

**ROLE OF EARNING QUALITY AND BOARD QUALITY IN EXPLAINING  
IDIOSYNCRATIC RETURN VOLATILITY**



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## CERTIFICATE

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## **Abstract**

The study examines the impact of earning quality and board quality on idiosyncratic return volatility in Pakistani equity market for the period of 2009 to 2018 by employing the data of 81 non-financial firms. Accrual based measures are used for earning quality and board quality (BQ) is measured by using three proxies such as board size, institutional ownership, gender diversity and board independence. The idiosyncratic return volatility is measured by using the direct decomposition method of Malkiel and Xu (2003) and estimates idiosyncratic volatility as the variance of the residuals of an asset pricing model as similar to CAPM. The moderating role of board quality and earning quality is also examined. The results of generalize the method of moments show that the firms with better board quality and earning quality mechanisms tend to have a lower idiosyncratic risk. This result of the study may helpful for firm managers, investors, shareholders, risk managers and policy-makers. Earning management should be considered by the regulatory authority and policy maker in order to get benefits and support toward idiosyncratic return volatility. The government should implement strategy for better board quality mechanism in order to reduce idiosyncratic return volatility in firms

**Key Words:** Idiosyncratic return volatility, board quality, earning quality, accruals quality, stock volatility, board independence, Pakistan stock market

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# Chapter 1

## Introduction

Financial markets play a significant role in any economy and the volatility in the prices of the securities traded in these markets is always a major concern for both the investors and academicians. Investors are interested to maximize the value of their investment by efficient allocation of the resources and acquire information about financial assets to form investment portfolios of bonds and stocks to achieve the value maximization objective by minimizing their cost of capital at a given level of risk (Bakar & Sulong, 2018).

In any organization, accounting plays an important role in building up a financial information system, which is being used by the managers and investors for decision-making. The accounting information is crucial for a firm because the biggest financial crisis arises as a result of auditing and accounting failures (Arruñada, 2005). In the wake of the crisis, Joseph Stiglitz a noble prize winner economist states about the cause of great recession that is “the financial markets hinge on trust, and they collapse when the trust eroded”<sup>1</sup>. The global financial crisis leads towards huge mistrust among the public and corporations, capital markets, and institutions. The global financial crisis of 2007-2009 decreases the stock prices and increases stock volatility all around the world and Morgan and Stanley index has fluctuated with -42.6% between 2007Q2 and 2008Q4<sup>2</sup>.

Firms are involved in windows dressing to reflect high performance of the company and managers try to temper the financial reports in order to show up desired firm performance

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<sup>1</sup> <https://www.theguardian.com/commentisfree/2008/sep/16/economics.wallstreet>

<sup>2</sup> International Finance Papers are preliminary materials circulated to stimulate discussion and critical comment. References to International Finance Discussion Papers (other than an acknowledgment that the writer has had access to unpublished material) should be cleared with the author or authors. Recent IFDPs are available on the Web at [www.federalreserve.gov/pubs/ifdp/](http://www.federalreserve.gov/pubs/ifdp/). This paper can be downloaded without charge from the Social Science Research Network electronic library at [www.ssarn.com](http://www.ssarn.com)



(Biswas, 2018). This manipulation by the financial reporters leads towards the biggest corporate scandals such as the case of Lehman brothers in 2008, Enron scandal (2001), the scandal of Freddie Mac and many others<sup>3</sup>. Such type of scandals has raised the question on the credibility of the financial system as a whole, investors feel insecure after experiencing these crises and have doubts about the real economic value of their assets. These concerns force them to revisit their evaluation as they have become more concerned about the reliability of internal control and corporate governance mechanism.

The value of the share is derived from firm fundamentals such as the firm's book value based upon earnings (Noma, 2010). The book value of equity can represent the past performance, current earning and an indicator of future performance (Barbee, Jr., & Raines, 1996). The share prices are the present value of future expected cash flows, and the volatility of stock prices is directly affected by the expectation of future cash flows (Poterba & Summers, 1986). Managers and stakeholders evaluate the company based on their earnings and earnings are associated with accruals. Accruals are linked with earnings; its relationship with market affects the idiosyncratic risk of a firm. The idiosyncratic return volatility is specifically associated with firm activities and affects the risk or return of a firm.

The value of a firm depends upon its earning quality because at a firm-level most of the investment and credit decisions are taken by evaluating earning quality. One of the tools to measure earning quality is the quality of its accruals, as accruals are depended upon earnings and they both are affected by the market volatility which affects the business risk. Chan et al. (2006) define accruals as "Accruals represent the difference between a firm's accounting earnings and its underlying cash flow" Accruals and earnings are deeply associated with each other. Dechow (2002) has identified that the role of accruals is to point out the changes in cash flows over time

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<sup>3</sup> <https://www.mediusflow.com/en/untapped/articles/people/cooking-the-books-accounting-scandals>

and that adjusted earnings better measures the earning quality of a firm relative to its performance.

The global financial crisis and its consequences on investors lead the economist to revive the policies of corporate governance and to do some financial restructuring. The financial analysts and economists put forward their efforts to regain the trust of investors by explicitly defining the policies for the firms (Maher & Andersson, 2010). Organization for Economic Co-operation and Development (OECD) in 1999 by defines corporate governance as “a set of relationships between a company’s board, its shareholders and other stakeholders. The board of directors (BOD) plays a significant role in implementation of these policies to ensure the earning quality mechanism of a firm. On the other hand, the separation of ownership and control lead toward the agency problem. Managers sometimes have self-interested motives and they mislead the shareholders which raise agency cost for the firm. Due to restricted grounds and improvement in earning quality, the role of the board of directors has been given due importance (Young, Peng, Ahlstrom, Bruton, & Jiang, 2008).

This study contributes to the literature in four ways. First, it explains the effect of earning quality idiosyncratic return volatility. Secondly, it measures the effect of board quality on idiosyncratic return volatility by using different variables specific to the firm. Thirdly, this study attempts to build the relationship between idiosyncratic return volatility and firm earning quality, to explain whether this earning quality increase or decrease the idiosyncratic volatility. Fourthly, this study investigates how board quality increases the relationship between earning quality and idiosyncratic return volatility.

### **1.1 Problem statement**

The idiosyncratic return volatility is a fundamental issue for investors and numbers of factors contribute to the idiosyncratic return volatility; but the literatures have inclusive

evidence. Rajgopal & Venkatachalam (2011) finds conclusive evidence about the effect of earning quality on idiosyncratic volatility. The study finds out deterioration in financial reporting quality is related to increasing in idiosyncratic volatility. Furthermore the previous literature identifies that earning quality was the major factor in certain corporate scandals<sup>4</sup>. However factors effecting idiosyncratic return volatility remained untapped in emerging economies like Pakistan. The managers try to manage the earnings by income smoothing and are involved in window dressing to show good performance (Biswas, 2018). The influence of board quality on idiosyncratic return volatility has not been studied in context of Pakistan. In recent years, the regulatory authorities in Pakistan have realized the importance of corporate governance after financial scandals and the mechanism for the regulatory framework has been revisited by the regulators. They brought up reform programs to replicate aspects of the legal and structural patterns of firms as board quality can strengthen the relationship between earning quality and idiosyncratic return volatility (Rajgopal & Venkatachalam, 2011). The study will address the role of earning quality in explaining the idiosyncratic return volatility of firms by looking how the board quality contributes to strengthen or weaken this relationship.

## **1.2 Research gap**

The relationship between earning quality and idiosyncratic return volatility has been investigated for developed and developing markets. Previous literature shows that if earning quality is proxies by accrual-based measure it will have an impact on idiosyncratic volatility (Ahmadpour et al. 2016). In developed economies, such as the USA and UK number of studies have been carried out to study the link between earning quality and idiosyncratic volatility by observing the structure of corporate governance. These results cannot be generalized to other markets because every country has a different set of financial markets having its structure and

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<sup>4</sup> <https://fortune.com/2017/12/31/biggest-corporate-scandals-misconduct-2017-pr/>

regulatory framework. The stock markets of developed countries are more stable as compare to developing countries where the markets have a lot of friction. Developed countries have higher earning quality as compare to developing countries as they have high accounting standards, lower financial constraints, lower market frictions, and lower conflict of interest (Kaaya, 2015).

Despite the interest of international financial analysts on earning quality and stock return volatility, the findings of the majority of the countries have not been applied to an emerging country such as Pakistan. Most of the less developed countries have less developed financial markets because of more financial constraints. They have less competitive stock markets as compared to developed countries. Firms in developing countries usually do not have a stable set of financial earning. Managers in these countries temper the financial statements more often to show up the desired working performance and to attract investors (Chan, Lee, & Lin, 2009).

Pakistani financial market is quite different from the international financial markets because of the absence of a strong legal system and the inefficient stock market (Khan & Ullah, 2015). In developed countries, the magnitude of financial reporting quality is very high because of accounting numbers matter lot there that is opposite in emerging markets<sup>5</sup>. To best of my knowledge no study has investigated the impact of earning quality and moderating role of board quality on idiosyncratic volatility on Pakistani market. Pakistani corporate sector has historically been dominated by few families owned businesses and non-professional directors that are primarily selected on the basis of links with the owners. The managers under the restricted professional base often involve in window dressing in order to show up high earnings. The bad monitoring and poor earning quality give rise to the volatility in stock price. Therefore, this study

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is an effort to capture the current dynamics of the firms earning quality and board quality by contributing the work in the domain of idiosyncratic return volatility.

### **1.3 Research Questions**

The study has the following research questions:

- What is the impact of earning quality on idiosyncratic return volatility?
- How board quality affects the idiosyncratic return volatility?
- Whether the presence of board quality can strengthen the relationship between earning quality and idiosyncratic return volatility?

### **1.4 Research Objectives**

The study has following objectives:

- To investigate the relationship between earning quality and idiosyncratic return volatility in the presence of board quality.
- To explore the moderating role of board quality on earning quality and idiosyncratic return volatility.
- To check the impact of earning quality and board quality on idiosyncratic volatility.

