

CAPITAL UNIVERSITY OF SCIENCE AND
TECHNOLOGY, ISLAMABAD



Does Corporate Sustainability and Corporate Governance Pays-off for Firm's Risk

by

Rabia Mehreen

A thesis submitted in partial fulfillment for the
degree of Master of Science

in the

Faculty of Management & Social Sciences
Department of Management Sciences

2021

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Dedicated to all strong women, I am blessed to call friends, are a gift to the world.



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Acknowledgement

In the Name of Allah, The Most Gracious, The Most Merciful. Praise be to God, the Cherisher and Sustainer of the worlds. All thanks to Almighty Allah, The Lord of all that exist, who bestowed me with His greatest blessing i.e. knowledge and Wisdom to accomplish my task successfully.

Thousands of salutations and benedictions to the Holy prophet **Hazrat Muhammad (PBUH)** the chosen-through by whom grace the sacred Quran was descended from the Most High. I am very thankful to **Dr. Arshad Hassan**, a great teacher, mentor and supervisor who made a difference in all aspect of my life. I am indebted to **Dr. Arshad Hassan** for his valuable guidance, encouragement and dedicated support that enabled me to complete my MS Degree Program.

I want to express my heartiest regards to my parents who always supported me morally, spiritually & prayed for my success.

Rabia Mehreen

Abstract

This study is intended to explore the impact of corporate sustainability and corporate governance on market risk. The study uses one of the large datasets on SSr, ESGC and CGC from 2013 to 2018 of 778 firms evidencing from the New York stock exchange. The study argue that higher sustainability score representing better firm's (environmental, social and governance) performance influence firm's risk level. Firm risk is measured by downside risk i.e. conditional value at risk and value at risk. Moreover, panel regression analysis is applied which conclude that fixed effect model is appropriate for this analysis. This study conclude that the presence of corporate governance committee and ESG committee can ensure the safe investment, increased returns and reduced risk. Also as the firm grows in size the risk is decreased and with the increase in leverage there is also the chance of increase in risk. These results suggest that the committees positively impact sustainability strengths, and mitigate risk, however sustainability score does not reduce risk concerns, which is the future recommendation for further research.

Keywords: VaR, CVaR, Sustainability Score, ESG committee, Fixed Effect Model.

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Abbreviations

CAPX	Capital Expenditure
CGC	Corporate Governance Committee
CVAR	Conditional Value at Risk
ESGC	Environmental, Social and Governance Committee
FS	Firm Risk
LEV	Leverage
SSr	Sustainability Score
VaR	Value at Risk

Chapter 1

Introduction

Good governance and corporate sustainability are the two most important contemporary business issues. Pressure is mounting nowadays on corporations for initiating active research in these areas. The talk about an impact of corporate activities on the external and internal environment have been greatly in discussion from couple of decades. More and more academic research work has seen, making corporations realize the importance of sustainability issues. Historically, corporate sustainability is considered mainly as an expense by businesses or a liability that mitigate the speed of efficiency, delay in procedures and hurdle the boosting profitability.

Now, after five decades, business leaders have begun to perceive corporate sustainability as an opportunity rather than as an obligation– progressively restructuring the mode that businesses operate and create value. Moreover, the hype in different corporate sustainability reporting standards like Global Reporting Initiative (GRI) and governing public regulations are placing extra pressure on corporations to develop or expand their sustainability practices (Karlsson & Bäckström 2015).

The short-term practice of avoiding sustainability, prevalent in many businesses create potential barriers for corporations to invest in more long-term sustainability practices. For example, the investor's expectations on company's announcements, may force top management to even earnings to secure equity prices and as an outcome perhaps sacrificing sustainable value creation (Bansal & DesJardine, 2014).

Subsequently, this leads to a possible trade-offs between being sustainable from a long-term prospect and being revenue generating from a short-term prospect. Nevertheless, it is getting more and more difficult to get away with more dubious, unethical business practices, thanks advances in technology and communication - at least for longer times to come. In addition, as the scale of global sustainability reporting is increasing exponentially (KPMG, 2013), it has become helpful to evaluate the sustainability policies of companies and their level of disclosure.

The sustainability activities of firms are assessed using criteria in three areas namely environmental, social and governance (ESG). Due to this obvious growth in social and environmental activities, sustainability disclosure becomes the part of corporate practices.

Sustainability is regarded as the cure to answer the global issues of poverty, environmental degradation and social exclusion. It is widely assumed in certain studies carried out by indigenous bodies and few private organizations that public-private partnerships has the possibility to breathe new life into neighborhoods. Besides this sustainability fits various purposes in different management disciplines like finance, quality management, HRM, marketing, communication and reporting all these factors show different views on sustainability aligned to the specific situation and challenges as a result the of contemporary ideas and thoughts are often tilted towards specific interests.

Change in social circumstances, force corporations to react and accordingly consider their societal role. This leads to the fact that corporations are forced to readjust all their business activities including vision, mission, and corporate affairs, decision-making and reporting. Many companies are now increasingly announcing sustainability involvement (Simnett, 2012; Mock et al., 2013) and moving ahead of only a sustainability disclosure.

The corporations are accountable, not only to its shareholders rather far huge audience. Resultantly, an increasing percentage of corporate governance mechanism is incorporated with sustainability's work with larger societal domains (Elkington, 2006). Policy makers in different countries have already promoting these concepts. Corporate governance and sustainability in the corporate structure have

been united in the "triple bottom line" approach (Elkington, 2006). In this triple bottom line approach, economic, environmental, and social dimensions are weighed equally.

Mitra, Dhar, & Agrawal (2008) have focused to include these behaviour into business, to get competitive edge over the competitors. The basic principle of the "triple bottom line performance" is its deliberate nature which pays off, in the form of competitive edge to the firms, practicing sustainable corporate governance (Potter 1991).

Sustainability rating indicate organization's better sustainability governance and its performance. Well harmonizing the interests of the investors and society (Mishra and Modi, 2013), less information asymmetry (Lahrech, 2011) and greater reputation (Godfrey et al., 2005) make companies CSR standards higher, make their equity less volatile and more resistant in times of crunch. Because of the diverse structure of risk i.e. unsystematic risks, total risk and systematic risk, empirical studies do not provide clear evidence about such claims. It is also due to methodologies i.e. measures of the various dimensions of social responsibility, empirical studies are unable to provide clear evidence of these sustainability rating claims about the risk. Consequently, it is very important to explore and study the likely connection between the different elements of corporate sustainability and incorporate it with firm risk. The study argue that higher sustainability score representing better firm's (environmental, social and governance) performance favorably influence firm's risk level. Hence by examining the impact of sustainability score on risk, also study the impact of capital expenditure, firm size and market capitalization on risk. The study further explore the real role to the investor offered by the sustainable alternative. The purpose of this study is to enlighten this debate.

1.1 Theoretical Background

In literature, there are certain arguments that tend to discuss the association between financial risk and social performance as described in detail in a review

article by Benlemlih and Girerd-Potin, (2014). The relationship with stakeholder and more specifically with stockholders is positively affected by ESG engagement. It is argued in stakeholder theory that the interests of equity holders, workers, stake holders and the society should be balanced by management in order to make sure the existence of the organization (Freeman, 1984; Mishra and Modi, 2013). The interests of all stakeholders definitely affect the goals of an organization. The chances of losing the support of one or more equity holders is definitely impact on reduced by CSR. On the other hand, companies secure and develop their reputation by enhancing social performance and meeting stakeholder expectations.

Participation in some types of CSR deeds can lead the firm to a form of trade mark or moral capital and many firms' relationship - based intangible assets are protected by that (Godfrey et al., 2005). Goodwill is vital in producing prospective tangible benefits though it is the intangible asset, impacting firm value (Godfrey et al., 2005).

Insulation from negative financial performance is the main factor that determine the reputation on financial performance. Thus providing protection to the shareholders just like an insurance and making a contribution to shareholder wealth. The thing that benefits the firms is the lower probability of legal actions that often results in financial penalties, higher employee loyalty, much lenient regulatory control and stronger customer trust. To add further to this, authors suggest that in case of a negative event the negative measures of stakeholders are reduced by CSR activities. These CSR activities thus helps to avoid sudden corrective steps which could cause certain negative decisions that affect badly the interests of stakeholders.

Risk management is positively influenced by a good relationship with stakeholders. This dampen the impact of an adverse event on the corporations (Kytle and Ruggie, 2005).

So it reduces ambiguity in the market place, diminish or eradicate disorder, reduce loss or harm to business operations. To be specific, the adoption of CSR and its conforming to social as well as environmental issues enhance the capability to regulator and decrease environmental and other risks of the firm such as consumer

boycotts, harm to goodwill, forfeits, high coverages to fines, reputation and trust, and penalty costs. As all the investors' are specifically anxious about the social adherence of firms, high social engagements or collectively called sustainability efforts, heavily reduces the cost of capital. Socially irresponsible firms are considered to riskier by socially responsible investors as confirmed in a study carried out by Sharfman and Fernando (2008). Hong and Kacperczyk (2009) add complements to exclusion of the firms with reduced CSR levels from their portfolios. According to (Lahrech, 2011) the cost of capital is also reduced due to high quality of information and less information ambiguity or asymmetry in business decisions. Finally, the risk profile of firms is influenced by environmental, social and governance (ESG) performance. This add other risk factors that are non-sustainability, including market risk, firm size, book-to-market ratio, and operational risks that are studied in literature by theoretical and empirical means (Manescu, 2011). "It is assumed here that an advantage for taking non-sustainability risk is the main factor that results in increased expected returns of firms having low-ESG (Benlemlih, & Girerd-Potin, 2014). ESG ratio of a company could be a determining parameter to show exposure of a company to a non-sustainability risk factor which include not only environmental risk but also those related with workplace quality of life, investor trust, legal action risk, and other immaterial advantages".

Thus if there is an enhanced awareness of sustainability risk it will lead to a higher non-sustainability premium. Doing business to have great operational performance or high profitability shall attract stakeholders to pay attention to those businesses. The attention should not paid to corporate social responsibility disclosure only, but other factors that can be mechanism driving corporate social responsibility disclosure should be taken into account.

The findings of the study revealed that different aspects of corporate governance have great impact on influencing the firm risk. As stated, the impact of an additional stakeholder on corporate behavior in the United States is documented in literature by pioneering work by Faleye et al. (2006). They find that companies giving importance to labor welfare are the companies that expect maximum profit they also give importance to social responsibility and disclose information

that can reflect on related persons for their perception as a group of stakeholders. Earlier studies find that companies that pay attention to corporate sustainability and social responsibility had opportunities to have great operational performance in every dimension including financial performance when companies tried to meet stakeholder's requirement.

Stakeholders would reciprocate by giving support and assistance to companies such as employees are loyal to their companies, people outside give more support and greater opportunities would be granted from financial institutions on making a loan, and an increase of operational performance (Bansal, 2005; Puangyane, 2018).

