistics and correlation matrix of all dependent, explanatory and control variables are reported in appendix.

3.4 Empirical Model

We use the following empirical model to test our hypotheses:

$$DRI_{i,t} = \alpha + \beta_1 OS_{i,t} + \beta_2 TOA_{i,t} + \beta_3 OFBS_{i,t} + \beta_4 LQU_{i,t} + \beta_5 BUSD_{i,t} + \beta_6 EQTY_{i,t} + \varepsilon_{i,t}$$

where $DRI_{i,t}$ is a measure of default risk of bank i at time t (Z-Score, ZP-Score, ZP1 and ZP2); $OS_{i,t}$ represents ownership structure of individual banks (categories of ownership & ownership concentration); $TOA_{i,t}$ is natural log total assets of each bank; $OFBS_{i,t}$ is the ratio of off balance sheet items to total asset; $LQU_{i,t}$ is the ratio of liquid assets to total assets; $BUSD_{i,t}$ is the ratio of deposits to total assets; $EQTY_{i,t}$ is the ratio of bank equity to total assets; and $\varepsilon_{i,t}$ is the residual. The details of all these variables are given in appendix.

There are generally two approaches which are used for panel data estimation in financial research: random effects model and fixed effects model. Fixed effects models are used when omitted variables are present in the model and these omitted variables are also correlated with other observed variables in the model. Random effects model is appropriate model estimation approach when there are no omitted variables or if omitted variables are not correlated with other variables in the model. Hausman test is used to check the appropriateness of random or fixed effects. In this study, we used random and fixed effects regressions and pooled regressions to estimate the above model.

We consider seven categories of owners that may influence the default risk of banks. Managers/directors (MANAGER) represent first category of ownership. They have less diversified portfolio of investment. So, the banks with higher stakes of manager and director owners may be reluctant to take high risk. Second category of owner is family/individual owners (FAMILY) which are long-term owners and they look at their firm as heritage for their descendants. Family owned businesses are mostly managed by family members, which reduces the agency problems. Moreover, individual and family owners have less diversification in their portfolio of investment and their liability is extended. In case of failure of banks, they suffer with more losses than others. Thus, it is expected that the higher stakes of

[48] $Z-score_t = (100 + \mu ROE_{t-2,t-1,t}) / SDROE_{t-2,t-1,t}$, where μ ROE at time t is (amount outstanding at time t + amount outstanding at time t-1)/2.

[49] $ZP-score_t = ZP1_t + ZP2_t$

[50] $ZP1_t = \mu ROA_{t-2,t-1,t} / SDROA_{t-2,t-1,t}$, where μ ROA at time t is (amount outstanding at time t + amount outstanding at time t-1)/2.

[51] $ZP2_t = \mu(E/A)_{t-2,t-1,t} / SDROA_{t-2,t-1,t}$, where μ E/A at time t is (amount outstanding at time t + amount outstanding at time t-1)/2.

[52] 'Foreign' comprises of proportionate share held by the foreign individuals and foreign organizations.

[53] 'Public' comprises of proportionate share held by government and state owned organizations.

[54] 'NBFI' comprises of proportionate share held by the non banking financial institutions like Insurance companies, Leasing companies, Modarabas, Mutual Funds etc.

[55] 'NFI' comprises of proportionate share held by non financial institutions like public and private companies.

individual/ family owners in ownership structure reduces the risk taking of banks. Third category of owner is foreign owners (FOREIGN). Literature shows that foreign owners have less local expertise in selecting creditors and know less about the aptitude of people of local country. Their presence in ownership may be positively related with risk taking of banks.

There are two views about the state ownership (PUBLIC): political and social. Public owners work for the welfare of the society, so they finance those risky developing projects that other banks are reluctant to take (social view). According to political view, political owners use the bank's resources for their political interest and give benefit to their supporters by low cost financing. In both cases, the involvement of public ownership increases the risk level of a bank. Bank owners (BANKS) is fifth category of ownership. Banks as a shareholder of other bank might support the conservative strategies due to their reputational concerns. Their involvement may also reduce the default risk due to their strong capital support to investee bank. Non banking financial institutional owners (NBFI) have well diversified portfolio of investment as they manage the money of ultimate owners. They have higher risk taking incentives and their involvement in ownership may increases the risk-taking. Non financial institutional owners (NFI) rarely hold well diversified portfolios which may lead to conservative strategies. On the other hand, the company owners also take risky loans for their company's projects from the banks, which ultimately increase the risk of banks.