### **1.5 Significance of the study**

Literature suggests that idiosyncratic volatility is less in those countries where there is high quality of earnings. The high quality of earnings is important for the financial wellbeing of the company, which improves capital market efficiency. Firms with high earning quality and compelling traits like strong ethical culture and transparent disclosures have low level of idiosyncratic volatility (Angelidis & Tassaromatis, 2008). These firms often have strong governance function consist of strong independent directors, audit committee which enhance the quality of earning. Radzi, Islam, & Ibrahim (2011) Study the effect of earning quality on public listed companies of Malaysia and find that the earning quality have significance impact on

returns of the company. However, in different regions and economic sectors the structure of corporate standards is different.

The urge in studying effect of earning quality and board quality on idiosyncratic volatility is because it effects the risk and reward relationship of a stock. The internal control mechanism at firms in Pakistan plays an important role in determining returns. It contributes to the body of literature because of different reasons. Pakistan being a developing country have high market fraction, strong internal control, less financial developments and less awareness about the impact of earning quality, board quality and its effect on idiosyncratic volatility. As Claessens, Djankov and Lang (2000) observed that two-third of firms in Asian markets have concentrated ownership. This situation creates the problem of wealth expropriation for minority shareholders. Therefore, in order to safeguard the interest of non-controlling shareholders, the revised code of corporate governance requires the listed companies to have at least one-third independent directors along with an independent audit committee. On the other hand (Dichev, Graham, Harvey, & Rajgopal, 2013) says that in order to avoid reporting loss, earnings declines managers have earning incentives. Chen et.al (2012) prove that the idiosyncratic return volatility is positively associated with the managerial discretion in terms of accruals. Therefore, current research investigates the effectiveness of board quality and earning quality in constraining the idiosyncratic volatility.

This study contributes significantly to the body of knowledge by explaining the relationship between earning quality and board quality on idiosyncratic returns of PSX listed firms. The significance for this study can see in four perspectives 1) investors 2) managers 3) academicians and 4) regulatory bodies. First, this study is helpful for devising investment strategies for investors that how earning quality can generate excess returns. Second, it provides evidence to the managers by making them to understand the importance of earning management

as it plays major role in determining quality of earning itself. Third, it provides additional insight about the role of board quality in explaining the relationship between earning quality and idiosyncratic return volatility for academicians. Finally, it will help regulatory bodies to understand that how regulation related to board quality is helpful to contribute to earning quality and its impact on idiosyncratic return volatility of a firm.

### **1.6 Organization of study**

The remaining study is structured as follows; chapter one consists of an introduction, research gap, problem statement, research objectives, and research questions. Chapter two concluded on theoretical arguments and literature review. Chapter three discusses the data description and methodology a measurement of the variable and statistical method. Chapter four is based upon finding of empirical results and discussion, following chapter five, the results summarizing and the conclusion of the study, policy implication.

## Chapter 2

### Literature review

#### 2.1 Theoretical background

This section elaborates on different theories regarding to the study and analyze the effects of independent variables on idiosyncratic volatility.

The discussion about the prediction of stock price behavior and returns started with Markowitz (1952). He develops the idea of stock returns based on several assumptions although in the real world these assumptions do not hold. He developed a model to measure the risk and return of a portfolio. His model proved that investors choose an optimum set of portfolio and by diversifying portfolio the total risk could be minimized. The Capital asset pricing model (CAPM) is based on Markowitz's theory of portfolio return and is used for measuring the risk and return of a portfolio based on the beta. Markowitz was the first one who initiated our understanding of systematic (un- diversifiable) and unsystematic (diversifiable) risk which was later explained by Sharpe (1964). The idea of Markowitz was criticized by many theorists because it was based upon several assumptions. Tobin (1958) extended the concept that was introduced by Markowitz and develop liquidity preference theory and separation theorem. According to him the value of a company is independent of its capital structure so it's irrelevant to do corporate risk management. The theorist argues that by using a risk-adjusted value approach and by doing efficient risk management one can increase corporate value. The work by Markowitz, (1952) was later simplified by (Sharpe (1963; 1964), Lintner (1965; 1969), and Mossin (1966)) which further develops the understanding of total risk. The total risk can be divided into systematic and unsystematic risk. The systematic risk of an asset is highly important because this risk cannot be eliminated by stock diversification and can affect the stock price.



In addition to the theoretical studies regarding stock market M&M theorem is developed; according Modigliani and Miller (1958) Markets are perfect. The firms invest in projects that have positive NPV. In the real world, things are beyond the idea of frictionless markets. Firms do under and over investments when the self-interests of manager diverge from those of shareholders. The agency theory presented by Jensen and Meckling, (1976) opens up new doors for managerial behavior the theory states that "the presence of two primary imperfections, namely adverse selection, and moral hazard, caused by the existence of information asymmetry. Thus, information asymmetry leads to poor financial reporting quality that provides greater opportunity for firm managers to play dysfunctional behavior". When information asymmetries exist in the market then over and under investment take place and leave financial distress in the economy (Myers, 1984). The information asymmetries lead towards several problems one of them is the problem of adverse selection and moral hazard where information asymmetry among managers, stockholders, and capital providers distracts them that lead towards under or over investments. Besides information, asymmetries theorist suggests that over or under investment can also take place due to the maximization of self-interest by the managers due to wealth maximization and wellbeing. This directly affects the earning quality of the firm (Jensen & Meckling, 1976).

The association of institutional ownership and stock return volatility can be better explained by agency theory. Early 1970 the agency theory initiated in the academic literature and investigates that the stock returns volatility sharing between insider and outsider Wilson, (1968) and Arrow, (1971). The agency theory follows the relationship between principle and agent. The principal-agent relationship is essentially a separation of ownership and control, between the principal (shareholder/owner) and the agent (management). This potentially problematic

relationship exists when an agent is appointed to act on behalf of the principle (Jensen & Meckling, 1976) and (Ross, 1973). Therefore, the agency problem is a serious problem for corporations that must be addressed and controlled. The fundamental aim of corporate governance is to ensure that managers put the interests of the firm and its shareholders before their own, and to help ensure that all financial stakeholders get a return on their financial investments. (Jensen & Meckling, 1976) and (Arrow, 1971).

## **2.2 Review of literature**

The concept of earning management has emerged during 60's and become the part of field. The main objective of improving earning quality is to guide the investors for making better decisions because accounting profit could be manipulated. There is no particular consensus on the definition of earning quality because the concept of earning quality is too diverse that various researchers view it through different aspects (Hermans, 2006). Penman and Xiao-Jun (2002) defines earning quality as the ability of an earning to show future earnings performance over a stable period. According to Dechow, (2002) the earning quality of a firm is backed by its past present and future cash flows. Ahmadpour and Shahsavari (2016) State that high earning quality is the one for which accounting estimations are accurate.

Various studies have carried out to open up the association between earnings quality, board quality and idiosyncratic return volatility. The investors to make investment decisions use the accounting information reported by the companies. According to the researchers, the primary goal of the investors is to gain profit by means of high return, so the prediction of return and its volatility is highly important for the investor. The financial analyst considered financial earning and quality of earning as a tool for prediction of return and to measure the volatility of return (Wurgler J. , 2000). Furthermore, Hawkins the accounting professor at Harvard University believes that the quality of earnings is affected by the six factors economic environment

(inflation rate and exchange rate), extraordinary events (sale of administrative buildings), ordinary and repeatable activities, capital structure (financial leverage), tax methods, accounting methods and relationship between them and change of earning per share. The earning quality of a firm depends upon in which business they are in or where they are in their business cycle? So the low quality earning does not necessarily mean that the firm's returns are lower. The concept of efficiency is different for different investors, some investors focus on long term gains and invest in firms that are large stock companies and give high cash dividends. The other investors might prefer growth and development as an important perspective for investment (Kazemi, Hemmati, & Faridvand, 2011). The modern portfolio theory by Markowitz is based on the idea that all investors are rational and prefer high returns over low returns. Return can be in the form of capital gain or loss, or it can be a percentage part of total investment (annual earning). Abnormal stock return is the gap between actual stock return and the expected return of the shareholder. Investors required a return to compensate for the risk that is associated with any investment and the company compensates the investors who have provided them their investments. The investors expected rate of return is the return rate that is acquired to protect the market value of the company and its stocks and the company fulfill their expectations by making different investments (Pesaran & Timmermann, 1998). Furthermore, Konan, Chan, Jegadeesh, and Lakonishok, (2006) have examined that there is information in earning quality for a future stock return. The traditional asset pricing model assumes that by diversifying the portfolio idiosyncratic risk could be eliminated and the systematic risk is priced at equilibrium. However, the contemporary literature shows that evidence by Campbell, Lettau, and Malkiel, (2007) indicates that to achieve portfolio diversification and avoid idiosyncratic volatility over time one must include at least fifty stocks to the portfolio. If the investors hold an undiversified set of the

portfolio, then their returns would be affected by the idiosyncratic risk and the classical asset pricing model would be failed as it only includes common systematic risk factors. The idiosyncratic volatility measures the part of volatility that cannot be explained by CAPM model developed by Sharpe (1963) and Lintner (1965). According to this model under some specific restricted assumptions, the only factor that is priced by the market is the beta. But later on various researchers try to relax those assumptions and presented some new models. Levy (1978) presented a model according to that model if each investor holds limited number of securities they will end up holding undiversified set of portfolio along with idiosyncratic risk. The importance of idiosyncratic risk was later explained by Merton (1987) according to him investors holds only a subset of asset universe in case of incomplete diversification along with high idiosyncratic risk they should earn higher return. Malkiel and Xu (2003) presented an extended model and according to this model idiosyncratic risk is not uncorrelated across securities and the premium for idiosyncratic risk depends on the covariance of idiosyncratic risk with the market-wide undiversified idiosyncratic risk. So in order to measure volatility one must keep an account for idiosyncratic return volatility.