Companies with corporate social responsibility have tendency to cause fewer negative situations in terms of environment, social consequences and good governance in their business plans. Besides, financial risk that beyond company expectation or business plan can be reduced (Buysse and Verbeke, 2003). Concerning shareholders view and stakeholders view, they found that investing in corporate social firm responsibility could add more value to business (Post et al., 2002).

Theoretically, this work contributes to two prominent models of governance research i.e. stakeholder theory and agency. So far there is no definite theory that explores the connection between corporate sustainability performance reporting and financial performance (Wood, 2010). The relation between sustainable performance and firm performance is, however, clarified by different theories.

In all theories, the stakeholder hypothesis is the most common one. Post et al. (2002) describes in depth that stakeholders are 'persons and constituencies who relate to their wealth-creating capability and practices, either willingly or involuntarily, and who are also their future beneficiaries and/or risk bearers.

Corporate social performance can be measured according to (Ruf et al., 2001) to the degree to which the organization satisfies the criteria of certain stakeholders. In the so-called stakeholder strategy, it is argued that stakeholders essentially monitor the access of a company to meager resources, and to ensure that this access is sustained firms must build up good linkage with key stakeholders (Roberts, 1992).

Thus, according to “stakeholder theory” companies with good corporate social responsibility always show better financial performance. The agency theory explore, risk sharing behavior between principle and agent. So, these agents perform on behalf of principal and run the business activities, make decisions fruitful for business operations and strive to achieve common goals (Jensen et al., 1976). As no single theory can answer fully the hypothesized relationships, here in this study.

Thus, corporate sustainability performance can only give fruitful results by maintaining good relations with stakeholders, create sustainable competitive edge and increase corporate goodwill as suggested by the combination of stakeholder theory and agency theory perspective. This all results in a positive effect on corporate sustainability rating and a negative effect on Firm risk. Therefore, participation in corporate sustainability, actively, can results in internal and external gains (Loureno et al., 2012).

1.2 Gap Analysis

Risk mitigation is an important area of research in finance. Number of studies has been done to explore the factors effecting risk. After numerous studies on risk reduction, it is still debated that how attributes of corporate sustainability effect the risk reduction? This study emphasis on the relation between, corporate sustainability, corporate governance and the risk of conventional and non-financial firms.

In view of the prior studies the current study tests for a significant association between corporate sustainability and firm risk. It also examine the linkage between corporate governance committee, corporate sustainability and other variables of corporate governance.

The study build and evaluate systematic risk mitigation hypotheses using a comprehensive sample of companies listed in various sectors. The study represents 778 non-financial industries, i.e. gas, water and multi-utilities, construction and materials, electricity, automobiles and parts, fixed line telecommunications, electronic and electrical equipment, food producers, travel and leisure, household goods and

home construction, general industrials, industrial transportation and few other sectors.

It finds that sustainability, representing engagement of the firm in sustainability negatively affects firm's market risk including other firm governance characteristics (Firm size, capital expenditure and firm size).

1.3 Problem Statement

Risk mitigation is an important area of research in finance. Number of studies has been done to explore the factors effecting risk. After numerous studies on risk reduction, it is still debated that how attributes of corporate sustainability effect the risk reduction? This study emphasis on the relation between, corporate sustainability, corporate governance and the risk of conventional and non-financial firms.

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1.4 Research Question

This study explores and establishes relationship between corporate sustainability

and market risk. This paper, based on assumption that increased firm risk is a result of less sustainable practices of corporate governance structure. In addition, Corporate Sustainability practices are accountable for value addition of the company. The major research question in this research is to find a link between corporate sustainability and firm risk from the.

So it is theorized that corporate sustainability practices such as maintaining good Sustainability by taking into consideration about Environmental, social and governance issues, having ESG committee on board, having corporate governance committee could have significant impact in reducing firm's risk.

1. Does high corporate sustainability mitigate firm risk?
2. Does existence of ESG committee mitigate firm risk?
3. Does existence of Corporate Governance Committee mitigate firm risk?
4. Whether there exists a relationship between corporate governance and corporate sustainability?

1.5 Objective of Study

The study has following objectives.

Research Objective 1:

Study the role of corporate sustainability in reducing the Firm Risk.

Research Objective 2:

Study the role of Corporate Sustainability in mitigating the Firm Risk.

Research Objective 3:

To examine the impact of existence of corporate governance committee in mitigating firm risk.

Research Objective 4:

To explore the impact of capital expenditure on firm risk.

Research Objective 5:

To explore the impact of firm specific variables on firm risk.

1.6 Significance of Study

Academician have been investigating for a long time, the methods to generate returns but often ignores the level of risk predictability that is triggered by low sustainability measures, associated in such investment methods. In recent years, the increasing importance of sustainability for firm value and growth has been expanded to upgrade the importance and significance of additional research work on this topic. The study is useful for investors, analysts or shareholders, interested in learning how better governance and sustainability be helpful in choosing a business with less risk to the market. The foundation of this study consists in the assumption of a model based on the “continuous optimization” of the portfolio.

The results of pioneer in analyzing the sustainability-risk relationship assessed by VaR and CVaR, from a theoretical perspective, to the awareness of the authors, while also assessing the effect of sustainability on stock return risk dynamics and risk predictability using a broad international sample of traditional and non-financial companies and advanced econometric models.

This research offers portfolio managers the opportunity to consider sustainability practices to improve the efficiency of risk accuracy forecast, minimize their portfolio's risk and the impact of negative returns on volatility while enhancing their ability to dampen their portfolio's volatility spread. This study also serves ground for further research and debates on different aspect of sustainability (economics, social, and governance) market risk and corporate governance.

1.7 Plan of Study

This study is composed of five main chapters. The first three chapters focus on the theoretical area of the relevant topic, whereas the last two chapters cover the

empirical aspects of the study. Chapter 1 focuses on the fundamental idea of the study. This section introduces the topic by providing basic information and theoretical background, gap analysis and problem statement, research question, objective of study and significance of work. Chapter 2 narrates deep investigation of topic including theoretical as well as empirical arguments on corporate sustainability and firm risk relationship around companies listed in NYSE. Chapter 3 includes the data description, methodology and related control variables, adopted for the investigation of the measurement of variables to estimate risk. Chapter 4 elaborates on the outcomes from data analysis empirical results and explain the finding based on study objectives. The findings are filtered through back testing techniques. Chapter 5 summarizes research outcomes, future research direction and policy recommendations.

Chapter 2

Literature Review

The literature review about the impact of corporate sustainability and corporate governance on measures of market risk, is discussed in this chapter. Downside risk measures i.e. conditional value at risk and value at risk are used in this study to measure risk, so focus is on risk in this study. Some academic evidence analyze the relationship between corporate sustainability and corporate risk through total risk elements determined by variance or standard stock return deviation, systematic risk or market risk, and unsystematic risk or idiosyncratic risk.

2.1 Sustainability Score and Market Risk

There are several forms of risk that are faced by global markets like market risk, operating risk, credit risk, and liquidity risk. Market risk measures loss potential to an investor, as a result of factors impacting the aggregate performance of the capital markets in which it operates. Market risk is the risk of equity investment losses arising from abnormal price fluctuations. Examples of market risk include: shifts in stock markets or commodity prices, changes in interest rates or volatility in foreign exchanges. Market risk is one of the three main risks that all companies face. Companies are expected to disclose and retain capital to manage it. The other two risks are credit risk and operating risk. The typical method for evaluating market risk is value-at-risk.

The study of Nawrocki (1999) assess past research and discuss the benefits of using Downside risk approach, in mitigation of a total risk stance. In terms of the total risk evaluation the Nawrocki (1999) study summarizes the literature and discusses the benefits of employing the Downside Risk approach. Researchers and business analysts have devoted more attention to Value at Risk (VaR) in market risk analysis, in recent years.

“Value-at-Risk and Conditional Value-at-Risk” used to measure downside risk are the appropriate risk measures used by managers, but still, the effect of sustainability on these measures has not been completely explored (Benlemlih and Girerd-Potin, 2014). A study conducted by Sherwood and Pollard (2017) proposes institutional investors that ESG investment strategies can allow to gain profit, from risk diversification.

Since the growth of corporate sustainability across both research and business around the world is remarkable, many studies like McGuire et al. (1988), Godfrey et al. (2009), Oikonomou et al. (2010), analyze the impact of sustainability participation on corporate risk.

There are also several studies that explore different aspects of risk mitigation, through incorporating sustainability practices, Even so, these studies indicate a somewhat inverse relationship between social responsibility and market risk as total risk calculated as unsystematic risk (Kim, 2010; Jo and Na, 2012; Mishra and Modi, 2013).

In a research work about downside risk of companies in emerging markets, Weber and Ang (2016) studies the efficiency of socially responsible investment. Weber and Ang (2016) argue that during bearish times, socially responsible investments indices have shown resistance to market low returns and can thus be used in bearish market periods to minimize equity risks. ESG stock investment approaches give extra understanding, useful in investing in emerging markets.

The study on “ESG Investing in Emerging and Frontier Markets” argue that Stakeholders, particularly shareholders, need much more insights into the role of the company in social and environmental activities. Therefore, in their annual reports and on their corporate websites many businesses are now voluntarily

publishing their contribution to sustainable practices, by endorsing social, environmental, and governance involvement. However, the literature suggest divided opinion on the attainment of social and environmental announcements and question the shareholders' well-being (Orlitzky, 2001; Orlitzky et al., 2003; Margolis and Walsh, 2003; El Ghouli et al., 2011).

Orlitzky and Benjamin (2001) revisit several empirical studies between 1978 and 1995, dealing with the relationship between financial risk and social performance in the US, meta-data analysis. Their findings endorse the presence of inverse relationship between these two variables.

In a recent study, the relationship between sustainability as an indicator of corporate social responsibility and firm total risk using data of the USA market, was reported by Jo and Na (2012) and Kim (2010). Jo and Na (2012) agree that CSR involvement has negative relationship with firm total risk.

The answer to the question, about a few empirical findings on the importance of socially responsible investment arguments and its relationships with expected returns can be to the combination of many dimensions of corporate governance, with conflicting results (Scholtens and Zhou, 2008). This then promotes the study of various elements of social responsibility. Kim's (2010) also demonstrate that composite CSR parameters have a positive effect, though some specific CSR characteristic calculated with the "business ethics score" have a adverse impact on total company risk. The findings of empirical studies, are inconsistent with providing clear evidence of the negative effects of Sustainability, based on market risk. In many studies a negative relationship between CSR and firm risk is found, (Mishra and Modi, 2013; Bouslah et al., 2013).

However Humphrey et al. (2012) and Kim (2010) does not agree. Lastly, Bouslah et al. (2013) focusing on individual social performance characteristics, discover that market risk is inversely linked to the relationship between employees and human rights, whereas other dimensions of CSR did not affect risk exposure. This research complements the idea that in determining the systematic risk of an organization, not all CSR dimensions are important. CSR participation also has an influence on systemic risk. Study results on the US markets find that systemic

risk is inversely related to corporate social performance. Kim, (2010); Jo and Na, (2012) demonstrate, that individual characteristics are indirectly but insignificantly connected to systemic risk, while social , employment and environmental have a positive and significant effect.

