

**The Effect of Board of Director  
Characteristics on Financial Performance:  
A Study on Oil and Gas Sector of Pakistan**

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**Zubair Khan**

**Faculty of Business, Government & Law**

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## **Dedication & Acknowledgements**

This thesis is dedicated to my family, who taught me that the best kind of knowledge to have is that which is learned for its own sake. It is also dedicated to my mother, who taught me that even the largest task could be accomplished if it is done one step at a time and sincerely prays for my success.

All those whose love, encouragement and help is always with me at every step in my life.

I would like to express my gratitude to my primary supervisor Dr. Harun Harun and Professor Monir as second supervisor whose expertise has contributed considerably to the completion of this work. My appreciation also goes to my former supervisor Dr. Mohobbot Ali and Dr. Habib Khan, an accounting academic in the University of Canberra for their helpful advice for this thesis.

## **Abstract**

This thesis provides an empirical understanding of Board of Director's (BoD's) characteristics and its effect on the financial performance of Oil and Gas (O&G) sector companies of Pakistan. Appropriate characteristics of BoD's are the most influential part of corporate which is very beneficial for the enhancement of the firm financial performance. The O&G is one of the largest and the most powerful sector in Pakistan.

The secondary data (panel) was taken from Attock Petroleum (AP), Pakistan State Oil (PSO), Attock Refinery (AR), Indus Oil Refinery (IOR), Khalifa Coastal Refinery (KCR), Pak-Arab Refinery (PAR), National Refinery (NR), Pakistan Refinery Limited (PRL), Mari Petroleum Company Limited (MPCL), Oil and Gas Development Company Limited (OGDCL), Pakistan Oil Fields (POF) and Pakistan Petroleum (PP). The data was collected via online business records and yearly consolidated financial statements (balance sheet and income statement) of aforementioned companies for the period of 2000 to 2015. The data was analyzed by utilizing statistical and econometric methods with the support of SPSS software.

Drawn from the statistical analysis, there were five findings revealed i.e. 1) the correlation amid board size (BS), number of board meetings and board change (BC) with return on asset (ROA), return on equity (ROE) and Tobin's Q predicts significant negative relationship, 2) correlation amid board composition (BC), chief executive officer (CEO) tenure, board education (BE) and female board members (FBM) with ROA, ROE and Tobin's Q predicts significant positive relationship with each other, 3) CEO compensation with ROA, ROE and Tobin's Q predicts insignificant positive relationship with each other, 4) firm age (FA) with ROA, ROE and Tobin's Q represents insignificant negative relationship with each other and 5) there also exists insignificant relationship between firm size with return on asset, return on equity and Tobin's Q.

The study suggested that the roles of board of directors and their characteristics are critically important in the contemporary corporate environment in order to ensure the strategies, programs and activities of management are mobilized to achieve the overall missions and goals of the firm. According to the statistical consequence of the study, the characteristics of board of directors have significant effect on oil and gas companies' financial performance in Pakistan. In addition, it is accepted that the board of directors' characteristics play a vital role in achieving better firm's financial performance.

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## **List of Abbreviations**

ROA	Return on Asset
ROE	Return on Equity
CEO	Chief Executive Officer
BS	Board Size
BComp	Board Composition
BM	Board Meeting
BC	Board Change
BE	Board Education
CEOT	CEO Tenure
CEOC	CEO Compensation
CMA	Capital Market Authority
CalPERS	California Public Employees' Retirement System
EPS	Earnings Per Share
FBM	Female Board Members
FA	Firm Age
FS	Firm Size
ICMAP	Institute of Cost and Management Accountants of Pakistan
IFC	International Financial Corporation
IPO	Initial Public Offering
KSE	Karachi Stock Exchange
KS	Kolmogorov-Smirnov
PINCG	Institute of Corporate Governance of Pakistan
PSO	Pakistan State Oil
ROA	Return on Investment
SECP	Security and Exchange Commission of Pakistan
SPSS	Statistical Package for Social Sciences

# Chapter – 1

## 1.1 Introduction

The role of board of directors' characteristics for a firm's financial performance has drawn increasing attention of researchers. The board of directors' characteristics has been found to play a vital role in achieving the overall missions and goals of firms, and has become critical in the current dynamic environment so that strategies, programs and activities of management can be effectively mobilized. Despite the significance of the impact of board of directors' characteristics on a firm's financial performance, there is a little research that investigates this phenomenon specifically in the context of developing countries such as Pakistan. This thesis investigates the effect of board of directors' characteristics on firm performance.

I used archival method to collect data from a repository of online business records and yearly consolidated financial statements of twelve oil and gas listed companies in Pakistan (2000-2015). I analyzed the data using the multiple regression statistical models (by using) statistical software Statistical Package for Social Sciences 20 (SPSS).

The findings of the thesis suggest that the board of directors' characteristics have significant effect on oil and gas firm financial performance in Pakistan. The result of correlation amid board size with Return on Asset (ROA), Return on Equity (ROE) and Tobin's Q predicts negative and insignificant relationship. Correlation amid board composition with return on asset, return on equity and Tobin's Q predicts significant positive relationship. Board meeting and return on asset, return on equity and Tobin's Q predicts significant negative relationship. Chief Executive Officer (CEO) tenure with return on asset, return on equity and Tobin's Q predicts significant positive relationship with each other. Chief Executive Officer compensation with return on asset, return on equity and Tobin's Q predicts insignificant positive relationship with each other. There exists

insignificant relationship between board change and return on asset, return on equity and Tobin's Q. Board education with return on asset, return on equity and Tobin's Q predicts significant positive relationship with each other. Female board members with return in asset return on equity and Tobin's Q predicts significant positive relationship whereas, there exists insignificant relationship between firm age, firm size and return on asset, return on equity and Tobin's Q. represents insignificant negative relationship with each other.

This thesis contributes to both theory and practice. On theoretical front, it contributes to the literature regarding the relationship between board of directors' characteristics and firm's financial performance in a developing country such as Pakistan by providing evidence that emerging variables such as board change and women on board are critical factors for firms' financial performance in a country like Pakistan – a phenomenon not well researched in the context of developing countries. On practical front, this study provides comprehensive information of the real world practices of the relationship between board of director characteristics and firm performance, which practitioners and organizations can benefit from by implementing the findings of this study within their organizations especially in sectors such as oil and gas. This study concludes by providing recommendation and future research directions.

## **1.2 Overview of Thesis Chapters**

This research report is structured into six chapters. The chapter one provides a general introduction about the topic and different sections incorporated in the research study.

The chapter two discusses the research study background where researcher defines the overview of corporate governance and board, research problem, research objectives, rationale of the study and significance of the study.

The chapter three highlights previous and existing literature pertaining to the topic and relevant theories for the development of study hypotheses and conceptual framework.

The chapter four of the research dissertation discusses the general aspects of research methodology such as selecting from alternative types of research and research design, provides some justifications for the study including the rationale and arguments for the study.

The chapter five represents the analytical model along with statistical compilation of the collected data including fixed effect multiple regression model and its appropriate measures for assumptions. The last chapter incorporated the findings, discussion, recommendations, summary and the conclusions drawn from the research study.

## Chapter – 2

This chapter discusses relevant literature on corporate governance, roles of the board members, significance of the study, problem statement, research questions, rationale and significance of the study.

### 2.1 Background of the Study

The corporate governance broadly refers to the mechanisms, processes and relations by which corporations are controlled and directed (Fama and Jenson, 1983). Corporate governance includes the processes through which corporations' objectives are set and pursued in the context of the social, regulatory and market environment (Thorn, Nijman, Smith, Nekaris, 2009). Globally there are different diverse models of corporate governance according to the variety of capitalism in which they are embedded (Polit and Beck, 2008). The Anglo-American model of corporate governance tends to emphasize the interest of shareholders and relies on a single-tiered board of directors that is normally dominated by non-executive directors elected by shareholders (Paul, Friday and Godwin, 2011). Because of this, it is also known as the unitary system. On the other hand, continental Europe countries i.e. (Germany, Austria, Netherland) and Asian country such as (Japan's) model of corporate governance recognizes the interests of workers, managers, suppliers, customers, and the community (Paul, Friday and Godwin, 2011). This model has two-tiered board, the executive board, made up of company executives, generally runs day-to-day operations while the supervisory board, made up entirely of non-executive directors who represent shareholders and employees, hires and fires the members of the executive board, determines their compensation, and reviews major business decisions (Paul, Friday and Godwin, 2011). In the United States, state laws directly govern corporations; shareholders cannot initiate changes in the corporate charter although they can initiate changes to the corporate bylaws (Thorne et al., 2009).

In 1997 the east Asian financial crisis severely affected the economies of Thailand, Indonesia, south Korea, Malaysia, and the Philippines through the exit of foreign capital after property assets collapsed (Dar, Naseem, Rehman and Niazi, 2011). The lack of corporate governance mechanisms in these countries highlighted the weaknesses of the institutions in their economies (Azam, Usmani and Abbasi, 2011). The Tehran Stock Exchange introduced a corporate governance code in 2007 that reformed the board compensation policies, improved internal and external audits, ownership concentration and risk management (Bozec, 2005). However, the code limits the directors' independence and provides no guidance on external control, shareholder rights protection, and the role of stakeholder rights (Javeed, Hassan and Azeem, 2014). In November 2006 the capital market authority (Saudi Arabia) (CMA) issued a corporate governance code in the Arabic language (Al-Matari et al., 2014). The Kingdom of Saudi Arabia have made considerable progress with respect to the implementation of viable and culturally appropriate governance mechanisms (Al-Hussain and Johnson, 2009).

In the context of Pakistani companies, the practices of corporate governance are reported to be weak and lacking in transparency which culminated in the country's financial crisis (Azam, Usmani and Abbasi, 2011). Fama and Jensen (1983) added that the board of directors should comprise of both external and internal directors. Internal directors have technical competencies and relevant knowledge of the firm, while external directors contribute to carrying out strategic decisions and they provide more effective management monitoring compared to internal directors (Al-Hussain and Johnson, 2009). The board of directors is a main structural mechanism that minimizes opportunistic activities. As a control mechanism, the board is responsible to represent and defend the interests of the shareholders against managerial entrenchment (Bozec, 2005).

In Pakistan numerous research scholars have investigated the association between corporate governance and firm performance (Azam et al., 2011; Javeed et al., 2014). In quantitative research studies, the issue of generalization is more

complicated and controversial. Firestone (1993) developed a typology depicting three models of generalizability of the research study that provides a useful framework for considering generalizations in quantitative research studies. The first model is statistical generalizability i.e. (extrapolating from a sample to a population). The second model is analytic generalization and the third model is case-to-case translation, which is often called reader generalizability or transferability.

One flaw stemming from the quantitative methodological paradigm of statistical generalizability is that, most quantitative researchers begin with a vague notion of a target population which is not well defined in most of the research studies; and, even they are more likely to have an explicit accessible population (Kerlinger and Lee, 2000). Moreover, (Polit and Beck, 2008) reported that probability sampling is the best vehicle through which the statistical model of generalization can be enacted. So, the best strategy for achieving a representative sample is to use probability methods of sampling, which give every member of the population an equal chance to be included in the study with a determinable probability of selection. Much of the research study conducted on the corporate governance in the oil and gas sector of Pakistan have failed to give any clear ideas about the selection of target population (Sheikh and Karim, 2015; Naseem, Niazi and Rehman, 2011; Hussain, Obaid, and Khan, 2014). In this study the researcher utilized the overall population of oil and sector including marketing, refiner, and exploration in order to overcome the sample bias and make the study statistically generalizable.

Secondly, analytic generalization in quantitative research occurs most keenly at the point of analysis and interpretation (Ayres, Kavanagh, Knafl, 2003). Through rigorous inductive analysis the inductive generalizations must use confirmatory strategies such as checking the statistical tests assumptions that addresses the credibility of the conclusion (Thorne et al., 2009) whereupon the researcher can arrive at some insightful and inductive generalizations regarding the phenomenon under study. In this study, the researcher used confirmatory strategies in terms of checking all the assumptions of the implemented tests and clearly inscribed all

data interpretations in order to make the study analytically generalizable.

The third model of generalizability is transferability of the research findings and ideas, which is also known as reader generalizability (Misco, 2007). In this generalizability approach the researcher's job is to provide detailed descriptions that allow readers to extrapolate the findings to other settings. The main work of transferability, however, is done by readers of research however, do the main work when it comes to transferability. Their job is to evaluate the extent to which the findings apply to new situations. Most of the studies in Pakistan in the context of board of director characteristics are failed to accurately address the generalizability of transferability (Shafique, Idress and Yousaf, 2014; Javed and Iqbal, 2010; Sheikh and Karim, 2015). In this study the researcher makes evidently addresses the key idea and vibrantly mentions all the findings of the research to make the study generalizable for the readers.

Firestone (1993) argued that in quantitative research the replication of participants in the form of adding to the sample size can enhance the generalization, as well as statistical power. He further argue that small convenience samples of participants who are not selected for any theoretical reasons are all too common in quantitative studies and cause severe threats to the conventional model of generalizability. Shafique et al. (2014) reported that planned replication of studies enhances the potential for generalizability. In order to make the research study more generalizable the researcher take overall population and make the planned replication of study in order to enhance the potential for generalizability.

Empirical evidence shows that there is lack of studies in the existing literature review that are dedicated to the important variable i.e. board change that help to improve the performance of the companies (Al-Matari et al., 2014a, p.557). Furthermore the firm financial performance was not measured in Pakistan combined with board of director's characteristics including board's size, board composition, board meetings, CEO tenure, CEO compensation, board change, women on board and board education with control variables firm age and firm size. Based on above discussion this study is going to bridge the gap in the existing

literature to study the relationship between board of director characteristics and firm performance in oil and gas sector of Pakistan. Secondly, this study is of great value to contribute significantly to the body of knowledge by adding new variables such as Chief Executive Officer (CEO) tenure, board change, women on board and board education in the context of Pakistan to the existed variables of the board of directors.

## **2.2 Corporate Governance (CG) in Pakistan**

Corporate governance comprises the private and public institutions (both formal and informal), which together govern the relationship between those who manage corporations and those who invest resources in corporations. These institutions typically include a country's corporate laws, securities regulations, stock market listing requirements, accepted business practices and prevailing business ethics (Omran, 2004). Security and Exchange Commission of Pakistan (SECP) in early 2002 introduced the Code of Corporate Governance (Javeed, Hussain and Azeem, 2014, p. 574). La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000) defined, corporate governance as a set of mechanisms through which outside investors protect themselves against expropriation by the insiders. They define "the insiders" as both managers and controlling shareholders.

The Code includes many recommendations in line with international corporate good governance practice. However, the Code's limited provision on director's independence remains voluntary and provides no guidance on internal controls, risk management and board compensation policies (Javid and Iqbal, 2010, p.5). The activism of the California Public Employees' Retirement System (CalPERS) brought awareness of the role of boards in relation to US based firms (Bathula, 2008, p.4). CalPERS demanded the appointment of non-executive (or independent) directors to the boards.

The establishment of the SECP represents an important milestone in the development of the regulatory framework of the capital market in Pakistan. It was initially concerned only with the regulation of the corporate sector and capital

market. In accordance with the approved corporate plan, the commission has been organized into the six divisions such as a) Company Law Division, b) Securities Market Division, c) Specialized Companies Division, d) Finance and Admin Division, e) Human Resource and Training Division and f) Insurance Division. Each division is then divided into departments and wings for effective administration. Executive directors head the departments, with oversight by commissioners. The SECP which is governed by the Securities and Exchange Commission of Pakistan Act, 1997, which encompasses the constitution of the commission appointment and terms and conditions of the chairman and commissioners, functions and powers of the commission and financial arrangements. The Securities and Exchange Commission of Pakistan is administering many laws. These includes: Insurance Ordinance, 2000 previously as insurance act, 1938, Company Ordinance, 1984 amended and implemented in 2002, Modaraba Companies and Modaraba Floatation and Control Ordinance, 1980; the Securities and Exchange Ordinance, 1969. The SECP Act establishes the policy board in order to provide guidance to the Commission in all matters relating to the functions of the commission and formulation of the policies. The policy board consists of a maximum of nine members who are appointed by the federal government. Out of nine members five members would be as ex-officio members and rest of the four members are from private sector.