Previous studies also indicate that high idiosyncratic volatility shows a significant relationship with mispricing (Li, Rajgopal, & Venkatachalam, 2014). The poor earning quality makes it crucial for the investors to translate information of reported earnings and trade on poorly available public information (Dasgupta, Ga, & Gao, 2010). In addition to the behavior of investors Foucault, Sraer, and Thesmar, (2011) finds that retail investors tend to trade for informational reason and behaves like noise traders, their trading can move the stock prices. These trading cause changes in a part of stock return and should be reflected in the noise part idiosyncratic volatility of stock return.

To develop further literature and in addition to our research questions, the study must include proxies for the earning quality. To understand the pattern of idiosyncratic volatility it is crucial to identify the determinant factors of idiosyncratic volatility. In literature, there are numerous studies who are empirically declared factors that tampering firm's idiosyncratic risk. Among these (Pástor & Pietro, 2003) find that idiosyncratic volatility of firm tends to be higher for those with higher uncertainty about future profitability and more volatile firm specific profitability, and for those whose pay no dividend. Fama and French (2004) explained that the increase in idiosyncratic volatility results of the increase in the number of firms listed at premature ages. Brown and Kapadia (2006) also showed that the increase in firm's volatility in the US is due to the listing of risk lover companies in the stock exchange. They found that firms that listed later in the sample have high idiosyncratic volatility than firms listed earlier. One of the most important indicators of earning quality is accounting accruals Chan et al. (2006) defines accruals as "Accruals represent the difference between a firm's accounting earnings and its underlying cash flow". The total accounting accruals can be decomposed into two parts the innate and discretionary accruals (Lobo, Song, & Stanford, 2012). The innate components of accruals deal with uncertainty about the nature of a firm's businesses whereas the accounting discretions and errors are reflected by the discretionary accruals; both of these accruals are based on information asymmetry (Bhattacharya, Desai, & Venkataraman, 2013). Further empirical studies show that the innate component has a greater impact on stock prices as compared to the discretionary component. More researchers have indicated that as managers manipulate earnings and due to it the accrual rises. When earning increase is due to the increase in accruals it has been researched that there is a negative relationship between earnings and accruals or the earning quality is seen quite low (Hribar, 2001). Chan, Lee, and Lin (2009) study the relationship

between return and earning quality. Based upon the data of 13 countries their results show that the earning quality is not static and it varies from country to country. Their research shows the evidence that countries which have high support of investors have a high quality of earning as compare to those who have low support of investors.

The relationship between earning quality measures and excess return is studied by (Perotti & Wagenhofer, 2011). Their study is based on the data of American nonfinancial companies from 1988 to 2000. They studied 8 earning quality measures to predict future returns. They ranked these measures based on the size of the portfolio return of stocks. Their results show that the high abnormality and smoothing in accruals are accompanied by high earning quality. Cerqueira and Pereira (2017) finds out that the analysts use the information provided in reported earnings and other additional information so there must be concurrency of information. The high dispersion in the forecast is due to poor information environment caused by the poor earning quality. The studies by Lobo et al. (2012) show similar results that the quality of earning measures affects the forecasting of stock returns.

The firms with poor earning quality are likely to have high volatility of abnormal accruals and poor earning quality. So there has been an inverse relationship between earning quality and idiosyncratic volatility.

The International Accounting Standard Board (2001) says that “the objective of a financial report is to provide information about the financial position, performance and change in financial position of an entity that is useful to a wide range of users in making economic decisions”. Managers are free to choose the accounting and reporting method in preparing financial reports (Egbunike & Odum, 2018). In most of the cases managers tries to manipulate the financial statements that mislead the investors. When managers (agents) the key

decision makers involves in self-seeking behavior and shows the perfect market picture to shareholders (principals) , by exploiting insufficiencies of accounting rules this give rise to agency problem (Ruangviset, Jiraporn, & J.C.Kim, 2014). The corporate boards are designed to monitor managerial use of opportunistic earnings management activities that effect the earning quality of firm (Vafeas, 2000). Most of the researchers suggested that financial reporting mitigate information asymmetries about a firm's performance and reduces the volatility of stock prices (Diamond & Verrecchia, 1991). Easley and O'Hara (2005) finds that the reporting quality and disclosure quality effects the information risk that subsequently effects the idiosyncratic volatility and cost of capital at firms. So boards directly or indirectly effects the earning quality of firm that increase or deacreses the idiosyncratic volatility of a firm.

Hamao, Mei, and Xu, 2003) investigated an abnormal decline in firm-level variability in Japan after the crash in its stock market in 1990. They attributed this significant fall in firm risk to the lack of corporate restructuring and a sharp rise in earning homogeneity. The study by Gu and Kim (2003) investigated the determinants of firm-specific risk of United Stated hotel real estate investment trusts (REITs). The investigation shows that high dividend payment and high debt burden tend to exaggerate the unsystematic risk, while heavy capitalization can substantially help reduce the unsystematic risk of hotel REITs. The study of Brandt et al.(2009) explained the puzzle of the steady increase in idiosyncratic volatility of individual firm in the U.S during 1962 to 1997 which reversal back to pre-1990s trend when they checked for 2013. They found two factors dominant over this reversal. One is corporations' low stock prices. and second is that the retail investors grabbed over these low stock prices.

Bekaert, Hodrick, and Zhang, (2012) inspected the reasons behind aggregate idiosyncratic volatility in US firms.For empirical analysis, they utilized daily US stock return

data from the year 1964 to 2008. The resulted outcome has shown that variables related firm cash flows such that market to book value and growth option, variables related to the business cycle and variables related to market volatility are the most influential determinants in the U.S aggregate idiosyncratic volatility. Bartram et al. (2012) examined that why there are risk differences between foreign firms and firms operating in the US. Using a large panel data across the world's big economies. The data time period is from 1991 to 2006 from (World scope). They explain that non-US firms have less idiosyncratic risk than US-based firms. One possible reason is that government quality and stability is inversely related to idiosyncratic volatility. A political crisis or a financial crisis can have a tremendous impact on stock price volatility. The impact of political crises on stock price volatility largely influences due to the psychological reaction. The presidential election in Taiwan in 2004 Is the typical example of stock market return. So, firms with better corporate governance or better performance can strengthen the shareholder confidence level during a panic situation. In this way, firms exhibit less price volatility and make overreaction during political crises compared with weak corporate governance (Huang & Chan, 2010). Follow the same line Mugaloglu and Erdag, (2013) in their empirical study showed that poor corporate governance and weak regulation generate uncertainty and unwilling circumstances in stock market. To overcome such type of conditions Istanbul stock exchange (ISE) introducing a corporate governance index namely XCURY, in which includes, company public disclosures and shares of companies in line with good corporate governance principle to encouraged corporate governance practices. The results of the study demonstrate that good corporate governance and transparency can lead to lower the uncertainty, decline the price volatility, and can achieve better economic growth and development. Similarly, Bistrova and Lace, (2012) argued that, because of the unstable environment it is more essential to follow



corporate governance practices with more attention. They further elaborate that companies with active corporate governance seem to offer lower risk.

The stock market volatility had increased over the period of time. The previous literature suggest that this rise is due to individual firm activities that increases idiosyncratic volatility of firm. On the other hand the previous literature shows that earning quality being an internal firm managed factor plays an important role in determining the financial wellbeing of a company. Managers use earning management as a tool to manipulate earnings and to show up the desired performance of company. Companies with high earning quality have some compelling traits. one of them is the presence of strong board. The presence of strong board increases the trust of investors over firm. For all that, it is important for investors and policy makers to identify the extent to which idiosyncratic volatility is effected by internal firm activities so that comprehensive policy with implementation procedures widening its scope with reference to the availability of finance. The extension of present literature on idiosyncratic volatility across the world is the center of attention in our study.

## Chapter 3

### Data description and Methodology

This section contains data description and methodology of the study, which covers the sample framework, population, data, measurement of the dependent and independent variables and list of variables and statistical model. This section also contains a review of the methods and approaches relevant to this study. This study is prompted by the relevant aspects of corporate governance and related theories regarding idiosyncratic regarding.

### 3.1 Data Description

#### 3.1.1 Population and sample

The population for the study includes all 554 firms out of which 417 firms are non-financial and are listed at Pakistan stock exchange (PSX). The sample for the study is 81 firms following the criteria given below:

- The balance sheet date of financial and non-financial firms is different in PSX. So, those non-financial firms prepare their financial statements on 30<sup>th</sup> June are selected.
- The sample period is of 10 years post crisis period from 2009 to 2018,.
- Those firms which are the part of PSX 100 index and are not delisted from PSX during the sample period from 2009 to 2018.

The secondary data is collected from the financial reports of the firms, official websites of PSX and central bank of Pakistan form their published reports.

### 3.2 Variable description

The study uses earning quality, board quality and size as independent variables and excess return as dependent variable. Moreover, four control variables include age of the firm, book to market ratio, leverage and return on equity are used.