Salama et al. (2011), emphasizing on environmental responsibility using a sample of Britain companies, underpin the environmental involvement of such companies is indirectly linked to systemic risk. Recent study indicates, that generally there is slightly negative association between corporate social responsibility and other risk measures (stock volatility, idiosyncratic risk and systematic risk).

The challenge of how sustainability can boost the certainty of risk measures in traditional firms exists today. Theoretically, risk indicators are also estimated by econometric time series model using stock return volatility properties. A study by Hoepner, et al (2018) analyze the impact of CSR ratings on downside risk parameters, using two determinants of downside risk, the lower partial moment and VaR (value at risk), they study the assumption that the ESG shareholder involvements can help in reducing risk.

According to Nofsinger and Varma (2014), because of their property to mitigate downside risk, socially responsible investments resist better during bearish trend. Similarly more diverse studies come forth like a research by Oikonomou et al. (2012), demonstrate using Bawa and Lindenberg beta, as downside risk measure, has no significant effect of sustainability on financial risk however significant positive results have been demonstrated while using Harlow and Rao beta, between value at risk and some individual characteristics of social responsibility, to name community concerns, employee relation concerns and environmental performance concerns.

Using Value-at-Risk (VaR) and Conditional VaR (CVaR) to determine the tail risk, and its relationship with social responsibility scores, Benlemlih and Girerd-Potin (2014) find that portfolios with low social responsibility scores are more risky than portfolios with high social responsibility scores. The research explore the relation between corporate sustainability and market risk in conventional industry sectors. In this analysis, we explore not just the relationship between the corporate

sustainability score and the amount of market risk, but also the dimensions of risk and the estimation of risk to argue whether the sustainability score can be used as a significant risk measure. Value-at-Risk (VaR) and Conditional Value at Risk (CVaR) assess market risk levels, while risk dynamics are calculated by the parameters of Historical Simulation model.

It is concluded that better corporate sustainability rating mitigate the risk volatility (measured by VaR and CVaR), reduce the impact of adverse returns on volatility along with other firm specific variables (Leverage, Market Capitalization, Firm Size) in terms of the expected risk characteristics. From a theoretical point of view, this research is foremost to analyze the sustainability-risk relationship tested by VaR and CVaR, along with evaluating the relationship of sustainability with the risk dynamics of share prices and risk estimation using a big international data and accurate econometric models. Previously, in literature Jo and Na, (2012) reports that firms can reduce their business risk through good management of corporate social concerns. Jiraporn et al. (2014) and Cheng et al. (2014) show that socially responsible corporations are regarded more credit worthy and have increased access to funding. This research supports this aspect of previous research by exploring whether sustainability is significant in mitigating the risk exposure. Keeping literature review and the main research question mentioned above, in mind, we formulated the hypotheses as follow:

H1: There is significant negative relationship between corporate sustainability and market risk.

H2: There is significant negative relationship between corporate sustainability and tail risk.

2.2 Corporate Governance Committee and Market Risk

Stockholders cannot have ample capital protection since losses can be unforeseen and volatile caused by risk. Compared to companies with stronger corporate

governance, Brown and Caylor (2004) note that companies with poor corporate governance are riskier. Due to the projected reduction in agency costs, improved corporate governance is likely to encourage good firm efficiency.

Ammann et al. (2011) conclude that shareholders assume more benefit and less cash flow from better-governed companies, which could be, otherwise leached off by self-interested executives. Better corporate governed companies also reduced auditing, monitoring, and capital costs. Good governed businesses are more explicit with less artifice and operate their company efficiently. Governance is based on many detailed governance characteristics linked to board size and committee composition, compensation and ownership, anti-takeover steps, and, external auditing, as stated by Aggarwal et al. (2009).

These are available on the Corporate Governance Quotient database compiled by Institutional Shareholder Services (ISS). Some dimensions of the linkage between corporate governance and risk are discussed in the literature, amongst US businesses (Bhojraj and Sengupta, 2003; Ashbaugh-Skaife et al., 2006; Cohen et al., 2010; Barger et al., 2010). To cut short, such findings demonstrate that US policies have raised the burden on US companies to reinforce their systems of governance and have limited corporate risk-taking.

Sayari and Marcum (2018) conducted a study to see the impact of corporate governance on the risk-taking actions of corporations based in emerging market countries, and also on a sample of US-based companies listed on the NASDAQ and NYSE. The study concluded that risks for both US and EM companies are likely to be minimized by improved governance.

However empirical studies show diverse opinion as to the role of governance committees. Sayari and Marcum (2018) show a substantial decrease in the risk of both cross-listed American Depository Receipts firms with an increase in the number of committees. But afterward the variable, "committees" is discarded from the American model, as, the Securities Exchange Commission instruct that all American companies must have at least 3 committees. A risk measure, used by Sayari & Marcum (2018) is the annual Beta, of a firm's weekly stock return. Some studies suggest that the presence of committees is more largely figurative than practical,

with committee actions targeted at minimizing or preventing legal actions and other credibility threats while not directly impacting corporate disclosures or the sustainability level of the organization (García-Sánchez, et al 2019).

Consequently, to identify whether a separation equilibrium exists, one can need a deeper examination. Brown, I., et al, et al (2009). Because of the uncertainty of non-financial risks, and because of the fact that financial risks resulting from the ongoing global financial crisis, the boards of many of these companies will no longer be able to count on entirely on the involvement of a committee to handle the company's risk management necessities.

H3: There is a significant positive impact of corporate governance committee on market risk.

H4: There is a significant positive impact of corporate governance committee on tail risk.

2.3 Environmental Social and Governance Committee (ESGC) and Market Risk

An over view at the ESG statistics on a Datastream terminal shows that several businesses have committees on corporate board, but are identified as not partaking a policy on climate change in place or having addressed measures to minimize emissions. This leads us to learn more about the link between the existence of such committees and the likelihood of their risk effects.

In addition, multiple studies have shown that among a number of large corporations, the greenwashing phenomenon (falsely signaling an accountable or sustainable corporate policy by implementing cosmetic mechanisms, for example ESG/CSR boards, and continuing business normally; effectively jumping on the trend to sustainability wave) is widespread among many of large firms. This study suggests that the establishment of a separate risk management committee is an effective governance mechanism for such firms (Brown, et al 2009). These findings can be explained by studies which discuss that the development of a sustainability,

is often linked to focused management body and its assumption of heterogeneous roles, a complexity that reduces efficacy.

Sustainability committees are usually found to be successful in influencing enough strengths, however are unable to alleviate associated challenges. These findings are aligned with the shared value framework, in which committees both create value through the pursuit of opportunities related to sustainability and preserve value through monitoring, but not bound to minimizing risks, related to sustainability. Though on the other hand, because of their independence and experience, the usefulness of the CSR committee is doubtful. Independent experts, who audit CSR data in comparable to that of the financial audit also facilitate the comparison (Martínez Ferrero et al., 2018).

The ownership structure of corporate governance mechanisms has a significant influence on company's management, and is likely to impact the risk appetite of companies. Wright et al. (1996) explores the effect on corporate risk taking of, corporate insiders, block holders and institutional ownership structure, while Gadhoum and Ayadi (2003) examine the linkage between modifications in Canadian companies' corporate risk exposure due to change in ownership structure. Discussed studies find an inverse association between the behavior of risk taking and the corporate governance mechanisms.

Said discrepancy is possibly attributable to the investment and financial decisions related to firm risk measures. The empirical results show that greater levels of systemic risk are correlated with more shareholder-friendly boards and institutions with better corporate governance structures (Iqbal, et al 2015). Risk management is also important for corporate governance purposes. Wang et al. (2015) discuss that better corporate governance will minimize firm risk, suggesting a dampened VaR as better corporate governance is supposed to reduce agency cost issues and guard the capital of shareholders. By using Taiwanese listed companies from 2002-2012, Wang et al. (2015) analyze the relationship between corporate governance and firm risk (downside risk).

To estimate downside risk, these studies use value-at-risk (VaR) and expected shortfall (ES) / conditional value at risk (CVaR). The findings of study conducted

on Taiwanese listed companies by Wang, Wang and Liao (2019) show that high corporate governance quality helps companies reduce their risks, especially in the case of more independent board members. Better Corporate Governance mitigates the effects on potential crash risk of short-term debt (Dang, Lee, Liu and Zeng, 2018).

A study by Wang et al. (2015) indicates that corporate governance policies such as greater management title and a higher number of independent directors will contribute to higher market value, which bring more unnecessary downside risk (measured by VaR). Corporate governance mechanisms consist of multiple basic components among them, is the Corporate Governance Committee, a considered to be the key ones. The positive linkage between the CSR committee and the CG committee is also seen in a study by Ntim, et al (2013). Accordingly, the hypotheses linking ESG committee and corporate governance committee to risk are set as follows:

H5: Environmental social governance committee has significant impact on market risk.

H6: Environmental social governance committee has a significant impact on tail risk.

2.4 Firm Specific Factors and Market Risk

2.4.1 Firm Size and Risk

One of the factors effecting corporate governance is, firm size. Booth et al. (2002) suggests, firm should select the most qualified governance attributes, to their governance structures as it could be modified. As the firm grows more complex a firm it requires more refined governance mechanism and processes. According to Jensen & Meckling, (1976), with size incurs the agency cost as larger structures and hierarchy usually offers greater managerial discretion and opportunism, ultimately requiring increased monitoring. Opposing smaller firms, financial hurdles can be avoided by large organizations as they have more capability to generate

funds, and use the desirable excess funds to invest in profitable projects (Short & Keasey, 1999).

Surely, board characteristics might be affected with the change in the firm size. The results of past studies suggest that corporate governance and different aspects of CSR of a company are influenced by the company size and industry (Elzahar & Hussainey, 2012; Cabedo & Tirado, 2004; Bozec & Bozec, 2012; Ntim et al., 2012).

Firm size as measured by natural log of total sales has significant and positive correlation with almost all corporate governance variables and so, is introduced as an independent variable in the regression analysis in many studies. Therefore, the study employs firm size as a measure to explore the impact of corporate governance characteristics on firm risk. Firm size is included in the empirical analysis as the logarithm of size as by Lo and Sheu 2007 and Jo and Harjoto 2011). The hypotheses linking firm size and risk are set as follows:

H7: Firm size has significant positive impact on market risk.

H8: Firm size has significant positive impact on tail risk.

2.4.2 Firm Leverage and Risk

Leverage is regarded as a tool to add firm value, and management of leverage managed firms have dedicated themselves to investors, to achieve a level of cash flow in order to shelter interest and principal payments (Grossman and Hart 1982). It is used by Short & Keasey, (1999) as one of the control variables in their study. Surely, board characteristics might be affected with the change in the firm size, to their governance structures as it could be modified.

Moore et al. (2013), show positive relationship of VaR and leverage and the scale parameter for the period 2008–2011. Leverage is measured by Mishra & Modi, 2013 as the ratio between the volume of the firm's short and long term debt and its total assets.