Many new financial instruments were introduced by the SECP in order to enhance corporate governance. The code of corporate governance was issued by the SECP in order to improve transparency, governance and protect the interest of the investors by improving the disclosure in financial reporting of companies. The code of corporate governance is the result of the joint effort of SECP and Institute of Cost and Management Accountants of Pakistan (ICMAP) and three stock exchanges such as Islamabad, Lahore and Karachi. The code includes many recommendations for international good practice. All listed companies publish and circulate a statement along with their annual reports to set out the status of their compliance with the best practices of corporate governance. The code primarily aims to establish a system whereby a company is directed and

controlled by its directors in compliance with the best practices so as to safeguard the interest of the diversified stakeholders. It proposes to restructure the composition of the board of directors in order to introduce broad based representation by minority corporate affairs and the decision making process and requires directors to discharge their fiduciary responsibilities in the larger interest of all stakeholders in a transparent, informed, diligent, and timely manner. The salient feature of the code includes setting up of audit committees and internal audit functions by all listed companies (Code of Corporate Governance, 2002). In August 2002 SECP launched a corporate governance project in collaboration with the UNDP and Economic Affairs Division of Government of Pakistan. This project was launched mainly for the implementation of code of corporate governance and strong regulatory framework for the corporate sector in Pakistan. In 2007 the Security and Exchange Commission of Pakistan, International Financial Corporation (IFC) and Institute of Corporate Governance of Pakistan (PINCG) conducted a survey on “code of corporate governance of Pakistan”.

The issue of corporate governance is important for developing countries because it is central to financial and economic development of a country. Pakistan has developed good corporate governance laws but with poor implementation of these laws together with political instability has adversely affected corporate governance. The adoption of the corporate governance code has improved the overall corporate structure and business environment. The quality of disclosure has improved over the last four years due to the increasing monitoring role of SECP and the requirement of the code. In Pakistan, the main owners are local family-controlled business groups and the families behind them, the state, and the affiliates of multinational corporations. Ownership is very concentrated in the few hands of large families. These families control ownership shares through pyramids and tunneling. Business groups have lower transparency and weaker corporate governance mechanism. Pyramid ownership structures make it possible to control some firms even with a very small share of their total capital. The basic shareholders rights are protected in Pakistan at least laws in book.

## **2.3 Roles of Board**

To understand the role of board, it should be recognized that boards consists of a team of individuals, who combine their competencies and capabilities that collectively represent the pool of social capital for their firm that is contributed towards executing the governance function (Carpenter and Westphal, 2001, p.639). Boards are expected to perform different functions, for example, monitoring of management to mitigate agency costs (Roberts, McNulty and Stiles, 2005), hiring and firing of management (Hermalin and Weisbach, 1998), provide and give access to resources (Hillman, Canella and Paetzold, 2000; Hendry and Kiel, 2004), grooming CEO (Vancil, 1987) and providing strategic direction for the firm (Javeed et al., 2014). Boards also have a responsibility to initiate organizational change and facilitate processes that support the organizational mission (Hill, Green and Eckel, 2001; Bart and Bontis, 2003). Further, the boards seek to protect the shareholder's interest in an increasingly competitive environment while maintaining managerial professionalism and accountability in pursuit of good firm performance (Ingleyi and Van der Walt, 2001; Hillman and Dalziel, 2003; Hendry and Kiel, 2004; McIntyre, Murphy and Mitchell, 2007).

The characteristics of board of Directors are the most influential aspect of corporate governance because they prevent the company and stakeholders from the conflict of interest in order to enhance the financial performance of the firm (Lam and Lee, 2012, p.6; Dar et al., 2011, p.4; Paul, Friday and Godwin, 2011, p.64; Ujunwa, 2012, p.5). Fama and Jenson (1983) reported that board of directors should comprise of both external and internal directors. Internal directors have technical competencies and relevant knowledge of the firm, while external directors contribute to carrying out strategic decisions and they provide more effective management monitoring compared to internal directors (Chahine and Safieddine, 2011).

In the emerging markets, the board becomes important tools complementing for the inefficient external corporate governance mechanisms to alleviate conflict of interests amongst parties. Consistent with the above arguments, the board of

directors is a main structural mechanism that minimizes opportunistic activities. As a control mechanism, the board is responsible to represent and defend the interests of the shareholders against managerial entrenchment (Nuryanah and Islam, 2011).

In Pakistan, the overall responsibility for the management and direction of company affairs handled by the board of directors of the companies (Nuryanah and Islam, 2011). In this regard, the directors should exercise strategic oversight of business operations while directly monitoring, measuring and rewarding management's performance (Afzal and Sehrish, 2015). In Pakistan, the board should also ensure the integrity of accounting and financial reporting systems and oversee the process of disclosure and communications (Azam et al., 2011). In addition to that the board of directors has the responsibility to ensure that corporate behavior conforms to best governance practices inside organization. This requires directors to exhibit certain behavioral norms, including: (a) informed and deliberative decision-making; (b) division of authority (c) effective monitoring of management; and (d) evenhanded performance of duties owed to the company and to shareholders as a class (Javeed et al., 2014).

## **2.4 Problem Statement**

Pakistan government has significant and vibrant role specifically in the oil and gas sector of Pakistan because oil and gas sector has significant economic contribution to the government (Afzal and Sehrish, 2011; Azam, et al., 2011) and the public in general (Arsalan et al., 2014) that have not been addressed in detail by the prior studies in this area. On the other hand, According to the report of Transparency International (2015) Pakistan has left Indian behind in the corruption and become the corrupt governments in the recent era around the globe like Bangladesh or Indonesia. Therefore, researching the governance issue is very necessary to understand the cause and effects of social and cultural context on Pakistani business organizations performance and how to improve the governance sector particularly in the gas and oil sector of Pakistan.

Moreover, Pakistan has delivered an unsatisfactory result so far in managing organizational operations (Hussain and Manzoor, 2014). There are multiple reasons associated with their inadequate result these are poor infrastructure, poor corporate governance, inappropriate size of board of women of board and uneducated board members. Business development requires more than natural resources, and it is obvious that organization or firm required an appropriate board of director characteristics for smooth functioning of its operation in Pakistan. This study investigates the aforementioned issues pertaining to the development of firm performance of Pakistan. Particular attention is given towards board of directors' characteristics.

## **2.5 Objective of the Study**

Following are the objectives of the study.

- 1) To measure the effect of board of director characteristics towards firm financial performance.
- 2) To find out the perceived benefits and strategic impact of board of director characteristics towards oil and gas sector financial performance in Pakistan.

## **2.6 Rationale and Significance of the Study**

Pakistan has a great strategic significance and potential of oil and gas reserves (Azam, et al., 2011). Due to this reason many foreign countries are interested to invest in oil and gas sector of Pakistan (Arsalan, Florackis and Ozkan, 2014). Most of the oil and gas reservoirs have been found in the diverse areas of Khyber Pakhtunkhwa (KPK) and Baluchistan provinces of Pakistan (Azam et al., 2011).

Pakistan meets about 18% of its oil demand from its local resources (Arsalan et al., 2014). The Government of Pakistan realizing that with the competitive advantage in oil and gas sector, the fresh investment can be attracted which bring economic stability and prosperity in Pakistan. On the other hand, the present economy growth rate of Pakistan shows that the energy needs will increase from 64.5 million tonnes of oil equivalent, in 2015-16 to over 361.31 million tonnes of

oil equivalent in 2030 (Afzal and Sehrish, 2015). To overcome the projected needs of energy, major dependence will remain on the oil & gas sector. Moreover, unfortunately the large areas of Pakistan – the Indus Basin, Makran Basin and Baluchistan Basin still remain as a geological frontier and hold the promise for future petroleum for generations to come and accumulation which may act as a game changer in energy self-sufficiency. The reason behind deprived financial performance in the oil and gas sector is due to the inefficient role of the board of directors and corporate governance (Hussain and Manzoor, 2014; Ibrahim et al., 2010). Moreover, the researchers reported that the corporate governance in Pakistan is at initial stages (Ibrahim et al., 2010) and proper application and practice of corporate governance is not present at this moment in Pakistan (Hussain and Manzoor, 2014). The study indicated its future research directions towards measure the influx of board of director's characteristics with firm financial performance (Ibrahim et al., 2010).

This study is beneficial for the economic structure of Pakistan because this study adds more literature in the perspective of the characteristics of the board of director's and firms performance, which has not been studied in the context of Pakistan. Second, this study follows the basic principle of the quantitative methodological paradigm of statistical, analytical and transferable generalizability. Third, this study pioneers an investigation into the overall oil and gas sector companies in Pakistan, as it measures the cause and effect relationship between the boards of director's characteristics for example, CEO tenure, board meeting and board education and financial performance with the variable (Tobin's Q) very first time fragmented sentence needs rewriting.

Moreover, none of the published studies were found so far in Pakistan, which measures the direct effect of CEO tenure, board meeting and board education on (Tobin's Q). Fourth, the contemporary study is imperative to the research scholars of Pakistan who may wish to carry out the research in the context of board of directors characteristics and firm financial performance because this research study adds literature regarding the role board of directors characteristics and firm

financial performance with emerging variables i.e. board change and women on board to the existing body of knowledge in Pakistan which are not taken into any published study in Pakistan. Fifth, the study has scholarly noteworthiness in light of the fact that the study gives definite information on how far the procedures taught in the class vary from that rehearsed in this contemporary reality. More specifically, the study provides comprehensive information of the real world practices of board of director characteristics and firm performance. Sixth, this study measures the effect of board of director characteristics and firm performance with control variables i.e. firm size and firm age first time in oil and gas sector of Pakistan. Besides, this study is the first study that empirically investigates the CG performance in oil and gas sector of Pakistan.

## Chapter – 3

### Literature and Hypothesis Development

This chapter reviews the relevant literature on board of director characteristics, financial performance of oil and gas firms, along with the theoretical framework used in this study.

#### 3.1 Agency Theory

Jenson and Meckling (1976) established agency theory as the dominant theoretical framework of the stakeholders, corporate governance and shareholders (Ibrahim et al., 2010). Agency theory is defined as the relationship between the principals, such as shareholders and agents such as the company executives and managers. In this theory, shareholders who are the owners or principals of the company, hires the agents to perform diverse work of the organization. Principals delegate the running of the business to the directors or managers, who are the shareholder's agents (Clarke, 2004). Agency theory is concerned with resolving problems that can exist in agency relationships; that is, between principals (such as shareholders) and agents of the principals (for example, company executives). The two problems agency theory addresses are: 1) the problems that arise when the desires or goals of the principal and agent are in conflict, and the principal is unable to verify (because it difficult and/or expensive to do so) what the agent is actually doing; and 2) the problems that arise when the principal and agent have different attitudes towards risk.

Agency theory describes organizations as a nexus of contracts among self-interested principals and agents, including managers, stockholders and board of directors, and argues that the contractual arrangements that survive are those that best solve the problem of minimizing agency costs (Eisenhardt, 1989). Moreover, Jenson and Meckling (1976) argue that the agency theory is “a theory of the ownership (or capital) structure of the firm (p.69)” that seeks to understand the causes and consequences of goal incongruence and principal-agent problems

(Barney, 1996). The key idea of agency theory is that the principal-agent relationships should reflect efficient organization of information and risk bearing costs (Eisenhardt, 1989). Eisenhardt (1989) further argues that agency theory differs from transaction cost economics in its intra-organizational emphasis on the risk attitudes of principals and agents.

Agents usually know more about the tasks than the principals (information asymmetry). Principals seek to gain information (by inspection or evaluation), and to develop incentive systems to ensure agent actions in the principal's interests. Agency theorists attempt to design the most cost-effective information systems. Agency theory states that organizations are needed to help monitor and give incentives to agents doing coordinated, cooperative work. Cooperative situations involving complex tasks give rise to hierarchical structures (Scott, 1998). When ownership is concentrated on principal, contracts are needed to define obligations and incentives, especially those in the periphery of the organisation. "Agency theory, recognising the costs of monitoring systems, stresses the need to design incentive systems that will induce all participants to contribute their fair share to the common enterprise" (Scott, 1998, p. 142).

The central dilemma investigated by agency theorists is how to get the agent to act in the best interests of the principal when the agent has an informational advantage over the principal and divergent goals or interests. Agency problems occur whenever the principal delegates' authority to the agent and the welfare of the principal is affected by the choices of the agent (Arrow, 1985). The delegation of decision-making authority from the principal to the agent is problematic because a) the interests of the principal and the agent will typically diverge; b) the principal cannot perfectly and cost effectively monitors the agent's actions; c) the principal cannot perfectly and cost effectively monitor and acquire the information available to or possessed by the agent (Barney et al., 1996).

The managerial action, like all social action, is embedded in ongoing social structures and is not entirely determined by economic incentives and information asymmetries (Granovetter, 1985). For example, agency theory seems to adopt an

unrealistic view of humans and organizations as being primarily motivated by financial gain (Barney et al., 1996). But we know from behavioral research that individuals are also motivated by status, community, etc. Even if you accept the premise that individuals are rational, self-interested and opportunistic, there is no discussion of the role of non-pecuniary incentives such as prestigious awards that could potentially serve as effective mechanisms for the reduction of agency problems.

A more philosophical critique by Perrow (1971) and others argue that agency theory has an inherent investor focus (Hirsch et al., 1990). But the criticism is true of most organizational economics research. However, Barney et al. (1996) argue that the focus is neutral and can be applied to a variety of contexts. Agency theory assumes that both behavior and consequences are relatively homogeneous and easily monitored, which may not hold true in the real world. But in a complex web of dyadic relationships, for example, the simplicity of the dichotomous choice between monitoring and providing incentives to regulate behavior or outcomes is ineffective (O'Donnell, 2000). Moreover, guarding against opportunistic behavior can result in stifling initiative, creativity, entrepreneurship and innovation within firms, a cost that is often ignored by agency theorists (Davis, Schoorman and Donaldson, 1997).

Theories of power and conflict would likely support the possibility that principals can exercise control or provide incentives to align agent behavior. For example, conflict theories have argued that workers can be co-opted into unconsciously working toward serving managerial interests (Burawoy, 1979). A similar argument can be extended to the managerial-owner relationship. Similarly, the goals of managers and owners may be aligned either because the manager is from the same caste or social class as the owner, or because the managers have been socialized into their current positions through their educational and professional experience (Zeitlin, 1974).

### **3.2 Resource Dependence Theory**

Pfeffer (1972) asserts that boards enable firms to minimize dependence or gain resources. Boards of director's conclude that resource dependency theory is supported more often than other board perspectives (Johnson, Daily, and Ellstrand 1996), including agency theory. Thus, although resource dependency theory is less commonly used to study boards than agency theory, empirical evidence to date suggests that it is a more successful lens for understanding boards. Pfeffer and Salancik (1978) suggest that directors bring four benefits to organizations: (a) information in the form of advice and counsel, (b) access to channels of information between the firm and environmental contingencies, (c) preferential access to resources, and (d) legitimacy. Hillman, Cannella, and Paetzold (2000) create taxonomy of directors based on the resource dependency theory benefits that directors provide, exploring how specific types of directors may be more/less valuable as environments change such as deregulation. They propose that directors can be classified as "business experts," "support specialists," and "community influential's," corresponding to the different types of resources they bring to a board. Kroll, Walters, and Le (2007) use and colleagues' taxonomy, finding young post-initial public offering (IPO) firms benefit from specific types of directors. Jones, Makri, and Gomez-Mejia (2008) observe that family firms pursuing diversification similarly benefit from specific types of directors over others. Thus, research has progressed toward identifying particular types of directors who match specific environmental needs facing firms.

Another stream of resource dependency theory research focuses on the times/types of firms most likely to benefit from the board resource provision. Much of this research considers the stages of a firm's life cycle in which director resources are most beneficial. Zahra and Pearce (1989) first proposed the idea that firm life cycle stage may influence the importance of the resource dependence role of boards, something Lynall, Golden, and Hillman (2003) and Gabrielson (2007) suggest is more relevant during early life cycle stages. Daily and Dalton (1993) support this empirically, finding a significant relationship between several

board characteristics (such as board size and composition) and performance in small corporations. Others find the monitoring function may be less salient to small firms because of their lack of critical resources (Fiegener, Brown, Dreux and Dennis, 2000), suggesting resource provision is more important.

Similarly, Daily, Mcdougall, Covin, And Dalton (2002) find that resource dependency theory logic holds up most consistently in entrepreneurial firms compared with other theoretical perspectives: “in the entrepreneurial firm, the resource dependence role may be even more critical than for larger, mature firms” (Daily et al., 2002, p.403). Although Certo (2003) bases his study on signaling theory, his findings that prestigious boards can improve organizational legitimacy and subsequent IPO performance also support resource dependency theory. Similarly, Certo, Daily and Dalton (2001, p.44) find that board size is significantly related to IPO performance suggesting “potential investors may view larger boards as a signal of increased access to resources”.

