

# CORPORATE GOVERNANCE AND FIRM PERFORMANCE USING GMM

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## Abstract

The study examines the empirically the linkage between Corporate Governance and firm performance GMM through Arellano-Bond Dynamic Panel-Data estimation technique. For this purpose, both the accounting and market based proxies of firm performance i.e Net Profit Margin, Return on Equity, Market Value of Equity, Market Value Added and Tobin's Q were used. Whereas ten Corporate Governance proxies were used i.e. Board Independence, Board Meetings, CEO duality, Concentrated Ownership, Institutional Ownership, Managerial Ownership, Big 5 Ownership, Audit Quality and Audit Committee Composition using the sample of 207 non-financial firms from 2003-2014. The Full-Sample as well as Industry analysis reveals that board size, board independence, board meetings, concentrated ownership, institutional ownership and audit committee significantly affect the firm performance. Further, Market Value of Equity is found to be the most suitable measure of firm performance.

Keywords: Corporate Governance, Firm Performance, Market Value of Equity

## 1. Introduction

The collapse of gigantic business corporations such as Enron, World Com, Tyco etc shattered the investor confidence on the equity markets around the globe. Similarly, the sophisticated investors raised serious reservations over the fragile financial system. This situation fetched an intensive urgency to instigate a

standard Code of Corporate Governance (hereafter CCG). As sequel, the Sarbanes-Oxley act was introduced in United States to ensure transparency and financial disclosure of the firm for the protection of shareholder's interest.

The first code of corporate governance was established in 1999 by OECD to reduce the agency problem and improve the protection of shareholders' rights. The Agency theory established the relationship between management of the firm known as agent, and shareholders of the firm, known as Principal. The theory suggested that agent needs to be fairly compensated to serve the best interest of principal (Fama & Jensen 1983).

These extremely critical interconnected anomalies enforced the establishment of governance mechanism for the listed firms in Pakistan. The corporate governance code covers the keys aspects such as board composition, ownership structure and audit quality (Kamran & Shah, 2014). The previous research studies have shown the inconclusive causal affect of corporate governance on the firm performance (Akbar, Hughes, El-Faitouri & Shah, 2016). Firm performance refers to optimal utilization of the available financial resources to create a greater appetite to grab future opportunities (Ali Shah, Butt, & Hassan, 2009). The empirical studies like Akbar, Hughes, El-Fatouri & Shah (2016), Fama & Jensen (1983) and Jensen (1986) argued that the strict observance of corporate governance practices attract the rational investors which stimulate the trading activity of financial markets. As a result, stock prices move upwards from current state as per Managerial Signaling theory. Beiner, Drobetz, Schmid, and Zimmermann (2006) and Weir & Laing (2000) suggested that corporate governance has insignificant influence on the firm performance i.e. governance practices are impudent to firm performance.

Theorists argue that the problem of endogeneity exist between the corporate governance and firm performance i.e. better corporate governance compliance leads to better firm performance. Likewise, better firm performance results in the good governance practices. The previous empirical studies have used least square regression or panel regression which is subject to the problem of endogeneity. The current research contributed to the literature using Generalized Method of Moments (GMM). This advance statistical technique caters the problem of endogeneity. The problem of endogeneity arises on account of unobservable heterogeneity, firm fixed effect and simultaneity dynamic endogeneity.

## **2. Literature Review**

### **2.1.1. Agency Theory**

The growth of business organizations has extended the scope of work beyond the capacity of managers. The lack of management control has resulted in the instigation of agency problem (Muth & Donaldson, 1998). The goal alignment issue between the shareholders and managers has been the cornerstone of agency theory and is considered as the most popular approach in academic literature (Hermalin & Weisbach, 2001; Jensen & Meckling, 1979). The agency theory suggests that the opportunistic behaviour of the managers must be restricted to safeguard the interest of owners. Moreover, the management should be controlled to reduce their personal interest which may arise at the expense of organizational profitability (Muth & Donaldson, 1998). According to Agrawal and Knoeber (1996), this conflict of interest can be reduced by several techniques such as employee stock option plans, increasing the block-holders and institutional investors, participation of non-executive directors, debt covenants etc. The

board composition is an effective governance tool which intends to align the interest of principal and agent through the monitoring and control mechanism (Kang, Cheng, & Gray, 2007). The supervisory role of the board empowers the directors to monitor the performance of managers and devise carrot and stick policies accordingly (Shivdasani & Yermack, 1999). Similarly, the debt covenants can be used to minimize the agency issue by stimulating the monitoring role of creditors (Agrawal & Knoeber, 1996). In short, the managers are opportunists and their personal interest overcome the interest of the organization. Consequently, the board of directors should be competent enough to restrict the managers and make them act in the best interest of stockholders.