The study apt leverage as total debt divided by total assets. The selection of the leverage as a variable is consistent with the previous studies done by Mishra &

Modi, S., 2013, Mukherjee & Sen, (2018). The hypotheses linking firm leverage and risk are set as follows:

H9: Leverage has significant negative impact on market risk.

H10: Leverage has significant negative impact on tail risk.

2.4.3 Capital Expenditure and Risk

Capital expenditure is measured by the change in a firm's book value of fixed assets to the total assets. There is wide-ranging of theoretical and empirical literature suggesting the influence of capital expenditure on firm risk. Capital expenditure can be the main cause leading risk in some industries, where there is poor control of investment spending (Amir et al., 2007). To, et al., (2020), underpinned that capital expenditure has an inverse relationship with firm risk.

Also in prior studies, there is a direct linkage between financial performance and capital expenditure (Lev and Thiagrajan, 1993; Chen, 2006). The analysts require capital expenditure as a significant signal used in predicting future profitability and stock returns (Lev and Thiagraja, 1993).

Therefore, capital expenditures is can lead to increase market valuation. With the announcements of corporate capital investments a significant and positive mean price and higher accounting performance is noticed in firms with higher capital expenditures (Chen 2006). The equity prices increase with the notice of rise in capital investments of announcing firms and the stock prices of rival firms decrease Chen et al. (2007).

In most reports on the effect of investment on business risk only mention capital spending as an object of comparison with expenditure on research and development (R & D). While capital expenditures are perceived to be reduced risk investments, the positive effect on earnings variability of capital expenditures is still not verified (Kothari et al., 2002). For the moment, capital expenditure has historically been found by Dhaliwal et al., (2017), to be deeply related with market measures of firm risk. Moreover, the volatility of stock returns is positively associated with net income volatility (Khan and Bradbury; 2014, 2015). Monthly stock return

variability can be used as dependent variables (Amir et al. 2007) with the investments in capital expenditure. Accepted by many studies, this study introduce it as a variable to underpin widely accepted negative impact of capital expenditure on firm's risk factors. While capital expenditures are perceived to be reduced risk investments, the positive effect on earnings variability of capital expenditures is still not verified (Kothari et al., 2002). For the moment, capital expenditure has historically been found by Dhaliwal et al., (2017), to be deeply related with market measures of firm risk. The hypotheses linking capital expenditure and risk are set as follows:

H11: Capital expenditure has significant positive impact on market risk.

H12: Capital expenditure has significant positive impact on tail risk.

2.5 Conceptual Framework

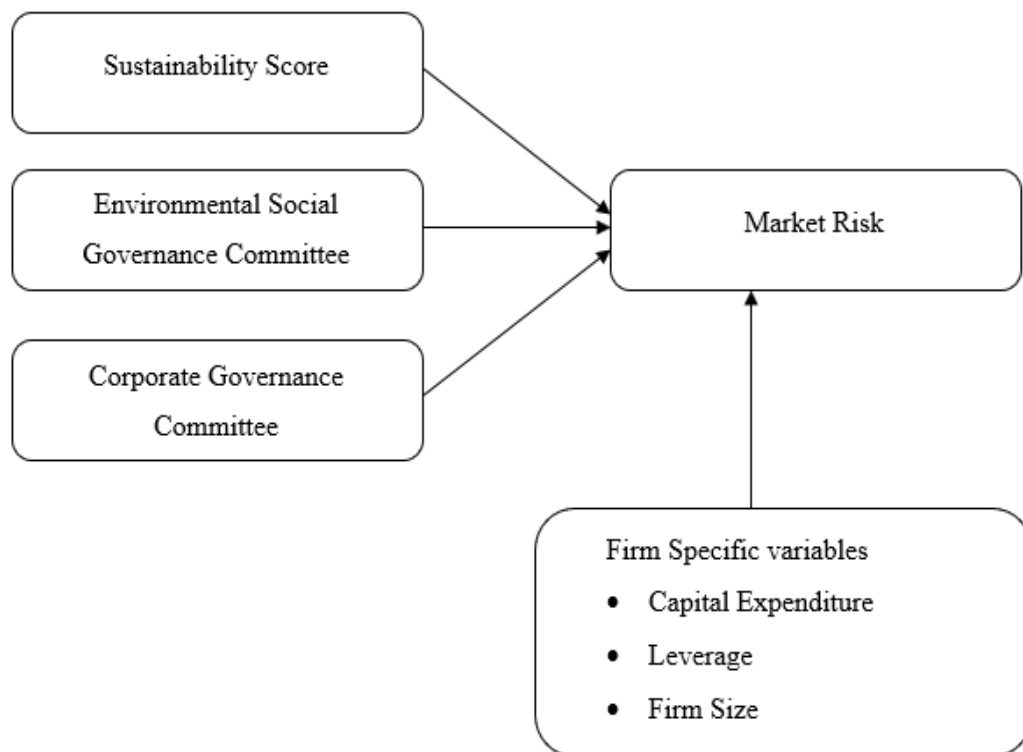


FIGURE 2.1: Research Model

2.6 Summary of Hypotheses

H₁: There is significant negative relationship between corporate sustainability and market risk.

H₂: There is significant negative relationship between corporate sustainability and tail risk.

H₃: There is a significant positive impact of corporate governance committee on market risk.

H₄: There is a significant positive impact of corporate governance committee on tail risk.

H₅: Environmental social governance committee has significant impact on market risk.

H₆: Environmental social governance committee has a significant impact on tail risk.

H₇: Firm size has significant positive impact on market risk.

H₈: Firm size has significant positive impact on tail risk.

H₉: Leverage has significant negative impact on market risk.

H₁₀: Leverage has significant negative impact on tail risk.

H₁₁: Capital expenditure has significant positive impact on market risk.

H₁₂: Capital expenditure has significant positive impact on tail risk.

Chapter 3

Research Methodology

3.1 Data Description

The main aim of this work is to study the corporate governance mechanism is negatively related with risk in non-financial firms. The period selected for the study is from 2013 to 2018. Governance and sustainability factors used in this investigation are selected from the Secondary data of extensive ESG database. The main advantage here is that the use of a particular database that removes the need for toning and reducing irregularities in the data. Thomson Reuter's DataStream ESG data are no doubt the most trustable and extensive data set covering all three sustainability measures accessible by a sole data provider.

3.2 Population and Sample

Assuming that the use of data for the whole number of firms given in the DataStream's, including a set of global firms, increase the complexity of study therefore base of sample are member firms listed on the New York Stock Exchange in the USA. The best practices of corporate sustainability and governance are applied by all of the world's biggest companies, from the most developed economies. Generally, small firms have less sophisticated boards. While on the other hand firms that publically trade in large emerging market are generally controlled either by

founding families or local bodies, both of which are not favorable to good corporate governance. Out of, more than 1000 firms listed on New York Stock Exchange, our final sample of 778 firms consists of 4668 firm-year (778 firms) observations from 2013 to 2018. Sectors under consideration are “automobiles and parts, construction and materials, personal goods, electronic and electrical equipment, oil and gas producers, pharmaceuticals and biotechnology, industrial transportation and mining and industrial metals, general retailers and food producers, home construction and household goods, health care equipment and services, electrical and electronic equipment, food and drug retailers, technology hardware and equipment, travel and leisure”. The sectors such as alcohol beverages, gambling, weapon industry, tobacco etc., are not considered because of violation of social norm. In the other hand, it may be the opposite scenario, according to the window dressing theory, and businesses in such sectors actually make a suspicious effort of “window dressing” to legalize dubious industry by CSR operations (Jo and Na. 2016).

3.3 Variable Specification

The definition and measure of variables used in study are explained below.

3.3.1 Dependent Variable

3.3.1.1 Market Risk

The samples forming the basis for the analysis of this study is the daily closing stock price. The volatility of stock return data over a 6-year period from 2013 to 2018 of the selected sample is taken from Datastream. Closing stock price data is collected for five working days. The dates for stock data are harmonized with each other, to get accurate daily analyses. The returns are calculated by using this formula:

$$R_t = \ln \left(\frac{P_t}{P_{t-1}} \right) \quad (3.1)$$

Where,

R represents the return earned for the day “t”

Pt represents the price of the index at day “t”.

Pt-1 represents the price of index at previous day “t-1”

In this study firm risk is measured by downside risk. It is defined as covariance of excess fund negative return relative to the market return.

The measures of downside risk used in our empirical analysis are the “Value at Risk (VaR) and Conditional Value at Risk (CVaR)” at 95% confidence level. VaR is defined as some confidence level (e.g., 95% quantile) of the portfolio negative returns/loss distribution, offering the expected maximum loss of equity or share price over a target time (e.g., one day or a year).

VaR represents firm risk measured and estimated by using the daily returns of firm for specific year and is obtained by running the Quantile Regression (QR) technique of Koenker and Bassett (1978).

$$VaR_t = -Z\sigma \quad (3.2)$$

Whereas a risk measure, the Conditional Value at Risk (CVaR), is defined as “the average loss of the position that is incurred for the worst possible cases over a given time horizon”. CVaR use historical data and provided a suitable technique to observe the possible return yield of an investment in the worst 5 % of market circumstances. It’s formula is as follow:

$$CVaR_t = \sum \frac{R_{i,t}}{n} \text{ where } R_{i,t} < VaR \quad (3.3)$$

3.3.2 Independent Variables

3.3.2.1 Environmental Social and Governance ESG Score

The Thomson Reuters ESG Scores are based on data reported by the company. The scores are structured to evaluate the relative ESG excellence of a company

opaquely and critically around ten categories (advancement of sustainable goods, human rights, carbon emissions, shareholders, etc.) These are aggregate rankings, adjusted for ESG issues, with major effect on companies. The key performance indicators of ESG score are divided into three pillars:

1. The Environmental Pillar.

Factors comprising resource usage and reduction; environmental activism and initiative; emissions and emissions reductions; and product or process innovation are observed.

2. The Social Pillar.

Factors comprising employment quality, training, human rights, health and safety issues, diversity, community involvement and product responsibility are examined.

3. The Corporate Governance Pillar.

Factors comprising board structure, board functions, compensation policy, shareholder rights and vision and strategy, financial and operational transparency are examined.

ESG scores from Thomson Reuters is an update and substitution of the current ASSET4 ratings which illustrate the technical ESG structure and are a robust measure of the ESG excellence of firms with minimum company size and transparency biases. Main upgrades to the legacy equivalent ASSET4 weighted scores are:

- ESG issues overlap
- Industry and Country standards at the data point scoring level
- Mechanically synchronized category scores constructed upon the size and impact of each category
- Percentile Rank scoring methodology to remove unknown overlays of calculations.