The resource dependency theory perspective on boards also has been important in the study of organizational decline and bankruptcy (Daily, 1996; Daily and Dalton, 1992). This research suggests that the directors’ role as resource providers may be especially salient during decline and bankruptcy because distressed firms often experience a reduction in their relative resource bases (Cameron, Kim, & Whetten, 1987). In support of resource dependency theory, Daily (1996) finds that firms with a greater proportion of outside directors were more likely to successfully reemerge from bankruptcy. Additionally, he finds the proportion of outside and affiliated directors to be positively related to prepackaged bankruptcy filings and negatively related to time spent in bankruptcy. Arthaud-day, Certo, Dalton, and Dalton (2006) similarly propose that during legitimacy crises such as financial restatements, director turnover can be an important step toward restoring legitimacy and reestablishing broken links to the environment. As Daily and Dalton (1998, p.248) suggest, the findings regarding the relationship between boards of directors and declining firms provide a far more consistent picture of the impact of board composition and leadership structure than is found in the general literature on the relationship between these two governance elements and

firm outcomes.

Thus, both early in the life cycle and in stages of decline, empirical research supports resource dependency theory. These findings combined with support that matching board compositions to external needs accrues specific benefits, prompted Daily and Schwenk (1996) to suggest that resource dependency theory is a key determinant of board composition. Although resource dependency theory-based studies of boards represent a strong research stream, as mentioned earlier, it has been dwarfed by applications of agency theory. The mounting empirical evidence in support of resource dependency theory and boards, however, bodes well for the future health of the resource dependency theory stream. In their review of corporate governance research, Daily, Dalton, and Cannella (2003, p. 275) discuss the limited results obtained from an agency theory perspective and suggest that rather than focusing predominantly on directors' willingness or ability to control executives, in future research scholars may yield more productive results by focusing on the assistance directors provide in bringing valued resources to the firm and in serving as a source of advice and counsel for CEO's.

To summarize, board of directors' research has seen the greatest application of resource dependency theory over the past 30 years. Again, strong support exists for Pfeffer and Salancik's (1978) assertions that boards can manage environmental dependencies and should reflect environmental needs. Strong support also has accrued for the four benefits directors can bring to firms: advice and counsel, channels of information flow, preferential access to resources, and legitimacy. The dynamic nature of boards (such as changing composition as environmental needs change) appears to be a nearly normative convention, although this has received little empirical testing. However, like the other areas, scholars still call for a multi theoretic view of boards, particularly one including agency theory. A richer understanding of the specific resources individual directors bring to a board, as well as their motivations to contribute to them, is

also needed.

### **3.3 Stewardship Theory**

Stewardship theory is a theory that managers, left on their own, will indeed act as responsible stewards of the assets they control. This theory is an alternative view of agency theory, in which managers are assumed to act in their own self-interests at the expense of shareholders (Barney and Hesterly, 2008). It specifies certain mechanisms which reduces agency loss including tie executive compensation, levels of benefits and also manager's incentive schemes by rewarding them financially or offering shares that aligns financial interest of executives to motivate them for better performance (Barney and Hesterly, 2008).

### **3.4 Board Size and Firm Performance**

The first important board characteristic is board size and it has along with its effect upon board effectiveness been extensively studied (Jensen, 1993, p.831). The board size refers to the number of directors on the board (Nanka-Bruce, 2011, p.28). The board of directors is the main internal governance mechanism responsible for monitoring executive decisions (Nanka-Bruce, 2011). The effectiveness of corporate governance practice is a function of the board where it has a vital role to play in a company, as its function is to manage and direct the management (Nuryanah and Islam, 2011, p.17). It also plays a monitoring role since a separation exists between ownership and control within the company (Jensen and Meckling, 1976, p.305). Likewise, the board is also core to corporate governance mechanisms and is considered as the main mechanism that shareholders can employ to control top management (John and Senbet, 1998). In empirical studies consistent to agency theory, there are many researchers around the world that investigated the relationship between board size and firm performance and they found there exist a negative relationship between board size and firm performance either in the developed or developing countries as follows in the tables.

**Table – 3.1: Negative Relationship between Board Size and Firm Performance**

<b>Authors</b>	<b>Location</b>	<b>Sample</b>	<b>Method</b>	<b>DV</b>	<b>Findings</b>
Irina and Z. Nadezhda (2009)	German	270 companies for the period of 2000-2006	Regression	Tobin-Q and ROA	Negative relationship between board size and Tobin Q and ROA
Nanka-Bruce (2011)	Europe and America	Public Manufacturing Firms over 2003-05	Truncated Regression	Technical Efficiency	Negative relationship between board size and technical efficiency
Florackis (2005)	UK	962 non financial large firms that were listed on the UK stock exchange	Multiple Regression	Tobin Q	Negative relationship between board size and Tobin Q
Al Manaseer et al. (2012)	Jordan	5 banks over 2007-09	Multiple regression	ROE, ROA,	Negative relationship between ROE and ROA
Haslindar and Fazilah (2011)	Malaysia	Family and non family ownership firms in Malaysia from 1999-2005	Panel data regression	Tobin Q and ROE	Negative relationship between board size and Tobin Q and ROE

Another theory which is related to company's performance known as the resource dependence theory and it is related to board directors' size. The firm board size has been receiving increasing attention especially considering the failures of prominent businesses. The more number of board members, the more relations to the external environment exist to gather critical resources and information for decision making on corporate policies that will improve efficiency (Nanka-Bruce, 2011). The following table shows the positive relationship:

**Table – 3.2: Positive Relationship between Board Size and Firm Performance**

<b>Authors</b>	<b>Location</b>	<b>Sample</b>	<b>Method</b>	<b>DV</b>	<b>Findings</b>
Larmou and Vafeas (2010)	Greek	257 firm poor operating performances in three consecutive years ending during 1996-2000	Using Panel	ROA, ROE and Market to book ratio	Positive relationship between Board size and ROA, ROE, Market to book ration
Bauer, Eichholtz and Kok (2009)	US	113 observations (firm-years) during 2004-2006	OLS Regression	Tobin-Q, ROE, ROA	Positive relationship between board size and Tobin Q, ROE and ROE
Fairchild and Li (2005)	US	354 firms that were during 1990 to 1993.	Regression analysis	Book to market value ratio	Positive relationship between board size and Market to book ration
Najjar (2012)	Bahrain	5 insurance firm 2005-10	Pooled regression	ROE	Positive relationship between board size and ROE
Obiyo and Lenee, (2011)	Nigeria	10 firms of 51 firms and 2004 -2008.	Linear regression	ROE, NPM	Positive relationship between board size and ROE and NPM

In Pakistan the relationship between corporate governance, especially board size and firm performance, is still a fundamental issue for researchers (Arsalan et al., 2014). The effect of board size on firm financial performance (ROA) was measured in chemical and pharmaceutical sector of Pakistan by (Ibrahim,

Rehman and Raof, 2010) and found that there exists a negative correlation of ROA with board size. Moreover, Yasser, Entebang and Mansor (2011) had taken the sample of 30 Pakistani listed companies and measure the board size and firm performance (ROE) by using regression model and found positive relationship. Dar et al. (2011) conducted a research on oil and gas firms listed on Karachi Stock Exchange (KSE-100) and found that board size have positive insignificant relationship with ROE. Another research study examines the relationship between board size and firm performance. This relationship was tested in the light of Pareto Approach for the Pakistani banking sector. For this purpose a sample of fourteen listed commercial banks in Pakistan for the years 2008-2012. The results of this study found significant positive relationship between board size and bank performance. It is concluded in the findings that a large board size can enhance the bank performance in Pakistani scenario (Malik et al., 2014). On the basis of the aforementioned discussion, the following is the alternative hypothesis of the study.

**H<sub>1</sub>: Board size has significant positive effect on firm performance (ROA, ROE, Tobin's Q).**

### **3.5 Board Composition and Firm Performance**

Generally, board composition is a critical element of corporate governance that contributes to overseeing firm performance as several studies have evidenced (Adjaoud, Zeghal and Andaleeb, 2007, p.623). Board composition is described as the number of independent non-executive directors having a seat on the board relative to the total number of directors (Lawal, 2012, p.22). An independent non-executive director refers to an independent director having no affiliation with the firm other than directorship (Clifford and Evans, 1997, p.224). In addition, regarding to Pakistani code of corporate governance that the board has to have at least three persons is non-executive specifically; the board should comprise of a majority of non-executive directors as board independence plays a key role in monitoring (Lin, Liao and Chan, 2011, p.159).

Fama and Jensen (1983, p.337) claimed that external directors have reputations and social status to protect and these work as incentives in monitoring management and ensuring effective company running. Also, the board composition also assists in reducing agency problem and that shareholders should request that internal directors be replaced by external ones to achieve effective management monitoring (Hermalin and Weisbach, 1991, p.101). By the same token, (Javeed, Hassan and Azeem, 2014) argued that external directors offer a more effective level of objectivity when assessing the firm's situation. Similarly, Hermalin and Weisbach (1991) contended that external directors are more effective when monitoring and acting as a disciplining mechanism for managers. Advocates of the agency theory are convinced that corporate governance should result in higher stock prices or improved long-term performance as managers are monitored effectively and agency costs are minimized. Consistent to resource dependence theory, the external sources provide a firm with external channel to improve performance of the company. Moreover, an independent board allows board members to comprehend complex environments and give multiple knowledge and experience from different sources and in turn, improve firm performance (Pfeffer, 1972). Concerning agency theory and resource dependence theory, both supports the contention that when the company should have more board independence to achieve improved performance. Following table shows the positive relationship between board composition and firm performance.

**Table – 3.3: Positive Relationships between Board Composition and Financial Performance**

<b>Authors</b>	<b>Location</b>	<b>Sample</b>	<b>Method</b>	<b>DV</b>	<b>Findings</b>
Larmou and Vafeas (2010)	Mauritius	All 42 firms listed on the Mauritius Stock Exchange over 2007	OLS regression	Performance	Positive relationship between board composition and firm performance
Yasser Entebang and Mansor (2011)	Korea	1104 non financial firms 2005-07	OLS regression	Tobins Q	Positive relationship between board composition and Tobins Q
Fairchild and Li (2005)	US	371 firms during 2000 to 2001.	Multiple regression	ROA and Tobins Q	Positive relationship between board composition and ROA and Tobins Q
Obiyo and Lenee, (2011)	India	83 firm 2008-2010	Panel Regression	ROE, NPM	Positive relationship between board composition and ROE and NPM
Najjar (2012)	Jordan	15 banks in Jordan 2007-09	Multiple regression	ROA	Positive relationship amid board composition and ROA

In Pakistan effect of board composition was measured on firm's performance (ROA and ROE). A sample of 91 listed companies at KSE-100 index was randomly selected. Group statistics and independent sample t-test were used as most appropriate measures of the categorical variable board composition. Result of the study depicted those companies heaving independent directors in their board composition will show greater firm performance (Javeed, Hassan and

Azeem, 2014). Research on corporate governance and firm performance in Pakistan found that there exists a positive and significant relationship between ROE and board composition, which evidences the significant linkage between board composition and firm performance, as ROE is a measure of firm performance (Yasser et al., 2011).

Shah et al. (2011) examined the relationship that exists between ownership structure and performance of the listed companies in Pakistan and found that a more independent and effective board of directors accelerates or boosts a firm's performance (ROE). Their results reflect the linkage between board composition and firm performance and evidences that independent board members are important because companies if adopt independent board, can improve firm performance. Rashid et al. (2010) examined the relationship between independent board composition and firm performance and found that independent board directors added value to the firm performance (ROA) of Pakistani firms.

Moreover, in Pakistan there are studies (Javed and Iqbal, 2007; Ibrahim et al., 2010) which revealed that corporate governance, in particular board composition have a direct effect on firm performance and it will enhance firm performance (ROA and ROE). But there is some contrasting views sector wise analysis stated that there is an insignificant impact (Ibrahim et al., 2010) for example, on pharmaceutical sector's profitability and performance (ROE). Conclusively the existing literature in Pakistani (Rashid et al., 2010; Shah et al., 2011) shows that if the composition of board is it will ultimately reflect higher firm performance. But the conflicting point is that some studies (Ibrahim et al., 2010) also stated there is some evidence that firms with supermajority independent boards are less profitable than other firms and it suggested that it may be useful for firms to have a moderate number of inside or dependent directors. Based on the above discussion concerning agency theory and resource dependence theory, both support the contention that when the company should have more board independence to achieve resulting in improved performance. Based on theoretical perspective and debate above, the following is the hypothesis.

**H2: Board composition has significant positive effect on firm performance (ROA, ROE, Tobin's Q).**

### **3.6 Board Meeting and Firm Performance**

The board meeting represents the number of meetings the board has during a year. Board meetings are important because boards act on the behalf of the company and there is a method where the board acts collectively namely the passing of a resolution on board meetings. More meeting means more chances of considering different decisions by the boards (Ibrahim et al., 2010). Consistent to previous suggestions and the resource dependence theory as mentioned above, the relationship between board meetings and firm performance is expected to be positive (Al-Matari et al., 2012). There have been studies in varying countries that found a positive association between board meetings and firm performance. Additionally, Khanchel (2007) suggested that increased board activity is a response to poor performance which is in turn, related to improve operating performance in the near future indicating the existence of a lag effect. On the other hand (Ibrahim et al., 2010) suggested that boards have to balance the frequency costs and benefits. Another point of view came from (Javeed, Hassan and Azeem, 2014) who claimed that the board meeting frequency is secondary to its quality.

Code of Corporate Governance (2002) in Pakistan suggest to board of directors that they should meet regularly after notifying the issues to be discussed. Board of directors should conduct a meeting after each quarter. There are two schools of thoughts concerning the number of board meetings and performance. One view is that higher number of meetings increases the performance. Other school of thought considers that numbers of board meetings don't assist in enhancing performance or it is inversely related with the performance of firm. There are limited studies in the developed countries and the developing countries revealing this negative relation.

**Table – 3.4: Negative Relationship between Board Meeting and Financial Performance**

<b>Authors</b>	<b>Location</b>	<b>Sample</b>	<b>Method</b>	<b>DV</b>	<b>Findings</b>
García-Sánchez (2010)	Spain	116 non financial firms 2004-06	Truncated regression	Technical efficiency	Negative relationship between board meeting and firm technical efficiency
Mohd (2011)	Malaysia	162 non financial firms 2006-08	Multiple regression	ROA	Negative relationship between board meeting and ROA
Qinghua et al. (2007)	China	1262 listed firms 2003	Multiple regression	ROA and Tobin-Q	Negative relationship amid board meeting and ROA/TQ.
Hasnah (2009)	Malaysia	520 companies 2007	Multiple regression	Tobin's Q	Negative relationship between board meeting and firm Tobin Q

In Pakistan Dar et al. (2011) found that, frequencies of board meetings have positive relationship with performance (ROA and ROE). But these meetings have no significant relationship. Javed and Iqbal (2007) found that, board should conduct meetings four times in a year and also accompanying monthly meetings of various board committees attended by directors, CEO, and chairman. Yasser (2011) described that, board meetings have positive impact on firm performance (ROA). The reason may be that they meet regularly without any time constraint and discussed the issues in detail. In these meetings decisions are take seriously because corporate have to transfer their assets to future generations.

The second school of thought is that meetings are not useful and do not assist in enhancing performance, as a result of increase in board meetings the performance of firm decrease. Vafeas (1999) concluded that, number of board meetings in a year is negatively related to performance. Boards that conduct board meetings in a year are usually linked with poor performance. Share price declines as a result of an increase in the board activities. A handsome cost is linked with board meetings; it includes travel expenses, meeting fees and managerial time etc. Jensen (1993) found that, the board meetings are not useful because directors spend very little time together and in this time there is no meaningful exchange of ideas with management and among themselves also. Based on the above discussion, there is supposed to be a negative relationship between frequency of board meetings and firm performance. However, there are limited studies in the developed and developing countries pertaining to board meetings and firm performance and revealing that board meeting has negative relationship with firm performance (Al-Matari et al., 2012). The following is the hypothesis of the study

**H<sub>3</sub>: Number of board meeting has significant negative effect on firm performance (ROA, ROE, Tobin's Q).**

### **3.7 CEO Tenure and Firm Performance**

CEO tenure is considered as an important construct for research in the field of organization and executive leadership (Herly and Sisnuhad, 2011; Simsek, 2007). Additionally, CEO tenure has often been related to the leadership quality and power (Herly and Sisnuhad, 2011). The CEO's leadership position has been measured in several studies according to the number of years in this position (Bhagat and Bolton, 2008; Herly and Sisnuhad, 2011; Ozkan, 2011; Simsek, 2007).