### **2.1.2. Stewardship Theory**

Contrary to the agency theory, the stewardship theory presumes the managers as ‘stewards’ instead of being self-centered (Muth & Donaldson, 1998). The theory suggests that that manager may have different motives other than their self interest. Therefore, it is assumed that the conflict of interest may not be the inherent factor when ownership is separated from control. According to Muth and Donaldson (1998), the theory identifies certain non-financial incentives to stimulate the managers behaviour which have been ignored by the agency theory such as appreciation, the internal satisfaction and recognition. In short, the stewardship theory presumes that the managers are dependable and perform their duties without fail for the shareholders wealth maximization. Therefore, the board must have a considerable representation of the executive directors for better control and effective decision making (Kiel & Nicholson, 2003).

### **2.2 Board Structure and Firm Performance**

The board of directors is the supreme authority for making decisions in the corporations. The primary role of the board is to enhance the shareholders return by improving the firm performance. Moreover, it effectively monitors and controls the managerial functions (Ahmed Sheikh & Wang, 2012). Majority of the previous studies have failed to reach a unanimous decision regarding the association between the board size and firm performance. Some of these studies are in accordance with agency theory; for example, Uadiale (2010), Jackling & Johl (2009) and Belkhir (2009) suggested a significant positive relationship between the size of board and firm performance. Conversely, Rashidet al. (2010), De Andres, Azofra & Lopez (2005) and Yermack (1996) indicated the negative association between board structure and performance of firm. Larger boards are generally ineffective because it is difficult for them to reach a consensus. Similarly, the lack of expertise and commitment of the board members reduces their control over management.

When the CEO and chairman of any corporation is a single individual, the phenomenon is known as CEO duality. Most of the previous research studies have analyzed the impact of combined leadership function on the financial performance of corporations. The agency theory augments the two-tier structure i.e., segregating the positions of CEO and chairman, to amplify the independence for better supervision and control resulting in better firm performance (Jensen, 1993). The CEO duality effects the decision

making giving rise to agency problem. Hence, it is not encouraged by the policy makers. The literature also suggests that when both positions are held by a single person, the effectiveness increases because of interest alignment. Moreover, the restriction on CEO duality is positively perceived by the market (Yermack, 1996). Conversely, separation between CEO and chairman positions is discouraged by stewardship theory. It is argued that effectiveness is achieved by business organizations when decision making is done by a single person (Dalton & Kesner, 1987; Donaldson & Davis, 1991). Likewise, the CEO duality helps to reduce the communication barrier between the CEO and chairman, thus minimizing the contradiction and disagreement in decision making.

The board independence i.e. percentage of independent directors to total directors has been considered as an integral determinant of financial performance. Weisbach (1988) suggested that corporations with outside directors perform better than their counterparts. Further, board independence is positively associated with firm performance (Anderson, Mansi, & Reeb, 2003; Mura, 2007). The basic reason for this positive relationship is based on the fact that presence of independent directors ensures board independence by unraveling supervision and execution of tasks. Moreover, the association between managers and stockholders can be improved by resolving the internal conflict of interest. In the same vein, the independent directors reduces communication barrier between inside directors and shareholders resulting in better corporate performance (Marashdeh, 2014). In contrast, Bhagat and Bolton (2008) found a negative relationship between number of outside directors and firm performance. Since the non-executive directors have more expertise and knowledge as compared to the executive directors therefore they play an effective role in implementation of corporate governance practices. Hence, it is anticipated that stock market response is positively associated with board independence (Brickley, Coles, & Terry, 1994).

Most of the previous research studies such as Perry and Shivdasani (2005), Ameer, Ramli & Zakaria (2010) and Uadiale (2010) have augmented a positive relationship in accordance with agency theory, whereas some of them found insignificant association between independent directors and firm performance (De Andres et al., 2005; Hermalin & Weisbach, 2001; Kajola, 2008 and Peng, 2004). The inclination towards the presence of non-executive directors is based on the agency theory (Dalton, Daily, Ellstrand & Johnson, 1998). Since the non-executive directors are not influenced by inside directors they are in a better position to exercise the monitoring and control function (Fama & Jensen, 1983). Moreover, unlike executive directors, the outside directors are generally tuned to make unbiased decisions because they are trivially affected by results (Alix Valenti, Luce, & Mayfield, 2011). Nonetheless, executive directors are deemed to be more supportive from the perspective of stewardship theory. Their professionalism, expertise, capabilities and acquaintance with the decision making of CEO makes them a better choice for evaluating the managerial function (Muth & Donaldson, 1998). Generally, from the perspective of stewardship theorists, executive directors are more productive in betterment of firm performance than non-executive directors because insiders have hands on expertise and availability of true and fair information for the better decision making.