The primary determinants depend on concerns about materiality, data availability, and industry significance. ESG measures categorize into 10 themes. A mix of the 10 categories constitutes the absolute ESG score. Thus the score reflects the company's publicly reported information dependent ESG performance. An overview of categories, scores and weights are provided in the table 3.1 below:

TABLE 3.1: ESG Score Criteria

Pillar	Category	Indicators in Scoring	Weights%
Environmental	Resource Use	20	11
	Emissions	22	12
	Innovation	19	11
Governance	Management	34	19
	Shareholders	12	7
	CSR Strategy	8	4.5
Social	Workforce	29	16
	Human Rights	8	4.5
	Community	14	7
	Product Responsibility	12	8
TOTAL		178	100%

$$\text{Score} = \frac{\text{No. of companies with a worst value} + \frac{\text{No. of companies with the same value included the current one}}{2}}{\text{No. of companies with a value}}$$

3.3.2.2 Corporate Governance Committee

Corporate governance committee is extracted from Datastream and dummy is created as variable is measured by using dummy. "0" and "1" i.e., reported "1", if for existence of the corporate governance committee and "0" otherwise.

3.3.2.3 Environmental Social and Governance Committee

Environmental social and governance committee data is extracted from Datas-tream and dummy is created as variable is measured by using dummy. “0” and “1” i.e., reported “1”, if for existence of the ESG committee and “0” otherwise.

3.3.3 Firm Specific Variables

3.3.3.1 Firm Size

Firm size is measured by natural log of market capitalization, Firm Size (FS) is significantly linked with risk and is thus introduced as an independent variable in the regression analysis.

Firm size = logarithm of market capitalization.

$$\text{Market capitalization} = \text{no. of shares} \times \text{MPS} \quad (3.4)$$

3.3.3.2 Leverage

This study predict leverage (Lev) as total debt divided by total assets. The selection of the said variable is consistent with the prior studies reported by Mukherjee & Sen, (2018), Mishra & Modi, S., 2013.

$$\text{Leverage} = \frac{\text{Total debt}}{\text{Total assets}} \quad (3.5)$$

3.3.3.3 Capital Expenditure

Capital expenditure (CAPX) is the change in fixed assets adding depreciation to total assets at the. This ratio is used by Huang and Wang (2015) to explore the impact of board size on the variation in firm performance, as the proxy for low-risk investment choice.

$$\text{CAPX} = \frac{\text{Fixed assets} + \text{depreciation}}{\text{total assets}} \quad (3.6)$$

3.4 Econometric Model

$$VaR_{i,t} = \beta_i + \beta_1 SSr_{i,t} + \beta_2 CGC_{i,t} + \beta_3 ESGC_{i,t} + \beta_4 Lev_{i,t} + \beta_5 FS_{i,t} + \beta_6 CAPX_{i,t} + \mu_{i,t} \quad (3.7)$$

$$CVaR_{i,t} = \beta_i + \beta_1 SSr_{i,t} + \beta_2 CGC_{i,t} + \beta_3 ESGC_{i,t} + \beta_4 Lev_{i,t} + \beta_5 FS_{i,t} + \beta_6 CAPX_{i,t} + \varepsilon_{i,t} \quad (3.8)$$

Overall, the signs of the all the dependent and independent variables are consistent with previous literature.

3.5 Model Estimation Techniques

Following are the model estimation techniques used in analysis.

3.5.1 Panel Data Analysis

The research applies a “panel data analysis” to measure the effects of sustainability score and corporate governance on market risk. The usefulness of panel data is that it increase the number of measurements, reduces the three-dimensional variables called “multicollinearity”, degrees of freedom and consistently improves the results in the case of lower years (Jensen, 1993). There are two magnitudes of panel data: the cross-sectional data represented by “n” and the time series represented by “t”.

Though the panel data measure is considered more complex, still it is extensively used due to its simple computation, ease of knowledge, and understanding. Beside several other substitute estimation techniques, panel results have improved, with fixed and random effect models. To select between random or fixed effect estimators, the Hausman test decides whether random or fixed effect model is more appropriate.

3.5.2 Common Effect Model

For better and more reliable panel results, other estimation techniques such as the “random effect model” or “fixed effect model” can be applied. To eliminate

the probability of hidden variable interacting to independent variables, random or fixed effect techniques are more effective. The “Hausman test” is employed for the selection between random effect model or fixed effect model. Equation for Common Effect Model as follow

$$\gamma_{i,t} = \alpha_o + \beta_1(\chi)1_{i,t} + \mu_{i,t} \quad (3.9)$$

Where, γ is the dependent variable and χ represents all independent variables, i represents all firms at time t , and μ is the error term.

3.5.3 Fixed Effect Model

This model proposes that for each cross section, the intercept will not be the same, but will be separate for each cross section. As intercept is specific for each unit, due to the variety of data; the “fixed effect model” is considered to be the better model for prediction. The hypothesis of the same intercept would be rejected, when the standard “F-statistic” is significant and a fixed effect model is applied, or else the random effect model is applied for the estimation. The fixed effect model is written as follows:

$$\gamma_{i,t} = \alpha_o + \beta_1(\chi)1_{i,t} + \beta_2(\chi)2_{i,t} \dots \beta(x)k_{i,t} + \mu_{i,t} \quad (3.10)$$

3.5.4 Random Effect Model

The “random effect model” follows the assumption about the intercept that it is unique across both cross sections and time series, so it is verified here in this model whether the intercept fits a structured path or not. The equation of “Random Effect model” is given below:

$$\gamma_{i,t} = \alpha_o + \beta_1(\chi)1_{i,t} + \beta_2(\chi)2_{i,t} \dots \beta(x)k_{i,t} + (v_i + \mu_{i,t}) \quad (3.11)$$

The “Hausman” test is employed to go for, either for the model for the fixed effect and the model for the random effect. If the analysis generates a significant result, a fixed model is used. Or else, the random effect model is adapted.

3.5.5 Hausman Test

The object of the Hausman test is to illustrate the probability of the fixed effect or random effect model, provided, if “p value” was significant at 5 percent confidence interval, then the fixed effect model could be applied, but if “p value” was greater than 5 percent, the random effect model is employed in the study and vice versa if “p value” was not significant.

3.5.6 Likelihood Ratio Test

The probability-ratio test evaluates the goodness of fit of both opposing models, i.e. fixed effect model and random effect model, depending upon their probability ratio, especially one discovered by maximization over the whole data of the parameter and another discovered with some restrictions.

3.6 Model Estimation

The study will take into account the data from the year 2013 - 2018 to regress it using the panel data methodology. We have employed the panel data analysis approach because the nature of the data is time series and cross-sectional.

Panel data has the advantage of increasing the number of observations, reducing the three-dimensional variables (multicollinearity), degrees of freedom and especially increase the data reliably in case of lower number of years (Jensen, 1993).

Panel data consist of two dimensions: cross sectional data dimension denoted by “n” and time series data denoted by “t”. The study used fixed model to find out the impact of Sustainability Score, ESG Committee and Corporate Governance Committee on VaR (95%) and CVaR (95%). This model proposes that intercept

will not be the same for every cross section but will be different for each cross section. The dummies for corporate governance committee and ESG committee are included in this method to show the extent of dissimilarity between the intercept of each cross section.

It is also called least square dummy variable. Due to diversity in data, intercept is different for each unit; hence best model for estimation would be the fixed effect model. The hypothesis of the same intercept would be rejected when the standard F-statistic is significant and hence fixed effect model will be applied, otherwise common effect model will be used for the estimation. The fixed effect model can be written as follow:

$$Y_{i,t} = \beta_i + \beta X_{i,t} + \varepsilon_{i,t} \quad (3.12)$$

3.7 Variables Description

S. No.	Variable description	Variable	Description
1	Value at Risk	VaR	Value at Risk, calculated as: $VaR_t = Z\sigma$
2	Conditional Value at Risk	CVaR	Conditional Value at Risk, calculated as: $CVaR = \sum \frac{R_{i,t}}{n} \text{ where } < VaR$
3	Environmental, Social and Governance Score	SSri,t	Sustainability Score = no. of companies with a worst value + No. of companies with the same value included the current one / 2 / No. of companies with a value
4	Corporate Governance Committee	CGC	Dummy Variable, Does the company have a Corporate Governance Committee. 1 if there is CG Committee and 0 if otherwise

5	Environmental, and Governance Committee	Social ESGC Com-	ESGC	Dummy Variable, Does the company have an ESG Committee. 1 if there is ESG Committee and 0 if otherwise
6	Leverage		Lev	Leverage, (measured as total debt divided by total assets). $Large = \frac{Totaldebt}{Totalassets}$
7	Firm Risk		FS	Firm Size (measured by calculating natural log of market capitalization). Market capitalization = no. of shares * MPS
8	Capital Expenditure		CAPX	Capital expenditure.

Chapter 4

Results and Analysis

4.1 Descriptive Statistics

Descriptive statistics shows the general behavior of the data, including the dependent, independent, and control variables. It includes measure of central tendency measure of dispersion and measure of location. The variables studied are presented in **Table 4.1** of descriptive statistics for value at risk, conditional value at risk, corporate sustainability score, corporate governance committee, environmental social governance committee, capital expenditure, leverage, and firm size are separately described.

Mean and median are measure of central tendencies and provide information about the average. Standard deviation tells about spread and measure of dispersion in the value of the data from the mean in which values show that how much data deviate from the average value of the mean. Minimum and maximum tell about range of variables. Skewness represents the deviation of the return from the normal distribution. A positive skewness indicates that the distribution is right-leaning, right-tail is comparatively longer than the left one. A negative skew shows that the distribution is left-leaning, the left tail is long compared to the right tail. Negative skewness is linked to the ability to yield negative returns with huge chance than proposed by asymmetric distribution'. (Albuquerque, 2012). Opposite tendency

is observed in positive skew. The normal distribution has '0' skewness. If any symmetric data has skewness near zero, than it is normally distributed.

A kurtosis estimate of the peakedness of data. It is a measure of whether the data compared to a normal distribution is heavy-tailed or light-tailed. That is, with greater kurtosis, data sets appear to have thick tails. It appears that thin tails have small kurtosis data sets. The value is also compared with the normal kurtosis distribution, which is equivalent to 3. If the kurtosis is greater than 3, the dataset has heavier tails than a normal distribution. The kurtosis less than, 3 represents that the dataset has lighter tails than a normal distribution. Descriptive statistics for value at risk, conditional value at risk, corporate sustainability score, corporate governance committee, environmental social governance committee, capital expenditure, leverage, and firm size are presenter in **Table 4.1**.

TABLE 4.1: Descriptive Statistics

Variables	Mean	Max.	Min.	Std. Dev.	Skewness	Kurtosis
VAR	-0.03	0.00	-0.13	0.01	-2.25	10.76
CVAR	-0.34	-0.01	-0.83	0.16	0.28	2.94
SSR	3.91	4.53	1.57	0.36	-0.55	3.05
ESGC	0.41	1.00	0.00	0.49	0.36	1.13
CGC	0.97	1.00	0.00	0.17	-5.56	31.87
CAPX	0.05	0.62	0.00	0.05	3.64	25.74
LEV	0.34	3.88	0.00	0.23	3.78	48.86
FS	15.56	19.9	11.4	1.42	0.24	2.86

Note: The dependent variables are value at risk (VaR) and conditional value at risk (CVaR). The independent variables are corporate sustainability score (SSR), environmental social governance committee (ESGC), corporate governance committee (CGC), capital expenditure (CAPX), leverage (Lev), firm size (FS).