On the basis of the resource dependence theory, the longer the tenure of the member, the higher his experience and knowledge gained (Pfeffer, 1987). In addition to that, Kyereboah-Coleman (2007) argued that with long CEO tenure in the firm, the incentive is heightened to promote the interest of shareholders owing

primarily to the fact that besides job security, the CEO is enabled to witness first hand, the outcome of the taken decisions and hence, has a positive impact on performance. Within the same field, the new CEO divulges extra information to steer clear of the suspicion that he/she is pursuing his/her personal interests. Hence, CEOs may be more inclined to divulge information compared to their long tenured counterparts particularly during low performance (Herly and Sisnuhad, 2011).

There are generally only a few studies that investigated the association between CEO tenure and firm performance in the developed countries and reported a positive association (Herly and Sisnuhad, 2011; Simsek, 2007). Other studies revealed similar results with the developing countries like (Al-Matari, Al-Swidi, BtFadzil and Al-Matari 2012; Ibrahim et al., 2010). According to the agency theory advocates, the relationship between CEO tenure and firm performance is negative but only few studies have been carried out to look into this relationship in developed countries. In addition, other author reported a negative result like (Maury, 2006).

A similar negative result was revealed between CEO tenure and firm performance by studies dedicated to the developing countries (Bektas and Kaymak, 2009; Herly and Sisnuhad, 2011; Jackling and Johl, 2009). On the other hand, other studies reported the absence of a relationship between CEO tenure and firm performance (e.g. Bhagat and Bolton, 2008; Fidrmuc and Fidrmuc, 2007; Firth et al., 2006; Gibson, 2003; Kyereboah-Coleman, 2007). The following table shows the positive relationship between CEO tenure and firm performance.

**Table – 3.5: Positive Relationship between CEO tenure and Firm Performance**

<b>Authors</b>	<b>Location</b>	<b>Sample</b>	<b>Method</b>	<b>DV</b>	<b>Findings</b>
Koufopoulos et al. (2008)	UK	358 firms 1998-2001	Multiple Regression	ROA	Positive relationship amid CEO tenure and ROA
Simsek (2007)	Swedish	All non financial companies 1993-2000	Logit Regression	Market to book	Positive relationship amid CEO tenure and market to book ratio
Herly and Sisnuhadi (2011)	Kuwait	136 non financial	Multiple Regression	ROA	Positive relationship amid CEO tenure and ROA
Hasnah (2009)	73 large firms	103 listed firms	Multiple Regression	Tobin's Q and ROA	Positive relationship amid CEO tenure and ROA and Tobins Q

In Pakistan so far none of the study has found in which CEO tenure and firm financial performance is measure. So, this study will be pioneer to measure the effect of CEO tenure on oil and gas sector financial performance. Therefore, following is the hypothesis for further empirical testing;

**H4: CEO tenure has significant positive effect on firm performance (ROA, ROE, Tobin's Q).**

### **3.8 The CEO Compensation and Firm Performance**

Executive compensation is a topic that has been debated within the field of corporate finance over the past twenty years. Compensation has its most direct effect on the attraction and retention of CEOs. According to Mayers and Smith (2010) compensation can align the interests of managers and shareholders.

Previous studies have a different measure of CEO compensation, such as total salary, bonuses, perquisites, stock option. Compensation in the form of cash encompasses salaries, bonuses and perquisites and stock options but the report on stock options is mixed (for firms that have options) and thus, a consistent measure throughout the firms is challenging to create.

From another perspective, according to Javeed et al., (2014) the tournament theory considers executive advancement in the business hierarchy as a tournament where individuals compete for rewards and promotions. Executives who show a high performance receive prizes in the form of generous pay and new position perks as the theory postulates that higher rewards can provide a significant success (Lawler, 1981). It has been comprehensively explained in the literature that CEO compensation has a significant impact on the firm performance. A thorough review of the current literature reveals conflicting results regarding this relationship (Adjaoud et al., 2007; Bauer et al., 2009; Deutsch 2007; Junarsin 2011; Kubo and Saito 2008; Pissaris et al., 2010; and Schiehl and Bellavance, 2009) found a positive relationship between CEO compensation and firm performance in the developed countries. In the developing countries, many researchers also found a positive association between CEO compensation and firm performance (Lin, Liao and Chan, 2011). On the other hand, there is evidence that revealed a negative relationship between CEO compensation and firm performance in developing countries (Dey, 2008). Similarly, in the developing countries, Javeed et al., (2014) found the relationship to be negative. Apart from that, there are some authors who found no relationship between CEO compensation and firm performance such as Adjaoud et al. (2007).

In Pakistan only a limited number of studies have been carried out on CEO compensation and firm performance (Hussain, et al., 2014). Adjaoud et al. (2007) carried out research on the transitional economy in order to find out the determinants of executive rewards and remuneration. They used data (panel set), which included a time series data spanning over 2000-2006 and cross sectional data integrating unbalanced panel. For analyzing their data they used “common

effect model after correlation and descriptive statistics (Hussain et al., 2014)". The results indicated that there is non-significant association among executive remuneration and firm performance; however, the size of the firm has a positive significant relationship with CEO compensation.

Al-Manaseer et al. (2014) examined the relationship between the firm size, performance and the composition of the board and the affect they have on CEO compensation. His data consisted of 83 listed firms on the Lahore Stock Exchange for the years 2007-2009. According to the result, it was concluded that the size of the firm is a major determinant of CEO compensation.

Hussain et al., (2014) conducted research on CEO compensation, size of the firm, and performance (ROA) on panel data of 15 companies of KSE for the years 2008-2010. Different statistical tests were used including descriptive statistics, correlation matrix, pooled OLS and common effects models. The research showed CEO compensation does not have any significant relationship with performance of the firm. Following table show the positive relationship between CEO compensation and firm performance.

**Table – 3.6: Positive Relationship between CEO compensation and Firm Performance**

Authors	Location	Sample	Method	DV	Findings
Dey (2008)	US	371 firms through 2000 to 2001.	Multiple regression	ROA and Tobins Q	Positive relationship between CEO compensation and ROA and Tobins Q
Frye, Nelling and Webb (2006)	US	400 companies that the period of 2001	Logistic regression	Performance	Positive relationship between CEO compensation and performance
Chen and Lee (2008)	Taiwan	Family firms covering the 2000 to 2005	Pooled regression	Sales, ROA,	Positive relationship between CEO compensation and Sales and ROA
Al-Farooque et al (2007)	Bangladesh	723 companies 8 years from 1995 to 2002.	SLS regression	Market to book value	Positive relationship between CEO-C and market value

Therefore, the following is the hypothesis.

**H<sub>5</sub>: CEO compensation has significant positive effect on firm performance (ROA, ROE, Tobin's Q).**

### **3.9 Board Change and Firm Performance**

Boards of directors are critical monitoring mechanisms that oversee management performance and protect the interests of shareholders (Fama & Jensen, 1983). The board change is defined to be the appointment of a new member in the board during a year (Fox & Opong, 1999). The objective behind a board change is to

give a new blood to the board and to make them more active in fulfilling their tasks. The board members' main target is to achieve the shareholder's target while at the same time achieving the target of the owners. So, agency theory postulates that the board is responsible to monitor and improve performance (Fama & Jensen, 1983). On the other hand, from the perspective of resource dependence theory, variety of members provides multiple knowledge and experience with which to enhance performance (Pfeffer, 1972, p. 328). Hence, this current study expects board changes to improve firm performance. More specifically, none of the previous studies have examined this relationship amid board change and firm financial performance in the developing countries (Al-Matari et al., 2014, p.153), and specifically, in Pakistan. Hence, the present study accounts for two important contributions; first, it examines the impact of firm board changes upon firm performance in Pakistan; and secondly, unique to itself, it is the pioneering study to examine the board change-firm performance relationship. Based on previous arguments the following is the hypothesis

**H<sub>6</sub>: Board changes have a significant positive effect on firm performance (ROA, ROE, Tobin's Q).**

### **3.10 Women Board Members and Firm Performance**

Building from the United States' Daily et al., (1999) found that women make 60% of all the purchases and, hence, inclusion of women on the boards of directors will likely boost up the revenue of the firms. In other words, women board members are sensitive observers of the market and hence, can bring a more realistic approach which can reflect the consumer point of view.

In Pakistan, research on women board members and firm performance are very limited (Shafique, Idrees and Yousuf, 2014). According to Hussain et al., (2014) gender diversity and firm performance reported that the women in top positions of the firm poorly manage the financial operations of the firm which results in negative firm financial performance. Haniffa and Hudaib (2006) found that females in top positions of management leans toward taking more risks which leads to better financial performance (ROE). According to Ibrahim (2010) there is

no considerable link between board gender diversity on firm performance (ROA) in Pakistan.

**H7: Women board member has significant positive effect on firm performance (ROA, ROE, Tobin's Q).**

### **3.11 Board Education and Firm Performance**

The role of a board is the internal corporate governance of a firm (Fama, 1980). A board is also a control system in a business (Fama and Jensen, 1983). A board of directors supervising management decisions in an efficient manner will improve firm's performance. By doing so requires each board member to be fully equipped with management knowledge such as finance, accounting, marketing, information systems, legal issues and other related areas to the decision making process. This requirement implies that the skills of each board member will contribute significantly and positively to management decisions, which then translated into the firm's performance (Nicholson and Kiel, 2004; Fairchild and Li, 2005; Adams and Ferreira, 2007). In Pakistan so far none of the study has found in which board education and firm financial performance is measure. So this research study will measure the board education and firm performance in oil and gas sector of Pakistan. On a ground of the above analysis, a research hypothesis is developed as below:

**H8: Board's educational has significant positive effect on firm's performance (ROA, ROE, Tobin's Q).**

### **3.12 Control Variables**

The control variables in this study will be the firm's age and size. The firm's age is an important determinant of growth, the variability of firm growth and the probability of firm dissolution (Evans, 1987). A study relating to firm age conducted by Dunne and Hughes (1994) finds that smaller companies were growing faster than the larger ones, though with more variable growth rate patterns. The smaller companies also shared a relatively low death rate from a

takeover compared to large companies, while medium sized companies were most vulnerable to a takeover. The findings also revealed that younger companies, for a given size, grew faster than older companies. Firm size can be “retarded” if a family management team is reluctant to raise external funds because it fears it will entail the loss of family control (Yasser, 2011). Daily and Dollinger (1992) argue that some family companies operate without growth plans. As a result, some family companies only grow at a pace consistent with meeting the advancement needs of organizational members within the family system. Cromie, Stephenson, and Montieth (1995) found that family companies were smaller in terms of employment and sales turnover than non-family companies. Trow (1961) argues that larger companies have more resources, making it easy to attract, train, and develop potential successors and to engage outside advisers who may encourage continuity planning (Yasser, 2011). To the best of this author’s knowledge control variables like firm size and age have not been measured previously in the oil and gas sector of Pakistan. So, this research study contributed to the existing body of literature on Pakistan.

**H<sub>9</sub>: Firm size has significant positive effect on firm’s performance (ROA, ROE, Tobin’s Q).**

**H<sub>10</sub>: Firm age has significant positive effect on firm’s performance (ROA, ROE, Tobin’s Q).**

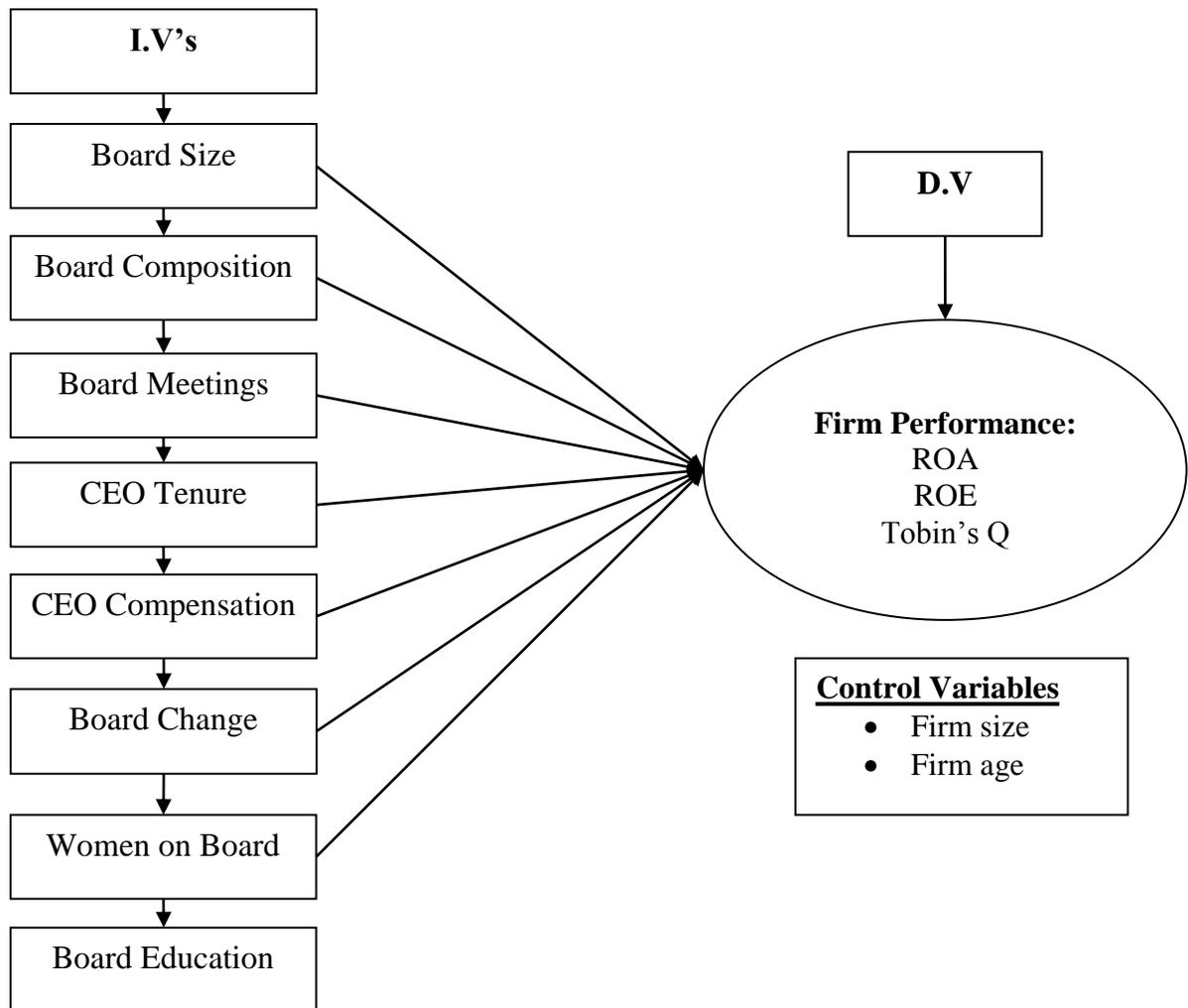
### **3.13 Research GAPS**

Following are the research gaps extracted from the existing literature on Pakistan:

Research studies reported that there are a limited amount of studies in the developed as well as developing countries pertaining to board meetings and firm performance (Al-Matari et al., 2012). Moreover, In Pakistan only a limited number of studies have been carried out on CEO compensation, women board members and firm’s financial performance (Hussain, Obaid, and Khan 2014; Shafique, Idrees and Yousaf , 2014). A further study reported that none of the previous studies examined in general this relationship amid board change and firm financial performance in the developing countries (Al-Matari et al., 2014,

p.153). In addition to the best of the author’s knowledge of Pakistan none of the studies have measured the board of directors’ characteristics with variables such as, CEO tenure, board education with control variables as, firm size and age and financial performance with the variable (Tobin’s Q) in the oil and gas sector of Pakistan. So, this research study fulfills the aforementioned gaps.

### 3.14 Conceptual Framework



## **Chapter – 4**

### **Research Methodology**

This chapter discusses research design, data collection and data analysis of the study. The contents of this chapter are: (1) to justify the study's research methodology, (2) to explain the research methodology used in the study, and (3) to demonstrate how research design, and data collection and analysis can be utilized in this study.

