



Corporate Governance and its Impact on Firm Risk

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The aim of this research is to explore the relationship of corporate governance with firm risk. This study establishes a link between corporate governance variables and firm risk for a sample of 106 Pakistani firms over a time of six years (2005–2010). Based on the estimation results, family control and bank control have negative impact on the firm risk whereas ownership structure and chairman/CEO duality posit positive relationship with risk. This provides a direction for firms to introduce more non-family control to the board of directors and not allow banks to have majority shareholding in their stocks. Also, directors should be asked to have a reasonable ownership in the stocks of the firm so that they can decide in the best interest of the firm and for the increase of their stock value. Chief executive should also hold the chair in order to have unity of command and a better decision-making influence.

Keywords: Corporate finance, Corporate Governance, firm risk, system GMM

JEL: G21, G32, G34

Studies on corporate governance have received considerable attention in the past decade or so due to the significant role of corporate governance in enhancing the firms' performance. Research has investigated the impact of various corporate governance measures have been on firm performance and firm value. Corporate governance measures like board structure, compensation structure and ownership structure are determined by one another, and by variables such as risk, cash flows, firms' size and regulations etc. These variables also strongly influence a firm's performance (Jensen and Meckling, 1976).

Firm risk¹ has a role to play in firm performance²,

because firms that take more risk generally have higher (although volatile) returns. Due to their volatile nature, firm-specific risks hinder the firm's policy makers and planning department's ability to forecast and plan their cash flows and related activities, etc. These risks are generally related to the returns on the firm's stocks (Bloom and Milkovich, 1998). However, firm-specific risks are also directly related to the performance of the firm (Nguyen, 2011). Firms that engage in risky projects are expected to yield better returns than those which lack the appetite to take risks. However, excessive risk taking may prove to be fatal for a firm.

The relationship between corporate governance

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¹ Firm risk represents the firm's idiosyncratic (unpredictable) risk. It is a risk unique to a certain asset or company.

² The results of activities of a firm over a given period of time.

measures and firms' performance has been widely studied in corporate literature; although the evidence on this strand of literature has been mixed. The relationship between firm performance and governance may also be authenticated, theoretically, by considering agency theory³.

This mixed evidence suggests that the impact of corporate governance measures on firm performance may not be direct. It seems plausible that this relationship is mediated by the levels of firm's risk. For example, bank control, a corporate control measure, is expected to hamper the performance of a firm; since the bank would not allow the firm to indulge in projects/investments that involve taking high risks, thereby derailing the performance of the firm⁴. Ownership structure may lead to the firm taking risky ventures since the directors now have their own stakes in the company and they would like to see their stakes get larger. Therefore, corporate governance has a strong role to play in the nature and intensity of risks taken by the firm, thereby impacting the performance of the firm.

A majority of the corporate governance studies have focused on developed countries. Although there has been significant development in research on the developing economies also over the last few years, comparatively fewer studies

focus on developing economies. Developing economies – the nature of their markets, economic uncertainty, the strength of their institutions, government interventions and the existence of individual biases – remain very different from developed economies. Corporate governance differs significantly in developed and developing countries (Rabelo and Vasconcelos, 2002). Therefore, the results of studies from developed markets might not be accurate in developing markets.

Furthermore, corporate governance research has mostly utilized Ordinary Least Square (OLS) and fixed/random effects estimation procedures. However, these studies also use explanatory variables that are not strictly exogenous, and use short time periods in their data panels.

Therefore, the published estimates may be biased (Wintoki, Linck, Netter, 2012)⁵. Wintoki *et al.* (2012) performed numerical simulations to show that the system Generalized Method of Moments (GMM) estimation used in this regard is powerful and unbiased, and shows different results from those of OLS and fixed effects estimation techniques. The system GMM estimator integrates the dynamic nature of corporate finance relationships and provides valid, yet powerful, instruments to control for ignored heterogeneity and simultaneity.

This study addresses these three issues simultaneously. This study investigates the role of corporate governance on firm risk, because of its significant relationship with firm performance. The

³ Agency theory predicts that the conflict between managers and shareholders reduces the performance of the firm; therefore, a liaison between managers' and shareholders' interest is necessary. This signifies the link between governance and firms' performance.

⁴ The example was based on the study of Weinstein and Yafeh (1998) who show that bank control hampers a firm's performance by limiting firm participation in risky ventures.

⁵ The study of Wintoki, Linck, Netter (2012) provides detailed arguments and related tests to prove the biasness of prior studies using static models.

empirical basis of this study is a developing market, Pakistan. Finally, the relationship between corporate governance variables and firm risk is explored using the dynamic panel GMM estimation technique instead of the OLS and fixed/random effects estimators. Therefore, this study serves as verification of Wintoki *et al.* (2012) regarding the bias of static models.

To the best of my knowledge, this is the first paper to investigate the link between corporate governance and firm risk using data of Pakistani firms. The study uses a data set that most global readers will find novel and unknown to them. Another contribution of this study is to incorporate a vast range of corporate governance variables in the analysis, including bank ownership⁶, family ownership⁷, managerial ownership⁸, block holders⁹, board independence¹⁰, board size¹¹, chairman/CEO duality¹² and audit committee independence¹³. This study will provide policy makers and managers an understanding of the corporate governance practices and their relationship with firm's risk in the context of a developing economy. The reason for selecting

these eight variables, *inter alia*, was their relationship pointed out in prior literature on the topic; as one of our aims was to compare our results of system GMM modeling with prior research utilizing OLS estimation. Ease of data availability was also one of the factors that led us to consider these specific eight variables.