Table 4.1, description of current study variables has been explained. The mean value of VaR (value at risk) is (-0.03). As it is the measure of negative returns or losses so we ignore the negative sign. It represents at 95 % confidence level that a loss could not exceed 3% or the maximum loss could be 3% at 95% confidence level. We can also say that there is a 5% chance that the minimum loss will be 3%. The deviation from that 3% can be 1.3% as represented by the standard deviation value. The mean value of CVAR (conditional value at risk) is (-0.34) it describes there is an average of 34% losses in a worst-case scenario. The standard deviation

from this 3.4% can be 16%. The minimum value is (-0.83) and the maximum value (-0.01).

The corporate sustainability score mean value is 3.91 and its standard deviation is 0.36, minimum value 1.57, and a maximum of 4.53. The environmental social governance committee (ESGC) mean value is 0.41 which represents on average 41% of companies have an ESG committee on board with a standard deviation of 49%. The average range of corporate governance committee (CGC) is 0.97 which shows 97% of the companies in the data having corporate governance committee involvement in the firm and the standard deviation is 0.17 i.e. 17%.

To minimize the impacts of outliers, all the variables are winsorized at the 1st and 99th percentiles. The control variable description such as average range of capital expenditure (CAPX) is 0.05 which means that the average value of non-financial firms having 5 % capital expenditure on the board and the standard deviation is 0.05, minimum value 0.1, and maximum value 0.62.

The mean value of leverage (LEV) is 0.34 which means that the average value of non-financial firms having 34% total leverage on the board and the standard deviation is 0.23, minimum value 0.0000, and maximum value 3.88. The average range of firm size (FS) is 15.56 which means that the average value of non-financial firms having 15.56% capitalization as the market of the firm like standard deviation is 1.42, minimum value 11.4, and maximum value 19.90.

4.2 Correlation Analysis

Correlation matrix examines the strength of the relationship among variables along with the direction of positive and negative direction. The range for correlation analysis is (-1 to +1) which shows the correlation between variables. If the value of any measure relies on 0 then the value shows that there is no correlation existed among variables, if (+1) positive then shows a positive relationship among variables. These values (+1, -1) also describes the perfect correlation between independent and dependent variables. Correlation coefficient determine the relationship between. In panel data analysis there are least chances of multicollinearity

still data is examined for the possibility of a potential multicollinearity problem. For further testing the multicollinearity problem, we used the formula (VIF=1/1-Adjusted R-squared) to finalize that whether any problem exists in the data set or not. The most observed rule is that a VIF above 10.0 indicates a multicollinearity problem. This is not the case in the study. So according to this standard both VIF values of VaR and CVaR (fixed-effect models) were 4.3877, -2.2511 respectively, which was less than 10. VIF confirms that there is no multicollinearity between independent variables beyond the tolerable limits, so all the variables can be used in the model. **Table: 4.2**, reports the correlation coefficient determined that correlation analysis among dependent, independent, and firm specific variables.

TABLE 4.2: Correlation Matrix

	VAR	CVAR	SSR	ESGC	CGC	CAPX	LEV	FS
VAR	1							
CVAR	0.65	1						
SSR	0.171	0.146	1					
ESGC	0.13	0.165	0.582	1				
CGC	0.015	0.029	0.042	0.046	1			
CAPX	-0.279	-0.103	-0.013	0.01	0.004	1		
LEV	-0.047	-0.02	0.005	-0.024	0.104	0.046	1	
FS	0.448	0.379	0.572	0.474	0.008	-0.014	-0.029	1

Note: Table 4.2, depicts that correlation analysis has no multicollinearity issues in panel data of 6 years non-financial sector from 778 firm because values relay below the 0.7. Correlation outcomes examined that significant correlations among all the measures below form 0.65.

Table: 4.2, correlation analysis provides that sustainability score (SSR) and sustainability committee (ESGC) has significant relationship with firm size (FS). The correlation between other independent variables is insignificant and explain that the problem of multicollinearity does not exit. The significant correlation between firm size (FS), value at risk (VaR) and conditional value at risk (CVaR) may have caused link. **Table 4.2**, indicates that the value at risk (VAR) is positively correlated with conditional value at risk (CVAR). Both VaR and CVaR are a measure of risk thus high correlation is the nature of variable.

For sustainability score (SSR) the correlation coefficient value 0.171 indicates a positive correlation with value at risk (VaR). The correlation coefficient value of 0.146 shows a positive correlation between corporate sustainability score (SSR)

and conditional value at risk (CVaR). For the environmental social governance committee (ESGC) correlation is 0.130 which indicates positive but insignificant linkage between the environmental social governance committee (ESGC) and value at risk (VaR). In the next row the coefficient correlation value of (ESGC) 0.165 which shows that the environmental social governance committee (ESGC) has positive but insignificant correlation with conditional value at risk variable of the firm, the coefficient value of (ESGC) 0.582 shows that significant & positive correlation between environmental social governance committee (ESGC) and Sustainability score (SSR).

There is positive but insignificant correlation between environmental social governance committee (ESGC) and corporate governance committee (CGC) i.e. .046. The value 0.010 shows positive but insignificant relationship between environmental social governance committee (ESGC) and capital expenditure (CAPX). There is positive but insignificant (0.474) correlation between environmental social governance committee (ESGC) and firm size (FS). The correlation between leverage and environmental social governance committee (ESGC) is negative but insignificant, i.e. -0.024.

For the corporate governance committee (CGC), the correlation coefficient value 0.015 represents the insignificant & positive linkage between corporate governance committee and value at risk. In the next row, the coefficient value of (CGC) 0.029 shows that corporate governance committee is insignificantly correlated with conditional value at risk (CVaR).

The correlation coefficient value of 0.042 shows a significant & positive correlation between corporate governance committee (CGC) and sustainability score (SSR). Similarly the coefficient value of 0.046 shows an insignificant correlation between corporate governance committee (CGC) and environmental social governance committee (ESGC).

For capital expenditure (CAPX), the correlation coefficient value of -0.279 shows a negative & insignificant correlation between capital expenditure and value at risk. In the next row, the coefficient value of capital expenditure (CAPX), -0.103 shows that capital expenditure is negatively correlated with conditional value at

risk (CVaR). The correlation coefficient value of -0.013, shows an insignificant correlation between capital expenditure (CAPX) and corporate sustainability score (SSR). Similarly the coefficient value of capital expenditure (CAPX) 0.010 shows an insignificant correlation between capital expenditure (CAPX) and environmental social governance committee (ESGC). The correlation coefficient value of 0.004 shows an insignificant & positive correlation between capital expenditure (CAPX) and corporate governance committee (CGC). There is positive but insignificant (0.046) correlation between capital expenditure (CAPX) and leverage (Lev). The correlation between firm size (FS) and capital expenditure (CAPX) is negative but insignificant, i.e. -0.014.

For the leverage (LEV) coefficient value of -0.046, indicates the insignificant & negative correlation between leverage and value at risk. In the next row, the correlation coefficient value -0.020, shows that leverage is insignificant but negatively correlated with conditional value at risk. The coefficient correlation value 0.005, shows an insignificant & positive correlation between leverage (Lev) and corporate sustainability score (SSR). The correlation coefficient value -0.024 shows an insignificant, negative correlation between leverage (Lev) and environmental social governance committee (ESGC). The correlation coefficient value of 0.104 shows an insignificant correlation between leverage and corporate governance committee. The coefficient value 0.046 shows an insignificant correlation between leverage and capital expenditure (CAPX).

For the firm size (FS) coefficient value 0.449 explored a significant & positive correlation between firm size and value at risk. In the next row, the coefficient value of (FS) 0.379 shows that firm size significantly/positively correlated with conditional value at risk variable of the firm. The coefficient value of firm size (FS) 0.572 explored a significant & positive correlation between firm size and corporate sustainability score. In the next row, the coefficient value of firm size (FS) 0.474 which shows that firm size is significantly/positively correlated with the environmental social governance committee (ESGC).

The coefficient value of firm size (FS) 0.008 explored that significant & positive correlation between firm size and governance committee. In the next row, the

coefficient value of firm size (FS) -0.014 shows that firm size is significantly/negatively correlated with capital expenditure. The coefficient value of firm size (FS) -0.029 explored a significant & negative correlation between firm size and leverage.

4.3 Impact of SSR, ESGC, CGC and Firm Specific Variables on VaR

In this section, panel regression analysis is applied, to study the impact of corporate sustainability score and corporate governance on market risk (VaR).

4.3.1 Random Effect Model

To explore the impact of sustainability score, ESG committee, corporate governance committee and firm specific variables on market risk, this study uses random effect model on panel data. The results of random effect model are described in table below.

TABLE 4.3: Random Effect Model (VAR)

Dependent Variable: VAR				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.1	0.004	-25.001	0.000
SSR	-0.008	0.001	-9.924	0.000
ESGC	-0.001	0.001	-1.166	0.244
CGC	0.004	0.002	2.349	0.019
CAPX	-0.039	0.004	-8.998	0.000
LEV	-0.004	0.001	-3.87	0.000
FS	0.007	0.000	29.586	0.000
Adjusted R-squared	0.207	Durbin-Watson stat		1.74
F-statistic	152.547			
Prob(F-statistic)	0.000			

Note: The dependent variable is value at risk (VAR) and the independent variables are corporate sustainability score (SSR), environmental social governance committee (ESGC), corporate governance committee (CGC), capital expenditure (CAPX), leverage (Lev), firm size (FS). The significance level used is 5 %.

The results show that how the value at risk is effected by corporate sustainability score (SSR), environmental social governance committee (ESGC), and corporate governance committee (CGC) The sustainability score (SSR) has significant but negative impact on VaR whereas CGC has significant and positive impact on market risk.

The beta coefficient of firm specific variables has a significant influence on a dependent variable. Capital expenditure has significant negative effect while size has positive effect. The values shows that the current study independent variables explain only a 21% variation of dependent variables. In other words, firm's market risk was just 21% described by the contribution of these independent variables collectively.

The random effect model assumes that the intercept is random across the cross-section but this may not be the case in final data. Therefore the study uses Hausman test identify fitting model between random effect model and fixed effect model.

4.3.1.1 Housman Test for VAR

The decision for the appropriate model is taken on the basis of Housman Test. The alternate and null hypothesis are given below.

H0: Random effect is more appropriate.

H1: Fixed effect is more appropriate.

TABLE 4.4: Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	325	6.000	0.000

Hausman Test is carried out for the sample of 778 conventional firms for the period of 2013 to 2018 using the Market risk as a dependent variable. The cross-sectional value of Chi-square statistic is more than tabulated value so null hypothesis is

rejected. The p value of random cross sections shows that fixed effect model is more appropriate for final analysis in this study.

4.3.2 Common Effect Model for Value at Risk

The study applies common effect model on panel data to explore the impact of corporate sustainability score, corporate governance and firm specific variables on firm risk. The results of common effect model are represented in table 4.5 below.