#### **4.1 Research Approach**

The quantitative research approach responds to research questions requiring numerical data whereas; the qualitative approach for research questions requires textural data (Williams, 2007). According to (Creswell, 2003, p. 77) quantitative research is specific in its surveying and experimentation, as it builds upon existing theories. The methodology of a quantitative research maintains the assumption of an empiricist paradigm (Creswell, 2003, p. 88). Quantitative research begins with a problem statement and involves the formation of a hypothesis, a literature review, and a quantitative data analysis. Creswell states, quantitative research “employ strategies of inquiry such as experimental and surveys, and collect data on predetermined instruments that yield statistical data” (2003, p.18). The findings from quantitative research can be predictive, explanatory, and confirming (Williams, 2007).

#### **4.2 Quantitative Research Methodology**

Creswell defines the research methodology as “the general approach the researcher takes in carrying out the research project” (2003 p.14). Quantitative research involves the collection of data so that information can be quantified and subjected to statistical treatment in order to support or refute “alternate knowledge claims” (Creswell, 2003, p.153). Creswell, (2003) asserts that quantitative research originated in the physical sciences, particularly in chemistry and physics. Creswell (2003) further argues that mathematical models as the methodology of

data analysis. Three historical trends pertaining to quantitative research include: research design, test and measurement procedures, and statistical analysis. Quantitative research also involves data collection that is typically numeric and the researcher tends to use mathematical models as the methodology of data analysis. Additionally, the researcher uses the inquiry methods to ensure alignment with statistical data collection methodology.

During the experimental research, the researcher investigates the treatment of an intervention into the study group and then measures the outcomes of the treatment. There are three types of exploratory approaches: pre-experimental, true experimental, and quasi-experimental (Creswell, 2003). The pre-experimental design involves an independent variable that does not vary or a control group that is not randomly selected. Campbell and Stanley (1963) endorsed the true experimental design, which provides a higher degree of control in the experiment and produces a higher degree of validity. The true experimental designs result in a systemic approach to quantitative data collection involving mathematical models in the analyses whereas; quasi-experimental design involves nonrandom selection of study participants. Therefore, control is limited and true experimentation is not possible. Since the variable cannot be controlled, validity may be sacrificed.

### **4.3 Research Design**

The researcher uses quantitative research technique because numerical change can likewise only accurately be studied using quantitative methods (Williams, 2007). Moreover, quantitative research method involves a numeric or statistical approach to research design (Williams, 2007). Contemporary study examines the effect of board of director's characteristics on firm financial performance in Pakistan. The secondary data (panel) was collected from oil and gas sector of Pakistan. Secondary data of dependent and independent variables are retrieved mainly from publications of company's financial statement of year 2000-2015. To analyze the collected data researcher used fixed effect multiple regression statistical model to analyze the impact of predictor's on the response variables. Statistical Package for Social Science (SPSS) software version 20.0 was used for the data analysis.

#### **4.4 Population**

The population of the study was the oil and gas sector of Pakistan which includes oil and gas marketing, oil and gas refinery and oil and gas petroleum exploration. In the oil and gas marketing sector of Pakistan there are two companies namely, Attock Petroleum and Pakistan State Oil (PSO). In the refinery sector there are six companies namely, Attock Refinery, Indus Oil Refinery, Khalifa Coastal Refinery, Pak-Arab Refinery, National Refinery and Pakistan Refinery Limited. In the petroleum exploration sector there four companies namely, Mari Petroleum Company Limited, Oil and Gas Development Company, Pakistani Oil Fields and Pakistani Petroleum. The total population of the oil and gas sector was comprised of twelve companies including (marketing, refinery and petroleum exploration). The data was collected from the aforementioned companies via online business records and yearly consolidated financial statements (balance sheet and income statement) of oil and gas companies working in Pakistan and also from the Karachi Stock Exchange (KSE-100) Index for the period between 2000 to 2015. I choose to study the entire population because the size of the population that has the particular set of characteristics was typically very small.

#### **4.5 Data Sources**

The data set has been taken from a number of sources, which include:

- 1) Internet Sources
- 2) KSE (100) Index
- 3) Research papers/Business Recorder

#### **4.6 Data Collection**

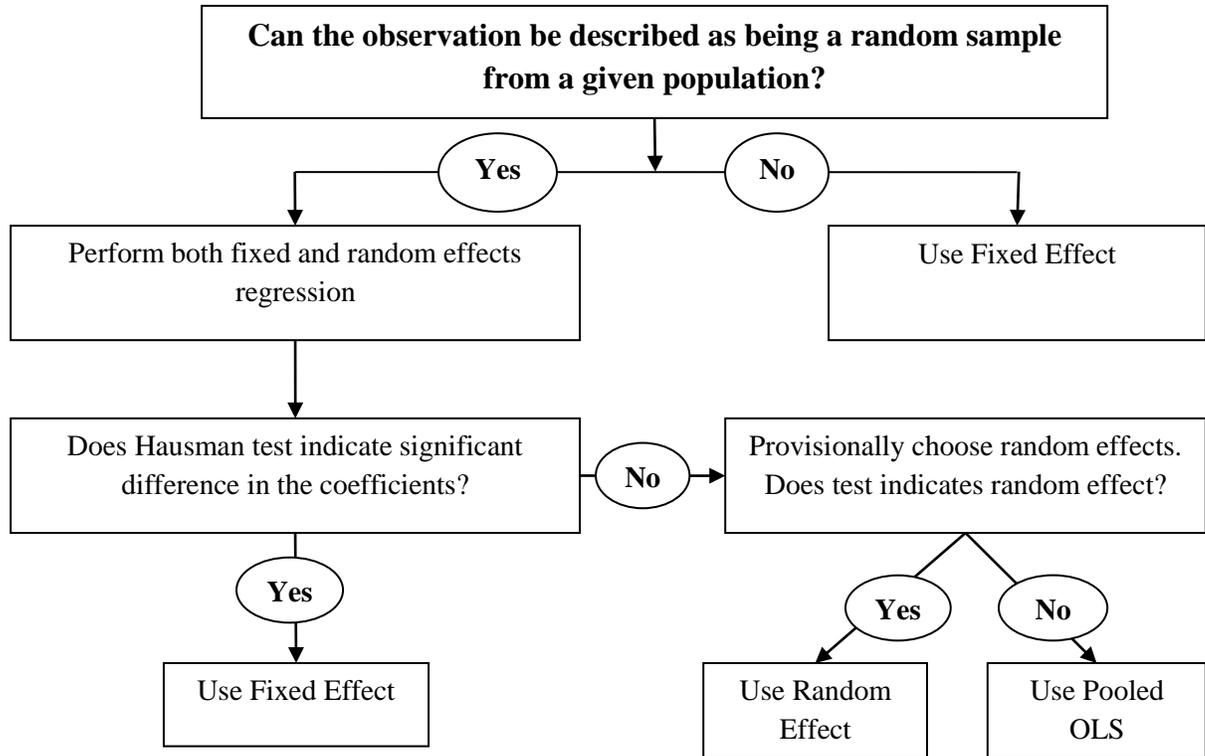
Total population sampling technique was used to collect the data about board of director's characteristics and firm financial performance of twelve oil and gas companies of Pakistan for the period of 2000 to 2015. According to Williams (2007) the most recent year's data should be incorporated in the research study for data analysis in order to get contemporary, clear and unbiased result. Therefore, panel data period for the proposed study is from 2000 to 2015 on yearly basis.

## **4.7 Reason of Selection of Panel Data**

In statistics and econometrics, the term panel data refers to multidimensional data frequently involving measurements over time. Panel data contain observations of multiple phenomena obtained over multiple time periods for the same firms or individuals. In biostatistics, the term longitudinal data is often used instead wherein a subject or cluster constitutes a panel member or individual in a longitudinal study (Diggle et al., 2002; Fitzmaurice et al., 2004). Series and sectional data are special cases of panel data that are one dimension only (one panel member or individual for the former, one time point for the latter). In this study I have used panel data for the year 2000 to 2015. The reason to use panel data for this study is that it helps in controlling the bias caused by unobserved heterogeneity (Tufail, 2013, p.14). It covers both dimensions i.e. time series and cross-sectional and panel data set has large number of observations. It provides more informative data than simple time series and cross sectional data with less multi-collinearity in variables (Amjad, Bilal, Tufail, 2013, p.14). The panel data set used is cross-sectional which is strongly balanced since observation is available for every unit and for every time period.

## 4.8 Choice of Regression Model for Panel Data

Following is the model for choice of regression model selection for panel data:



Source: Adopted from Dougherty (2011)

The decision regarding which regression model provide best suitable result fixed effects model or random effects model, is mainly based on decision making criteria presented by Dougherty (2011) which is above mentioned. According to this figure, if no sample is taken from the population, then both techniques of panel data such as fixed effects and random effects should be employed. Fixed effect approach primarily concerns with uniqueness of every cross sectional component in sample and permit intercept term to vary across each component. On the other hand, random effect model assumes that variables in the study are not correlated by any means. I used the total population sampling which is the type of purposive sampling so in that case according to the suggestions given by (Dougherty, 2011) researcher used fixed effects model instead of other models.

## 4.9 Measurement and Concept of Variables

Variables	Definition	Measurement
<b>Dependent variable</b>		
Firm Performance (ROA,ROE, Tobin's Q)	<p><b>ROA:</b> An indicator of how profitable a company is relative to its total assets</p> <p><b>ROE:</b> The amount of net income returned as a percentage of shareholders equity</p> <p><b>Tobin' Q:</b> The ratio of the market value of an additional unit of capital to its replacement cost.</p>	$ROA = \frac{\text{Net Income}}{\text{Total Asset}}$ $ROE = \frac{\text{Earning befor tax and interest}}{\text{Total assets}}$ $\text{Tobin's Q} = \frac{\text{Total market value of firm}}{\text{Total Asset value of firm}}$
<b>Independent variables</b>		
Board Size (%)	Total number of directors serving on the board of directors.	
Board Composition (%)	The number of independent non-executive directors on the board relative to the total number of directors.	
Board Meeting (number)	The frequency number of meetings during a year for the board directors.	
CEO Tenure	The time period of CEO's serving in the company.	
CEO Compensation	The total CEO compensation is the sum of the total. Cash compensation that includes salaries, bonuses and perquisites.	
Female Board Member	Total number of female board members serving with the board of directors	
Board Education	Dummy variable 1 for literate and 0 for illiterate	
Board Change	Dummy variable 1 if the board has a new appointment during a year and 0 others.	
<b>Control variables</b>		
Firm Size	Firm Size	Natural logarithm of book value of total assets
Firm Age	Years of establishment	Natural logarithm of years since establishment

## Chapter – 5

### Data Analysis

Chapter 5 presents the data analysis and interpretation. The objectives of this chapter are a) to systematically present the descriptive findings of the research study, b) to interpret significance of these findings as results of data analysis and c) to present the results of testing the model for firm ROA, ROE and Tobin's Q.

### 5.1 Data Presentation, Analysis and Interpretation

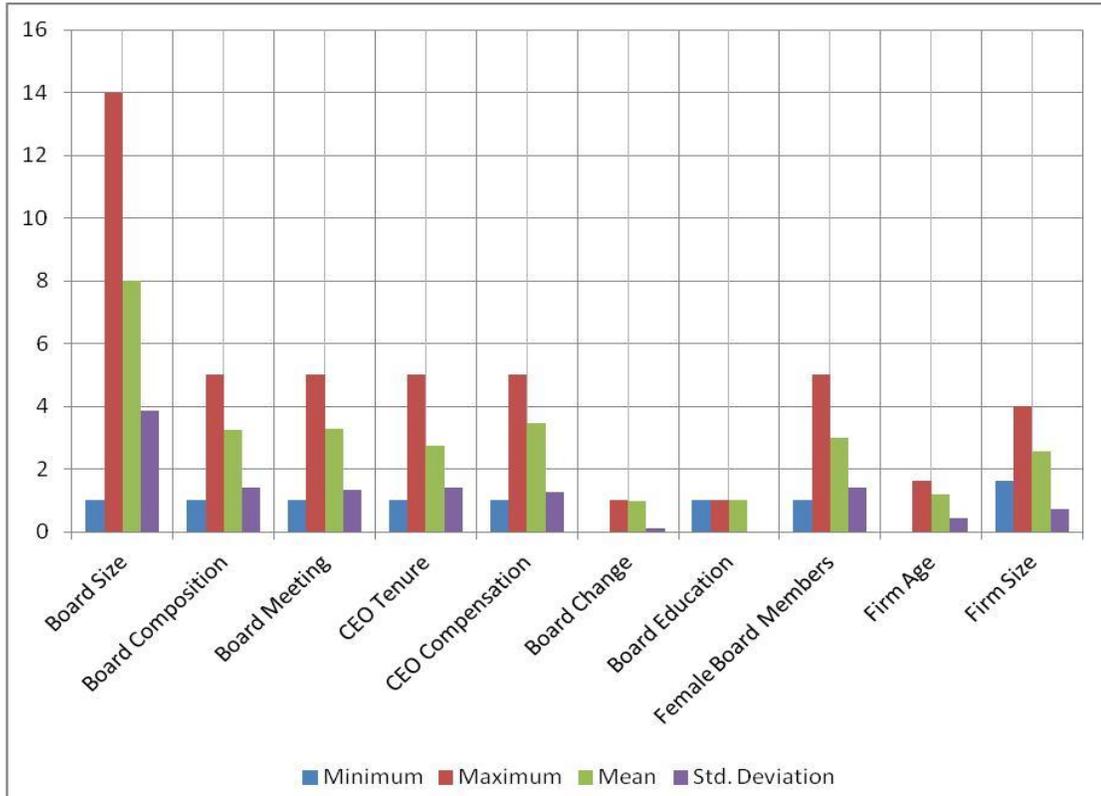
This researcher used Statistical Package for Social Sciences (SPSS) version 20.0 software for the data analysis. Primarily descriptive statistics were calculated and then correlation and regression statistical tools were applied on the data.

**Table –5.1: Descriptive Statistics**

	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
Board Size	1.00	14.00	8.0193	3.85786
Board Composition	1.00	5.00	3.2367	1.41319
Board Meeting	1.00	5.00	3.2947	1.35285
CEO Tenure	1.00	5.00	2.7585	1.42434
CEO Compensation	1.00	5.00	3.4493	1.25260
Board Change	0.00	1.00	.9855	0.11980
Board Education	1.00	1.00	1.0000	0.00000
Female Board Members	1.00	5.00	3.0097	1.40038
Firm Age	0.00	1.61	1.1784	0.43761
Firm Size	1.61	3.99	2.5778	0.71104
Valid N (list wise)				

The above table depicts the descriptive statistics of the predictor variables. The calculated descriptive statistics includes number of observations (N), minimum and maximum ranges, mean and standard deviation of the data.

**Figure – 1: Descriptive Statistics**



## 5.2 Correlation

### 5.2.1 Matrix Correlation

In statistics, the Pearson product-moment correlation coefficient (sometimes referred to as PCC or Pearson's  $r$ ) is a measure of the linear correlation (dependence) between two variables  $X$  and  $Y$ , giving a value between  $+1$  and  $-1$  inclusive, where  $1$  is total positive correlation,  $0$  is no correlation, and  $-1$  is total negative correlation. It is widely used in the sciences as a measure of the degree of linear dependence between variables (Hussain and Manzoor, 2014). Pearson's correlation coefficient when applied to a population is commonly represented by the Greek letter  $\rho$  (rho) and may be referred to as the population correlation coefficient or the population Pearson correlation coefficient. The formula for  $\rho$  is as follows:

$$\rho_{X,Y} = \frac{\text{cov}(X, Y)}{\sigma_X \sigma_Y}$$

Where:

$\text{cov}$  is the covariance

$\sigma_X$  is the standard deviation of  $X$

The formula for  $\rho$  can be expressed in terms of mean and expectation. Since

$$\bullet \mid \text{cov}(X, Y) = E[(X - \mu_X)(Y - \mu_Y)]$$

Then the formula for  $\rho$  can also be written as

$$\rho_{X,Y} = \frac{E[(X - \mu_X)(Y - \mu_Y)]}{\sigma_X \sigma_Y}$$

Where:

- $\text{cov}$  and  $\sigma_X$  are defined as above
- $\mu_X$  is the mean of  $X$
- $E$  is the expectation.

Since

- $\mid \mu_X = E(X)$
- $\mid \mu_Y = E(Y)$
- $\mid \sigma_X^2 = E[(X - E(X))^2] = E(X^2) - E(X)^2$
- $\mid \sigma_Y^2 = E[(Y - E(Y))^2] = E(Y^2) - E(Y)^2$
- $\mid E[(X - \mu_X)(Y - \mu_Y)] = E[(X - E(X))(Y - E(Y))] = E(XY) - E(X)E(Y),$

Then the formula for  $\rho$  can also be written as

$$\rho_{X,Y} = \frac{E(XY) - E(X)E(Y)}{\sqrt{E(X^2) - E(X)^2} \sqrt{E(Y^2) - E(Y)^2}}$$

Following are the result of Pearson's r for population.