The board effectiveness can be measured by using the proxy of number of meetings held in a year. The literature suggest that firms with higher number of board and audit committee meetings are less likely to face earnings management issues (Xie, Davidson, & DaDalt, 2003). The prior research has documented mixed results while analyzing the relationship between board meeting frequency and firm performance. Vafeas (2003) analyzed the increase in firm performance due to higher frequency of board meetings. However, Jackling & Johl (2009) and De Andres et al. (2005) found insignificant association between board meetings and corporate performance. According to Conger, Finegold & Lawler (1998) the board effectiveness is directly proportional to the time spent on board meetings. Therefore, board meeting frequency is used as a measure to monitor the management and evaluate board effectiveness. Francis, Hasan & Wu (2012) suggested a positive association between board meetings and firm performance during financial crisis. Nonetheless, Fich and Shivdasani (2006) argued that the presence of directors decreases with increase in the board meeting frequency, which results in negative impact on firm performance. The results of their findings suggested that board effectiveness decreases with the increase in cross directorships of outside directors. Since the directors become busy they rarely attend the board meetings.

### **2.3 Ownership Structure and Firm Performance**

The ownership structure of a firm has a greater contribution towards it's performance. Empirical studies such as Claessens & Djankov (1999) argued that concentrated ownership has a positive association with firm performance. Likewise, Nguyen (2011) explored the causal relationship and concluded that ownership concentration has positive effect on firm performance. Similarly, McConnell & Servaes (1990) explored that institutional investment increases firm performance.

The structure of ownership either weakens or strengthens the relationship between shareholders and management. In case of scattered ownership, management has serious threat of insecurity from outside shareholders. This situation gives rise to agency problem (Jensen & Meckling, 1976). Nevertheless, concentrated ownership minimizes the conflict between principal and agent. Agency theory suggests that majority shareholders have the will and competency to oversee managerial function and keep the management motivated to serve best interest of shareholders. Thus, the dispute of principal and agent is shifted towards conflict between majority shareholder and minority shareholder (Claessens & Yurtoglu, 2013; Hussainey & Al-Najjar, 2012).

Empirical studies such as Sarkar & Sarkar (2000); Faccio & Lang (2002) and Smith (1996) suggested a positive effect of majority shareholders on firm performance. Conversely, Agrawal & Knoeber (1996) and Short & Keasey (1999) observed that concentrated structure of ownership has no statistically significant role to either improve or destroy firm performance. However, Andreou, Louca & Panayides (2014); Huang, Hsiao & Lai (2007) and Pound (1988) were unable to determine whether concentrated ownership structure contributes in a positive or negative way to firm performance.

The board ownership would have positive effect on firm performance on account of incentive alignment effect. According to incentive alignment effect, board of directors would be motivated to reduce the principal-agent conflict due to increasing proportion of shares owned by them (Jensen & Meckling, 1976).

In support of the said argument, empirical studies such as Huang et al. (2007); Sarkar & Sarkar (2000) and Yermack (1996) found that increase in board ownership enhance firm performance by reducing the agency cost.

Nonetheless, managerial ownership reduces firm performance. The basic proposed rationale is that manager cum shareholders provide minimal level of information regarding their internal affairs. This would trigger “asymmetric information” regarding their corporate governance practices. This situation may involve the management in moral hazard (Holderness, Kroszner, & Sheehan, 1999; Hussainey & Al-Najjar, 2012; Morck, Shleifer, & Vishny, 1988)

Contrary to above discussion, Demsetz (1983) and Fama & Jensen (1983) concluded that managers act in the best interest of shareholder wealth even with small proportion of shareholdings due market discipline. However, Randøy, Down & Jenssen (2003) found no significant effect of managerial ownership on firm performance.

The existence of institutional investors in board of directors is preferred by majority of stakeholders (Ullah, Ali, & Mehmood, 2017). Minority share holders feel secure in the presence of institutional investors due to institutional activism. Therefore, presence of institutional investors reduces agency cost up-to large extent (Cornett, Marcus, & Tehranian, 2008). The high level of institutional involvement in firm operations yield high performance. In addition, their presence reveals a positive signal to the market participants which increase the liquidity of stock as well as market value of firm. Institutional investors may act as intermediaries between minority and majority shareholders which has positive implications.

#### **2.4 Ownership Structure and Firm Performance**

The audit committee is primarily concerned with the accuracy and reliability of financial information before the its disclosure to the stakeholders. The committee opinion enhances the credibility of financial statements. Thus sufficient number of independent directors are required to improve the efficiency and effectiveness of audit committee (Borlea, Achim, & Mare, 2017). Lin & Chang (2012) argued that independent directors and audit committee magnify the firms’ financial performance. Likewise, Hsu & Wu (2014) and Cadbury (1992) suggested that compulsion of audit committee is another suitable measure to protect shareholders’ interest by improving transparency and accountability across the board. Similarly, Wild (1994) observed a positive response of rational investors on account of audited financial disclosure. The opinion of Big-4 audit firms is widely acceptable to all stakeholders. Empirical studies such as Dasilas & Papasyriopoulos (2015); Mansi, Maxwell & Miller (2004) and Pittman & Fortin (2004) proved that Big-4 transparent audit has a positive effect on financial performance of corporations.