TABLE 4.5: Common Coefficient Model (VAR)

Dependent Variable: VAR				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.0877	0.003	-28.9594	0.000
SSR	-0.0037	0.0007	-5.2427	0.000
ESGC	-0.0017	0.0005	-3.3952	0.0007
CGC	0.0017	0.0011	1.4697	0.1417
CAPX	-0.0685	0.0036	-18.9431	0.000
LEV	-0.0013	0.0009	-1.5206	0.1285
FS	0.005	0.0002	29.7388	0.000
Adjusted R-squared	0.288	Durbin-Watson stat		0.9138
F-statistic	236.233			
Prob(F-statistic)	0.0000			

Note: The dependent variable is value at risk (VAR) and the independent variables are corporate sustainability score (SSR), environmental social governance committee (ESGC), corporate governance committee (CGC), capital expenditure (CAPX), leverage (Lev), firm size (FS). The significance level used is 5 %.

Table 4.5, the results show the value at risk influenced by corporate sustainability score, environmental social governance committee (ESGC). There exist significant negative relationship between sustainability score and market risk. Similarly there is significant and positive impact of ESGC on market risk.

All the beta coefficients of CAPX and FS variables are also significant. Corporate governance committee (CGC) and leverage (LEV) has insignificant impact on market risk. The value of R2 shows that the independent variables explain only a 30% variation in dependent variable. The common effect model assumes that the intercept is constant across the cross-section and time series. This may not be the case in fixed time series.

4.3.2.1 Likelihood Ratio Test for VAR

The selection for appropriate model between common coefficient model and fixed effect model is taken on the basis of likelihood ratio test. The null and alternate hypothesis are given below.

H0: Common effect is more appropriate.

H1: Fixed effect is more appropriate.

TABLE 4.6: Likelihood Ratio Test for VAR

Effects Test	Statistic	d.f.	Prob.
Cross-section F	7	-7762702	0.000
Cross-section Chi-square	3952	776	0.000

Likelihood test is carried out for the sample of 778 conventional firms for the period of 2013 to 2018 using the Market risk as a dependent variable.

In the likelihood ratio test calculated chi square value is more than tabulated value so null hypothesis is rejected. The p value of Chi-square shows that fixed effect model is more appropriate for analysis in this study. As the results of Housman test and Likelihood Ratio both indicate that fixed effect model is best for testing the relationships, thus we use fixed effect model for VaR.

4.3.3 Fixed Effect Model for VaR

According to the recommendation of likelihood and Housman test the study apply fixed effect model to explore the impact of corporate sustainability score and corporate governance on firm risk. The results of fixed effect model are represented in table 4.7.

TABLE 4.7: Fixed Effect Model (VaR)

Dependent Variable: VAR				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.186	0.008	-23.306	0.000
SSR	-0.008	0.001	-8.244	0.000
ESGC	0.002	0.001	2.267	0.023
CGC	0.003	0.003	1.247	0.213
CAPX	-0.016	0.006	-2.796	0.005
LEV	-0.005	0.002	-2.646	0.008
FS	0.012	0.000	27.974	0.000
Adjusted R-squared	0.705	Durbin-Watson stat		2.27
F-statistic	11.661			
Prob(F-statistic)	0.000			

Note: The dependent variable is value at risk (VAR) and the independent variables are corporate sustainability score (SSR), environmental social governance committee (ESGC), corporate governance committee (CGC), capital expenditure (CAPX), leverage (Lev), firm size (FS) . The significance level used is 5 %.

Table 4.7, represents the results of impact of corporate sustainability score, environmental social governance committee (ESGC), and corporate governance committee (CGC) including firm specific variables like capital expenditures, leverage, and Firm size by using the fixed effect model. The beta values of independent

have significant impact on the dependent variable, except the corporate governance committee variable which is insignificant.

The sustainability score (SSR) has significant and negative impact on value at risk (VaR). Whereas environmental social governance committee (ESGC), and corporate governance committee (CGC) has significant positive impact on value at risk (VaR). Leverage (LEV) and capital expenditure has significant negative relationship with value at risk (VaR) whereas firm size (FS) has significant and positive relationship.

The value of R^2 shows that 70.5% fluctuation in the firm's value at risk (VaR) happened due to the role of independent variables. In other words, a firm's value at risk (VaR) is 70.5% explained by independent variables such as corporate sustainability score, environmental social governance committee, and corporate governance committee and firm specific variables. Moreover, the value of R-square also provides a justification for model goodness to fit.

Coefficient value of corporate sustainability score (SSR) - 0.008, significant at the level of $p < 0.000$, show a significant negative influence of sustainability score on value at risk. Thus these results confirm the study conducted by (Jo and Na 2012; and Kim 2010). Both reported that the relationship between sustainability, as a measure of CSR, and firm total risk, is inverse.

The same results have been proved by (Weber and Ang 2016; El Ghouli et al., 2011) which confirmed that socially responsible investments induces less volatility to market returns during the downward trend market condition and therefore can be used to reduce financial risk. The coefficient value of environmental social governance committee (ESGC) $\beta = 0.002$ significant at the level of $p < 0.05$. This result shows that the environmental social governance committee (ESGC) significantly positively influence on value at risk. Similar studies by Iqbal, J., et al (2015) indicate that increased level of systemic risk is faced by financial institutions with stronger corporate governance mechanisms and more shareholder-friendly boards.

Additionally, the study by (DeZoort, & F. T. 1998) suggests that the positive impact of a committee on risk measures is due to elements of committee member

expertise (e.g. knowledge, ability) and judgment performance. The corporate governance committee has coefficient value $\beta = 0.003$ insignificant at the level of $p < 0.05$ and its shows that CGC positive but insignificant influence on value at risk.

Similar results have been found by García-Sánchez, et al (2019) that the presence of committees is more largely figurative than practical, with committee actions targeted at minimizing or preventing legal actions and other credibility threats while not directly impacting corporate disclosures.

The next section study also examines the effect of capital expenditures, leverage, and market capitalization on market risk measures such as value at risk and conditional value at risk. Therefore, coefficient value of capital expenditure (CAPX) is $\beta = -0.016$ significant at the level of ($p < 0.05$). Therefore, value shows that capital expenditure significant negative influence on market risk. The coefficient value of leverage (LEV) is $\beta = -0.005$, significant at the level of $p < 0.05$, hence the value shows that leverage significantly negatively influenced on value at risk. Moreover, coefficient value of market capitalization (FS) is $\beta = 0.012$ significant at the level of ($p < 0.05$). Its mean firm size significantly positive impact on market risk. In nut shell leverage and governance go hand in hand and increase risk.

4.4 Impact of SSR, ESGC, CGC and Firm Specific Variables on CVaR

In this section, we apply panel regression analysis to study the impact of corporate sustainability score and corporate governance on market risk (CVaR).

4.4.1 Random Effect Model

To explore the impact of sustainability score, ESG committee, corporate governance committee and firm specific variables on market risk, this study uses random effect model on panel data. The results of random effect model are reported in table 4.6 below.

TABLE 4.8: Random Effect Model (CVaR)

Dependent Variable: CVAR				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.89	0.04	-21.32	0.00
SSR	-0.07	0.01	-7.3	0.00
ESGC	0.02	0.01	2.32	0.02
CGC	0.04	0.02	2.29	0.02
CAPX	-0.25	0.05	-5.07	0.00
LEV	-0.01	0.01	-1.12	0.26
FS	0.05	0.00	22.09	0.00
Adjusted R-squared	0.14		Durbin-	1.84
F-statistic	96.5		Watson stat	
Prob(F-statistic)	0.00			

Note: The dependent variable is conditional value at risk (CVAR) and the independent variables are corporate sustainability score (SSR), environmental social governance committee (ESGC), corporate governance committee (CGC), capital expenditure (CAPX), leverage (Lev), firm size (FS) . The significance level used is 5 %.

The results show that how the conditional value at risk (CVaR) is effected by corporate sustainability score (SSR), environmental social governance committee (ESGC), and corporate governance committee (CGC) along with other form specific variables. The sustainability score (SSR) has significant but negative impact on CVaR whereas ESGC and CGC has significant and positive impact on market risk. The beta coefficient of firm specific variables has a significant influence on a dependent variable. Capital expenditure and leverage has significant negative effect while firm size has positive effect. The value of adjusted R-square shows that the current study independent variables explain only a 14% variation of dependent variables. In other words, firm's market risk was just 14% described by the contribution of these independent variables collectively. The random effect model assumes that the intercept is random across the cross-section but this may not be the case in final data. Therefore the study uses Hausman test identify fitting model between random effect model and fixed effect model.

4.4.1.1 Housman test for CVaR

The decision for the appropriate model is taken on the basis of Housman Test. The alternate and null hypothesis are given below.

H0: Random effect is more appropriate.

H1: Fixed effect is more appropriate.

TABLE 4.9: Housman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	311	6.000	0.000

Hausman test is carried out for the sample of 778 conventional firms for the period of 2013 to 2018 using the Market risk as a dependent variable. The cross-sectional value of Chi-square statistic is more than tabulated value so null hypothesis is rejected. The p value of random cross sections shows that fixed effect model is more appropriate for final analysis for the impact of independent variables on CVaR.

4.4.2 Common Effect Model for Conditional Value at Risk

The study applies common effect model on panel data to explore the impact of corporate sustainability score, corporate governance and firm specific variables on market risk (CVaR). The results of common effect model are represented in table 4.10 below.

TABLE 4.10: Common Coefficient Model (CVaR)

Dependent Variable: CVAR				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.91	0.04	-22.89	0.00
SSR	-0.05	0.01	-5.78	0.00
ESGC	0.01	0.01	1.54	0.12
CGC	0.03	0.01	1.91	0.06
CAPX	-0.3	0.05	-6.38	0.00
LEV	0.00	0.01	-0.29	0.77
FS	0.05	0.00	22.33	0.00
Adjusted R-squared	0.2	Durbin-		1.7
F-statistic	112.5	Watson stat		
Prob(F-statistic)	0.00			

Note: The dependent variable is conditional value at risk (CVAR) and the independent variables are corporate sustainability score (SSR), environmental social governance committee (ESGC), corporate governance committee (CGC), capital expenditure (CAPX), leverage (Lev), firm size (FS) . The significance level used is 5 %.

Table 4.10, the results show the value at risk influenced by corporate sustainability score, environmental social governance committee (ESGC), including variables such as capital expenditures, leverage, and firm size.

There exist significant negative relationship between sustainability score and market risk (CVaR). Similarly there is significant and negative impact of CAPX on market risk. All the beta coefficients of CGC and FS variables are also significant. Environmental social and governance committee (ESGC) has insignificant impact on market risk.

The value of R^2 shows that the independent variables explain only a 20% variation in CVaR. The common effect model assumes that the intercept is constant across the cross-section and time series. This may not be the case in fixed time series.