LITERATURE REVIEW

Better corporate governance leads to better operating performance (Drobetz, Schillhofer and Zimmermann, 2003). Corporate governance has a major role to play in the performance of firms. This role may be in relation to its decision-making metrics or its ability to indulge in risky projects to increase the chances of superior returns. Aman and Nguyen (2008) point out the opposing nature of the relationship between corporate governance and firm performance. Aman and Nguyen (2008) create a governance index for Japanese firms which reflected board characteristics, ownership structure, quality of disclosure and respect for investors' interests. The analysis covering the period 2000 – 2005 shows that stock prices reflect the risk associated with corporate governance in accordance with the market efficiency. Firms with lower governance ratings are observed to have produced higher returns because of more exposure to risk.

The empirical literature on the relationship between corporate governance and firm risk is not very well-developed, although there is vast literature available on the impact of corporate governance on firm's value (and performance). Since it is known that risk is directly related to

⁶ Bank control is positive when a bank has more than 50% shareholding in the firm.

⁷ Family control is considered positive when the founder or the founding family has influence over the firm policy and decision making.

⁸ The ratio of shares held by board of directors and the total number of shares.

⁹ The ratio of shares owned by top five shareholders and the total number of shares.

¹⁰ The ratio of non-executive directors to the total number of members of the board of directors.

¹¹ It is represented by the total number of members of the board.

¹² A dummy having value as 1 if the chairman or the chief executive officer is the same person and 0 otherwise.

¹³ The ratio between non-executive directors in audit committee and the total number of directors in audit committee

returns, therefore, firm risk has a strong, although indirect, link to the performance of the firm.

Table 1 (Panel A) presents a summary of studies that have explicitly discussed the relationship between corporate governance and firm risk, whereas Table 1 (Panel B) focuses on those studies implicitly related to this study by researching the impact of corporate governance on firm performance (or firm value). Table 1 (Panel C) refers to some of the studies carried out in Pakistan on the impact of corporate governance on firm performance. Table 1 (see Appendix-I) also shows the type of estimator used in each study.

Family Ownership and Firm Risk

Nguyen (2011) studies the impact of corporate governance (through family control, bank control and ownership concentration) on risk taking of Japanese firms. For a sample of 1252 non-financial firms covering 27 industry sectors, Nguyen concludes that family control and ownership concentration are positively related to the idiosyncratic risk, whereas bank control reduces operational risk. Relating the firms' corporate governance structure to its risk-taking approaches, firms with concentrated ownership perform well. Saito (2008) also studies the impact of corporate governance (through family control) on the performance of Japanese firms. Family firms¹⁴ managed by founders are traded at premium. The performance of family firms owned *and* managed by founder's descendents is below non-family firms. On the other hand, the

performance of family firms owned *or* managed by founder's descendents is higher than non-family firms. Anderson and Reeb (2003) show that U.S family firms have higher profitability and valuation than their non-family counterparts. For a sample of 1672 non-financial firms from 13 Western European countries, Maury (2006) finds that family control is linked with 7 percent higher valuations and 16 percent higher profitability in comparison with firms controlled by non-family owners. It can therefore be concluded that firms managed by family members show better performance. The underlying reason behind this better performance can be the powerful decision-making authority in the hands of the family running the business. Thus, risky projects may also get accepted and in turn higher performance is achieved. Because firm performance and firm risk are correlated, family ownership may lead to higher risk-taking by family firms. These observations lead to the first hypothesis.

H₁: Family Ownership is positively related to firm risk.

Bank Ownership and Firm Risk

Another corporate governance measure significant in this regard is the bank control or bank ownership. Banks are expected to have low risk-taking preferences and are most likely to avoid risky ventures. Morck, Nakamura and Shivdasani (2000) have reported a negative association between bank ownership of Japanese firms and its value. On the same line, studies like Weinstein and Yafeh (1998) and Nguyen (2011), using Japanese firm-level data, show negative association between bank control and firm risk. The argument that returns volatility (risk) is

¹⁴ Family firms are those firms where the founder or the founding family has influence over the firm policy and decision making.

positively related to firm's performance can also be validated from the analysis of Weinstein and Yafeh (1998) who show that banks have lower earnings volatility and poor operating performance. Therefore, it is expected that higher bank ownership would lead to lesser firm risk.

H₂: Bank Ownership is negatively related to firm risk.

Ownership Structure and Firm Risk

Managerial ownership plays a significant role in firm's risk-taking. Lesser ownership in this regard may hold back the managers to indulge in risky projects. In case the executives of a firm also own stocks of the firm, they will prefer actions that are in the best interest of all the investors (Singh and Harianto, 1989). Hirshleifer and Thakor (1992) indicate that some managers cater for their careers and avoid risk-taking; sometimes even those risks are avoided that could have potentially increased the value of the firm. Empirical evidence in this regard is divided where studies like Wright, Ferris, Sarin and Awasthi (1996) estimate a negative relation between managerial ownership and firm risk. On the same lines Shah *et al.* (2011) and Wahla, Shah and Hussain (2012) also indicate a negative relationship between managerial ownership (ownership structure) and firm performance in Pakistani context. On the contrary, managerial ownership is found to have positive relationship with firm risk in the analysis of Hutchinson (2001) and with firm value in the studies of Morck *et al.* (2000) and Chen, Guo and Mande (2003). In their studies on Pakistani sample of 60 firms over the time period of 2003–2008, Javid and Iqbal (2008) also estimate a positive relationship between

managerial shareholding and firm performance.

On the whole, this study is motivated of the positive nature of the relationship between ownership structure and firm risk considering that there is an incentive for managers to indulge in risky ventures.

H₃: Managerial Ownership is positively related to firm risk.

Block Holders (Ownership Concentration) and Firm Risk

Distributed ownership reduces the interest of individual stakeholders in the performance of the firm. Concentrated ownership, on the other hand, raises the interest of the stakeholders to monitor the progress of the firm and thereby contributing towards its better performance. Claessens and Djankov (1999) find that enhanced ownership concentration has a positive impact on the profitability and labor productivity of Czech firms. Similar positive associations of ownership concentration have also been presented by McConnell and Servaes (1990) and Nguyen (2011) with corporate performance and firm risk respectively. In the Pakistani context, Javid and Iqbal (2008) also estimate a positive relationship between ownership concentration and firm performance.