The second aspect of ownership structure is ownership concentration (TOP5 and (HINDEX). Literature shows that owners of banks are interested in high risk taking to increase shareholder wealth. In concentrated ownership, controlling owners have power and expertise to monitor management and they can pressurize management to take more risk. Concentrated ownership may also elevate the free riding problem and reduces the conflict of interest between managers and owners. Literature shows that concentrated ownership, up to some extent, increases the risk-taking of banks and also improves the performance of banks (Convergence of Interest Hypothesis). But very high concentration reduces the performance because highly concentrated owners are interested in getting private benefit at the expense of minority owners (Entrenchment Hypothesis). Hence, it is assumed that concentration of ownership is positively related with risk of banks.

4. Results

The redundant fixed effect likelihood ratio test show that fixed effect models are adequate because null hypothesis of this test is rejected at 1% level of significance. The results of Hausman test are insignificant which suggest that the random effects are preferred over fixed effects in our model. The results in table 1 show the impact of different categories of ownership and ownership concentration on default risk of banks by using random effects. Here, the default risk is measured by Z-scores (PF) and ZP-scores (TDFR) which are inversely related with default risk. ZP-score is further decomposed into ZP1-score (measure of bank portfolio risk BPR) and ZP2 scores (measure of leverage risk LR).

The results show that among the different categories of ownership, managerial ownership is insignificantly negatively related with default risk of banks. The results of second category of ownership, individual/family ownership, show that they have significant negative relation with the default risk of banks. Bank portfolio risk and leverage risk also reduces with increase in individual/family ownership. The reason for reduction in default risk, bank portfolio risk and leverage risk is may be that individual and family owners have less diversified portfolio of investment, and in case of failure of banks, they suffer with more losses than others. So, they tend to take less risky projects and favor a lesser amount of debt in capital structure. These results are same as they were expected in this study. Furthermore, these results are align with the findings of Barry et al. (2011); Paligorova (2010) and contradictory to the findings of Lamy (2012); Leaven (1999).

The result of foreign category shows that involvement of foreign owner has insignificant positive relation with default risk but they significantly increases the bank portfolio risk of banks. The foreign owners know less about the aptitude of people of local country and also they may have less local expertise to select the creditor, which may leads to increase in bank portfolio risk. These results are parallel with the findings of Angkinand and Wihlborg (2010); Fungáčová and Solanko (2009); Yeyati and Micco (2007); Maechler et al. (2007). The results of remaining three categories of ownership: Banks, NBFI and NFI, show that they have insignificant impact on default risk, bank portfolio risk and leverage risk of banks.

Table 1. Impact of Ownership Structure on Default Risk of Banks: Random Effects Regression

Variables	PF	BPR	LR	TDFR
Managers	0.443020	0.050569	0.192994	0.243562
	(0.1517)	(0.6723)	(0.7138)	(0.6937)
Families	0.589215	0.515195	1.664595	2.179790
	(0.0556)*	(0.0000)***	(0.0013)***	(0.0003)***
Foreign	-0.107416	-0.077151	-0.210409	-0.287560
	(0.3673)	(0.0923)*	(0.2983)	(0.2261)
Public	-0.416190	-0.063215	-0.413723	-0.476938
	(0.0392)**	(0.4168)	(0.2273)	(0.2362)
Banks	0.165780	0.036719	-0.135859	-0.099140
	(0.6134)	(0.7711)	(0.8069)	(0.8794)
NBFI	0.114749	0.040356	0.267698	0.308054
	(0.5362)	(0.5721)	(0.3943)	(0.4042)
NFI	0.104393	-0.021009	-0.045267	-0.066276
	(0.6391)	(0.8066)	(0.9046)	(0.8813)
Top 5	-0.396475	-0.231675	-0.868133	-1.099808
	(0.0160)**	(0.0002)***	(0.0018)***	(0.0007)***
Hindex	-0.004434	-0.001884	-0.006092	-0.007976
	(0.0136)**	(0.0067)***	(0.0480)**	(0.0273)**