### 3.2.1 Dependent variables

#### 3.2.1.1 Idiosyncratic return volatility

Idiosyncratic return volatility is used as a measure of idiosyncratic risk. The measure of Malkiel and Xu (2003) for idiosyncratic return volatility is used in the current study. Malkiel and Xu (2003) have used direct decomposition method and estimates idiosyncratic volatility as the variance of the residuals of an asset pricing model as similar to CAPM. The regression equation is as follow

$$r_{i,t} = r_{f,t} + \beta_i * (r_{m,t} - r_{f,t}) + \varepsilon_{i,j,t} \quad 3.1$$

Where,  $r_{i,t}$  is the return of the daily return of the stock,  $r_{f,t}$  is the risk free rate,  $r_{m,t}$  is the market return of the stock and  $\beta_i$  used in estimations is obtained on an annual basis given by the average of monthly betas . The six months Treasury bill rates are used as a measure of the risk-free rate. Whereas  $\varepsilon_{i,j,t}$  is natural interpretation of idiosyncratic return volatility at time t and firm i. For each period, we define idiosyncratic return volatility as  $\text{VAR}(\varepsilon_{i,j,t})$  and industry return volatility as  $\sqrt{\text{VAR}(\varepsilon_{i,j,t})}$  . Independent variables

### 3.2.2 Independent variables

#### 3.2.2.1 Earnings Quality

The widely used proxy in literature to measure the earning quality of a firm is the accrual quality, abnormal accruals are meant to capture distortions induced by the application of the accounting rules or earnings management (Dechow, Ge, & Schrand, 2010). There are two main approaches through which accruals can be measured:

- Balance sheet approach
- Cash flow statement approach

#### ➤ Balance Sheet Approach

According to this approach total accruals can be calculated by using the following formula created by Jones (1991)

$$TA_{i,t} = \Delta CA_{i,t} - \Delta CL_{i,t} - \Delta cash_{i,t} + \Delta STdebt_{i,t} + Depn_{i,t} \quad 3.2$$

**TABLE 3.1 SUMMARY OF ACCRUAL MEASURES**

Variable name	Formula
CA	$\Delta CA_{i,t} = \Delta cash + \Delta account\ recievable + \Delta inventories$
CL	$\Delta CL_{i,t} = \Delta accounts\ payables + \Delta short\ term\ borrowings + \Delta other\ current\ liabilities$
Cash	$\Delta cash_{i,t} =$ Net cash provided by operating activities + Net cash used in investing activities + Net cash used in financing activities + Effect of exchange rates on cash and cash equivalents
Stdebt	$\Delta STDebt_{i,t} =$ Quick ratio = $\frac{\text{current assets} - \text{inventory}}{\text{current liabilities}}$
Depn	Depreciation given as per balance sheet

Where  $\Delta CA_{i,t}$  is the change in current assets of firm i at time t,  $\Delta CL_{i,t}$  is the change in current liabilities of firm i at time t,  $\Delta cash_{i,t}$  is the change in cash of firm i at time t,  $\Delta STDebt_{i,t}$  is a change in short term debt of firm i at time t and  $Depn_{i,t}$  is the depreciation and amortization expense in year t firm i at time t.

### ➤ Cash Flow Approach

Accruals can also be calculated by using following formula:

$$TA_{i,t} = NIBE_{i,t} - CFO_{i,t} \quad 3.3$$

Where  $TA_{i,t}$  is defined as the difference between  $NIBE_{i,t}$  net income before extraordinary items and  $CFO_{i,t}$  which is cash flow operations.

The current study uses cash flow approach to measure accruals because most of the researcher preferred cash flow approach over balance sheet approach. Collins and Hriber [1999] in their study provide different reasons for which balance sheet approach is inferior to cash flow approach.

According to researchers accruals have been divided into two parts discretionary and non-discretionary accruals. This is because according to them accruals alone are not representative of earning management. Earning management can only be performed when there is discretion of these accruals is with authorities. Since its not possible to measure discretionary accruals the non-discretionary accruals are subtracted from total accruals to get discretionary accruals.

#### ➤ **Measurement of Discretionary Accruals**

There are number of models created to measure the discretionary accruals i.e. The DeAngelo Model [1986], The Healy Model [1985], The Jones Model [1991] and modified Jones model [1995]. The most latest model is modified jones model (1995) and the current study uses this model. The Modified Jones Model is designed to eliminate the conjectured tendency of the Jones Model to measure discretionary accruals with error when discretion is exercised over revenue recognition. In the modified model, nondiscretionary accruals are estimated during the year as:

$$NDA_{i,t} = \alpha_1 \left( \frac{1}{A_{t-1}} \right) + \alpha_2 \frac{(\Delta REV_{i,t} - \Delta REC_{i,t})}{A_{t-1}} + \alpha_3 \left( \frac{PPE_{i,t}}{A_{t-1}} \right) + \varepsilon_{i,t} \quad 3.4$$

Where  $NDA_{i,t}$  is nondiscretionary accrual of firm i in year t scaled by lagged total asset,  $\Delta REV_{i,t}$  is change in revenues of firm i in year t less  $\Delta REC_{i,t}$  is net receivables of firm i in year t and  $PPE_{i,t}$  is gross property plant and equipment of firm i at the end of year t.  $\varepsilon_{i,t}$  is the residual, which represents the firm-specific discretionary portion of total accruals In order to obtain the

residuals  $\varepsilon_{i,t}$  for firm  $i$  and year  $t$ . Accruals quality in year  $t$  refers to the standard deviation of a firm's residuals calculated over year

### 3.2.2.2 Board quality:

Board quality is one of the significant internal factors that affect the idiosyncratic volatility of the firm. The companies with poor board quality have a high-risk premium as compare to those who have strong board characteristics. The board quality is measure by Siam, Laili, & Khairi (2014) using different characteristics of the board such as board size, board independence, CEO duality, financial expertise of board of direction (BOD) and board meetings. To measure the impact of board quality in the context of Pakistan the current study forms board quality index based on the variables used by Siam, Laili, & Khairi (2014) that capture the effects of the board at the firm level.

In Pakistan, recent reforms of SECP recommend a board with non-executive directors. According to Pakistan's standards of corporate governance, 25% of board should comprise of Independent manager<sup>6</sup>. So in this study board independence is taken as a percentage of non-executive directors on board.

$$\text{Board Independence} = \frac{\text{non-executive directors in the board}}{\text{Total directors}} \quad 3.5$$

The second variable for board quality is the board size including non-executive directors and is measured by a total number of members on the board. MAK and Kusnadi (2005) studied that there is a direct association between board size and performance of the firm. Whereas, Yermack (1996) and Liang and Li (1999) have reported that board size is negatively related to exports of the firm.

$$\text{Board Size} = \text{Total number of board members} \quad 3.6$$

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<sup>6</sup> <https://www.secp.gov.pk/wp-content/uploads/2019/03/Finance-Minister-applauds-global-recognition-of-Pakistan%E2%80%99s-enhanced-compliance-with-International-Corporate-Governance-Standards-.pdf>

The third variable for board quality is the Institutional Ownership. The increase in the ownership percentage of institutional investors increases the earning quality of the firm (Emamgholipour, Bagheri, Mansourinia, & Arabi, 2013). Institutional ownership ratio in this study is measured as:

$$\text{institutional ownership} = \frac{\text{number of share held by institutional investor}}{\text{total number of shares outstanding}} \quad 3.7$$

The fourth variable for board quality is gender diversity. The firms have more the gender diversity on board are more innovative, more creative and they are more effective in problem-solving (Robinson & Dechant, 1997). The board diversity in firm increase the financial value of a firm and female director are more risk-averse towards earning management and frauds (Man & Wong, 2013). Gender diversity in this study is measured as a percentage of female directors in total firm size.

$$\text{Gender diversity} = \frac{\text{female directors on borad}}{\text{total directors}} \quad 3.8$$

**TABLE 3.2 SUMMARY OF BOARD QUALITY MEASURES**

<b>Variable name</b>	<b>Formula</b>
BI	Board Independence = $\frac{\text{non-executive directors in the board}}{\text{Total directors}}$
BS	Board Size = Total number of board members
IO	institutional ownership = $\frac{\text{number of share held by institutional investor}}{\text{total number of shares outstanding}}$
GD	Gender diversity = $\frac{\text{female directors on borad}}{\text{total directors}}$

### 3.2.2.3 Firm Size

The information asymmetries are high in smaller firms, where few managers have a large portion of the information as compared to larger firms. Several proxies are used to measure firm size but in recent literature, most of the researchers use total assets as a proxy (Dang, Li, & Chen, 2018). So I have measure the size of the firm by using the following formula:

$$\text{Size} = \ln(\text{total assets}) \quad 3.9$$

### 3.2.3 Control variables

#### 3.2.3.1 Book to market ratio:

A book to market is used as another control variable to measure the idiosyncratic volatility of stocks. Sloan(1996) used a book to market ratio as a variable to measure the volatility of stocks. The book to market ratio is calculated:

$$\text{book to market} = \frac{\text{Book value of equity}}{\text{Market value of equity}} \quad 3.10$$

#### 3.2.3.2 Leverage:

Leverage is taken as a control variable for measuring idiosyncratic volatility of stocks (Kaaya, 2015), (Gugler, 2001), (Biswas, 2018). The debt to equity (Fontaine, Haarman, & Schmid, 2006) ratio is used to calculate the leverage of a firm. Rajgopal & Venkatachalam (2011) uses the same control variable for measuring stock return volatility.

$$\text{leverage} = \frac{\text{Total debt}}{\text{Total equity}} \quad 3.11$$

#### 3.2.3.3 Return on equity:

ROE in the equation represents the return on equity. It is also used as control variable for measuring volatility of stocks following (Wei & Zhang, 2006). The return on equity is calculated by: (Sapientza & Zingales, 2012)

$$\text{ROE} = \frac{\text{Net income}}{\text{Book value of equity}} \quad 3.12$$

**TABLE 3.3 SUMMARY OF CONTROL VARIABLES**

Variable name	Formula
BM	$\text{book to market} = \frac{\text{Book value of equity}}{\text{Market value of equity}}$
BS	$\text{leverage} = \frac{\text{Total debt}}{\text{Total equity}}$
ROE	$\text{ROE} = \frac{\text{Net income}}{\text{Book value of equity}}$



### **3.3 Model specification**

#### **3.3.1 Panel Data Regression Model**

The data set that comprises of time series and the cross-sectional element is called panel data or longitudinal data. Since the data set is spread along the time of 2009-2018 of 100 firms and is based upon their different variables it's a panel data. Due to the limited availability of data the analysis is done on 81 firms. For analysis purposes generalize the method of moments (GMM) is used. It involves estimating a single equation on all the data together. The data set of dependent variable  $y$  is entered into a single column containing all the cross-sectional and time-series observations and data set of all the independent variables are entered into single columns in the  $x$  matrix. Then the equation is estimated using GMM.