4.4.2.1 Likelihood Ratio Test for CVaR

The selection for appropriate model between common coefficients model and fixed effect model is taken on the basis of likelihood ratio test. The null and alternate hypothesis are given below.

H0: Common effect is more appropriate.

H1: Fixed effect is more appropriate.

TABLE 4.11: Likelihood Ratio Test for CVaR

Effects Test	Statistic	d.f.	Prob.
Cross-section F	1.8	-7762702	0.00
Cross-section Chi-square	1429.1	776	0.00

Likelihood test is carried out for the sample of 778 conventional firms for the period of 2013 to 2018 using the Market risk as a dependent variable.

In the likelihood ratio test calculated chi square value is more than tabulated value so null hypothesis is rejected. The p value of Chi-square shows that fixed effect model is more appropriate for analysis of CVaR. As the results of Housman test and Likelihood Ratio both indicate that fixed effect model is best for testing the relationships, thus we use fixed effect model for CVaR.

4.4.3 Fixed Effect Model for Conditional Value at Risk

According to the recommendation of likelihood and Housman test the study apply fixed effect model to explore the impact of corporate sustainability score and corporate governance on market risk (CVaR). The results of fixed effect model are represented in table 4.12

TABLE 4.12: Fixed Effect Model (CVaR)

Dependent Variable: CVAR				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.29	0.15	-1.92	0.05
SSR	-0.27	0.02	-14.16	0.00
ESGC	0.05	0.01	3.92	0.00
CGC	0.15	0.05	2.96	0.00
CAPX	0.31	0.11	2.86	0.00
LEV	-0.24	0.03	-6.83	0.00
FS	0.06	0.01	6.90	0.00
Adjusted R-squared	0.28	Durbin-		2.39
F-statistic	2.76	Watson stat		
Prob(F-statistic)	0.00			

Note: The dependent variable is conditional value at risk (CVAR) and the independent variables are corporate sustainability score (SSR), environmental social governance committee (ESGC), corporate governance committee (CGC), capital expenditure (CAPX), leverage (Lev), firm size (FS) . The significance level used is 5 %.

Table 4.12, represents the results of impact of corporate sustainability score (SSR), environmental social governance committee (ESGC), and corporate governance committee (CGC) including firm specific variables like capital expenditures, leverage, and firm size on market risk, using the fixed effect model. The beta values of independent have significant impact on the dependent variable. The sustainability score (SSR) has significant and negative impact on conditional value at risk (CVaR). Whereas environmental social governance committee (ESGC), and corporate governance committee (CGC) has significant positive impact on conditional value at risk (CVaR).

Leverage (LEV) has significant negative relationship with conditional value at risk (CVaR) whereas firm size (FS) has significant and positive relationship. The value of R2 shows that 28% fluctuation in the firm's value at risk (VaR) happened due to the role of independent variables. In other words, a firm's conditional value at risk (CVaR) is 28% explained by independent variables such as corporate sustainability score, environmental social governance committee, and corporate governance committee and firm specific variables. Moreover, the value of R-square also provides a justification for model goodness to fit.

Coefficient value of corporate sustainability score (SSR) – 0.27, significant at the level of $p < 0.05$, show a significant negative influence of sustainability score on conditional value at risk (CVaR). Thus our results confirm the study conducted by Jo and Na (2012) and Kim (2010) who studied the relationship between sustainability, as a measure of CSR, and firm total risk, concluding that firm total risk is inversely related to CSR engagement.

The same results have been proved by (Weber and Ang 2016; El Ghouli et al., 2011) which confirmed that socially responsible investments induces less volatility to market returns during the downward trend market condition and therefore can be used to reduce financial risk.

The coefficient value of environmental social governance committee (ESGC) $\beta = 0.05$ significant at the level of $p < 0.05$. This result shows that the environmental social governance committee (ESGC) significantly positively influence on value at risk. Similar studies by Iqbal, J., et al (2015) indicate that financial institutions

with stronger corporate governance mechanisms and more shareholder-friendly boards are associated with higher levels of systemic risk.

Additionally, the study by DeZoort, & F. T. (1998) suggests that the positive impact of a committee on risk measures is due to elements of committee member expertise (e.g. knowledge, ability) and judgment performance. The corporate governance committee has coefficient value $\beta = 0.15$ significant at the level of $p < 0.05$ and its shows that CGC positive but influence on value at risk. The next section study also examines the effect of capital expenditures, leverage, and market capitalization on market risk measures such as value at risk and conditional value at risk.

Therefore, coefficient value of capital expenditure (CAPX) is $\beta = 0.31$ significant at the level of ($p < 0.05$). Therefore, value shows that capital expenditure significant positive influence on market risk. The coefficient value of leverage (LEV) is $\beta = -0.24$, significant at the level of $p < 0.05$, hence the value shows that leverage significantly negatively influenced on conditional value at risk. Moreover, coefficient value of market capitalization (FS) is $\beta = 0.06$ significant at the level of ($p < 0.05$). Its mean firm size significantly positive impact on market risk.

Chapter 5

Discussion and Conclusion

5.1 Conclusion

Ernst and Young says that, “sustainability has found its way into the realm of controllership and financial risk management”. This study aimed to analyze and clarify the link between corporate sustainability, corporate governance, and risk, evidencing data from the New York stock exchange.

Those who support sustainable capitalism are often confronted to explain why sustainability adds value. But the real question to be answered should be: “Why does an absence of sustainability not damage companies, investors, and society at large?” The study is a remarkable contributions using an international database which creates diverse information particularly considering different, corporate governance systems, corporate environments and so on.

We tested the impact of corporate sustainability score, environmental social governance committee, corporate governance committee, capital expenditure, leverage, firm size on market risk. Our results conclude that the presence of ESG committee can ensure the safe investment, increased returns and reduced risk. Same impact of corporate governance committee can be concluded as the risk can be reduced by the presence of it. As the firm grows in size the risk is decreased and with the increase in leverage there is also the chance of increase in risk.

Weber and Ang (2016) argue that during bearish times, socially responsible investments indices have shown resistance to market low returns and can thus be used in bearish market periods to minimize equity risks. Orlitzky and Benjamin (2001) revisit several empirical studies between 1978 and 1995, dealing with the relationship between financial risk and social performance in the US, meta-data analysis. Their findings endorse the presence of inverse relationship between these two variables.

Previously, in literature Jo and Na, (2012) reports that firms can reduce their business risk through good management of corporate social concerns. Jiraporn et al. (2014) and Cheng et al. (2014) show that socially responsible corporations are regarded more credit worthy and have increased access to funding.

These studies focus on environmental responsibility, report that the environmental performance of these companies is inversely related to risk. Indigenous bodies and few private organizations must realize that public-private partnerships has the possibility to breathe new life into neighborhoods. Besides this sustainability fits various purposes in different management disciplines like finance, quality management, HRM, marketing, communication and reporting all these factors show different views on sustainability aligned to the specific situation and challenges as a result the of contemporary ideas and thoughts are often tilted towards specific interests.

The major input of this paper lies in the use of sustainability score which is a novelty in measuring sustainability performance and the use of an extensive database that makes the study comprehensive and reliable.

5.2 Discussion

All the market players must be aware that sustainability is regarded as the panacea which will solve the global poverty gap, social exclusion, and environmental degradation. Considering the presence of committees in the firm for governance and sustainability we have come across diverse empirical studies regarding their roles.

Some of the researchers consider the large presence of insiders in committees increases the risk that the committees serve only as a mask for non-socially responsible, profit-making actions, following the fashion of many European companies (Burke et al., 2017). It further add that sustainability committees are effective at impacting relevant strengths, but do not mitigate risk concerns. These results are the same as found by Ayse Kucuk Yilmaz and Triant Flouris (2010) who argue that Sustainability management will succeed only if managers and personnel recognize that the reforms create value for them. They also add committees that generate value by pursuing sustainability-related opportunities and protect value by monitoring, but not necessarily mitigating sustainability-related risks.

Thus we assume that the presence of a sustainability and corporate governance committee indicates an attempt to empower stakeholder management but they do not necessarily mitigate risk. For doing so an effective sustainability committee and corporate governance committee must have independent members, particularly those who have experience in risk evaluation and techniques so that the committee also serves for the safe investment and reduced risk.

The results show that in order to explain the effect of board composition of sustainability committee and corporate governance committee we need to go beyond the narrow and traditional distinction between committee members, focusing on the specific characteristics of each member.

The committee members may be constrained by their education and experience to handle risk. If sustainability committee members and corporate governance committee members lack experience in oversight areas such as risk evaluation and control, then their ability to govern corporate sustainability activity and facilitate corporate risk management in those areas may differ from companies with such experience.

5.3 Limitations

Nonetheless, this research is subject to some limitations. Our result is consistent with the original theory outlined in this paper and proposes that corporate

governance committees are possibly a mechanism to improve a firm's overview of an impact on stakeholder groups, but sometimes at the cost of economic success. First, the study is restricted to the fact that other elements of the corporate governance committee and ESG committee, i.e. committee member expertise (e.g. awareness, expertise, ability, education, and risk exposure) and judgment performance (e.g. stability, hypothesis generation) are not apprehended.

Another apprehension of both committees is, they serve management in setting strategy, setting goals, and incorporating sustainability and corporate governance into the routine business matters of the company. These results suggest that the committees positively impact sustainability strengths, but do not mitigate risk concerns. In sum, the prediction for the association between sustainability committee, corporate governance committees, and risk concerns is not without tension.

5.4 Future Directions

In closing, we acknowledge that this study can be extended in several directions. This study strongly recommends to all corporations, the market stakeholders including investors, portfolio managers, and policymakers to be aware of the threats of corporate activities on the external and internal environment.

All the market players must know that sustainability is regarded as the cure which will solve the global poverty gap, social exclusion, and environmental degradation. Some important recommendations of this study are given below.

- The measure of governance committee used are in common for which data are available. But the concept of using sustainability score is evolving and new metrics to defined risk. Future studies can replicate this study with additional measures of sustainability and governance.
- Different committees can be studied as additional research with diverse range of tasks to fully address whether and when a lack of relevant member or experience increases the risk of economic loss.

- Analysis among different sectors can be done based on the sustainability score as there is the possibility of a score that does not say much about firm risk reduction, making the comparison across firms.
- To investigate the effect of sustainability score on risk, different measures of risk could be used.
- Future research can further elaborate these results with in-depth qualitative studies comprising a large number of interviews and questionnaire-based surveys from the corporations, by making criteria for sustainability ratings.

5.5 Specific Recommendations

1. The presence of corporate governance committee is significant in reducing risk so its role must be strengthened in corporate governance structure.
2. ESG committee must be incorporated where the firm do not have ESG committee and its effective role should be ensured.
3. Though use of leverage can mitigate risk but care must be taken using leverage as its excessive use can increase risk.
4. Capital expenditure generally leads to new investments but according to “pecking order theory”, debt should be used first. So capital expenditure can create uncertainty about risk reduction. Thus disclosures should be increased to reduce the ambiguity regarding capital expenditure.
5. The role of sustainability score is ambiguous and it should be investigated further in detail.

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