In addition, external auditors are considered as critical part of monitoring system. In UK, external auditors provide consultancy in portraying the true and fair picture of business organizations. Financial reporting council particularly focuses on the independence of auditor. DeFond, Raghunandan & Subramanyam (2002) argued that independent auditors improve the credibility of financial disclosure that onward leads to remarkable firm performance. Colbert & Jahera (1988) recommended that audit fee is part of monitoring activity and feedback must be shared with shareholders. Thus audit fee resembles the agency cost. Schroeder & Hamburger (2002) argued that non-audit services would provide a better understanding of essential elements of operations to external auditors.



### 3. Methodology

The study investigates the effect of corporate governance on firm performance by analyzing a sample of 206 Non-Financial firms from 2003-2014 listed on Pakistan Stock Exchange (PSX) using six firm performance and ten corporate governance proxies, detail of which are in table 2. Moreover, current research analyzed the relationship using GMM through Arellano-Bond Dynamic Panel-Data estimation technique. This method is useful to curtail the problem of endogeneity which exists between the corporate governance and firm performance. Further, the Arellano-Bond Dynamic regression also minimizes the problem of unobservable heterogeneity. Previous studies such as Akbar, Hughes, El-Fatouri & Shah (2016) and Roodman (2006) suggested that ordinary least square (OLS) regression and Random Effect Fixed Effect regression is subject to the question of generalizability. As a sequel, the study used industry wise analysis by considering market value of equity as the proxy for firm performance which has outperformed the other measures in the main regression analysis.

#### 3.2 Econometric Models

The study used the following econometric equation for the analysis

$$NPM_{it} = \beta_{it}BSIZE_{it} + \beta_{it}BIND_{it} + \beta_{it}BMEET_{it} + \beta_{it}CD_{it} + \beta_{it}CONC_{it} + \beta_{it}INST_{it} + \beta_{it}MANG_{it} + \beta_{it}BIG5_{it} + \beta_{it}AUQ_{it} + \beta_{it}ACC_{it} + D/A_{it} + Size_{it} + \varepsilon_{it} \quad (1)$$

Where  $NPM_{it}$  stands for Net profit margin,  $BSIZE_{it}$  is board size,  $BMEET_{it}$  is board meeting. Further  $CD_{it}$  is used for CEO duality,  $CONC_{it}$  for concentrated ownership,  $INST_{it}$  used for institutional ownership,  $MANG_{it}$  is managerial ownership,  $BIG5_{it}$  is big five shareholder,  $AUQ_{it}$  is audit quality;  $ACC_{it}$  used for audit committee composition and  $\varepsilon_{it}$  is used for Error term.

$$ROE_{it} = \beta_{it}BSIZE_{it} + \beta_{it}BIND_{it} + \beta_{it}BMEET_{it} + \beta_{it}CD_{it} + \beta_{it}CONC_{it} + \beta_{it}INST_{it} + \beta_{it}MANG_{it} + \beta_{it}BIG5_{it} + \beta_{it}AUQ_{it} + \beta_{it}ACC_{it} + D/A_{it} + Size_{it} + \varepsilon_{it} \quad (2)$$

Where  $ROE_{it}$  stand for Return on equity, which calculated as Net income divided equity

$$MR_{it} = \beta_{it}BSIZE_{it} + \beta_{it}BIND_{it} + \beta_{it}BMEET_{it} + \beta_{it}CD_{it} + \beta_{it}CONC_{it} + \beta_{it}INST_{it} + \beta_{it}MANG_{it} + \beta_{it}BIG5_{it} + \beta_{it}AUQ_{it} + \beta_{it}ACC_{it} + D/A_{it} + Size_{it} + \varepsilon_{it} \quad (3)$$

Where  $MR_{it}$  is used for Market to Book ratio. This ratio is measure as book value divided market value.

$$MVA_{it} = \beta_{it}BSIZE_{it} + \beta_{it}BIND_{it} + \beta_{it}BMEET_{it} + \beta_{it}CD_{it} + \beta_{it}CONC_{it} + \beta_{it}INST_{it} + \beta_{it}MANG_{it} + \beta_{it}BIG5_{it} + \beta_{it}AUQ_{it} + \beta_{it}ACC_{it} + D/A_{it} + Size_{it} + \varepsilon_{it} \quad (4)$$

Where the study used  $MVA_{it}$  stands for Market value added.

$$\text{TobinQ}_{it} = \beta_{it} \text{BSIZE}_{it} + \beta_{it} \text{BIND}_{it} + \beta_{it} \text{BMEET}_{it} + \beta_{it} \text{CD}_{it} + \beta_{it} \text{CONC}_{it} + \beta_{it} \text{INST}_{it} + \beta_{it} \text{MANG}_{it} + \beta_{it} \text{BIG5}_{it} + \beta_{it} \text{AUDQ}_{it} + \beta_{it} \text{ACC}_{it} + D / A_{it} + \text{Size}_{it} + \varepsilon_{it} \quad (5)$$

Where TobinQ<sub>it</sub> stands for market capitalization plus total debt divided by total asset of the company .