##### **3.3.1.1 Generalized method of moments:**

The estimation of our panel data through OLS will lead us towards biased results because in our model the error terms are not normally distributed and the problem of heteroscedasticity will arise. Apart from that the model also contains lagged variables and lagged dependent variable terms that will raise the problem of endogeneity. To overcome this inconsistency that might arise the study uses a one-step system GMM technique for estimation. The GMM technique was developed by Arellano and Bond (1991). This technique is used to control unobservable heterogeneity and prevent potential endogeneity problems (Blundel, Bond, & Windmeijer, 2001). It also avoids the problem of serial correlation, heteroscedasticity, and reverse causality. Three main causes lead to the endogeneity problem in the model. The first cause is omitted variables problem it arises when a researcher does not include an important variable that has a substantial effect on the dependent variable in the regression. the mislaid variable goes to error term region where if its relationship is being found with explanatory

variables then the problem of endogeneity may happen to occur. The second cause is simultaneous causality it occurs in two ways when the independent variable affects the dependent variable and dependent variable effect independent variable in the regression line. The third is a cause is errors in variables it refers to the phenomena when researcher some time uses the proxies of those variables which is quite difficult to measure directly. More often the error has been found between the variable of interest and its proxy while measuring it. So, the measurement imperfection of variables leads us to measurement error. this error also incorporates in the unobserved area i.e. ( $\mu$ ) and generating the problem of endogeneity. GMM technique increasingly popular if one dealing with firm-level panel data. There are different types of GMM i.e. difference GMM, system GMM. In this study one-step system GMM is used. System GMM approach was introduced Arellano and Boverb (1995) and Blundell and Bond (1998), which use appropriate lagged levels and lagged first differences of the regressors as their instruments. Taking the first differences controls for the non-observable firms fixed effect. It is assumed that there is no serial correlation in the disturbance term and all the lagged variables can be used as valid instruments in the first difference equation (Ahmed & Javid, 2009)

### **3.3.2 Principal component analysis:**

The principal component analysis (PCA) is a technique that is used to merge many associated variables under fewer variables is known as principal components. It reduces the number of variables and transforms them into a prime variable. It reduces the dimensionality of large data set as if there are numbers of proxies for a single concept the PCA will reduce these variables into a lesser number of components called principal component. It will help to spot the trends, variations, and outliers in the data set. PCA is a statistical procedure that converts the set of correlated variables into a linearly uncorrelated set of variables known as principal

components. If there are  $n$  variables then the number of principal components is  $n-1$ . The transformation is done in such a way that the first variable in principal component accounts for much variability in a data set, and each subsequent variable has the highest possible variance under the constraint that it is orthogonal on the previous variable. The PCA equation is as under.

$$BQI_{i,t} = W_1 IO_{i,t} + W_2 Gender Div_{i,t} + W_3 BI_{i,t} + W_4 BS_{i,t} \quad 3.13$$

In PCA the components are a weighted average of the original variables. In the above equation  $BQI_{i,t}$  is the Board quality Index of firm  $i$  at time  $t$ .  $IO_{i,t}$  is the institutional ownership of firm  $i$  at time  $t$ ,  $Gender Div_{i,t}$  represents gender diversity of firm  $i$  at time  $t$ ,  $BI_{i,t}$  represents board independence of firm  $i$  at time  $t$  and  $BS_{i,t}$  represents board size of firm  $i$  at time  $t$ . The weights,  $W$ , are constructed so that the variance of  $BQI$  of firm 1,  $Var(BQI_1)$ , is maximized. Also, so that  $Var(BQI)$  of firm 2 is maximized and that the correlation between  $BQI_1$  and  $BQI_2$  is zero. The remaining BQI's are calculated so that their variances are maximized, subject to the constraint that the covariance between  $BQI_i$  and  $BQI_t$ , for all  $i$  and  $t$  ( $i$  not equal to  $t$ ), is zero. The study uses board characteristics, which have several proxies. For good visualization and to reduce the dimension of proxies into distinct sets of a variable PCA is used and transformed into an uncorrelated set of the principal component.

### 3.4 Empirical Model:

In this section, we develop the empirical models used to estimate the association between the quality of earning and idiosyncratic volatility. In this model, in the first equation is similar to CAPM three factor model. The regression equation is as under.

$$r_{i,t} = \alpha_1 + \beta_i r_{j,t} + \varepsilon_{i,j,t} \quad 3.14$$

In model 3.14,  $r_{i,t}$  is the return of the stock  $i$  at time  $t$  company. Where  $r_{i,t}$  the return of  $I$  firm at time  $t$ . is  $\beta_i$  measures the firms  $i$  exposure to its industry return  $\varepsilon_{i,j,t}$  has natural

interpretation of idiosyncratic return volatility at time t and firm i. For each period, idiosyncratic return volatility is defined as  $\text{VAR}(\varepsilon_{i,j,t})$  and industry return volatility as  $\sqrt{\text{VAR}(\varepsilon_{i,j,t})}$

Nevertheless, analysts, managers, and investors compare a firm's return concerning their peers in the same industry. Motivated by this observation I take "industry return" as a "market" return for the firm. I then define idiosyncratic and systematic volatility according to the firm's exposure to industry means. For now, I have label "systematic return volatility" such defined "industry return volatility". Using this approach following parsimonious regression for each firm every year. For each period I define idiosyncratic return volatility as  $\sqrt{\text{VAR}(\varepsilon_{i,j,t})}$  and industry return volatility as  $\sqrt{\text{VAR}(\widehat{r}_{i,j,t})}$  where  $\widehat{r}_{i,j,t} = \widehat{\alpha}_1 + \widehat{\beta}_i r_{j,t}$  is predicted return calculated from the regression model 3.18

$$IVOL_{i,t} = \alpha_0 + \alpha_1 IVOL_{i,t-1} + \alpha_2 AQ_{i,t-1} + \alpha_3 BQI_{i,t-1} + \alpha_4 SIZE_{i,t-1} + \varepsilon_{i,t} \quad 3.15$$

In model 3.15 IVOL is the annual idiosyncratic volatility as defined above and we have also include the lagged variable in order to avoid endogeneity problem. The first proxy variable for earning quality is AQ which is accruals quality measure given by the standard deviation of residual. BQI is the board quality index made from the weighted average of the scores calculated from Ownership Structure, Board Size, Institutional Ownership, and Board Independence. SIZE is measured by the natural logarithm of total assets.

$$IVOL_{i,t} = \alpha_0 + \alpha_1 IVOL_{i,t-1} + \alpha_2 AQ_{i,t-1} + \alpha_3 BQI_{i,t-1} + \alpha_4 AGE_{i,t} + \alpha_5 BM_{i,t-1} + \alpha_6 LEV_{i,t-1} + \alpha_7 ROE_{i,t-1} + \alpha_8 SIZE_{i,t-1} + \varepsilon_{i,t} \quad 3.16$$

Model 3.15 includes control variables in the model including Age, Book to market ratio, leverage, and return on equity. AGE is the firm's age calculated as several years since incorporation. BM is book to market ratio measured as the ratio between the book value of equity and the market value of equity. LEV is leverage and measured by long term debt to equity

ratio. ROE represents a return on equity, measured by the ratio between net income and book value of equity.

$$IVOL_{i,t} = \alpha_0 + \alpha_1 IVOL_{i,t-1} + \alpha_2 AQ_{t-1} + \alpha_3 CBQ_{i,t-1} + \alpha_4 AGE_{i,t} + \alpha_5 BM_{i,t-1} + \alpha_6 LEV_{i,t-1} + \alpha_7 ROE_{i,t-1} + \alpha_8 SIZE_{i,t-1} + \varepsilon_{i,t} \quad 3.17$$

$$IVOL_{i,t} = \alpha_0 + \alpha_1 IVOL_{i,t-1} + \alpha_2 AQ_{t-1} + \alpha_3 BQI_{i,t-1} + \alpha_4 AGE_{i,t} + \alpha_5 (AQ_{t-1} * BQI_{i,t-1}) + \alpha_6 BM_{i,t-1} + \alpha_7 LEV_{i,t-1} + \alpha_8 ROE_{i,t-1} + \alpha_9 SIZE_{i,t-1} + \varepsilon_{i,t} \quad 3.18$$

Model 3.17 includes the independent variables along with control variables. To capture the effect of each board quality component one by one CBQ is used. The CBQ is term used for characteristics of board quality that includes all board size, board independence, institutional ownership and gender diversity.

Model 3.18 includes the independent variables as well identify several control variables that affect idiosyncratic volatility. To measure the degree of effect of board quality on a firm's accrual quality an interaction term is included that captures this effect.

Defining a systematic component of return volatility for an individual firm is not an easy task because there is a lack of benchmark for "market" return. To do that we must have a comprehensive set of variables that describes the industry and macroeconomic conditions.

## Chapter 4

### Empirical results and discussion

This chapter contains the results of empirical models that are discussed in the previous chapters. The models are estimated by the research methodology discussed in chapter 3. To evaluate the impact of board quality and accrual quality on idiosyncratic volatility, a sample was taken from companies that are listed at PSX. The sample period is of 10 years from 2009 to 2018. The first and second the section of this chapter explains the descriptive statistics and the correlation matrix. The third section discusses the econometric models to check the association among idiosyncratic volatility, board quality, and accrual quality. The last section presents an interpretation of the experimental results.

#### 4.1 Descriptive statistics

Table 4.1 exhibit descriptive statistics for the characteristics of data. . IVOL is defined as idiosyncratic return volatility and calculated as  $\text{VAR}(\varepsilon_{i,j,t})$  and industry return volatility as  $\sqrt{\text{VAR}(\varepsilon_{i,j,t})}$ . The change in current assets are be calculated by using the at time t minus inventories at time t-1). The change in current liabilities is measured by change in accounts payables (accounts payables at time t minus accounts payables at time t-1); change in short term borrowings (short term borrowings at time t minus short term borrowings at time t-1); and by change in other current liabilities (current liabilities at time t minus current liabilities at time t-1). The change in cash (cash at time t minus current liabilities cash at time t-1) is measured by adding up net cash provided by the operating activities. The change in short term debt is measured by (short term debt at time t minus short term debt at time t-1) is calculated by current asset less other current liabilities. Board independence is taken as a percentage of non-executive

directors on board. Board size including non-executive directors and is measured by a total number of members on the board. Institutional ownership is measured as percentage of top10 non-executive directors on board. Gender diversity in this study is measured as a percentage of female directors in total firm size. Firm size is measured by taking log of total assets. Age is measured by number of years since incorporation. book to market ratio is calculated by dividing book value of equity with market value of equity. Leverage is measured by dividing debt with equity. ROE is the return on equity is measured by dividing net income with firms equity.