H₄: Block holders have positive relation with firm risk.

Board Independence and Firm Risk

Structuring of a firm's board of directors also plays a crucial role in reducing the agency costs (Hutchinson and Gul, 2003). Therefore, the role of the executive board's structure is also crucial for the firm's value. Non-executive directors on the board of directors, acting on the part of

external shareholders, are generally expected to monitor firm's strategy and decision-making in this regard (Fama, 1980). For a sample of 91 Pakistani firms, Khan and Awan (2012) find positive association between board composition (independence) and firm performance. Similar positive relationship has also been estimated by Ibrahim, Rehman and Raof (2010) and Yasser, Entebang and Mansor (2011) for a sample of 10 and 30 Pakistani firms respectively. On the contrary, studies like Bhagat and Black (2002) and Bhagat and Bolton (2008) have found a negative relationship between board independence and firm performance. In short, there has been no consensus on the nature of relationship between board independence and firm's performance. However, this study is motivated that the presence of more non-executive directors may obstruct the indulgence of the firm in riskier projects as they are concerned with the volatility of the returns in such scenarios. Also the chief executive officer (CEO) may not feel comfortable to discuss all the strategic matters with the non-executive directors, thereby creating a gap between the firm's decisions and the involvement of its independent board members. Therefore, a negative association may be expected in this regard.

H₅: Board independence is negatively related to firm risk.

Board Size and Firm Risk

Board size is also relevant to the firm performance as more the number of directors in the board are, better will be the decision-making, as no one person will be able to make decisions

on his own. Belkhir (2009) and Kyereboah-Coleman and Biepkke (2006) have found a positive relationship between board size and firm performance. Halebian and Finkelstein (1993) advocate larger boards because of the enhanced collective information that they may possess in terms of markets and strategies. Dar, Naseem, Rehman and Niazi (2011), for a Pakistani sample of 12 firms over the period 2004–2010, estimate a positive relationship between board size and firm performance. Similar positive association has also been reported by Yasser *et al.* (2011) considering Pakistani firms.

However, research has also specified opposite relationship between board size and firm performance. Yermack (1996) estimate a negative relationship between board size and firm performance for a sample of 491 U.S firms over the time period of 1984 – 1991. Similar negative association has been found by Eisenberg, Sundgren and Wells (1998) for Finland sample. Some of the other studies to establish negative relationship in this regard include Conyon and Peck (1998), Lasfer (2004), Cheng, Evans and Nagarajan (2008) and Guest (2009).

Because of the risky environment facing the Pakistani firms, it is expected that there may exist a positive relationship between board size and firm risk as collective information of the members of the board will be useful and may prevail in such environments.

H₆: Board size is positively related to firm risk.

Audit Committee Independence and Firm Risk

An independent audit committee may force the decision-makers to indulge in limited risk-taking projects as failure of a volatile one will raise

uncertainty among the shareholders. Mak and Kusnadi (2005) do not find any significant relationship between audit committee independence and firm value for a sample of Singaporean and Malaysian firms. Similar results have also been estimated by Hsu (2008). For a sample of Canadian firms over the 1993–1997 time period, Erickson, Park, Reising and Shin (2005) find a positive relationship between audit committee independence and firm performance. In the Pakistani scenario, Dar *et al.* (2011) have found a negative relationship between audit committee independence and firm performance. This study is motivated of the negative relationship between an independent audit committee and firm risk.

H₇: Audit committee independence is negatively related to firm risk.

Chairman/CEO Duality and Firm Risk

Considering agency theory, CEO duality may hamper the performance of the firm as the control and monitoring on chief executive officer is compromised. The chief executive officer, in his rights as chairman of the firm, may select those directors alongside him in the board who are either family members or are less likely to differ in opinion and decision-making (Westphal and Zajac, 1995). On the contrary, stewardship theory may relate to better performance since there is unified command and decision-making becomes focused. This will help reduce the confusion among managers and other stakeholders about the actual decision-maker and may help in an effective decision-making (Finkelstein and D' Aveni, 1994). Based on the motivation achieved from the stewardship theory,

this study expects a positive relationship of CEO duality and firm risk.

H₈: Chairman/CEO Duality is positively related to firm risk.

Firm Risk Modeling

– Measuring Idiosyncratic (Firm) Risk

Firm risk is calculated using Fama and French (1993) three factor model in line with the methodology of Saito (2008) and Nguyen (2011). The three factor model is an extension of the single factor CAPM model where apart from the traditional beta; it utilizes two other factors in the form of value and size factors. Fama and French (1993) three factor model includes monthly excess return on market index ($R_M - R_f$), size (*SMB*) factor and book-to-market (*HML*) factor. Fama and French 3-factor model can be represented as:

$$E(R_i) = R_f + \beta_1 \text{MKT} + \beta_2 \text{SMB} + \beta_3 \text{HML} \dots\dots(1)$$

where $E(R_i)$ represents the expected stock returns on the stock i , *SMB* represents the size premium and *HML* represents the value premium.

Stocks are arranged in descending order according to their market capitalization and then the sample is divided into two equal portfolios on either side of the median. The portfolio having market capitalization more than the median is named as 'Big' whereas the other one is named as 'Small'. Now, these two portfolios are each further sub-divided into three portfolios (upper 30 percent, middle 40 percent and lower 30 percent) based on their book-to-market ratio arranged in ascending order. The 'small' and 'big' portfolios are subsequently named as S/L (small and lower 30 percent), S/M (small and

middle 40 percent), S/H (small and upper 30 percent), B/L (big and lower 30 percent), B/M (big and middle 40 percent) and B/H (big and upper 30 percent).