### 3.3 Sample for Industry-Wise Analysis:

Table 1: Sample Size (Industry Wise Firm Distribution)

S.No	Industry Name	Firms
1	Textile industry	67
2	Miscellaneous	15
3	Oil and Gas	20
4	Transport, Technology and Communication	8
5	ENGINEERING and allied industries	12
6	Fertilizer	6
7	Glass & Ceramics	6
8	Paper & Board	6
9	Automobile Parts & Accessories	16
10	Pharmaceuticals	7
11	Food & Personal Care Products	29
12	Cement	18
13	Chemical	21

Table 2: Measurement of Firm Performance and Corporate Governance Factors

S.No	Variable	Symbol	Measurement
<b>Firm Performance</b>			
1	Net Profit Margin	NPM	Net Income after Tax divided by Sales (Junarsin, 2011)
2	Return on Equity	ROE	Net Profit after tax / Total number of outstanding common shares (Al-Manaseer, Al-Hindawi, Al-Dahiyat, & Sartawi, 2012)
3	Market value of Equity	MVE	Market price per share multiplied by number of shares outstanding (Mollah & Talukdar, 2007)
4	Market to Book ratio	MBR	Market value of equity / Book value of equity (Al Farooque, Van Zijl, Dunstan, & Karim, 2007)
5	Market value Added	MVA	It is the difference between the Market Value and book value of Equity (Abdullah, Shah, & Hassan, 2008)
6	Tobin Q	TobinQ	The market capitalization plus total debt divided by total asset of the company (Karaca & Eksi, 2012)
<b>Corporate Governance</b>			
1	Board size	BSIZ	Number of board members (Christy, Matolcsy, Wright, & Wyatt, 2013)
2	Board independence	BIND	The number of independent directors divided by the total directors (Bhagat and Bolton, 2008)
3	Board Meeting	BMEET	Dummy variable = 1, if Four meeting once in a year Vafeas (2003)
4	CEO duality	CD	Dummy variable = 1 if CEO is also board chairperson and 0 otherwise (Roodposhti & Chashmi, 2011)
5	Concentration Ownership	CONC	Shareholders for firm i at the end of year; Christy et al. (2013)
6	Institutional Ownership	INST	Percentage of common stock held by institutions Roodposhti and Chashmi (2011)
7	Managerial Ownership	MANG	Percentage of common stock held by management (Saleh, Iskandar, & Rahmat, 2005)
8	Big 5 Ownership	BIG5	Sum of ownership percentage of the five biggest firm shareholders (Masood & Shah, 2014)
9	Audit quality	AUDQ	Dummy variable = 1 if firm is audited by the Big Four (PwC, Deloitte Touche Tohmatsu, Ernst & Young, KPMG) and 0 otherwise (Hsu and Wu, 2014)
10	Audit Committee com	ACC	Audit committee non executive members divided by Total members (Borlea et al., 2017)
<b>Control Variables</b>			
1	Size	Size	Size of the firm
2	Financial leverage	Debt-Asset	Debt to asset ratio



#### 4. Data Analysis

The study analyzed the characteristics of six proxies for firm performance (Net profit margin, Return on equity, Market value of equity, Market to book ratio, Market value added and Tobin's Q along with ten proxies of corporate governance (Board size, Board independence, Board meetings, CEO duality, Concentrated ownership, Institutional ownership, Managerial ownership, Big 5 ownership, Audit quality and Audit committee composition).

##### 4.1 Descriptive Statistics and Correlation Matrix:

Table 3: Descriptive Statistics

Variable	Obs	Mean	Std.Dev	Min	Max
NPM	2220	-0.052	2.926	-104.054	25.478
ROE	2251	0.204	2.594	-32.646	110.180
MVE	2208	13.93	2.118	5.224	20.896
MBR	2683	1.746	5.385	-48.420	148.047
MVA	2683	3.831	12.91	-17.62	20.808
Tobin's Q	2590	1.385	1.150	0.454	25.425
BSIZE	1857	8.002	1.730	20.000	0.000
BIND	1708	0.184	0.248	1.000	0.000
BMEET	1753	5.406	2.575	34.000	0.000
CD	1691	0.223	0.416	1.000	0.000
CONC	1881	7.541	1.267	16.064	2.079
INST	1888	0.128	0.153	0.988	0.000
MANG	1888	0.224	0.259	0.960	0.000
BIG5	1888	0.579	0.213	1.000	0.000
AUQ	1951	0.557	0.497	1.000	0.000
ACC	1747	0.801	0.220	1.000	0.000