**TABLE 4.1 DESCRIPTIVE STATISTICS FOR THE PERIOD OF 2009-2018**

<b>Variable</b>	<b>Mean</b>	<b>Std.Dev.</b>	<b>Min</b>	<b>Max</b>	<b>Median</b>	<b>Kurtosis</b>	<b>Skewness</b>
<b>IVOL</b>	0.017	0.014	0.002	0.064	0.014	4.881	1.747
<b>Accruals</b>	4.681	35.479	-1.787	307.093	-0.628	277.459	14.833
<b>BQI</b>	-0.753	0.982	-16.826	2.110	-1.031	88.204	-4.770
<b>BI</b>	0.695	0.186	0	1.042	0.714	0.676	-0.765
<b>Board size</b>	8.308	4.649	8	13	7.349	581.666	22.304
<b>IO</b>	0.391	0.206	0	0.668	0.708	-0.282	-0.653
<b>Gender div.</b>	0.589	0.883	0	0.4	0.000	1.613	1.497
<b>Firms age</b>	29.333	11.329	10	55	27.000	-0.991	0.154
<b>BM</b>	1.3	5.868	-18.463	134.308	0.829	365.912	17.283
<b>Leverage</b>	0.315	0.282	-0.997	0.990	0.270	0.796	0.108
<b>ROE</b>	12.52	27.184	-117.53	85.43	13.600	38.033	-4.006
<b>Firms size</b>	16.124	1.498	11.811	20.318	0.969	33.210	5.062

*\*\*Note: Descriptive statistics is calculated for each variable from 2009 to 2018. Where IVOL is the idiosyncratic return volatility of firm, Accruals represents the total accruals of each firm calculate by modified johns model. BQI is the board quality index created through PCA. BI is the Board independence measured by percentage of independent board members, board size is the size of the board, IO is the institutional ownership, gender div. is the number of female directors on board, Firms size is size of firm, Firms age is the age of firm, BM is the book to market ratio of firm, Leverage is the total leverage, ROE is the return on equity.*

The table 4.1 contains descriptive statistics of the study. The descriptive statistics table is shown for dependent, independent, and control variables. In this table, the trends of the variables are shown. The mean and median is the measure of location in the data set. The standard deviation is used to measure the dispersion from the mean. The mean value of IVOL is .017 with a median of 0.01394 and a standard deviation of .014. The Accruals of the data have a mean 4.681 with a standard deviation of 35.479 and a median of -0.62782. The board quality index has a mean -.753 with a standard deviation of .982. The board size has a mean of 8.308 with a standard deviation of 4.649 and a median of 7.348687. The gender diversity across firms has a mean and median of .589 and 0 with a standard deviation of .883. The average firm age is 29.333 with a standard deviation of 11.329 and a standard deviation of 27. The mean and median of a book to market ratio is 1.3 and 0.829393 with a standard deviation of 5.868. The leverage has a mean value of .315 with a standard deviation of .282. The return on equity has a mean value of 12.52 and the standard deviation is 27.184. The firm size has a mean of 16.124 with a standard deviation of 1.498 and a median of 0.969.

In table 4.1 the maximum value shows the highest value and the minimum value shows the lowest value of the data set. The minimum value of idiosyncratic return volatility was small is as 0.002 and the maximum value is 0.064. The minimum value of Accruals in non-financial firms in Pakistan is -1.787 the maximum value is 307.093. The minimum value reported for the board independence which is measured by the percentage of non-executive directors on board is 0 and the maximum is 2.11. The board size which is measured by a total number of board members reported having a minimum value of 8 and a maximum 13. The institutional ownership which is measured by the percentage of shares held by institutional investors has minimum value 0 and maximum is 0.668. The previous studies show that higher the value of the ownership



percentage of institutional investors better will be the earning quality of a firm (Emamgholipour, Bagheri, Mansourinia, & Arabi, 2013). The gender diversity across firms is small as it has a minimum value of 0 and a maximum of 0.4. The minimum value of the Firm's age is 10 which is of worldcall telecom and the maximum is 55 which is of Pakistan Telecommunication Company Ltd. The book to the market ratio which is measured by dividing the book value of equity by market value of equity has a minimum value of -18.463 which is of Pakistan international airline and a maximum of 134.308. The minimum value for the leverage is -.997 and the maximum is .99. The minimum value for return on equity is -117.53 and the maximum is 85.43. The firm size which is measured by the natural log of total assets has a minimum value of 11.811 and maximum is 20.318.

The skewness and kurtosis are used to measure the normality of data set. If the value of kurtosis is 0 or close to zero then the data is normally distributed. kurtosis is the measure of outliers in the data set. If the value of kurtosis is 3 the data is normally distributed and the distribution is called mesokurtic. If kurtosis is  $<3$  the distribution is called leptokurtic.

#### **4.2 Correlation**

To check the association among variables correlation is run and the results are shown in Table 4.2. The result of Pearson correlation analysis tells us about the strength and magnitude of the relationship between dependent and independent variables. The value of the Pearson correlation coefficient always lies between -1 to +1. If the Pearson correlation coefficient is zero it means that two variables don't have any linear relation. Whereas -1 indicates the two variables are perfectly negatively linearly related and + 1 means that two variables are perfectly positively linearly related. The analysis indicate that the idiosyncratic return volatility is negatively correlated with board independence, firm's age, the book to market ratio, leverage, and firm size.

Whereas its positively related to accruals, board quality index, Board size, institutional ownership, gender diversity, and return on equity. There is no variable in the correlation table that has a high correlation and cause multicollinearity among the variables.

**TABLE 4.2 CROSS-SECTIONAL CORRELATION OF IDIOSYNCRATIC RETURN VOLATILITY, EARNING QUALITY AND BOARD QUALITY VARIABLES**

Variables	IVOL	Accr - uals	BQI	BI	Board size	IO	Gender div.	Firm s age	BM	Lever age	RO E	Firm s size
<b>IVOL</b>	1.000											
<b>Accrual</b>	0.096*	1.000										
<b>BQI</b>	0.002	0.021	1.000									
<b>BI</b>	-0.066	-0.012	-0.219*	1.000								
<b>Board size</b>	0.014	-0.036	-0.668*	0.206*	1.000							
<b>IO</b>	0.053	-0.014	-0.177*	-0.101*	-0.022	1.000						
<b>Gender div.</b>	0.035	-0.008	0.734*	-0.248*	-0.020	-0.073*	1.000					
<b>Firms age</b>	-0.080*	0.036	-0.145*	0.124*	-0.014	0.012	-0.216*	1.000				
<b>BM</b>	-0.060	-0.024	-0.006	-0.097*	-0.025	-0.101*	-0.035	-0.037	1.000			
<b>Leverage</b>	-0.097*	-0.086*	-0.049	-0.009	-0.066	0.051	-0.119*	0.046	0.087*	1.000		
<b>ROE</b>	0.015	-0.097*	-0.010	0.028	0.064	0.001	0.041	0.073*	0.080*	0.089*	1.000	
<b>Firms size</b>	-0.176*	-0.047	-0.174*	0.218*	0.190*	-0.008	-0.105*	-0.018	-0.077*	-0.038	-0.048	1.000

\* shows significance at the .05 level

Note: *The Pearson correlation coefficients report the averaged value from 2009 to 2018. All variables of table 4.1*

### 4.3 Test for multicollinearity

In order to check the degree of multi-collinearity among variables the variance inflation factor (VIF) is calculated. If variance inflation factor is <5 it means multi-collinearity is not present and there is no need to eliminate one or more variables from the data set. The table 4.3 shows that there is multi-collinearity in the data.

**TABLE 4.3 VARIANCE INFLATION FACTOR**

	<b>VIF</b>	<b>1/VIF</b>
<b>BQI</b>	1.059	.945
<b>Firms size</b>	1.048	.955
<b>Leverage</b>	1.04	.962
<b>BM</b>	1.039	.962
<b>Firms age</b>	1.033	.968
<b>ROE</b>	1.03	.971
<b>Accrual</b>	1.021	.979
<b>Mean VIF</b>	1.039	.

#### **4.4 Impact of earning quality and board quality variables on idiosyncratic return volatility**

This study aims to observe the role of earning quality and board quality on idiosyncratic return volatility of the firm by using the generalized method of moments technique in panel data analysis. The dependent variable is idiosyncratic return volatility whereas, earning quality and board quality is the explanatory variable. The study measures the idiosyncratic volatility of firms using the direct decomposition method (Malkiel & Xu, 2003). The study uses accruals as a proxy to measure quality of earning using Jones Model (1991) and Modified Cross Sectional Jones Model [1995]. Other independent variable is board quality index which is used to measure the impact of board quality in the context of Pakistan. The current study form board quality index based on the variables used by Siam, Laili, & Khairi (2014) that capture the effects of the board at the firm using percentage of non-executive directors on board, board size, Institutional Ownership and gender diversity.

Firm size is also used as a moderating and independent variable to measure its effect on idiosyncratic return volatility. Apart from dependent and independent variable some control variables such as size, book to market ratio, leverage are used to capture the effect of these variables on idiosyncratic return volatility. Several proxies are used to measure earning quality and board characteristics so the problem of endogeneity was raised. In order to resolve this

problem and to reduce the dimension of proxies into two distinct sets of a variable the run PCA and transforms them into an uncorrelated set of the principal component. The weighted variables obtained from PCA are used for the regression analysis further. In order to avoid further endogeneity and mismeasurement in variables the study uses S-GMM approach to estimate the results. For estimating multivariate equation, total 81 firms are used for a period of 2009 to 2018. The further tables presents the time series coefficient, adjusted R-Square (model fit statistic), standard error, AR (2), Hansen and variable significance statistic (P-value).