The three Fama and French factors are then calculated as:

$$SMB = \frac{\left(\frac{S}{H} - \frac{B}{H}\right) + \left(\frac{S}{M} - \frac{B}{M}\right) + \left(\frac{S}{L} - \frac{B}{L}\right)}{3}$$

$$HML = \frac{\left(\frac{S}{H} - \frac{S}{L}\right) + \left(\frac{B}{H} - \frac{B}{L}\right)}{2}$$

$$MKT = R_M - R_f \quad \text{where,} \quad R_M = \frac{P_t}{P_{t-1}}$$

R_M represents the market return for month t . P_t and P_{t-1} are closing values of KSE-100 Index for month t and $t - 1$ respectively. R_f is risk-free rate for which monthly T-bill rate has been used as proxy.

After estimating equation (1) for each stock year dataset (a total of 636 regressions are run for 106 stocks and 6 years) in the sample, the standard deviation of the regression residual determined the firm-specific or idiosyncratic risk.

- Dynamic Modeling of Firm Risk

Following equation represents a dynamic model for the impact of ownership and board characteristics on firm risk:

$$f(y_{xt} | y_{x,t-1}, \dots, y_{x,t-k}, O_{xt}, B_{xt}, C_{xt}, \lambda_x) = \alpha + \sum_m \rho_m y_{x,t-m} + \beta_x O_{xt} + \gamma_x B_{xt} + \chi_x C_{xt} + \lambda_x \dots \dots \dots (2)$$

where, $m = 1, 2, \dots, k$ and O , B , C and y represent ownership, board characteristics, firm characteristics and risk respectively. λ represents a firm effect that is unobserved whereas β_x and γ_x measure the impact of ownership variables and board characteristics on firm risk. Inclusion of lagged dependent variables indicates the fact

that past values of the variables also have an impact on the current values.

Cross-sectional estimation of the model in equation (2) leads to the following equation:

$$y_{xt} = \alpha + \sum_m \rho_m y_{x,t-m} + \beta O_{xt} + \gamma B_{xt} + \chi C_{xt} + \lambda_x + \varepsilon_{xt} \dots \dots \dots (3)$$

where, $m = 1, 2, \dots, k$ and ε_{xt} is the random error term. β and γ measure the average impact of ownership variables and board characteristics on firm risk.

- Dynamic Panel GMM Estimation

In order to attain unbiased and consistent estimates, dynamic generalized method of moments (GMM) panel estimation technique initiated by Holtz-Eakin, Newey and Rosen (1988) and Arellano and Bond (1991) has been used in this research. This estimation methodology is preferred because it removes chances of any bias that may arise from ignoring dynamic endogeneity. Also it presents powerful yet reliable instruments to account for simultaneity and eliminating unobservable heterogeneity. It is a two-step procedure where the equation (3) is first written in first-differenced form as:

$$y_{xt} = \alpha + \rho_m \sum_m \Delta y_{x,t-m} + \beta \Delta O_{xt} + \gamma \Delta B_{xt} + \chi \Delta C_{xt} + \varepsilon_{xt} \quad \text{where } \rho > 0 \dots \dots \dots (4)$$

After first differencing, equation (4) is estimated using GMM technique by using lagged values of the explanatory variables as instruments for present values of the variables¹⁵.

However, there are three potential problems with this procedure as identified by Wintoki *et al.* (2012). First, there is a power reduction in the

¹⁵ Historical values of firm risk, ownership, board characteristics and other firm characteristics are used as instruments for current changes in them.

tests after differencing due to signal to noise ratio when the conceptual model is in levels (Beck, Levine and Loayza, 2000). Secondly, variables in level form can be weak instruments for the differenced equations (Arellano and Bond, 1995). Thirdly, the effect of measurements errors on the dependent variables may worsen after first-differencing (Griliches and Hausman, 1986).

System GMM estimator¹⁶, using the first-differenced variables as instruments for the level equations in a system of equations including equations in levels and difference form, may help in addressing the above shortcomings. The system GMM estimation equation is as follow:

$$\begin{bmatrix} y_{xt} \\ \Delta y_{xt} \end{bmatrix} = \alpha + \rho \begin{bmatrix} y_{xt-m} \\ \Delta y_{xt-m} \end{bmatrix} + \beta \begin{bmatrix} O_{xt} \\ \Delta O_{xt} \end{bmatrix} + \gamma \begin{bmatrix} B_{xt} \\ \Delta B_{xt} \end{bmatrix} + \chi \begin{bmatrix} C_{xt} \\ \Delta C_{xt} \end{bmatrix} + \varepsilon_{xt}$$

..... (5)

METHODOLOGY

Corporate governance data for the 106 firms used in the study was collected mainly from individual firm's annual reports. The time period under study was 2005 – 2010. This time period

was selected based on the ease of availability of data for the variables.

Summary statistics for the variables used in this study are reported in Table 2 below.

The sample of 106 firms was selected keeping the mind the following criteria as adopted by Nguyen (2011) and Wahla *et al.* (2012):

- Financial institutions (banks, securities, insurance companies and financial service-providing companies) were excluded due to their particular performance and risk-taking metrics.
- Firms with negative equity were also excluded due to potentially excessive risk-taking behavior.

Instances with missing ownership and board characteristics information or incomplete financial data were also excluded from the sample. After removing the financial institutions from the complete sample, 447 companies survived out of the total 667 companies listed on the Karachi

Category	Variable	Mean/%	Median	Std. Dev.
Risk	Firm Risk	0.12	0.11	0.05
Ownership	Managerial ownership	18.83%	6.11	24.82
	Block holders	66.68%	68.5	18.5
Board Characteristics	Board independence	0.66	0.71	0.22
	Board size	2.10	2.08	0.19
	Audit committee independence	0.78	0.67	0.23
Control Variables	Firm size	22.03	21.97	1.61
	Firm leverage	42.85%	35.32	35.56
	Growth opportunities	0.98	0.66	1.05
	Firm profitability	11.79%	9.37	13.24
	Capital intensity	40.68%	39.51	23.65

Note: Statistics for dummy variables have not been presented in the table.