**Table –5.2: Matrix Correlation**

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Board Size	1												
2. Board Composition	-.040	1											
3. Board Meeting	.109	.159*	1										
4. CEO Tenure	.028	.159*	.234**	1									
5. CEO Compensation (million)	.185**	-.006	.752**	.184**	1								
6. Board Change	.053	-.094	-.093	.008	-.118	1							
7. Board Education	.229**	.041	.157*	-.119	.193**	.108	1						
8. Female Board Members	-.053	.200**	.765**	.167*	.576**	-.115	.028	1					
9. Firm Size	.075	.173*	.615**	.105	.609**	-.078	.030	.554**	1				
10. Firm Age	-.029	.072	-.060	-.012	-.139*	.072	-.057	-.048	.073	1			
11. ROA	-.088	.190**	-.105*	.203**	.003	-.014	.013	.057	-.055	-.089	1		
12. ROE	-.076	.185**	-.106*	.198**	.005	-.012	.025	.055	-.066	-.090	.997**	1	
13. Tobin's Q	-.058	.174*	-.102*	.187**	.010	-.009	.039	.050	-.080	-.093	.986**	.996**	1

\*P<.05, \*\*P<.01

The Pearson Correlation was performed to examine the relationship amid predictors and response variables. The result of correlation amid board size with ROA ( $r = -.088, p > .05$ ), ROE ( $r = -.076, p > .05$ ) and Tobin's Q ( $r = -.058, p > .05$ ) predicts negative and insignificant relationship with each other. Pearson correlation amid board composition with ROA ( $r = .190, p < .05$ ), ROE ( $r = .185, p < .05$ ) and Tobin's Q ( $r = .174, p < .05$ ) predicts significant positive relationship with each other. Board meeting and ROA ( $r = -.105, p < .05$ ), ROE ( $r = -.106, p < .05$ ) and Tobin's Q ( $r = -.102, p < .05$ ) predicts significant negative relationship with each other. CEO tenure with ROA ( $r = .203, p < .01$ ), ROE ( $r = .198, p < .01$ ) and Tobin's Q ( $r = .187, p < .01$ ) predicts significant positive relationship with each other. CEO compensation with ROA ( $r = .003, p > .05$ ), ROE ( $r = .005, p > .05$ ) and Tobin's Q ( $r = .010, p > .05$ ) predicts insignificant positive relationship with each other. Board change with ROA ( $r = -.014, p > .05$ ), ROE ( $r = -.012, p > .05$ ) and Tobin's Q ( $r = -.009, p > .05$ ) represents insignificant negative relationship with each other. Board education with ROA ( $r = .013, p > .05$ ), ROE ( $r = .025, p > .05$ ) and Tobin's Q ( $r = .039, p > .05$ ) predicts significant positive relationship with each other. Female board members with ROA ( $r = .057, p < .05$ ), ROE ( $r = .055, p < .05$ ) and Tobin's Q ( $r = .050, p < .05$ ) predicts significant positive relationship with each other. Firm Age with ROA ( $r = -.055, p > .05$ ), ROE ( $r = -.066, p > .05$ ) and Tobin's Q ( $r = -.080, p > .05$ ) represents insignificant negative relationship with each other. Firm size with ROA ( $r = -.089, p > .05$ ), ROE ( $r = -.090, p > .05$ ) and Tobin's Q ( $r = -.93, p > .05$ ) represents insignificant negative relationship with each other.

### **5.3 Regression Analysis**

In statistics, regression analysis is a statistical process for estimating the relationships among variables. It includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between dependent variable and one or more independent variables (or 'predictors'). More specifically, regression analysis helps one understand how the typical value of the dependent variable (or 'criterion variable') changes when any one of the

independent variables is varied, while the other independent variables are held fixed. Most commonly, regression analysis estimates the conditional expectation of the dependent variable given the independent variables – that is, the average value of the dependent variable when the independent variables are fixed. Less commonly, the focus is on a quintile, or other location parameter of the conditional distribution of the dependent variable given the independent variables.

#### **5.4 Assumption for Panel Data Multiple Regression Analysis**

Panel data multiple regression analysis makes several key assumptions. The first assumption is the data should be normally distributed. The second assumption is that there exists no multi-collinearity in the data. The third is that there exists no auto-correlation in the data and last assumption is that there exists homoscedasticity in the data (Al-Matari, Al-Swidi and BtFadzil 2014). I used following analysis for checking the regression assumptions.

#### **5.5 Normality of Data**

The normality of the data was calculated through Kolmogorov-Smirnov (KS-test) and Shapiro-Wilk test. Following are the hypotheses of KS and Shapiro-Wilk test.

$H_0 : P > .05$  (data is normally distributed)

$H_1 : P < .05$  (data is not normally distributed)

Following is the test statistics of KS and Shapiro Wilk test.

##### **5.5.1 Kolmogorov-Smirnov Test Statistics**

The empirical distribution function  $F_n$  for  $n$  id observations  $X_i$  is defined as

$$F_n(x) = \frac{1}{n} \sum_{i=1}^n I_{[-\infty, x]}(X_i)$$

Where  $I_{[-\infty, x]}(X_i)$  is the indicator function, equal to 1 if  $X_i \leq x$  and equal to 0 otherwise.

The Kolmogorov–Smirnov statistic for a given cumulative distribution function  $F(x)$  is

$$D_n = \sup_x |F_n(x) - F(x)|$$

Where  $\sup_x$  is the supremum (the smallest quantity that is greater than or equal to each of a given set or subset of quantities) of the set of distances.

### 5.5.2 Shapiro-Wilk Test Statistics

The Shapiro–Wilk test utilizes the null hypothesis principle to check whether a sample  $x_1, \dots, x_n$  came from a normally distributed population. The test statistic is:

$$W = \frac{\left(\sum_{i=1}^n a_i x_{(i)}\right)^2}{\sum_{i=1}^n (x_i - \bar{x})^2}$$

Where

- $x_{(i)}$  (with parentheses enclosing the subscript index  $i$ ) is the  $i$ th order statistic, i.e., the  $i$ th-smallest number in the sample;
- $\bar{x} = (x_1 + \dots + x_n) / n$  is the sample mean;

$$(a_1, \dots, a_n) = \frac{m^T V^{-1}}{(m^T V^{-1} V^{-1} m)^{1/2}}$$

Where

$$m = (m_1, \dots, m_n)^T$$

and  $m_1, \dots, m_n$  are the expected values of the order statistics of independent and identically distributed random variables sampled from the standard normal distribution, and  $V$  is the covariance matrix of those order statistics.

**Table –5.3: Tests of Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Board Size	.189	207	.274	.922	207	.267
Board Composition	.285	207	.548	.838	207	.678
Board Meeting	.215	207	.624	.876	207	.345
CEO Tenure	.166	207	.247	.875	207	.639
CEO Compensation	.230	207	.584	.878	207	.578
Board Change	.535	207	.642	.106	207	.189
Board Education	.465	.207	.651	.902	207	.432
Female Board Members	.194	207	.276	.883	207	.154
Firm Age	.288	207	.687	.734	207	.241
Firm Size	.247	207	.354	.877	207	.196
ROA	.233	207	.276	.885	207	.182
ROE	.245	207	.584	.875	207	.146
Tobin's Q	.239	207	.642	.887	207	.171

a. Lilliefors Significance Correction

For the normal data the significance value should be above than  $P > 0.05$  (Fasano and Franceschin, 1987). In above captioned table all the computed values of all aforementioned variables are above 0.05, which further indicates that the data is normally distributed. So, null hypothesis should be accepted that data is normally distributed.

## 5.6 Homoscedasticity and Heteroscedasticity of Data

In statistics, Levene's test is an inferential statistic used to assess the equality of variances for a variable calculated for two or more groups. The equality of variance was checked by Levene statistics. According to (Howard, 1960) if the P value of Levene statistics is greater than 0.05 this depicts population variance is

equal or homoscedasticity and if the value of P is less than 0.05 this depicts population variance is unequal (heterogeneity). Following is the hypothesis of homoscedasticity and heteroscedasticity of data.

$H_0 : P > .05$  (homoscedasticity of data)

$H_1 : P < .05$  (heteroscedasticity of data)

### 5.6.1 Levene Test Statistics

The following is the formula of the homoscedasticity of the data which is given by Howard (1960). The Levene statistics is abbreviated to W and defined as follows:

$$W = \frac{(N - k) \sum_{i=1}^k N_i (Z_{i.} - Z_{..})^2}{(k - 1) \sum_{i=1}^k \sum_{j=1}^{N_i} (Z_{ij} - Z_{i.})^2}$$

Where

- $W$  is the result of the test,
- $k$  is the number of different groups to which the sampled cases belong,
- $N$  is the total number of cases in all groups,
- $N_i$  is the number of cases in the  $i$ th group,
- $Y_{ij}$  is the value of the measured variable for the  $j$ th case from the  $i$ th group,

$$Z_{ij} = \begin{cases} |Y_{ij} - \bar{Y}_i|, & \bar{Y}_i \text{ is a mean of } i\text{-th group} \\ |Y_{ij} - \tilde{Y}_i|, & \tilde{Y}_i \text{ is a median of } i\text{-th group} \end{cases}$$

**Table –5.4: Leven Statistics**

<b>Variables</b>	<b>F</b>	<b>Sig</b>
Board Size	0.73	.788
Board Composition	1.89	.174
Board Meeting	1.03	.313
CEO Tenure	1.43	.237
CEO Compensation	2.18	.145
Board Change	1.47	.239
Board Education	.035	.879
Female Board Members	3.14	.082
Firm Age	1.11	.293
Firm Size	.738	.394
ROA	.323	.570
ROE	.862	.354
Tobin's Q	.737	.393

In above captioned table the significance values of board size, board composition, board meeting, CEO tenure, CEO compensation, board change, board education, female board members, firm age, firm size, ROA, ROE and Tobin's Q shows  $P > .788, .174, .313, .237, .145, .239, .879, .082, .293, .394, .570, .354$  and  $.393$  respectively which further demonstrates there exists homoscedasticity in data.

## **5.7 Durbin Watson Test for Panel Data**

In order to fulfill the third assumption of panel regression the autocorrelation was tested using the Durbin-Watson test. The Durbin-Watson test values lay between 0 and 4, values around 2 and less than two indicates no autocorrelation (Montgomery, Peck and Vining, 2001; Franzini and Narendranathan, 1982; Watson, 1951). As a rule of thumb values of  $1.0 < d < 2.0$  show that there is no auto-correlation in the data. Following are the hypothesis of Durbin-Watson statistics.

$H_0: \mu > 2$  (Auto-correlation in the data)

$H_1: \mu \leq 2$  (No auto-correlation in the data)

For panel data this statistic was generalized as follows by Bhargava et al. (1982). If  $e_{i,t}$  is the residual from an OLS regression with fixed effects for each panel  $i$ , associated with the observation in panel  $i$  at time  $t$ .

### 5.7.1 Durbin-Watson Test Statistics for Panel Data

The following is the formula of auto-correlation presented by Durbin and Watson (1951).

$$d_{pd} = \frac{\sum_{i=1}^N \sum_{t=2}^T (e_{i,t} - e_{i,t-1})^2}{\sum_{i=1}^N \sum_{t=1}^T e_{i,t}^2}.$$

This statistic can be compared with tabulated rejection values (Bhargava, Franzini and Narendranathan, 1982, p.537). These values are calculated dependent on  $T$  (length of the balanced panel-time periods the individuals were surveyed),  $K$  (number of regressors) and  $N$  (number of individuals in the panel). This test statistic can also be used for testing the null hypothesis of a unit root against stationary alternatives in fixed effects models (Bhargava et al, 1982).

**Table –5.5: Durbin-Watson Statistics**

Models	Durbin-Watson
IV's-----ROA	1.107
IV's-----ROE	1.108
IV's-----Tobin's Q	1.094

The above table shows the Durbin-Watson statistics of three different regression models. All the computed values are less than 2. According to (Montgomery, Peck and Vining, 2001; Bhargava, Franzini and Narendranathan, 1982; Watson, 1951) Durbin-Watson values around 2 and less than two indicates no

autocorrelation. So, alternate hypothesis should be accepted that there exists no auto-correlation in the data.

## 5.8 Multicollinearity

In statistics, multicollinearity (also collinearity) is a phenomenon in which two or more predictor variables in a multiple regression model are highly correlated, meaning that one can be linearly predicted from the others with a non-trivial degree of accuracy. In this situation the coefficient estimates of the multiple regressions may change erratically in response to small changes in the model or the data. Multicollinearity does not reduce the predictive power or reliability of the model as a whole, at least within the sample data set; it only affects calculations regarding individual predictors. That is, a multiple regression model with correlated predictors can indicate how well the entire bundle of predictors predicts the outcome variable, but it may not give valid results about any individual predictor, or about which predictors are redundant with respect to others.

Multicollinearity refers to a situation in which two or more explanatory variables in a multiple regression model are highly linearly related. We have perfect multicollinearity if, for example as in the equation above, the correlation between two independent variables is equal to 1 or -1. In practice, we rarely face perfect multicollinearity in a data set. More commonly, the issue of multicollinearity arises when there is an approximate linear relationship among two or more independent variables.

Mathematically, a set of variables is a perfectly multicollinear if there exist one or more exact linear relationships among some of the variables. For example, we may have

$$\lambda_0 + \lambda_1 X_{1i} + \lambda_2 X_{2i} + \dots + \lambda_k X_{ki} = 0$$

Holding for all observations  $i$ , where  $\lambda_j$  are constants and  $X_{ji}$  is the  $i^{\text{th}}$  observation on the  $j^{\text{th}}$  explanatory variable.

**Table–5.6: Collinearity Statistics for IV’s and ROA**

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Board Size	.888	1.067
Board Composition	.865	1.149
Board Meeting	.251	4.532
CEO Tenure	.884	1.094
CEO Compensation	.346	2.806
Board Change	.945	1.039
Board Education	.848	4.022
Female Board Members	.376	1.071
Firm Age	.515	1.965
Firm Size	.935	1.069

DV: ROA, ROE, Tobin’s Q

The above table includes multicollinearity figures. According to Robert and O'Brien (2007) tolerance less than 0.20 indicate the multicollinearity problem. In the above table the value of tolerance of all the independent variables values is above than .20 which evidence that the level of tolerance is completely reasonable and good. The reciprocal of tolerance is recognized as variance inflation factor (VIF). According to Robert and O'Brien (2007) when the variance inflation factor is 10 or higher than it implies the multicollinearity issue. In the given table the value of VIF of each independent variable are not above than 4.532, which have not shown any multicollinearity issues in the data.

## 5.9 Fixed Effect Multiple Regression Model

Multiple regression analysis is used to establish the relationship among independent variables and the dependent variable and to identify the direction of the relationship. It reflects the level to which a set of variables is capable of predicting a specific outcome. It is also a multivariate statistical method that can

be utilized to investigate the relationship between independent variables and a single dependent variable (Al-Matari et al., 2014). The research study uses fixed effect multiple regression model in order to analyze effect of independent variables (board size, board composition, board meeting, CEO tenure, CEO compensation, board change, female board members, firm age and firm size) on dependent variable firm financial performance (ROA, ROE and Tobin's Q).

The fixed effect multiple regression model is as follow.

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 X_{6it} + \beta_7 X_{7it} + \beta_8 X_{8it} + \beta_9 X_{9it} + \mu_{it}$$

Where Y is (dependent variable)

$\beta_0$  = constant

$\beta$  = regression coefficient which may be positively or negatively affecting dependent variable.