#### 4.4.1 Relationship of idiosyncratic return Volatility with earning quality and board quality along with control variables:

In order to investigate how earning quality and board quality along with some control variables effects the effect idiosyncratic volatility of the firm, we estimated Model 2 mentioned in equation (3.16). This model also contained a one-year lag of dependent variable followed by some control variables, in order to control firm-specific effects which is also used in previous studies

**TABLE 4.4 IMPACT OF EARNING QUALITY AND BOARD QUALITY ON IDIOSYNCRATIC RETURN VOLATILITY FOR THE PERIOD OF 2009-2018**

<b>IVOL</b>	<b>Coef.</b>	<b>St.Err.</b>	<b>t-value</b>	<b>p-value</b>	<b>Sig</b>
<b>IVOL(-1)</b>	0.347	0.035	9.96	0.000	***
<b>Accrual</b>	0.003	0.001	3.26	0.002	***
<b>BQI</b>	-0.004	0.001	-4.62	0.000	***
<b>Firms age</b>	-0.000	0.000	-3.67	0.000	***
<b>BM</b>	0.544	0.259	2.11	0.036	**
<b>Leverage</b>	-0.001	0.002	-0.78	0.440	
<b>ROE</b>	0.260	0.107	2.43	0.015	**
<b>Firms size</b>	-0.002	0.000	-6.85	0.000	***
<b>Constant</b>	0.041	0.004	9.51	0.000	***
Mean dependent var	0.017	SD dependent var		0.014	
Number of obs	648.000	F-test		28.77	
AR(2)	-1.170(0.243)	Hansen test		46.290(0.229)	

*NOTE\*\*\*In the table 4.6 IVOL is the idiosyncratic return volatility of firm i during time t-1. Accruals represents the total accruals of each firm i during time t-1. BQI is the board quality index created through PCA. Firms age is the age of firm i during time t, BM is the book to market ratio of firm i during time t-1, Leverage is the total leverage of firm i during time t-1, ROE is the return on equity of firm i during time t-1. Hansen test is a test of over-identifying*

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*restriction. Significance level is as follow at 99% (\*\*\*)  $p < 0.01$ , at 95% (\*\*)  $p < 0.05$ , at 90% (\*)  $p < 0.1$ .*

Table 4.4 contains the results of Model (2). The table contains the results of the variables of our main interest. It also presents the information regarding to diagnostics test for the adequacy and the results of some test i.e. the number of observations AR (2) and Hansen statistics, F-test. But before presenting the main results of table we first, interpret the results of diagnostic tests that show the adequacy and reliability of the model. The Arellano-Bond AR (2) test and Hansen test report the information that the instrument used in the model are valid. The Arellano-Bond AR (2) test's null hypothesis suggests that the instruments used by model are valid and second-order correlations of error term are not found with these instruments. While the null hypothesis of the Hansen j-statistics suggests that the instrument as a whole are exogenous and orthogonal to the error term. The probability value of AR (2) is (0.243) are insignificant so we cannot reject the null hypothesis of the test. Moreover, it suggests that our model is valid enough. Similarly, the probability value of Hansen test is (0.229) also highly insignificant so we cannot reject the null hypothesis.

Now our focus lies on the coefficient of variables that tells about what changes occurred in idiosyncratic return volatility if there is one-unit change occur in other variables. Table 4.5 reports that accrual quality, book to market and return on equity are significantly positive related to idiosyncratic volatility as we expected. However, leverage shows an insignificant relationship with idiosyncratic volatility. While the association of book to market ratio is significant with idiosyncratic return volatility of the firm. Our finding is consistent with the results (Cerqueira & Pereira, 2017). The positive relationship between idiosyncratic return volatility and one time-lagged idiosyncratic return volatility suggests that firm-specific volatility in the previous year is followed by current year firm-specific volatility. The accrual quality of the firm is positively and

significantly related to IVOL which shows the noise view of idiosyncratic volatility suggesting that the poorest the information environment the higher the firm-specific volatility. The inverse relation of board quality index with idiosyncratic volatility is because corporate governance practices may reduce some private benefits of a manager and induce investor benefits (John & Litov, 2006). (Hutchinson, 2004) Suggests that managers see corporate governance as a barrier that reduces the idiosyncratic volatility of the firm. The firm size is highly significant with IVOL which shows that larger the of size firm less will be the riskiness.

Firm size is another component of the firm volatility in many studies. The coefficient of firm size (-0.002) that shows 1% increase in size reduce IVOL by 0.002%. This result is consistent with the finding of (Giannetti & Zhao, Board Diversity and Firm Performance Volatility, 2016). One of the reasons of this relationship is explained by Li et al. (2014) that larger firms are more open to information available to general public as compare to smaller firms. They are more monitored by the analysts that reduce their idiosyncratic volatility. Firm's age and volatility are negatively related to each other the results suggest that idiosyncratic volatility increases for younger firms because of their higher uncertainty about future profitability (Pástor & Pietro, 2003). Leverage has also negative coefficient that shows with increase in leverage (debt to equity ratio) firm volatility decreases. The relationship of book to market ratio is statistically significant with idiosyncratic volatility.

#### 4.4.2 Relationship of idiosyncratic return Volatility with earning quality and board characteristics along with control variables:

**TABLE 4.5 IMPACT OF EARNING QUALITY AND BOARD CHARACTERISTICS ON IDIOSYNCRATIC RETURN VOLATILITY FOR THE PERIOD OF 2009-2018**

<b>IVOL</b>	<b>Coef.</b>	<b>St.Err.</b>	<b>t-value</b>	<b>p-value</b>	<b>Sig</b>
<b>IVOL(-1)</b>	0.338	0.016	21.37	0.000	***
<b>Accrual</b>	0.037	0.007	5.53	0.000	***
<b>BI</b>	-0.006	0.003	1.80	0.076	*
<b>Board size</b>	0.001	0.000	3.75	0.000	***
<b>IO</b>	0.001	0.000	1.30	0.076	*
<b>Gender div.</b>	0.002	0.000	5.70	0.000	***
<b>Firms age</b>	0.042	0.008	5.11	0.000	***
<b>BM</b>	0.559	0.030	18.43	0.000	***
<b>Leverage</b>	0.000	0.001	0.34	0.736	
<b>ROE</b>	0.506	0.039	13.14	0.000	***
<b>Firms size</b>	-0.002	0.000	-11.69	0.000	***
<b>Constant</b>	0.041	0.002	17.75	0.000	***
Mean dependent var	0.017	SD dependent var		0.014	
Number of obs	648.000	F-test		334.778	
AR(2)	-1.260(0.207)	Hansen test		70.800(0.994)	

*NOTE\*\*\*In the table 4.6 IVOL is the idiosyncratic return volatility of firm i during time t-1. Accruals represents the total accruals of each firm i during time t-1. Following the characteristics of board quality. BI is the Board independence measured by percentage of independent board members, board size is the size of the board, IO is the institutional ownership, gender div. is the number of female directors on board, Firms size is size of firm i during time t-1, Firms age is the age of firm, BM is the book to market ratio of firm i during time t-1, Leverage is the total leverage of firm i during time t-1, ROE is the return on equity of firm i during time t-1. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.*

The Board quality index tells us the overall picture of its influence on the idiosyncratic volatility of the firm. However, we are also interested in an inquest the impact of Board quality attributes (each and every component of Board quality used in Board quality in equation (3.16)) on idiosyncratic volatility separately. For this purpose, we regress the model in which our dependent variable is same as used in previous models but our left side of the equation contains components of BQI that are board Independence, the board size, institutional ownership, gender diversity with some firm-specific control variables which already mentioned in the previous model

Alike Table 4.4 Table 4.5 has also similar features. The table contains a diagnostic test for model accuracy and estimation method. The Hansen statistic and AR (2) tests p-value are high i.e. (0.994 and 0.207 respectively) and we cannot reject the null hypothesis which says that our instruments are valid and orthogonal to the error terms of the model. The table also contains results of the main variables of study interest, where one time-lagged idiosyncratic return volatility is positively correlated with its dependent variable (idiosyncratic volatility). This positive relation shows that the previous fluctuation in volatility is being followed by current fluctuation in idiosyncratic return volatility. Board independent is has a significant and direct relationship with IVOL. However, board size and gender diversity have a positive and highly significant relationship with IVOL. Institutional ownership has an insignificant relationship with IVOL. The firm's age has a negative and significant relationship with IVOL. The book to market ratio and leverage has negative and semi-strong significance relationship with IVOL.

The board independent has a negative coefficient with a significant relationship with IVOL which shows that when there are more outside directors on the board the idiosyncratic volatility is less which is similar to the results of Giannetti & Zhao(2016). This kind of relationship exists between them because “independent directors are independent of their decision making. They take good measures for the progress of the firm besides their self-interest and self-benefits. The coefficient of board size is 0.001%, which means that 1% change in board size cause 0.001% increase in IVOL. This means as the number of board members increases the better will be the IVOL of the firm. On the other hand, at 1% level of significance, the gender diversity is positively related to the idiosyncratic volatility of the firm. The results are inconsistent with results of (Giannetti & Zhao 2016) the more diversity the board have better will be the decision making. Institutional ownership has a positive and significant impact on IVOL. The coefficient



of institutional ownership is 0.001 which means 1% change in institutional ownership can increase the IVOL with 0.001%. so it means that increasing the ownership percentage of institutional investors can increase the IVOL of the firm. This is because institutional investors play an important role on board they can manipulate the financial statements and can limit the activities of management. The results are similar to the study of (Bagheri, Mansourinia, & Arabi, 2013). All other control variables have significant relationship with IVOL except the leverage which is insignificant across all models. Among control variable firm age (0.042) is positively associated while firm size(-0.002) and leverage (-0.00) are negatively related with IVOL. ROE (0.506) is significantly positive at 1% level of significance.