Table 2. Summary Statistics

¹⁶ With System GMM estimation, efficient estimates are obtained and dynamic endogeneity, unobserved heterogeneity and simultaneity are also controlled. It is also assumed that there is no serial correlation in the error term ε .

Stock Exchange (KSE). Out of the available sectors, 'Personal Goods' sector had majority of the representation i.e., 43% of the total

number of companies in the reduced sample of 447 companies. In order to minimize the impact of sector-specific biases/metrics on our estimation, each sector was given appropriate representation in the data (no single sector had more than 15% representation in the sample). Accounting for the firms with negative equity and/or instances of missing or incomplete data, the final sample was reduced to 106 firms. Table 3 presents the participation of each sector in the reduced and the selected sample for this study.

characteristics variables. Ownership variables include family ownership, bank ownership (control dummies for family and bank), managerial ownership and block holders. Board characteristics include board independence, board size, chairman/CEO duality and audit committee independence. Table 4 provides a description of governance variables used in the study.

Control variables¹⁷ include firm's size, leverage, growth opportunities, profitability and capital

Sector Number	Sector Name	Total Number of Companies	%age in Total Available Sample	Selected Number of Companies	%age in Selected Sample
1	Oil and Gas	12	2.68%	7	6.60%
2	Chemicals	33	7.38%	14	13.21%
3	Forestry and Paper	4	0.89%	2	1.89%
4	Industrial Metals and Mining	8	1.79%	2	1.89%
5	Construction and Materials	38	8.50%	12	11.32%
6	General Industries	13	2.91%	6	5.66%
7	Electronic and Electrical Equipment	3	0.67%	1	0.94%
8	Industrial Engineering	11	2.46%	5	4.72%
9	Automobile and Parts	16	3.58%	7	6.60%
10	Beverages	4	0.89%	1	0.94%
11	Food Producers	58	12.98%	15	14.15%
12	Household Goods	13	2.91%	2	1.89%
13	Leisure Goods	1	0.22%	1	0.94%
14	Personal Goods	191	42.73%	13	12.26%
15	Tobacco	3	0.67%	1	0.94%
16	Health Care Equipment and Services	2	0.45%	1	0.94%
17	Pharma and Bio Tech	9	2.01%	5	4.72%
18	Travel and Leisure	5	1.12%	2	1.89%
19	Fixed Line Telecommunication	5	1.12%	3	2.83%
20	Electricity	16	3.58%	5	4.72%
21	Gas Water and Multiutilities	2	0.45%	1	0.94%
Total		447		106	

Table 3. Sector-wise Distribution of Selected Firms

Data for control variables was extracted from State Bank of Pakistan (SBP) Financial Statements Analysis (FSA) of Non-Financial Companies (2005–2010). Stock prices and market capitalization data was taken from the Business Recorder website.

Governance variables used in this study can be categorized into ownership variables and board

intensity. These are included in the regression as they are considered to affect either the firm's risk or the measurement of that risk.

- Size is the natural logarithm of the firm's total assets.

¹⁷ These variables had strong support in prior literature. Similar variables have been used by Nguyen (2011).

- Leverage is the ratio of book equity to total assets.
 - Growth opportunities are proxied by book to market ratio.
 - Profitability is represented by return on assets (ROA) which is the ratio of operating profits to total assets.
 - Capital intensity is represented by the ratio of fixed to total assets.
- share of directors in the stocks of the firm relates to higher risk-taking due to the incentive of higher returns on their own stocks also. Chairman/CEO duality was also positively related to firm risk indicating the significance of having the same person as the chairman and the chief executive officer. All the control variables except firm leverage significantly correlated with firm risk.

Category	Variable	Definition
Ownership	Family ownership	A dummy having value 1 for a family firm (firms where the founder or the founding family has influence over the firm policy and decision making.) and 0 otherwise.
	Bank ownership	A dummy having value 1 for a firm having a bank as its majority shareholder (more than 50% shareholding) and 0 otherwise.
	Managerial ownership	It is the ratio of shares held by board of directors and the total number of shares.
	Block holders	It is the ratio of shares owned by top five shareholders and the total number of shares.
Board Characteristics	Board independence	It is the ratio of non-executive directors (external board members) to the total number of members of the board of directors.
	Board size	It is represented by the total number of members of the board.
	Chairman/CEO duality	A dummy having value as 1 if the chairman and the chief executive officer is the same person and 0 otherwise.
	Audit committee independence	It is the ratio between non-executive directors in audit committee and the total number of directors in audit committee.

Table 4. Description of Governance Variables

RESULTS AND DISCUSSION

Correlation Analysis

Table 5 (see Appendix-II) corresponds to the correlation analysis of the variables used in the study. Family ownership is positive related to firm risk as is expected in our hypothesis 1. This indicates that more family ownership should induce higher risk-taking on the part of the decision-makers. Bank ownership has a negative relationship with firm risk. This strengthens our hypothesis 2 which expects a negative association between the two variables. Managerial ownership is also significantly correlated with firm risk indicating that higher

Number of Significant Lags for Estimation

It is well-known that the appropriate number of lags of the dependent variable has to be incorporated in the dynamic models so that all the information from the past is captured. Failing to include all the significant lags will result in an omitted variable bias mis-specifying the equation (3). Also, all older lags can be used as valid instruments since they are argued to be exogenous with respect to the residuals of the present. For checking the significant lags required for our estimation, three¹⁸ lags of the dependent

¹⁸ The estimation was also conducted for more than 3 lags but insignificant estimates were achieved for higher lags.

variable are included in the regression of current firm risk on the lags of past firm risk. Control variables are also used in the regression. Table 6 presents the results of the estimation.

and firm risk by including the past performances and the fixed effects so that dynamic endogeneity and unobservable heterogeneity can be controlled.