Table 4: Correlation

		NPM	ROE	MVE	MBR	MVA	TobinQ	BSIZE	BIND	BMEET	CD	CONC	INST	MANG	BIG5	AUQ	ACC
1	NPM	1.00															
2	ROE	0.01	1.00														
3	MVE	0.06	0.15	1.00													
4	M/B	0.03	0.09	0.26	1.00												
5	MVA	-0.05	0.04	0.29	0.28	1.00											
6	TobinQ	-0.02	0.09	0.27	0.50	0.48	1.00										
7	BSIZE	0.03	0.06	0.31	0.11	0.17	0.08	1.00									
8	BIND	0.00	0.03	0.01	0.04	0.02	0.02	0.05	1.00								
9	BMEET	0.01	-0.02	0.11	-0.02	-0.01	-0.06	0.05	-0.04	1.00							
10	CD	0.00	-0.10	-0.14	-0.08	-0.07	-0.02	-0.11	0.06	-0.04	1.00						
11	CONC	-0.03	0.00	0.52	0.00	0.14	0.02	0.35	0.08	-0.02	-0.03	1.00					
12	INST	0.04	0.01	0.12	0.01	-0.02	-0.08	0.13	0.09	-0.10	-0.08	0.12	1.00				
13	MANG	-0.03	-0.01	-0.33	-0.12	-0.17	-0.16	-0.21	-0.15	-0.04	0.17	-0.38	-0.23	1.00			
14	BIG5	0.03	0.05	0.14	0.14	0.22	0.21	-0.05	-0.05	-0.05	-0.05	0.03	-0.11	-0.09	1.00		
15	AUQ	0.08	0.05	0.44	0.13	0.15	0.13	0.20	0.04	0.01	-0.15	0.26	0.09	-0.21	0.17	1.00	
16	ACC	0.03	0.01	0.10	0.06	0.06	-0.01	0.18	0.07	-0.13	-0.13	0.18	0.11	-0.21	0.04	0.16	1.00

NPM is Net profit Margin, ROE is Return on Equity, Market value of Equity is MVE, MBR stands for Market to Book ratio, MVA stands for Market value added, Tobin's Q stands for Tobin Q, Board Size (BSIZE), Board Independence (BIND), Board Meetings (BMEET), CEO Duality (CD), Concentrated Ownership (CONC), Institutional Ownership (INST), Managerial Ownership (MANG), Big 5 Ownership (BIG5), Audit Quality (AUQ) and Audit Committee Independence (ACC).

Table 5: GMM through Arellano-Bond Dynamic Panel-Data Estimation

Variables	NPM	ROE	MVE	MBR	MVA	Tobin Q
BSIZE	0.0272*** -0.00496	0.124*** -0.0271	0.0543*** -0.016	0.127*** -0.0224	1.233*** -0.252	0.0607*** -0.00996
BIND	0.107*** -0.0291	0.242* -0.132	0.542*** -0.1	0.410*** -0.0902	6.864*** -1.506	0.161*** -0.0327
BMEET	0.00298 -0.00286	0.0139 -0.0135	0.0214* -0.0119	0.012 -0.0113	0.0719 -0.162	0.00483 -0.00461
CD	-0.0787*** -0.0158	-0.635*** -0.104	-0.326*** -0.0699	-0.365*** -0.0962	-0.545 -0.915	-0.192*** -0.0321
CONC	0.152*** -0.0546	0.317*** -0.111	0.327*** -0.117	0.267* -0.142	2.171 -1.99	0.144** -0.0675
INST	0.268*** -0.0556	-0.0462 -0.174	1.271*** -0.25	-0.26 -0.239	11.85*** -3.707	0.493*** -0.109
MANG	0.0393 -0.0399	-0.0623 -0.135	0.204 -0.187	0.727*** -0.192	7.350** -3.102	0.123 -0.0753
BIG5	-0.0796 -0.0506	-0.178 -0.147	0.0258 -0.14	-0.117 -0.185	-2.348 -1.783	0.0125 -0.0818
AUQ	0.0498 -0.0384	0.0128 -0.169	-0.106 -0.115	0.117 -0.107	3.481* -1.997	0.029 -0.0636
ACC	0.0267 -0.0226	-0.0179 -0.0807	-0.0714 -0.133	0.608*** -0.161	0.378 -1.423	-0.00821 -0.0388
Size	0.0830*** -0.0271	0.0387 -0.0584	0.329*** -0.08	-0.071 -0.0968	-0.464 -1.188	0.133*** -0.0376
Debt_asst	-0.371*** -0.0614	-0.381* -0.206	-0.275* -0.167	-0.0186 -0.0518	-0.464 -0.91	0.767*** -0.0252
Constant	0.294 -0.516	1.329 -1.151	1.07 -1.469	0.741 -1.873	3.162 -23.84	-2.234*** -0.622
Wald chi2(13)	23118.24***	449.32***	313.14***	178.44***	134.49***	4391.98***
Observations	717	735	717	747	747	735
Number of id	205	207	203	206	206	204

Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1, NPM is Net profit Margin, ROE is Return on Equity, Market value of Equity is MVE, MBR stands for Market to Book ratio, MVA stands for Market value added, Tobin's Q stands for Tobin Q, Board Size (BSIZE), Board Independence (BIND), Board Meetings (BMEET), CEO Duality (CD), Concentrated Ownership (CONC), Institutional Ownership (INST), Managerial Ownership (MANG), Big 5 Ownership (BIG5), Audit Quality (AUQ) and Audit Committee Independence (ACC).