Note: ***, ** and * indicate significance at 1%, 5% and 10% levels respectively. P-values in parentheses. Variable definitions: PF = Z-Score (measure of probability of failure); BPR = ZP1-Score (measure of bank portfolio risk); LR = ZP2-Score (measure of leverage risk); TDFR = ZP-Score (measure of total default risk); Top 5 = Cumulative percentage of shares held by largest five shareholders (measure of ownership concentration); Hindex = Sum of squared percentage of shares held by largest five shareholders (measure of ownership concentration). Managers, Families, Foreign, Public, Banks, NBFI and NFI represent the proportionate share held by managers/directors, families/individuals, foreign owners, government, banks, non banking financial institutions and non financial institutions respectively.

Both proxies of ownership concentration (TOP5 and HINDEX) provide uniform results. The results reveal that ownership concentration significantly increases the default risk of banks. The reason for increase in default risks is that controlling owners have more incentive and power to pressurize bank's management to consider risky projects and risky lending, as they know that high risk is associated with high probable returns. Thus, concentrated owners get private benefits at the expense of other minority share holders which results in high expropriation cost (Entrenchment Hypothesis). These findings are consistent with the expectations of the study. The results of ownership concentration with risk taking support the findings of some earlier studies (Paligorova, 2010; Leaven and Levine, 2008; Zeitun and Tian, 2007; Kim, et al., 2007; Levine, 2004).

Many control variables also have significant impact on default risk of banks. Size of banks (TOA) has significant negative impact on default risk of banks. In contrast, off balance sheet items (OBS) have no significant relationship with default risk of banks. Moreover, liquidity (LQU) and business difference (BUSD) also have insignificant relation with default risk of banks. Finally, leverage significantly increases the default risk of banks[56]. The results of the study are also obtained through pooled regressions which are shown in table A4 in appendix. The results of our ownership variables remain unchanged.

5. Conclusion

The aim of our study is to analyze whether different ownership structures are related with default risk of banks. We take two dimensions of ownership structure: categories of owners and ownership concentration. We further differentiate categories of owners into seven categories (Manager, Family, Foreign, Public, Banks, NBFI, and NFI) having different risk taking incentives. Working with panel data of commercial banks of Pakistan on ownership structure and default risk measures, we find that changes in ownership structure are significant in explaining the difference of default risk of banks.

From the results discussed in section 4, it is concluded that involvement of family/individual ownership in ownership structure significantly reduces the default risk of banks. Regarding public ownership, when their stakes are higher in banks, they seem to increase the default risk of these banks. In addition, involvement of foreign ownership is positively related with only bank portfolio risk. All other categories (Managers, Banks, NBFI, and NFI) do not have significant relation with default risk of banks. Finally, the result of ownership concentration suggests that

[56] Extensive tables on the results of control variable are available on request.

concentrated ownership enhances the default risk of banks in commercial banks of Pakistan. The recommendation of the study is to reduce the ownership concentration to some extent in banking sector of Pakistan. As our study is confine to small number of banks, the scope of the study should be extended in future studies.

References:

1. Angkinand, A., & Wihlborg, C. (2010). Deposit Insurance Coverage, Ownership, and Banks' Risk-Taking in Emerging Markets. *Journal of International Money and Finance, 29*(2), 252-274.
2. Barry, T. A., Lepetit, L., & Tarazi, A. (2011). Ownership Structure and Risk in Publicly Held and Privately Owned Banks. *Journal of Banking & Finance*, *35*(5), 1327-1340.
3. Berle, A. A., & Means, G. C. (1932). *The Modern Corporation and Private Property*. New York, NY: Macmillan.
4. Boyd, J. H., & Graham, S. L. (1986). Risk, regulation, and bank holding company expansion into nonbanking. *Federal Reserve Bank of Minneapolis Quarterly Review*, *10*(2), 2-17.
5. Choi, S., & Hasan, I. (2005). Ownership, Governance, and Bank Performance: Korean Experience. *Financial Markets, Institutions & Instruments, 14*(4), 215-242.
6. Detragiache, E., Tressel, T., & Gupta, P. (2008). Foreign Banks in Poor Countries: Theory and Evidence. *Journal of Finance, 64*(5), 2123-2160.
7. Fang, Y., Hasan, I., & Marton, K. (2011). Market Reforms, Legal Changes and Bank Risk-Taking: Evidence from Transition Economies. Research Discussion Papers 7, Bank of Finland.
8. Fungáčová, L., & Solanko, L. (2009). Risk-Taking by Russian Banks: Do Location, Ownership and Size Matter? BOFIT Discussion Paper 21, Bank of Finland.
9. Gordy, M., & Howells, B. (2006). Procyclicality in Basel II: Can We Treat the Disease without Killing the Patient? *Journal of Financial Intermediation, 15*(3), 395-417.
10. Goyeau, D., & Tarazi, A. (1992). Assessing the Risk of Bank Failure in Europe. *Journal of Political Economy, 102*(2), 249-280.
11. Gujarati, D. N. (2003). *Basic Econometric*. Fourth edition. International Edition. McGraw Hill: Madrid.
12. Iannotta, G., Nocera, G., & Sironi, A. (2007). Ownership Structure, Risk and Performance in the European Banking Industry. *Journal of Banking & Finance*,*31*(7), 2127-2149.
13. Jensen, M., & Meckling, W. (1976). Theory of Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics, 3*(4), 305-360.
14. Kim, K. A., Lee, S. H., & Rhee, S. G. (2007). Large Shareholder Monitoring and Regulation: The Japanese Banking Experience. *Journal of Economics and Business, 59*(5), 466-486.
15. Kindleberger, C. P. and Aliber, R. Z. (2005). *Manias, Panics and Crashes: A History of Financial Crises.* 5th edition, Wiley: New Jersey.
16. Konishi, M. and Yasuda, Y. (2004). Factors Affecting Bank Risk Taking: Evidence from Japan. *Journal of Banking and Finance, 28*(1), 215-232.
17. Laeven, L. & Levine, R. (2008). Bank Governance, Regulation, and Risk Taking. *Journal of Financial Economics, 93*(2), 259-275.
18. Laeven, L. (1999). Risk and Efficiency in East Asian Banks. World Bank Policy Research Working Paper No. 2255.
19. Lamy, M. L. P. (2012). How does Ownership Structure influence Bank Risk? Analyzing the Role of Managerial Incentives. Universidad Carlos III de Madrid, Job market paper.
20. Lepetit, L. and Strobel, F. (2013). Bank Insolvency Risk and Time-Varying Z-score Measures. *Journal of International Financial Markets, Institutions & Money, 25*(C), 73-87.
21. Levine, R. (2004). The Corporate Governance of Banks: A Concise Discussion of Concepts and Evidence. World Bank Policy Research. Working Paper No. 3404.
22. Liu, H., Molyneux, P., & Wilson, J. O. (2013). Competition and Stability in European Banking: A Regional Analysis. *The Manchester School, 81*(2), 176-201.
23. Maechler, A., Mitra, S., & Worrell, R. (2007). Decomposing Financial Risks and Vulnerabilities in Eastern Europe. IMF Working Paper No. 07/248.
24. Magalhaes, R. D., Gutiérrez, M., & Tribó, J. A. (2010). Banks' Ownership Structure, Risk and Performance. Universidad Carlos III de Madrid, Working Paper.
25. Marco, T., & Fernández, M. D. (2008). Risk-taking Behavior and Ownership in the Banking Industry: The Spanish Evidence. *Journal of Economics and Business, 60*(4), 332-354.
26. Onali, E. (2012). Moral Hazards, Dividends, and Risk in Banks. Bangor Business School Research Paper No. 11.
27. Paligorova, T. (2010). Corporate Risk Taking and Ownership Structure. Bank of Canada Working paper 2010-3.
28. Pound, J. (1988). Proxy Contests and the Efficiency of Shareholder Oversight. *Journal of Financial Economics, 20*(1 and 2), 237-265.
29. Saunders, A., Strock, E., & Travlos, N.G. (1990). Ownership Structure, Deregulation, and Bank Risk Taking. *Journal of Finance, 45*(3), 643-654.
30. Shleifer, A., & Vishny, R. (1986). Large Shareholders and Corporate Control. *Journal of Political Economy, 94*(3), 461-488.
31. Shleifer, A., & Vishny, R. (1986). A Survey of Corporate Governance. *Journal of Finance, 52*(2), 737-783.
32. Simkovic, M. (2009). Secret Liens and the Financial Crisis of 2008. *American Bankruptcy Law Journal, 83*(2), 253-296.
33. Smith, A. (1776). *An Inquiry into the Nature and Causes of the Wealth of Nations.* Kessinger Publishing.
34. Yeyati, E. L., & Micco, A. (2007). Concentration and Foreign Penetration in Latin American Banking Sectors: Impact on Competition and Risk. *Journal of Banking & Finance, 31*(6), 1633-1647.
35. Zeitun, R., & Tian, G. (2007). Does Ownership Affect a Firm's Performance and Default Risk in Jordan? *Corporate Governance, 7*(1), 66-82.