Dependent Variable: <i>Firm Risk</i>	All 3 Lags Included	First Lag Ignored
Risk ($t - 1$)	0.981 (29.09)^{***}	
Risk ($t - 2$)	- 0.032 (0.51)	0.91 (13.21)^{***}
Risk ($t - 3$)	- 0.102 (0.09)[*]	- 0.22 (- 2.41)^{**}
Firm Size	- 0.002 (- 1.23)	- 0.003 (- 1.77)[*]
Firm Leverage	0.0001 (1.00)	0.0002 (2.40)^{**}
Growth Opportunities	0.003 (2.10)^{**}	0.004 (2.50)^{**}
Firm Profitability	- 0.0002 (- 1.26)	- 0.003 (- 1.44)
Capital Intensity	0.0001 (0.89)	0.0002 (1.34)
R^2	0.84	0.54

Notes:

- t -statistics are reported in parentheses.
^{***}, ^{**}, ^{*} represent significance at 1%, 5% and 10% levels respectively.

Table 6. Number of Significant Lags for Estimation

In the first column of the Table 6, using all the 3 lags of risk, it can be observed that the first lag is highly significant with the second lag being insignificant. This ensures that the first lag is enough to capture the dynamic nature of the firm risk and corporate governance relationship. In the second column of Table 6, the most recent (first lag) is dropped and the two older lags are used. Now, the older lags also become significant which indicates that although the older lags include related information, that information is absorbed by the most recent lag.

Dynamic Modeling of the Impact of Corporate Governance on Firm Risk

Using system GMM modeling allows estimating the relationship between corporate governance

The results of Table 7 indicate the relevance of the independent variables in estimating the firm risk. Bank ownership ($- 0.0096$, $t = - 1.81$) and family ownership ($- 0.0312$, $t = - 2.01$) are both significant and negative rejecting hypothesis 1 and accepting hypothesis 2 of the study. These results show that the firms that have banks as strong shareholders are less risk-taking in general. The negative and significant nature of the bank ownership variable is in line with the findings of Weinstein and Yafeh (1998) and Nguyen (2011) for Japanese firms. On the contrary, the negative coefficient of family ownership contradicts the findings of Nguyen (2011) who indicated a positive relationship between family ownership and firm risk. The

reason for this contradictory result may be the nature of the two markets, Japan and Pakistan, where the latter is more vulnerable and therefore the firms that have family influence over decision-making do not indulge in excessive risk-taking due to lesser probability of higher returns.

results of Hutchinson (2001). This indicates that if members of the board of directors also have reasonable shareholding in a firm, more risk-taking behavior should be expected. The reason for such behavior is that now they would also have stronger incentives to indulge in risky

Dependent Variable: Firm Risk	System GMM
Bank Ownership	- 0.0096 (- 1.81) *
Family Ownership	- 0.0312 (- 2.01) **
Managerial Ownership	0.002 (4.62) ***
Block holders	0.0002 (1.46)
Board Independence	- 0.0084 (- 0.59)
Board Size	0.031 (1.49)
Chairman/CEO Duality	0.017 (1.99) **
Audit Committee Independence	- 0.0167 (- 1.46)
Firm Size	0.0074 (3.46) ***
Firm Leverage	0.0003 (8.34) ***
Growth Opportunities	0.0049 (4.34) ***
Firm Profitability	0.0002 (3.02) ***
Capital Intensity	0.0002 (2.15) **
Firm Risk ($t - 1$)	0.0414 (1.06)
Difference-in-Hansen test of exogeneity (p -value)	(0.61)
$AR(1)$ test (p -value)	(0.29)
$AR(2)$ test (p -value)	(0.25)

Notes:

- Difference-in-Hansen test of exogeneity is under the null that exogenous instruments are used for level equations.
- $AR(1)$ and $AR(2)$ are 1st and 2nd order serial correlation (in the first differenced residuals) tests. The null hypothesis is no correlation.
- t -statistics are reported in parentheses.
***, **, * represent significance at 1%, 5% and 10% levels respectively.

Table 7. Impact of Corporate Governance on Firm Risk (Dynamic Model)

Managerial ownership is seen to impact firm risk by showing a significant and positive coefficient (0.002, $t = 4.62$) supporting the

ventures. Positive association of managerial ownership with firm risk is contradicting with the results of Shah *et al.* (2011) and Wahla *et al.*

(2012) for Pakistani sample. The reason for this contradicting result may be the biased nature of the estimation techniques used by these researchers.

CEO/Chairman duality is also positively (and significantly) related to firm risk (0.017, $t = 1.99$) supporting hypothesis 8 of the study. The likelihood of Chairman and CEO being the same person also increase the risk-taking behavior of firms as it is only one person who is now responsible for highest level decision-making.

Based on the estimation results in Table 7, this study did not find any significant relationship between block holders, board independence, board size and audit committee independence for their relationship with firm risk. This indicated that there was no empirical support for hypotheses 4, 5, 6 and 7.

As expected, all the control variables show significant coefficients as their relationship with firm risk was backed up by strong empirical and theoretical grounds. The most important of these is the relationship of firm profitability (measured by ROA¹⁹) with firm risk. As, much of this study's motivation was based on the intuition that firm performance (profitability) is positively related to firm risk; the positive coefficient (0.0002, $t = 3.02$) indicated strong support for this relationship.

$AR(1)$ and $AR(2)$ tests of serial correlation, having the hypotheses of no serial correlation, indicate that there is no serial correlation in first or second differences. Since, this study uses only

one lag of firm risk as an instrument, the system may not be over-identified in this case.

Static Modeling of the Impact of Corporate Governance on Firm Risk

Based on the argument of Wintoki *et al.* (2012) related to the biasness of static models used for the estimation of governance-performance relationship, this study also employed static panel data techniques (Pooled OLS and Random effects estimation²⁰) to see if the argument is supported by the present study's data.