#### 4.4.3 Combine effect of BQI and Accrual quality on idiosyncratic return Volatility

In this part of the study we find the combine effect of board quality and idiosyncratic return volatility of firm by adding an interaction term in model 2. In this model 4 our effort is to find out that how board quality index along with accruals affects the idiosyncratic volatility of the firm.

**TABLE 4.6 IMPACT OF BQI AND ACCRUAL QUALITY ON IDIOSYNCRATIC RETURN VOLATILITY FOR THE PERIOD OF 2009-2018**

<b>IVOL</b>	<b>Coef.</b>	<b>St.Err.</b>	<b>t-value</b>	<b>p-value</b>	<b>Sig</b>
<b>IVOL(-1)</b>	0.352	0.034	10.36	0.000	***
<b>Accrual</b>	0.049	0.009	5.63	0.000	***
<b>BQI</b>	-0.004	0.001	-4.17	0.000	***
<b>AQ*BQI</b>	0.058	0.011	5.25	0.000	***
<b>Firms age</b>	0.099	0.029	3.43	0.001	***
<b>BM</b>	0.020	0.008	2.52	0.014	**
<b>Leverage</b>	-0.001	0.002	-0.73	0.465	
<b>ROE</b>	0.066	0.011	5.79	0.000	***
<b>Firms size</b>	-0.002	0.000	-6.57	0.000	***
<b>Constant</b>	0.040	0.004	9.30	0.000	***
Mean dependent var	0.017	SD dependent var		0.014	
Number of obs	648.000	F-test		31.712	
AR(2)	-1.260(0.208)	Hansen test		46.380(0.226)	

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*NOTE\*\*\*In the table 4.6 IVOL is the idiosyncratic return volatility of firm i during time t-1. Accruals represents the total accruals of each firm i during time t-1. BQI is the board quality index created through PCA . AQ\*BQI is the interaction term of accruals and board quality index. Firms age is the age of firm i during time t, BM is the book to market ratio of firm i during time t-1, Leverage is the total leverage of firm i during time t-1, ROE is the return on equity of firm i during time t-1. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1*

Table 4.6 shows the results of model 4. The diagnostic tests of the models are valid as there is no 2nd order serial correlation in the instruments; the instruments used in this study are valid and exogenous throughout the models. Because the P-value of both tests is greater than 0.05. The lag of the dependent variable of all Models shows a positive association with idiosyncratic volatility means that it follows idiosyncratic volatility of the previous year of the firms. By adding the interaction term in the model the results of the models have changed slightly as compared to the previous model. At 1% level of significance, the accruals have a positive association with accruals of the firm which indicates that poor information quality is positively associated with accruals idiosyncratic volatility of the firm. The interaction term of AQ\*BQI shows a positive and highly significant association with IVOL at 1% level of significance. At 5% level of significance, the BM shows a positive association with IVOL of the firm. However, leverage, and firm size shows a negative association at 1% level of significance.

#### **4.5 Discussion**

Based on the literature, to my knowledge, the associations between idiosyncratic risk earning quality and board quality together has not been previously studied in the context of PSX. The results reveal that there is a clear and strong effect of earning quality, board quality on idiosyncratic return volatility. Moreover, the Pakistan market is a well-organized, well-functioning, fair and efficient market. Thus, idiosyncratic risk is relevant in such a market and is integral to good earning quality and board quality. The study also contains some results

regarding control variables. The results show that in the case of nonfinancial firms listed on PSX smaller and younger firms that are more levered tend to increase the firm-specific volatility.

The overall results of the study are similar to the results of (Cerqueira & Pereira, 2017). The study finds out a strong and positive association between accrual quality and idiosyncratic return volatility. The overall results show that if the firms improve their quality of earning the firm-specific volatility will be reduced. The results indicate strong association between accruals and idiosyncratic volatility. Therefore, accruals quality is an effective indicator of poor earnings quality because firms with high values of accruals, which represent more volatile abnormal accruals, exhibit higher levels of IVOL.

The results also reveal that board quality along with accruals plays a huge role in determining the idiosyncratic return volatility of non-financial firms in Pakistan. The study uses different proxies to measure board quality and the results supports the previous literature. One proxy of board quality is board independent that has a negative relationship with IVOL which is similar to the results of Giannetti et al. (2016). In context of board size the findings indicate positive association. The finding are align with (Zaheer, 2013) analysis. Gender diversity is positively related to the idiosyncratic volatility of the firm which contradictory to the study of (Giannetti & Zhao, 2016). The instituitinal ownership has positive impact on idiosyncratic volatility. The findings are supported by study of Bagheri et al. (2013) they also found positive and significant relationship between institutional ownership and IVOL on some listed companies on Tehran Stock Exchange by examining a sample of 700 firm-years data over the period 2006-2010.

The results show the control variables (return on equity, book to market ratio) have significant relationship with IVOL whereas Leverage and firm size has negative impact across all models. So These results are angling with of Chan at al.(2009) finding. They state that as the size of the firm increases the firm's variability decreases. Higher book to market ratio, increase the IVOL which also supports previous literature.

## Chapter 5

### 5.1 Conclusion

The results indicate a statistically significant positive association between earning quality and idiosyncratic return volatility. Therefore, our study emphasizes that improving the accrual quality of the firm reduces idiosyncratic return volatility. The impact of Board quality on idiosyncratic return volatility has been widely investigated more in developed countries. Whereas, in developing countries like Pakistan few studies discussed the effect of specific board components and earning quality on idiosyncratic volatility or firm risk. This study explores the relationships of idiosyncratic volatility with of earning quality, board quality and other performance measures. The study is conducted in context of Pakistan with data from 2009-2018. The study uses different proxies for measuring earning quality and board quality. An index of board quality is made to reduce the dimensionality of data set through PCA. The study uses one-step system GMM for estimation of the models.

The results of previous studies indicate a statistically significant positive association between earning quality and idiosyncratic return volatility (Cerqueira & Pereira, 2017) (Angelidis & Tessaromatis, 2008). Therefore, our study emphasizes that improving the accrual quality of the firm reduces idiosyncratic return volatility. Ghafoor, Zulfiqar, & Khurshid (2002) conducted a study in Pakistan on corporate governance and idiosyncratic risk in a market with internal-governance-control characteristics. Their results indicate that the firms with better corporate governance mechanisms tend to have a lower idiosyncratic risk. The investors use board quality as a tool to reduce agency problem that also reduces idiosyncratic volatility of firm. (Anjala Kalsie, 2016). The results by (Rajgopal & Venkatachalam, 2011) suggests that poor earnings quality is associated with greater firm-level return volatility

While applying the system GMM the outcome of the study shows a negative relationship between board quality index and idiosyncratic volatility of the firm. Secondly, this study empirically investigated to measure the relationship between board quality (institutional ownership, the board size, gender diversity, and board independence) and the idiosyncratic volatility of the firm. Among board quality proxies positive relationship has been found between some components of board quality in Pakistan. Firms with more female directors on board will have more effect on the idiosyncratic volatility of the firm. Institutional ownership has a positive and significant relationship with idiosyncratic volatility. These results are similar to the analysis of (Bushee & Noe, 2010), (Anjala Kalsie, 2016) (Shah, Butt, & Hasan, 2009 ) and (Alam & Shah, 2013). The study further suggests that to overcome firm-specific volatility in the case of developing countries like Pakistan the quality of earning and components of board quality plays a huge role. To reduce the idiosyncratic volatility of firms the firms should have less female directors on board, better disclosure of their information and appoint more outside directors on board.

## **5.2 Policy recommendation**

The study has contributed policy implications in four dimensions. Firstly, the empirical results provide the importance of the role that board quality and earning quality plays in the idiosyncratic return volatility of a firm that is highly important for the investors. The investors should not ignore the idiosyncratic volatility and should consider it as a part of total risk. The idiosyncratic volatility can effect the risk and reward relationship so it's important to understand its behavior. The board quality is highly important for the investors as transparency and accountability can prevent corporate scandals, fraud and issues pertaining to corporate liability.

Second, the managers manager's choice of investment and financing policies can increase or decrease the firm accruals. When managers tries to maximize their utility and tries to keep the books clean this give rise to the accruals at firm, which ultimately increase the idiosyncratic volatility of firm. So the managers should adopt the method that presents the true picture of their firms in order to avoid corporate scandals. Managers being representations of a firm should give well-documented recommendations and information to the board about the company. Third the academicians can use the results to design better model that c that can capture the idiosyncratic volatility at firm level.

Fourth, the regulatory bodies and policymaker to get benefits and support towards idiosyncratic return volatility should not ignore the accrual and board quality of the firm. The finding shows that the government should implement a strategy for invited institutional owners to invest in the stock market of local firms. The study has some significant implications for firms to enhance their performance. Firms should aim at independent directors on the board and should not allow institutions to be their major shareholders since institutional ownership increases the firm's idiosyncratic risk. The Security Exchange Commission of Pakistan (SECP) to adopt and conduct corporate governance codes and practices to ensure implementations and regulations of these practices. To enhance performance and keep risk at a stable, low, or moderate level they should follow and implement strict corporate governance practices, and to invest in those corporations which follow and supervised good corporate governance practices

### **5.3 Limitation and future research**

The current study uses 81 non-financial firms that are listed on PSX. One can get the data of all non-financial firms and can capture the effect of accrual and board characteristics in the future. It will be useful to use other proxies of earning quality and idiosyncratic volatility in the

future. The study can also be repeated for other markets and time i.e the data frequency can be monthly to check the robustness of the results. The current study uses some proxies of board quality to make index one can repeat the study using corporate governance data or using other proxies as well. The study can be repeated by calculating the idiosyncratic return volatility of different industrial data. It would be interesting to check what other variables might affect the idiosyncratic volatility of the firm. Taking advantage of the episode of financial crisis period due to corona, It will be useful to observe the behavior of idiosyncratic volatility and what determines its reversal in periods before the financial collapse.



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