Appendix. A

Table A1. Variables List

VARIABLES	EXPLAINATION	SOURCE
DRI	DRI stands for default risk and it is measured by either Z-score (PF) or ZP-score (TDFR). ZP-score is subdivided into ZP_1 (BPR) and ZP_2 (LR);	Authors' calculation based on audited financial statements of banks.
OS	Ownership structure is an independent variable in the models. It will either be managerial ownership, family ownership, foreign ownership, public ownership, banks ownership, non banking financial institutions ownership (NBFI), other non financial institutions ownership (NFI_OTHERS), Cumulative percentage of shares held by largest five shareholders (TOP5), sum of squared percentage of shares held by largest five shareholders (HINDEX);	Annual reports of each bank.
TOA	Total asset, a control variable for size of banks and is measured by natural log of total assets;	Audited financial statements of banks.
OFBS	Off balance sheet, a control variable and is measured by ratio of off balance sheet items to total asset;	Audited financial statements of banks.
LQU	Liquidity, a control variable and is measured by ratio of liquid assets to total assets;	Audited financial statements of banks.
BUSD	Business differences, a control variable and is measured by ratio of deposits to total assets;	Audited financial statements of banks.
EQTY	Equity, a control variable and is measured by ratio of bank equity to total assets;	Audited financial statements of banks.

Table A2. Descriptive statistics for our panel data of 23 commercial banks of Pakistan, over the period of 2005-11

	Observations	Mean	Std. Dev.	Maximum	Minimum
Descriptive statistics of the explanatory variables					
MANAGERS	122	7.967652	12.93427	70.56000	0.000000
FAMILIES	122	13.47683	11.68100	51.34000	0.000000
FOREIGN	122	33.50914	30.85877	99.12900	0.000000
BANKS	122	4.289383	11.21446	80.38000	0.000000
PUBLIC	122	14.06434	19.72061	78.74830	0.000000
NBFI	122	14.71679	22.00955	86.02000	0.000000
NFI	122	11.97739	16.11855	56.61000	0.000000
TOP 5	122	69.61629	21.21887	100.0000	17.16290
HINDEX	122	2597.124	2049.401	9798.301	102.9983
Descriptive statistics of the control variables					
TOA	122	18.74446	1.408370	20.86266	14.52268
OBS	122	35.09115	23.97994	105.8475	0.326697
LQU	122	16.91247	14.55068	121.6113	4.098874
BUSD	122	75.59507	14.89486	90.83151	0.000000
EQTY	122	10.03709	7.734610	42.71728	0.286904
Descriptive statistics of dependent variables					
PF	122	31.01244	37.78872	211.7678	-0.528426
BPR	122	5.415952	14.30261	120.4374	-5.371258
LR	122	35.79961	64.01251	434.8044	0.949292
TDFR	122	41.21556	74.70442	499.1361	-2.289183