Table 01 indicates summary statistics of variables used in the current research. NPM has higher negative

minimum value of -104.054 among all the endogenous variables. MBR ratio has higher standard deviation of 5.385.

Refer to table 01& 02. Board size has an average value of 8.002 which is similar to Ullah and Kamal (2017). Moreover, among the corporate governance proxies, board independence has higher variation as per its standard value of 2.575. The correlation results showed either strong or moderate association among variables. However, there is no issue of Multicollinearity. According to Gujarati (2009), problem of multicollinearity exists if correlation value exceeds 0.80.

The research used Generalized Method of Moments (GMM) through Arellano-Bond Dynamic Panel-Data Estimation method to examine the casual-effect of corporate governance on firm performance. Refer to table 03, in first regression, the study used firm Net profit margin as a measure of firm performance. The results of study depicts board size, board independence, CEO duality, concentrated ownership and institutional ownership have statistically significant coefficient values of 0.0272, .0.107, -0.0787, 0.152 and 0.268 respectively. The study reveals that board size, board independence, concentrated ownership and institutional ownership improve firm performance. Conversely, the study suggests that CEO duality has adverse effect on financial performance of firms.

Likewise, in second regression the study used Return on Equity (ROE) as a measure of firm performance. The results suggest that board size, board independence, CEO duality, concentrated ownership have statistically significant coefficient values of 0.124, 0.242, -0.635 and -0.317 respectively. The results depict positive association among board size, board independence and concentrated ownership and return on equity. Nonetheless, CEO duality has substantial influence. Similarly, in the 3<sup>rd</sup> regression, the study used Market value of equity as proxy of firm performance. The study reveals that board size and board independence and board meetings coefficient values are 0.0543, 0.542 and 0.0214 respectively. This suggested that proper board structure increase the market value of equity (firm performance). Moreover, CEO duality has persistent negative coefficient value of -0.326, which indicates the decrease in firm performance in the presence of CEO duality. Further, concentrated ownership and institutional ownership positively contribute towards the firm performance as per their coefficients values of 0.327 and 1.271.

In fourth regression, Market to Book ratio is used as a market based measure of firm performance. The study reveals that board size, board independence, CEO Duality, managerial ownership and audit committee composition significantly improves the firm performance as indicated by coefficient values of 0.127, 0.410, -0.365, 0.727 and 0.608.

In addition, the Market Value Added (MVA) is proved to be a weak measure of firm performance because MVA absorbed the effect of board size, board independence, institutional ownership and managerial ownership. Likewise, in last regression, TobinQ is used as proxy of firm performance. The results revealed that board size, board independence, CEO duality, concentrated ownership and institutional ownership significantly affect the TobinQ as their coefficient values of 0.0607, 0.161, -0.192, 0.144 and 0.493 respectively.