Table 8 (See Appendix-III) shows support for the argument of Wintoki *et al.* (2012) as the results show major differences in coefficient estimates (with their related significance) compared to those of Table 7 for the dynamic model. Although bank ownership and Chairman/CEO duality were significant in both of the static estimations, family ownership and managerial ownership did not produce significant coefficients as is the case in Table 7. Block holders (RE estimation) and board independence (OLS estimation) are significantly related to firm risk producing negative and positive associations respectively. Also majority of the control variables, which have empirical and theoretical support for their relationship with firm risk/performance, did not yield significant coefficients in the case of static estimations.

CONCLUSION

The impact of corporate governance on firm performance and firm risk has been widely discussed, empirically and theoretically in prior studies; although the latter needs more research

¹⁹ ROA has been in many prior studies as a proxy for firm performance.

efforts. Based on the study results of Wintoki *et al.* (2012) that endogeneity concerns hamper the real estimates of the relationship between firm performance and corporate governance, prior studies considering static estimation models may present biased and unreliable estimates.

The significance of this research is two-fold. First of all, the relationship between corporate governance (ownership variables and board characteristics) and firm risk is explored in this study. For a sample of 106 Pakistani firms over a time period of 2005 – 2010, system GMM estimates indicate that family ownership and bank ownership are negatively related to firm risk. Also, a positive relationship is established for the association of managerial ownership and Chairman/CEO duality with firm risk.

Secondly, this study provides some argument on the nature of the developing and the developed markets. It is expected that the metrics of the markets in developed and developing economies vary. Therefore, a separate code of corporate governance may be established and applied in developing markets that is representative of the nature of these markets. The contrasting nature of the two markets can be envisioned from the relationship of family ownership and firm risk where studies based on Japanese, US and Western Europe samples estimated a unanimous positive association between the two variables. But in case of our sample for a developing country, a negative relationship was found specifically due to the

contrasting nature of the developed and developing markets.

IMPLICATIONS

The study has some significant implications for firms in order to enhance their performance. Firms should aim at non-family directors on the board and should not allow banks to be their major shareholders since both negatively impact the firm's risk-taking abilities and thereby hampering its performance. Firms should also encourage its directors to have more ownership in its stocks since that would induce them to make decisions catering for their incentives also. Also, a single person should hold both the chairman and chief executive officer since it provides a better decision-making power and the unity of command.

LIMITATIONS

The code of conduct for the firms in relation to corporate governance has not been applied in true sense by many firms. Company websites do not contain historical reports, and in some cases even the websites do not exist. This hampers the objectives of researchers who are interested in exploring corporate governance and its relationships. At present, data availability is the major hurdle in such projects. Issues like data verification and data authenticity may also be relevant in this context.

FUTURE DIRECTIONS

Future research should be aimed at exploring more corporate governance variables for their associations with firm risk and firm performance using the dynamic panel estimation techniques. Also, an effort should be made to enhance the

²⁰ Random effects model was used on the basis of the result of Hausman's Test.

sample size in this regard. Sector-wise analysis may also be done in order to explore the sector-specific firm risk metrics. Researchers should try to adopt modern econometric techniques in order to establish causality between the corporate governance variables. Future research should also try to incorporate more firms into the analysis so that the issues like selective sampling bias could be catered for; which at present is not possible because of the data unavailability.

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Paper	Sample (firms)	Period	Governance Variables Used	Methodology	Estimated Relationship
<i>Panel A: Relationship between Corporate Governance and Firm Risk</i>					
Wright, Ferris, Sarin and Awasthi (1996)	358 (1986), 514 (1992)	1986, 1992	Managerial Ownership (MO), Block-holder Ownership (BO), Institutional Ownership (IO)	OLS	IO and Risk: Positive MO and Risk: Negative
Weinstein and Yafeh (1998)	700 (Japan)	1977-1986	Bank Control (BC)	OLS	BC and Risk: Negative
Hutchinson (2001)	282 (Australia)	1998/99	Executive Remuneration (ER), Managerial Ownership (MO), Board Composition (BC)	OLS	MO and Risk: Positive ER and Risk: Positive ER and Performance: Positive
John, Litov and Yeung (2008)	6024 (39 Countries)	1992-2002	Investor Protection (IP), Stakeholder Influence (SI)	OLS, 2SLS	IP and Risk: Positive
Eling and Marek (2011)	35 (UK and Germany)	1997-2010	Board Compensation (BC), Board Monitoring (BM), Number of Block-holders (BH)	SEM	BC and Risk: Negative BM and Risk: Negative BH and Risk: Negative
Nguyen (2011)	1252 (Japan)	1996-2003	Bank Control (BC), Family Control (FC), Ownership Concentration (OC)	OLS	FC and Risk: Positive BC and Risk: Negative OC and Risk: Positive

Table 1. Prior Empirical Literature

Alam and Shah

Panel B: Relationship between Corporate Governance and Firm Performance (or Firm Value)

Claessens and Djankov (1999)	706 (Czech Republic)	1992-1997	Ownership Concentration	OLS, RE	OC and Performance: Positive
Morck, Nakamura and Shivdasani (2000)	373 (Japan)		Bank Ownership (BO), Managerial Ownership (MO)	OLS	BO and Value: Negative MO and Value: Positive
Anderson and Reeb (2003)	403 (US)	1992-1999	Family Ownership (FO), CEO Compensation (CC), Directors' Ownership (DO), Percentage of Outside Directors (POD)	OLS, RE	FO and Performance: Positive
Maury (2006)	1672 (Western Europe)	1996/97/98/99	Family Control (FC)	OLS, Heckman (1979) Two-Step Treatment Effects Model	FC and Performance: Positive
Saito (2008)	1818 (Japan)	1990-1998	Family Control (FC)	OLS	FC and Performance: Positive
Aman and Nguyen (2008)	(Japan)	2000-2005	Board Characteristics, Ownership Structure, Quality of Disclosure and Respect for Investors' Interests	OLS	Corporate Governance and Performance: Negative
O'Connor (2012)	251 (20 countries)	1980-2000	Strength of Corporate Governance (CG)	OLS, RE, FEVD	CG and Value: Positive
Wintoki, Linck, Netter (2012)	6000	1991-2003	Board Size (BS), Board Composition (BC) and Board Leadership (BL)	OLS, FE, DOLS, System GMM	No relationship between Board Structure variables and Performance using System GMM