Table A3. Correlation coefficient among the sample variables

	PF	BPR	LR	TDFR	MANAGERS	FAMILIES	FOREIGN	BANKS	PUBLIC	NBFI	NFI	TOP 5	HINDEX	TOA	OBS	LQU	BUSD	EQTY
PF	1.0000																	
BPR	0.3690	1.0000																
LR	0.7013	0.6983	1.0000															
TDFR	0.6716	0.7898	0.9906	1.0000														
MANAGERS	0.0842	-0.0052	0.0298	0.0246	1.0000													
FAMILIES	0.0815	0.3440	0.2116	0.2471	-0.0606	1.0000												
FOREIGN	-0.0507	-0.1198	-0.0711	-0.0838	-0.0653	-0.3578	1.0000											
BANKS	-0.0441	-0.0323	-0.0497	-0.0488	-0.1288	-0.1215	-0.2031	1.0000										
PUBLIC	-0.1022	0.0412	-0.1024	-0.0798	-0.2808	-0.1273	-0.3734	0.0828	1.0000									
NBFI	0.0756	-0.0454	0.1167	0.0913	-0.2444	0.0650	-0.4002	-0.1278	-0.1439	1.0000								
NFI	0.0224	0.0182	-0.0407	-0.0314	0.1332	0.1605	-0.4583	-0.0423	-0.0520	-0.1851	1.0000							
TOP 5	-0.1514	-0.3414	-0.2021	-0.2385	-0.1166	-0.699	0.2531	0.1556	0.0535	0.1441	-0.3087	1.0000						
HINDEX	-0.101	-0.1967	-0.0982	-0.1218	-0.3106	-0.474	0.2991	0.2376	-0.0905	0.0897	-0.3301	0.7395	1.0000					
TOA	0.1065	0.2171	-0.0126	0.0308	-0.2073	-0.1062	0.1243	-0.2182	0.4446	-0.3931	0.1498	-0.1209	0.0921	1.0000				
OBS	0.1112	0.0569	0.0581	0.0606	-0.1652	-0.0715	0.2026	-0.1907	-0.0632	-0.0332	0.0516	0.1023	0.0879	0.3010	1.0000			
LQU	-0.0150	-0.0800	-0.0096	-0.0235	-0.1236	-0.1184	-0.0578	0.0175	-0.0907	0.3969	-0.1474	0.1326	0.0174	-0.3630	0.0792	1.0000		
BUSD	0.0211	0.0985	0.0045	0.0227	-0.1623	-0.0490	0.0006	0.0891	0.2238	-0.2218	0.1313	-0.0534	-0.1309	0.5839	0.1656	-0.2090	1.0000	
EQTY	0.1311	-0.1246	0.1470	0.1021	0.0787	-0.1087	-0.0228	-0.0557	-0.2249	0.4490	-0.240	0.2271	0.2389	-0.6069	-0.1489	0.2875	-0.6022	1.0000

Table A4. Impact of Ownership Structure on Default Risk of Banks: Pooled Regression

Variables	PF	LR	BPR	TDFR
Managers	0.325414	-0.044331	0.050569	-0.002533
	(0.4390)	(0.9390)	(0.6735)	(0.9973)
Families	0.527203	1.867907	0.515195	2.179790
	(0.1998)	(0.0002)***	(0.0000)***	(0.0004)***
Foreign	-0.116215	-0.179049	-0.077151	-0.266027
	(0.4737)	(0.4145)	(0.0935)*	(0.3469)
Public	-0.473667	-0.398822	-0.063215	-0.463341
	(0.0916)*	(0.2875)	(0.4187)	(0.3412)
Banks	0.660746	0.107647	0.036719	0.167063
	(0.2275)	(0.8727)	(0.7722)	(0.8484)
NBFI	0.219431	0.292518	0.040356	0.344553
	(0.4219)	(0.4429)	(0.5733)	(0.4836)
NFI	0.016956	-0.226198	-0.021009	-0.282890
	(0.9563)	(0.5790)	(0.8073)	(0.5920)
Top 5	-0.383004	-0.910184	-0.231675	-1.099808
	(0.0996)*	(0.0015)***	(0.0002)***	(0.0010)***
Hindex	-0.004542	-0.007004	-0.001884	-0.007976
	(0.0758)*	(0.0375)**	(0.0070)***	(0.0309)**

Note: ***, ** and * indicate significance at 1%, 5% and 10% levels respectively. P-values in parentheses. Variable definitions: PF = Z-Score (measure of probability of failure); BPR = ZP1-Score (measure of bank portfolio risk); LR = ZP2-Score (measure of leverage risk); TDFR = ZP-Score (measure of total default risk); Top 5 = Cumulative percentage of shares held by largest five shareholders (measure of ownership concentration); Hindex = Sum of squared percentage of shares held by largest five shareholders (measure of ownership concentration). Managers, Families, Foreign, Public, Banks, NBFI and NFI represent the proportionate share held by managers/directors, families/individuals, foreign owners, government, banks, non banking financial institutions and non financial institutions respectively.