**Table 6: Industry-Wise GMM through Arellano-Bond Dynamic Panel-Data Estimation**

	Textile	Miscellaneous	Oil and Gas	Fertilizer	Automobile	Food&Pers	Cement	Chemical
Variable	MVE	MVE	MVE	MVE	MVE	MVE	MVE	MVE
BSize	0.00033	<b>0.288**</b>	-0.0403	<b>4.552**</b>	0.132	<b>0.427***</b>	0.0542	-0.195
	-0.0275	-0.141	-0.0633	-2.015	-0.149	-0.132	-0.107	-0.152
BIND	<b>0.748***</b>	1.7	-0.294	<b>-14.14**</b>	-1.795	<b>0.999***</b>	-0.376	-0.865
	-0.124	-1.544	-0.446	-7.161	-2.384	-0.183	-0.6	-2.649
BMEET	0.0148	-0.418	-0.0118	0.0987	0.00784	0.00907	-0.0175	-0.0427
	-0.012	-0.458	-0.0321	-0.123	-0.27	-0.0635	-0.035	-0.242
CD	<b>-0.291***</b>	0.124	<b>0.241*</b>	0.0459	-16.8	-0.0904	-0.307	-2.068
	-0.0407	-0.957	-0.136	-1.003	-10.85	-0.312	-0.309	-1.879
CONC	<b>0.738***</b>	0.624	-0.112	<b>35.50**</b>	10.43	1.011	-1.419	-1.063
	-0.0573	-1.05	-0.208	-15.67	-18.38	-1.078	-1.399	-2.9
INST	-0.227	-0.517	-2.61	<b>88.47**</b>	1.802	<b>1.495*</b>	0.426	-5.151
	-0.288	-0.42	-2.172	-42.5	-3.704	-0.889	-1.394	-8.087
MANG	0.0942	2.424	-2.116	<b>57.01**</b>	29.68	-0.175	3.006	-0.154
	-0.13	-2.506	-3.876	-25.35	-21.3	-1.564	-4.58	-5.041
BIG5	<b>0.389***</b>	6.394	-0.0418	<b>77.61**</b>	6.326	0.464	-0.218	-2.34
	-0.111	-8.833	-0.474	-35.72	-5.191	-0.986	-0.193	-2.493
AUQ	-0.0268	-3.458	0.512	0.251	5.653	0.298	0.417	0.235
	-0.155	-3.038	-0.789	0.908	-5.583	-0.371	-0.502	0.671
ACC	<b>0.584***</b>	<b>3.683*</b>	-0.549	<b>45.49**</b>	-1.311	-0.0024	0.797	1.454
	-0.184	-1.903	-0.449	-20.79	-0.926	-0.953	-0.904	-1.132
Debt_asst	<b>-2.665***</b>	<b>-10.20**</b>	<b>-6.365**</b>	<b>4.454*</b>	2.361	0.0147	-4.052	-0.0898
	-0.176	-4.668	-2.966	-2.441	-1.67	-0.151	-4.231	-3.34
size	<b>0.274***</b>	0.714	0.937*	<b>-21.91**</b>	1.535	0.107	0.72	<b>1.772***</b>
	-0.048	-0.478	-0.531	-10.05	-1.869	-0.273	-0.552	-0.516
Constant	-0.55	0	6.704	0	-101.7	5.665	15.13**	-1.899
	-0.737	0	-5.92	0	-171.6	-6.23	-7.191	-12.81
Wald chi2(13)	<b>5753.83***</b>	<b>56961.37***</b>	<b>5075.16***</b>	<b>51655.46***</b>	<b>319.25***</b>	<b>4296.85***</b>	<b>1920.74***</b>	<b>225946.73***</b>
Observations	194	35	68	57	52	81	72	66
Number of id	57	11	20	12	16	25	17	16

Standard errors in parentheses. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1, NPM is Net profit Margin, ROE is Return on Equity, Market value of Equity is MVE, MBR stands for Market to Book ratio, MVA stands for Market value added, Tobin's Q stands for Tobin Q, Board Size (BSize), Board Independence (BIND), Board Meetings (BMEET), CEO Duality (CD), Concentrated Ownership (CONC), Institutional Ownership (INST), Managerial Ownership (MANG), Big 5 Ownership (BIG5), Audit Quality (AUQ) and Audit Committee Independence (ACC).

### 4.3 Industry Wise Analysis:

The research analyzed the causal relationship between corporate governance and firm performance of all listed non-financial firms grouped into for seven industries such as Textile, Oil and Gas, Fertilizer, Automobile Parts & Accessories, Food & Personal Care Products, Cement, Chemical while excluded Transport, Technology and Communication, Engineering and allied industries, Glass & Ceramics, Paper & Board, Pharmaceuticals due to lesser firm observations.

The Market Value of Equity has showed the greater absorption power among the six proxies used for firm performance which is represented by the significant impact of maximum number of corporate governance variables on the Market Value of Equity. Therefore, for Industry analysis, the research has concentrated on the relationship between corporate governance and firm performance using Market Value of Equity.

In textile industry, results revealed that board independence, concentrated ownership, big five shareholders and audit committee composition has a significant positive association as indicated by coefficient values of 0.748, 0.738, 0.389 and 0.584 respectively. Likewise, Food & Personal Care Products board size, board independence and institutional ownership have statistically significant influence on firm performance.

Further, study revealed that strong foothold of corporate governance on firm performance in fertilizer industry. The study suggested that board size, board independence, concentrated ownership, institutional ownership, managerial ownership, big-5 ownership and audit committee composition significantly affect

the firm performance as per their coefficient values of 4.552, -14.14, 35.50, 88.47, 57.01, 77.61, and 45.49. Nonetheless, the study showed that Miscellaneous, Oil and Gas, Automobile, Cement, Chemical industries have footprint of the relationship between corporate governance firm performance.

## 5. Conclusion

The study analyzed the impact of Corporate governance on firm performance for Full-Sample as well as for industry-Wise using Generalized Method of moments. The study used six proxies for firm performance measurement. In order to find the best proxy that would be suitable for this market. Moreover, the study used ten Corporate governance proxies.

The study suggests that Board Size and Board Independence and Board Meeting Concentrated Ownership and Institutional Ownership statistically significantly improve the firm performance. Nevertheless, CEO duality damages the firm performance for Full-Sample. The study results reveal that Market value of equity is better proxy for firm performance measure in Pakistan stock exchange.

Further, the study used market value of equity for firm performance in industry-wise analysis. The research observes strong foothold of Corporate governance in Fertilizer sector. Moreover, the study reveals that observance of Corporate governance varies across industries.

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