$\mu_{it}$  = error of the firm i in time t

Following is the fixed effect multiple regression model which predicts the direct effect of predictors and ROA.

$$ROA_{it} = \beta_{0i} + \beta_1 (BS_{it}) + \beta_2 (BComp_{it}) + \beta_3 (BM_{it}) + \beta_4 (CEOT_{it}) + \beta_5 (CEOC_{it}) + \beta_6 (BC_{it}) + \beta_7 (BE_{it}) + \beta_8 (FBM_{it}) + \beta_9 (FA_{ln}) + \beta_{10} (FS_{ln}) + \mu_{it} \dots \dots \dots (1)$$

Where

- ROA= Return on Investment (dependent variable)
- BS= Board Size (Independent variable)
- BComp = Board Composition (Independent variable)
- BM = Board Meeting (Independent variable)
- CEOT = CEO Tenure (Independent variable)
- CEOC = CEO Compensation (Independent variable)
- BC = Board Change (Independent variable)
- BE = Board Education (Independent variable)
- FBM = Female Board Members (Independent variable)

FA = Firm Age (ln)

FS = Firm Size (ln)

$\mu_{it}$  = error of the firm i in time t

**Table –5.7: Regression (Fixed Effect Multiple Regression Model)**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.426	.181	.140	1.2675

**ANOVA**

Model	Sum of Square	Df	Mean Square	F	Sig
Regression	69.751	10	6.97	4.34	.000
Residual	314.91	196	1.607		
Total	384.66	206			

**Coefficients**

	Unstandardized Coefficient		Standardized Coefficient		
	B	Std. Error	Beta	T	Sig
Constant	2.590	.911		2.844	.005
Board Size	-.024	.024	-.069	-.999	.319
Board Composition	.192	.067	.199	2.859	.005
Board Meeting	-.587	.130	-.581	-4.506	.000
CEO Tenure	.218	.066	.227	3.309	.001
CEO Compensation	.276	.120	.253	2.302	.022
Board Change	.102	.758	.009	.135	.893
Board Education	.240	.215	.078	1.115	.266
Female Board Members	.303	.103	.310	2.943	.004
Firm Size	-.227	.281	-.073	-.806	.421
Firm Age	-.149	.128	-.078	-1.163	.246

a. Predictors: (Constant), BS, BC, BM, CEOT, CEOC, BCh, BE, FBM, FA(ln), FS (ln) DV: ROA

The correlation coefficient i.e. “R” = .426 or 42.6% relationship exists between board change, board composition, board meeting, CEO tenure, CEO compensation, board change, board education, female board members, firm age,

firm size (I.V's) and return on asset (D.V). The coefficient of determination "R<sup>2</sup>" was represents .181 that shows 18.1% of variation in ROA is explained by board change, board composition, board meeting, CEO tenure, CEO compensation, board change, board education, female board members, firm age and firm size. In the above table the F value is found 4.341 and the significance value is less than  $P \leq 0.05$  that shows that over all regression models is statistically significant, valid and fit.

In the above table the regression coefficient ( $\beta_1$ ) shows the value of -.069 which implies that one percent increase in board size decreases by 6.9% in the ROA if other variables are kept controlled. Moreover, one unit increase in board size will decrease .24 units in ROA. The T value is -.999 and is found insignificant at .319 because significance level is  $P < .05$ . This further indicates board size is not a significant predictor of ROA so that the alternate hypotheses should be rejected and null hypothesis should be accepted that is: Board Size has insignificant effect on ROA. The result is consistent with the previous studies of Rachdi and Aneur, 2011; Dar et al., 2011; Millet-Reyes and Zhao, 2010, Al-Matari, et al., 2014.

The regression coefficient ( $\beta_2$ ) shows the value of .199 that implies that one percent increase in board composition increases 19.9% in ROA if other variables are kept controlled. Furthermore, one unit increase in board composition will increase .192 units in ROA. The T value is 2.859 and is significant at .005 because significance level is  $P < .05$ . It implies that the board composition is the significant predictor of firm performance so alternate hypothesis should be accepted that is: Board composition has significant positive effect on ROA. The result is consistent with the previous study of Al-Matari, et al., 2014.

Regression coefficient ( $\beta_3$ ) shows the value of -.581 that implies that one percent increase in board meeting decreases 58.1% in ROA if other variables are kept controlled. The T value is -4.50 and is significant at .000. Moreover, one unit increase in board meeting will decrease .587 units in ROA. It implies that board meeting has significant negative effect on firm performance the alternate hypothesis should be accepted that is: Board meeting has significant negative

effect on ROA. The result is consistent with the previous studies of Al-Matari et al., 2014, Al-Manaseer, 2014.

The regression coefficient ( $\beta_4$ ) shows the value of .227 that implies that one percent increase in CEO tenure increases 22.7% in ROA if other variables are kept controlled. This further revealed that one unit increase in CEO tenure will increase .218 units in ROA. The T value is 3.309 and is significant at .001. It implies that the alternate hypothesis should be accepted that is: CEO tenure has significant positive effect on ROA. The result is consistent with the previous study of Al-Matari et al., 2014.

The regression coefficient ( $\beta_5$ ) shows the value of .253 that implies that one percent increase in CEO compensation increases 25.3% in ROA if other variables are kept controlled. Moreover, one unit increase in CEO compensation will increase .276 units in ROA. The T value is 2.302 and is significant at .022. It implies that the alternate hypothesis should be accepted that is: CEO compensation has significant positive effect on financial performance. The result is consistent with the previous study of Al-Matari et al., 2014.

The regression coefficient ( $\beta_6$ ) shows the value of .009 that implies that one percent increase in board change increases .9% in ROA if other variables are kept controlled. The T value is .135 and is insignificant at .893. It implies that the null hypothesis should be accepted that is: board change has insignificant positive effect on ROA. The result is consistent with the previous study of Al-Matari et al., 2014.

The regression coefficient ( $\beta_7$ ) shows the value of .078 that implies that one percent increase in board education increases 7.8% in ROA if other variables are kept controlled. The T value is 1.115 and is insignificant at .266. It implies that board education has insignificant effect on the firm financial performance so the alternate hypothesis should be accepted that is: board education has insignificant positive effect on ROA.

The regression coefficient ( $\beta_8$ ) shows the value of .310 that implies that one percent increase in female board members increases 31% in ROA if other variables are kept controlled. The T value is 2.943 and is significant at .004. It implies that female board members significantly enhance the firm financial performance so the alternate hypothesis should be accepted that is: female board members have significant positive effect on ROA. The result is consistent with the previous study of Luckerath-Rovers, 2011.

The regression coefficient ( $\beta_9$ ) shows the value of -.073 that implies that one percent increase in firm age decreases 7.3% in ROA if other variables are kept controlled. The T value is -.806 and is insignificant at .421. It implies that the null hypothesis should be accepted that is: firm age has insignificant negative effect on ROA. The result is consistent with the previous studies of Al-Matari, et al., 2014.

The regression coefficient ( $\beta_{10}$ ) shows the value of -.078 that implies that one percent increase in firm size decreases 7.8% in ROA if other variables are kept controlled. The T value is -1.163 and is insignificant at .246. It implies that the alternate hypothesis should be accepted that is: firm age has insignificant negative effect on ROA. The result is consistent with the previous studies of Al-Matari et al., 2014.

### 5.10 Panel Regression of IV's and ROE

Following is the fixed affect multiple regression models which predict the direct effect of predictors and ROE.

$$ROE_{it} = \beta_{0i} + \beta_2 (BS_{it}) + \beta_2 (BComp_{it}) + \beta_3 (BM_{it}) + \beta_4 (CEOT_{it}) + \beta_5 (CEOC_{it}) + \beta_6 (BC_{it}) + \beta_7 (BE_{it}) + \beta_8 (FBM_{it}) + \beta_9 (FA_{ln}) + \beta_{10} (FS_{ln}) + \mu_{it} \dots \dots \dots (1)$$

Where

ROE= Return on Equity (dependent variable)

BS= Board Size (Independent variable)

BComp = Board Composition (Independent variable)

BM = Board Meeting (Independent variable)

CEOT = CEO Tenure (Independent variable)

CEOC = CEO Compensation (Independent variable)

BC = Board Change (Independent variable)

BE = Board Education (Independent variable)

FBM = Female Board Members (Independent variable)

FA = Firm Age (ln)

FS = Firm Size (ln)

$\mu_{it}$  = error of the firm i in time t

**Table –5.8: Regression (Panel Regression of IV’s and ROE)****Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.424	.180	.138	1.26269

**ANOVA**

Model	Sum of Square	Df	Mean Square	F	Sig
Regression	68.381	10	6.838	4.289	.000
Residual	312.498	196	1.594		
Total	380.879	206			

**Coefficients**

	Unstandardized Coefficient		Standardized Coefficient		
	B	Std. Error	Beta	t	Sig
Constant	2.598	.907		2.864	.005
Board Size	-.020	.024	-.058	-.846	.399
Board Composition	.189	.067	.197	2.828	.005
Board Meeting	-.583	.130	-.581	-4.498	.000
CEO Tenure	.212	.066	.222	3.232	.001
CEO Compensation	.282	.119	.260	2.365	.019
Board Change	.109	.755	.010	.144	.886
Board Education	.264	.215	.086	1.229	.221
Female Board Members	.306	.102	.315	2.986	.003
Firm Size	-.282	.280	-.091	-1.007	.315
Firm Age	-.145	.128	-.076	-1.132	.259

a. Predictors: (Constant), BS, BC, BM, CEOT, CEOC, BCh, BE, FBM, FA(ln), FS (ln)  
DV: ROE

Correlation coefficient “R” = .424 or 42.4% relationship exists between board change, board composition, board meeting, CEO tenure, CEO compensation, board change, board education, female board members, firm age, firm size (I.V’s) and return on equity (D.V). The coefficient of determination “R<sup>2</sup>” was represents

.180 that shows 18% of variation in ROE is explained by board change, board composition, board meeting, CEO tenure, CEO compensation, board change, board education, female board members, firm age and firm size. In the above table the F value is 4.289 and the significance value is less than  $P \leq 0.05$  that shows that over all regression models is statistically significant, valid and fit.

In the above table the regression coefficient ( $\beta_1$ ) shows the value of -.058 that implies that one percent increase in board size decreases 5.8% in ROE if other variables are kept controlled. The T value is -.846 and is insignificant at .399 because significance level is  $P < .05$ . This further indicates board size is not a significant predictor of ROA so that the alternate hypotheses should be rejected and null hypothesis should be accepted that is: Board Size has insignificant effect on ROE. The result is consistent with the previous studies of Al-Matari et al., 2012; Rachdi and Ameer, 2011; Al-Matari et al., 2014.

The regression coefficient ( $\beta_2$ ) shows the value of .197 that implies that one percent increase in board composition increases 19.7% in ROE if other variables are kept controlled. The T value is 2.828 and is significant at .005 because significance level is  $P < .05$ . It implies that the board composition is the significant predictor of firm performance so alternate hypothesis should be accepted that is: Board composition has significant positive effect on ROE. The result is consistent with the previous study of Al-Matari et al., 2014.

Regression coefficient ( $\beta_3$ ) shows the value of -.583 that implies that one percent increase in board meeting decreases 58.3% in ROE if other variables are kept controlled. The T value is -4.49 and is significant at .000. It implies that board meeting has significant negative effect on firm performance the alternate hypothesis should be accepted that is: Board meeting has significant negative effect on ROE. The result is consistent with the previous studies of Al-Matari et al., 2014.

The regression coefficient ( $\beta_4$ ) shows the value of .222 that implies that one percent increase in CEO tenure increases 22.2% in ROE if other variables are kept

controlled. The T value is 3.232 and is significant at .001. It implies that the alternate hypothesis should be accepted that is: CEO tenure has significant positive effect on ROA. The result is consistent with the previous study of Al-Matari et al., 2014.

The regression coefficient ( $\beta_5$ ) shows the value of .260 that implies that one percent increase in CEO compensation increases 26% in ROE if other variables are kept controlled. The T value is 2.365 and is significant at .019. It implies that the alternate hypothesis should be accepted that is: CEO compensation has significant positive effect on ROE. The result is consistent with the previous study of Al-Matari et al., 2014.

The regression coefficient ( $\beta_6$ ) shows the value of .010 that implies that one percent increase in board change increases 1% in ROE if other variables are kept controlled. The T value is .144 and is insignificant at .886. It implies that the null hypothesis should be accepted that is: board change has insignificant positive effect on ROA. The result is consistent with the previous study of Al-Matari et al., 2014.

The regression coefficient ( $\beta_7$ ) shows the value of .078 that implies that one percent increase in board education increases 8.6% in ROE if other variables are kept controlled. The T value is 1.229 and is insignificant at .221. It implies that board education has insignificant effect on the firm financial performance so the alternate hypothesis should be accepted that is: board education has insignificant positive effect on ROE.

The regression coefficient ( $\beta_8$ ) shows the value of .315 that implies that one percent increase in female board members increases 31.5% in ROE if other variables are kept controlled. The T value is 2.986 and is significant at .003. It implies that female board members significantly enhance the firm financial performance so the alternate hypothesis should be accepted that is: female board members have significant positive effect on ROA. The result is consistent with the previous study of Luckerath-Rovers, 2011.

The regression coefficient ( $\beta_9$ ) shows the value of -.091 that implies that one percent increase in firm age decreases 9.1% in ROE if other variables are kept controlled. The T value is 1.007 and is insignificant at .315. It implies that the null hypothesis should be accepted that is: firm age has insignificant negative effect on ROE. The result is consistent with the previous studies of Al-Matari et al., 2014.

The regression coefficient ( $\beta_{10}$ ) shows the value of -.076 that implies that one percent increase in firm size decreases 7.6% in ROE if other variables are kept controlled. The T value is -1.132 and is insignificant at .259. It implies that the alternate hypothesis should be accepted that is: firm age has insignificant negative effect on ROE. The result is consistent with the previous studies of Al-Matari et al., 2014.

### 5.11 Panel Regression of IV's and Tobin's Q

Following is the fixed affect multiple regression models which predict the direct effect of predictors and Tobin's Q.

$$TQ_{it} = \beta_{0i} + \beta_1 (BS_{it}) + \beta_2 (BComp_{it}) + \beta_3 (BM_{it}) + \beta_4 (CEOT_{it}) + \beta_5 (CEOC_{it}) + \beta_6 (BC_{it}) + \beta_7 (BE_{it}) + \beta_8 (FBM_{it}) + \beta_9 (FA_{ln}) + \beta_{10} (FS_{ln}) + \mu_{it} \dots \dots \dots (1)$$

Where

- TQ= Tobin's Q (dependent variable)
- BS= Board Size (Independent variable)
- BComp = Board Composition (Independent variable)
- BM = Board Meeting (Independent variable)
- CEOT = CEO Tenure (Independent variable)
- CEOC = CEO Compensation (Independent variable)
- BC = Board Change (Independent variable)
- BE = Board Education (Independent variable)
- FBM = Female Board Members (Independent variable)
- FA = Firm Age (ln)
- FS = Firm Size (ln)
- $\mu_{it}$  = error of the firm i in time t

**Table –5.9: Regression (Panel Regression of IV’s and Tobin’s Q)****Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.413	.171	.128	1.26532

**ANOVA**

Model	Sum of Square	Df	Mean Square	F	Sig
Regression	64.550	10	6.455	4.032	.000
Residual	313.800	196	1.601		
Total	378.350	206			

**Coefficients**

	Unstandardized Coefficient		Standardized Coefficient		
	B	Std. Error	Beta	t	Sig
Constant	2.620	.909		2.882	.004
Board Size	-.015	.024	-.044	-.637	.525
Board Composition	.184	.067	.191	2.735	.007
Board Meeting	-.562	.130	-.561	-4.323	.000
CEO Tenure	.200	.066	.210	3.043	.003
CEO Compensation	.294	.120	.272	2.460	.015
Board Change	.119	.757	.011	.158	.875
Board Education	.280	.215	.092	1.301	.195
Female Board Members	.298	.103	.308	2.905	.004
Firm Size	-.371	.281	-.120	-1.322	.188
Firm Age	-.139	.128	-.073	-1.083	.280

a. Predictors: (Constant), BS, BC, BM, CEOT, CEOC, BCh, BE, FBM, FA(ln), FS (ln)

DV: TQ

Correlation coefficient “R” = .413 or 41.3% relationship exists between board change, board composition, board meeting, CEO tenure, CEO compensation, board change, board education, female board members, firm age, firm size (I.V’s)I and Tobin’s Q (D.V). The coefficient of determination “R<sup>2</sup>” was represents .171

that shows 17.1% of variation in Tobin's Q is explained by board change, board composition, board meeting, CEO tenure, CEO compensation, board change, board education, female board members, firm age and firm size. In the above table the F value is 4.032 and the significance value is less than  $P \leq 0.05$  that shows that over all regression models is statistically significant, valid and fit.