Panel C: Relationship between Corporate Governance and Firm Performance in Pakistan

Javid and Iqbal (2008)	60 (Pakistan)	2003-2008	Ownership Concentration (OC), Managerial Shareholding (MS),	OLS	OC and Performance: Positive MS and Performance: Positive
Ibrahim, Rehman and Raooof (2010)	10 (Pakistan)	2005-2009	Board Size (BS), Board Independence (BI), Ownership Concentration (OC)	OLS	BI and Performance: Positive
Shah, Butt and Saeed (2011)	67 (Pakistan)	2005	Ownership Structure (OS)	Cluster Analysis	OS and Performance: Negative
Yasser, Entebang and Mansor (2011)	30 (Pakistan)	2008-2009	Board Size (BS), Board Composition (BC), CEO/chairman duality (CD), Audit Committee (AC)	OLS	BS and Performance: Positive BC and Performance: Positive AC and Performance: Positive
Dar, Naseem, Rehman and Niazi (2011)	12 (Pakistan)	2004-2010	Board Size (BS), Audit Committee (AC), CEO Status (CS)	OLS	BS and Performance: Positive AC and Performance: Negative CS and Performance: Negative
Khan and Awan (2012)	91 (Pakistan)	2010	Board Composition (BC)	<i>t</i> -tests	BC and Performance: Positive
Wahla, Shah and Hussain (2012)	61 (Pakistan)	2008-2010	Managerial Ownership (MO), Ownership Concentration (OC)	CE	MO and Performance: Negative

	IR	BO	FO	MO	BH	BI	BS	DUALITY	ACI	FS	FL	GO	FP	CI
IR	1													
BO	-0.11***	1												
FO	0.12***	0.02	1											
MO	0.11***	-0.02	0.46***	1										
BH	-0.04	-0.08*	-0.35***	-0.14***	1									
BI	0.01	0.06	-0.09**	-0.37***	0.04	1								
BS	-0.05	0.10***	-0.18***	-0.23***	-0.13***	0.33***	1							
DUALITY	0.19***	0.02	-0.07*	0.10**	0.24***	-0.21***	-0.17***	1						
ACI	-0.02	0.02	-0.21***	-0.35***	0.15***	0.74***	0.30***	-0.09**	1					
FS	-0.24***	0.18***	-0.26***	-0.23***	0.07*	0.16***	0.35***	-0.07*	0.23***	1				
FL	-0.01	-0.04	-0.11***	-0.12***	0.11***	-0.13***	-0.05	0.10**	-0.12***	-0.15***	1			
GO	0.10***	0.09**	0.22***	0.14***	-0.19***	-0.11***	-0.13***	0.02	-0.171***	-0.14***	0.07*	1		
FP	-0.09**	-0.11***	-0.21***	-0.24***	0.16***	0.15***	0.10***	-0.02	0.12***	0.10***	0.29***	-0.39***	1	
CI	0.07*	-0.02	0.08*	0.29***	-0.19***	-0.01	-0.01	0.02	-0.03	0.14***	-0.21***	0.004	-0.28***	1

Note: IR represents the idiosyncratic (or firm-specific) risk. BO and FO refer to bank ownership (a dummy variable having value 1 for a firm having a bank as its majority shareholder (more than 50% shareholding) and 0 otherwise) and family ownership (a dummy variable having value 1 for a family firm and 0 otherwise) respectively. MO and BH correspond to managerial ownership (the ratio of shares held by board of directors and the total number of shares) and block holders (the ratio of shares owned by top five shareholders and the total number of shares) respectively. BI refers to board independence which is the ratio of non-executive directors (external board members) to the total number of members of the board of directors. BS is the board size, represented by the total number of members of the board. DUALITY and ACI represent chairman/CEO duality (a dummy having value as 1 if the chairman and the chief executive officer is the same person and 0 otherwise) and audit committee independence (the ratio between non-executive directors in audit committee and the total number of directors in audit committee). FS, firm size is the natural logarithm of the firm's total assets. FL represents firm leverage, which is the ratio of book equity to total assets. GO, growth opportunities are proxied by book to market ratio. FP, firm profitability is represented by return on assets (ROA) which is the ratio of operating profits to total assets. CI, capital intensity is represented by the ratio of fixed to total assets. ***, **, * represent significance at 1%, 5% and 10% levels respectively.

Table 5. Correlation Matrix

Appendix–III

Dependent Variable: <i>Firm Risk</i>	Pooled OLS	Random Effects
Bank Ownership	– 0.019 (– 2.37)**	– 0.018 (– 1.89)*
Family Ownership	0.006 (1.25)	0.003 (0.30)
Managerial Ownership	0.00003 (0.29)	0.0003 (1.57)
Block holders	– 0.00005 (– 0.39)	– 0.0004 (– 1.98)**
Board Independence	0.025 (1.74)*	0.011 (0.59)
Board Size	0.019 (1.51)	0.012 (0.65)
Chairman/CEO Duality	0.028 (5.38)***	0.020 (2.50)**
Audit Committee Independence	– 0.002 (– 0.15)	0.014 (0.83)
Firm Size	– 0.008 (– 5.24)***	– 0.001 (– 0.67)
Firm Leverage	– 0.00003 (– 0.50)	0.0002 (3.31)***
Growth Opportunities	0.004 (1.61)	0.005 (2.71)***
Firm Profitability	– 0.00008 (– 0.44)	0.00004 (0.22)
Capital Intensity	0.0002 (1.76)*	0.0001 (1.01)
R^2	0.13	0.07

Notes:

- *t*-statistics are reported in parentheses.
*** **, * represent significance at 1%, 5% and 10% levels respectively.

Table 8. Impact of Corporate Governance on Firm Risk (Static Model)