In the above table the regression coefficient ( $\beta_1$ ) shows the value of -.044 that implies that one percent increase in board size decreases 4.4% in Tobin's Q if other variables are kept controlled. This further reveals that one unit increase in board size will decrease .015 units in Tobins' Q. The T value is -.637 and is insignificant at .525 because significance level is  $P < .05$ . This further indicates board size is not a significant predictor of Tobin's Q so that the alternate hypotheses should be rejected and null hypothesis should be accepted that is: Board Size has insignificant effect on Tobin's Q. The result is consistent with the previous studies of Al-Matari et al., 2012; Rachdi and Ameer, 2011; Dar, Naseem, Rehman and Niazi, 2011; Millet-Reyes and Zhao, 2010, Al-Matari et al., 2014.

The regression coefficient ( $\beta_2$ ) shows the value of .191 that implies that one percent increase in board composition increases 19.1% in Tobin's Q if other variables are kept controlled. This further reveals that one unit increase in board size will increase .184 units in Tobins' Q. The T value is 2.735 and is significant at .007 because significance level is  $P < .05$ . It implies that the board composition is the significant predictor of firm performance so alternate hypothesis should be accepted that is: Board composition has significant positive effect on ROE. The result is consistent with the previous study of Al-Matari et al., 2014.

Regression coefficient ( $\beta_3$ ) shows the value of -.561 that implies that one percent increase in board meeting decreases 56.1% in Tobin's Q if other variables are kept controlled. This further reveals that one unit increase in board meeting will decrease .562 units in Tobins' Q. The T value is -4.323 and is significant at .000. It implies that board meeting has significant negative effect on firm performance the alternate hypothesis should be accepted that is: Board meeting has significant

negative effect on Tobin's Q. The result is consistent with the previous studies of (Matari, Al-Swidi and BtFadzil, 2014).

The regression coefficient ( $\beta_4$ ) shows the value of .210 that implies that one percent increase in CEO tenure increases 21% in Tobin's Q if other variables are kept controlled. This further reveals that one unit increase in board meeting will decrease .562 units in Tobins' Q. The T value is 3.043 and is significant at .003. It implies that the alternate hypothesis should be accepted that is: CEO tenure has significant positive effect on Tobin's Q. The result is consistent with the previous study of (Al-Matari et al., 2014).

The regression coefficient ( $\beta_5$ ) shows the value of .272 that implies that one percent increase in CEO compensation increases 27.2% in Tobin's Q if other variables are kept controlled. This further reveals that one unit increase in CEO tenure will increase .200 units in Tobins' Q. The T value is 2.460 and is significant at .015. It implies that the alternate hypothesis should be accepted that is: CEO compensation has significant positive effect on Tobin's Q. The result is consistent with the previous study of (Al-Matari et al., 2014).

The regression coefficient ( $\beta_6$ ) shows the value of .011 that implies that one percent increase in board change increases 1.1% in Tobin's Q if other variables are kept controlled. The T value is .158 and is insignificant at .875. It implies that the null hypothesis should be accepted that is: board change has insignificant positive effect on Tobin's Q. The result is consistent with the previous study of (Al-Matari et al., 2014).

The regression coefficient ( $\beta_7$ ) shows the value of .092 that implies that one percent increase in board education increases 9.2% in Tobin's Q if other variables are kept controlled. The T value is 1.301 and is insignificant at .195. It implies that board education has insignificant effect on the firm financial performance so the alternate hypothesis should be accepted that is: board education has insignificant positive effect on Tobin's Q.

The regression coefficient ( $\beta_8$ ) shows the value of .308 that implies that one percent increase in female board members increases 30.8% in Tobin's Q if other variables are kept controlled. The T value is 2.905 and is significant at .004. It implies that female board members significantly enhance the firm financial performance so the alternate hypothesis should be accepted that is: female board members have significant positive effect on Tobin's Q. The result is consistent with the previous study of Luckerath-Rovers, 2011.

The regression coefficient ( $\beta_9$ ) shows the value of -.120 that implies that one percent increase in firm age decreases 12% in Tobin's Q if other variables are kept controlled. The T value is -1.322 and is insignificant at .188. It implies that the null hypothesis should be accepted that is: firm age has insignificant negative effect on Tobin's Q. The result is consistent with the previous studies of Al-Matari et al., 2014.

The regression coefficient ( $\beta_{10}$ ) shows the value of -.073 that implies that one percent increase in firm size decreases 7.3% in Tobin's Q if other variables are kept controlled. The T value is -1.083 and is insignificant at .280. It implies that the alternate hypothesis should be accepted that is: firm age has insignificant negative effect on Tobin's Q. The result is consistent with the previous studies of Al-Matari et al., 2014.

## 5.12 Summary for Multiple Regression Analysis

The following table demonstrates the summary of three different regression models which is discussed above.

**Table – 5.10: Summary of Regression Model**

Model	ROA			ROE			Tobin's Q		
	F= 4.34 R = .426 R <sup>2</sup> = .181, Sig= .000			F= 4.28, R =.424, R <sup>2</sup> = .180, Sig= .000			F= 4.08, R =.413, R <sup>2</sup> = .171, Sig= .000		
	Beta	T	Sig.	Beta	T	Sig.	Beta	T	Sig.
<b>(Constant)</b>		2.844	.005		2.864	.005		2.882	.004
<b>Board Size</b>	-.069	-.999	.319	-.058	-.846	.399	-.044	-.637	.525
<b>Board Composition</b>	.199	2.859	.005	.197	2.828	.005	.191	2.735	.007
<b>Board Meeting</b>	-.581	-4.506	.000	-.581	-4.498	.000	-.561	-4.323	.000
<b>CEO Tenure</b>	.227	3.309	.001	.222	3.232	.001	.210	3.043	.003
<b>CEO Compensation</b>	.253	2.302	.022	.260	2.365	.019	.272	2.460	.015
<b>Board Change</b>	.009	.135	.893	.010	.144	.886	.011	.158	.875
<b>Board Education</b>	.078	1.115	.266	.086	1.229	.221	.092	1.301	.195
<b>Female Members</b>	.310	2.943	.004	.315	2.986	.003	.308	2.905	.004
<b>Firm Age</b>	-.073	-.806	.421	-.091	-1.007	.315	-.120	-1.322	.188
<b>Firm Size</b>	-.078	-1.163	.246	-.076	-1.132	.259	-.073	-1.083	.280

**DV: ROA, ROE, Tobin's Q**

The overall multiple regression analysis reveals that all three diverse models are statistically significant valid and fit. This further demonstrates that the board of director's characteristics has significant impact on firm financial performance in oil and gas sector of Pakistan.

## Chapter – 6

### Findings and Conclusion

This chapter provides a summary of the key findings and conclusions, theoretical and practical contributions and limitations of this study. The chapter also highlights the suggestions for future research.

#### 6.1 Findings and Discussion

The study investigates the relationship between board of director's member's characteristics and firm performance in the oil and gas sector of Pakistan. I used Pearson product-moment correlation coefficients and multiple linear regressions for data analysis. However, preliminary analyses were performed to ensure that there is no violation of the assumptions of normality and linearity. The Kolmogorov-Smirnov and Shapiro-Wilks test was used for checking normality, Durbin-Watson statistics was used to check for checking auto-correlation, and to check for equality of variance the Levene statistics was used and finally to check for multicollinearity in the data VIF and Tolerance statistics was used. The consequences of analysis reveal the linearity, normality, equality of variance and no auto-correlation was found in data.

The total population comprised of twelve oil and gas companies four diverse sectors including (marketing, refinery and petroleum exploration) companies. The data was collected from above mentioned companies from online business recorders and yearly consolidated financial statements (balance sheet and income statement) of oil and gas companies working in Pakistan and also from Karachi Stock Exchange (KSE-100) Index for the period between 2000 to 2015. Total population sampling technique was used in this study. The Pearson Correlation was performed to check out the relationship amid predictors and response variables. The result of correlation amid board size with ROA, ROE and Tobin's Q predicts negative and insignificant relationship. Correlation amid board composition with ROA, ROE and Tobin's Q predicts significant positive relationship. Board meeting and ROA, ROE and Tobin's Q predicts significant

negative relationship. CEO tenure with ROA, ROE and Tobin's Q predicts significant positive relationship with each other. CEO compensation with ROA, ROE and Tobin's Q predicts insignificant positive relationship with each other. Board change with ROA, ROE and Tobin's Q represents insignificant negative relationship with each other. Board education with ROA, ROE and Tobin's Q predicts significant positive relationship with each other. Female board members with ROA, ROE and Tobin's Q predicts significant positive relationship with each other. Firm Age with ROA, ROE and Tobin's Q represents insignificant negative relationship with each other. Firm size with ROA, ROE and Tobin's Q represents insignificant negative relationship with each other.

The first hypothesis of the study was whether the board size had a significant effect on firm performance (ROA, ROE, Tobin's Q). Results indicate board size was not a significant predictor of firm performance (ROA, ROE and Tobin's-Q). So null hypothesis was accepted that is: Board size has an insignificant effect on firm performance (ROA, ROE and Tobin's-Q). The result was consistent with previous studies of Rachdi and Ameer, 2011; Dar et al., 2011; Millet-Reyes and Zhao, 2010; Al-Matari et al., 2014.

The second hypothesis of the study was whether board composition had significant effect on firm performance (ROA, ROE, Tobin's-Q). Results indicate board composition is a significant predictor of firm performance (ROA, ROE and Tobin's-Q). So an alternate hypothesis was accepted which was Board composition has a significant positive effect on firm performance (ROA, ROE and Tobin's-Q). The result was consistent with the previous study of Al-Matari et al., 2014.

The third hypothesis of the study was whether board meetings had as significant negative effect on firm performance (ROA, ROE, Tobin's-Q). Results indicate board meetings are a significant predictor of firm performance (ROA, ROE and Tobin's-Q). So the alternate hypothesis was accepted: Board meetings had a significant negative effect on firm performance (ROA, ROE and Tobin's Q). The results were consistent with the previous studies of Al-Matari et al., 2014.

The fourth hypothesis of the study was CEO tenure has significant positive effect on firm performance (ROA, ROE, Tobin's-Q). Result indicates CEO tenure has a significant predictor of firm performance (ROA, ROE and Tobin's-Q). So alternate hypothesis was accepted that is: CEO tenure had significant positive effect on firm performance (ROA, ROE and Tobin's-Q). The result is consistent with the previous studies of Millet-Reyes and Zhao, 2010, Al-Matari et al., 2014.

The fifth hypothesis of the study was whether CEO compensation had as significant positive effect on firm performance (ROA, ROE, Tobin's-Q). Result indicates CEO compensation has a significant predictor of firm performance (ROA, ROE and Tobin's Q). So alternate hypothesis was accepted that is: CEO compensation has significant positive effect on firm performance (ROA, ROE and Tobin's-Q). The result was consistent with the previous studies of Rachdi and Ameur, 2011; Dar, et al., 2011.

The sixth hypothesis of the study was board change has significant positive effect on firm performance (ROA, ROE, Tobin's-Q). Result indicated that board changes have an insignificant effect on firm performance (ROA, ROE and Tobin's-Q). So null hypothesis was accepted that is: board change have insignificant positive effect on firm performance (ROA, ROE and Tobin's Q). The result was consistent with the previous studies of Al-Manseer et al., 2012; Dar, et al., 2011.

The seventh hypothesis of the study was board education have significant positive effect on firm performance (ROA, ROE, Tobin's-Q). Result indicated that board education has an insignificant effect on firm performance (ROA, ROE and Tobin's-Q). So null hypothesis was accepted that is: board education has insignificant positive effect on firm performance (ROA, ROE and Tobin's-Q).

The result was consistent with the previous studies of Rachdi and Ameur, 2011; Millet-Reyes and Zhao, 2010.

The eighth hypothesis of the study was female board members has significant positive effect on firm performance (ROA, ROE, Tobin's-Q). Result indicates female board member has significant effect on firm performance (ROA, ROE and Tobin's-Q). So alternate hypothesis was accepted that is: female board members significantly positive effect on firm performance (ROA, ROE and Tobin's-Q). The result was consistent with the previous studies of Luckerath-Rovers, 201; Rachdi and Ameer, 2011.

The ninth and tenth hypothesis of the study was firm age and firm size has significant effect on firm performance (ROA, ROE, Tobin's-Q). Result reveals that firm size and firm age has insignificant negative effect on firm performance (ROA, ROE and Tobin's-Q). The result was consistent with the previous studies of Dar, et al., 2011; Al-Matari et al., 2014.

**Table – 6.1: Summaries of Hypotheses**

<b>S#</b>	<b>Hypotheses</b>	<b>Accept/ Reject</b>
1	Board size has significant effect on firm performance	Reject
2	Board composition has significant positive effect on firm Performance	Accept
3	Board meeting has significant negative effect on firm Performance	Accept
4	CEO tenure has significant positive effect on firm performance	Accept
5	CEO compensation has significant positive effect on firm Performance	Accept
6	Board change has significant positive effect on firm performance	Reject
7	Board education has significant positive effect on firm Performance	Reject
8	Women on board has significant positive effect on firm Performance	Accept
9	Firm size has significant positive effect on firm performance	Reject
10	Firm age has significant positive effect on firm performance	

## **6.2 Theoretical Contribution**

This study is valuable for the better financial prosperous of Pakistan. The study considers the essential rule of the quantitative methodological view of generalizability and is the pioneer which investigated the cause and effect relationship between boards of director's characteristics i.e. CEO tenure, board meeting and board education and financial performance with the variable (Tobin's Q) very first time in overall oil and gas sector companies of Pakistan. Besides that the contemporary study assists the research scholars of Pakistan and adds the literature regarding the role board of directors characteristics and firm financial performance with emerging variables i.e. board change and women on board to the existing body of knowledge in Pakistan which are not taken into any

published study in Pakistan. This study provides comprehensive information of the real world practices of board of director characteristics and firm performance and measures the effect of board of director characteristics and firm performance with control variables i.e. firm size and firm age first time in oil and gas sector of Pakistan.

### **6.3 Conclusion**

This study examined the relationship between board of director's characteristics (board size, board composition, board meeting, CEO tenure, CEO compensation, female board members, board education, board change, firm size and age) and financial performance of oil and gas sector companies working in Pakistan. More specifically, as mentioned earlier, the study motivation lies in the gap in existing literature in the context of developing countries, particularly in Pakistan. This study enhances the understanding of board of director characteristics influencing firm financial performance, especially with the unique culture and business environment in Pakistan. The resource based theory is more applicable to most Pakistani business, as the board diversity facilitates the enhancement of performance through diversity of members such as experience, qualification and others.

The corporate governance is critical for developing countries since it is the key to budgetary and financial advancement of a nation. Pakistan has grown great corporate administration laws however with poor execution of these laws together with political unsteadiness that unfavorably influence corporate administration. The general obligation regarding the administration and course of organization issues took care of by the top managerial staff of the organizations in Pakistan (Nuryanah and Islam, 2011). In such manner, the chiefs ought to practice key oversight of business operations while specifically observing, measuring and remunerating administration's execution (Afzal and Sehrish, 2015). In Pakistan, the board ought to likewise guarantee the trustworthiness of bookkeeping and monetary reporting frameworks and supervise the procedure of exposure and correspondences (Azam, Usmani and Abbasi, 2011). Notwithstanding that the

topmanagerial staff or board of directors should understand the obligation to guarantee that corporate conduct fits with best administration practices such as to educated and deliberative basic leadership; (b) division of power (c) successful observing of administration; and (d) fair execution of obligations owed to the organization and to the class of shareholders.

#### **6.4 Limitations and Suggestions for Future Study**

This study has some limitations. First, the research design employed in the study is limited to oil and gas sector of Pakistan only. Hence, the outcomes validation may not be appropriate for financial and non-listed companies. Making generalization which is applicable to all sectors should therefore be made with caution. This study considers only 15 years data i.e. 2000-2015 which is short period of time so in future researcher should consider the extension of this period and to all sectors. Second, this study only examined integrations between boards of director characteristics. This study recommends that future researcher should examine some variables' significant relationship to corporate governance such as ownership structure, purchase committee, remuneration committee, audit committee characteristics (size, independence, and meeting) and executive committee characteristics (size, independence, and meeting) and other committees' relevance to evaluate performance of the company. This study only examined the agency theory and resource dependence theory. On the other hand, future studies could extensively examine the tournament theory with firm performance because there is a lack of studies in this field. Future studies could also examine relationship between corporate governance and firm performance in light of other theories such as stewardship theory, institutional theory, stakeholder theory, transaction cost theory, political theory, ethical theories, tournament theory etc. Finally, this study just examined directly the relationship between board of director characteristics and firm financial performance so that, the future research could be considered to investigate this relationship through other variables like board diversity, Islamic perspective and others in order to enhance this relation.

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