An Empirical Investigation on the Wealth Protection Function of Corporate Social Responsibility (CSR)

By

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Certificate

Dedication

This thesis is dedicated to

My parents
(Mr. and Mrs. Muhammad Rizwan Khan)
who inspired me to start this journey

My advisors
(Dr. Asfia Obaid and Dr. Dawood Ashraf)
who kept me moving

&

My wife and son
(Rahat and Asfandyar)
who stimulated me to complete it.

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All praise unto Allah, Lord of all the worlds. The most
Affectionate, The Merciful.
And countless praises and blessings on prophet Mohammad
(PBUH), the perfect in all the human beings, and "Mercy unto the
Worlds".

Last but not the least, I express my deepest gratitude to my family: my parents, my wife, my son, my brother, and sisters for their support and motivation during my life in general and cumbersome study period in particular.

Abstract

The economic consequence of engagement in socially responsible activities on firm valuation is quite a contentious issue. The debate on whether the objective of business is to maximize shareholders' wealth or to maximize the welfare of society touches upon issues relevant to the long-term sustainability of firms. Businesses are under increasing pressure to act more ethically and responsibly due to the changes in technology, easy access to information, and better awareness of the adverse effects of business operations. Public pressure is mounting for corporate accountability covering all aspects of business operations whether legal, social, moral, governance, or financial by various stakeholders. Consequently, corporations are responding by issuing corporate social responsibility (CSR) related reports and analysts are providing coverage on CSR-related issues. Increasing number of investors not only evaluate the financial performance of firms but also looking at how corporations are meeting their social responsibilities.

Academic literature related to the benefits of CSR engagement suggests two channels: a wealth enhancement function and a wealth protection function. This study empirically investigates the wealth protection channels of CSR. Specifically, three questions are addressed in this thesis in three different essays. The first essay investigates the impact of engagement in CSR and how it affects the credit default risk of firms. The second essay explores whether CSR disclosures mitigate stock price misalignment through increased firm-specific information diffusion. The last essay considers whether socially responsible firms develop and sustain social capital through superior business practices and investigates whether this social capital is reflected in the financial statements attested by external auditors.

To measure the level of CSR engagement, annual data on CSR-related disclosures of non-financial US firms from 2000 to 2012 was obtained from KLD Research and Analytics Inc. While financial statements, market prices and analysts' recommendation data was acquired from Thomson Reuters' DataStream. The data for auditors' opinions was obtained from Audit Analytics. In addition to the composite measure of CSR using the principle component analysis (PCA) technique, separate measures related to primary and secondary stakeholders are developed to understand whether the impact of CSR is any different based on CSR activities.

The empirical findings support the credit protection function of CSR. The empirical results indicate that firms scoring higher on CSR index have significantly lower default risk. However, this negative relationship between CSR and probability-of-default is more pronounced in CSR activities related to primary stakeholders while CSR-related to secondary stakeholders do not have any significant risk mitigation relationship.

The second essay provides evidence that firms with higher levels of engagement in CSR activities have higher firm-specific information diffusion through stock prices implying that stock prices of socially responsible firms are less prone to stock price misalignment. Moreover, in line with the legitimacy theory, the size of firms' plays a negative moderating role in this relationship suggesting that as the size of the firm increases the marginal impact of CSR on firm-specific information diffusion decreases. Furthermore, primary (technical) CSR is found to be significant in the CSR-information diffusion function and secondary (institutional) CSR has inverse relationship with stock price informativeness.

The third essay attest the credit protection role of CSR where firms reporting higher on CSR index found to be more likely to receive favorable auditors' opinion on financial reporting. The empirical findings suggest that as firms increase their engagement in CSR-related activities the accuracy and reliability of their financial reporting also increases which support the existence of social capital related to CSR engagements.

The findings of this thesis have policy implications for firm management, especially for smaller firms. This study concludes that investment in CSR provides an important risk mitigation function that acts like an insurance against credit default risk, provides informative stock prices and builds intangible social capital that ultimately benefits various stakeholders of the firm. Management is encouraged to invest in CSR to capitalize on these wealth protection aspects. Furthermore, in the presence of scarcity of funds, management can focus on CSR activities related to primary stakeholders as the risk mitigation benefits from these engagements are more pronounced as compared with investment in issues related to secondary stakeholders.

For regulators, the findings of this study can provide a direction for future regulation whereby firms may have disclosure requirements related to CSR issues. By incorporating CSR-related disclosures in the routine filings of reporting firms, regulators make it easier for investors to invest in those companies that are more socially responsible. For investors, risk mitigation is an important function and CSR can play an important role in risk management. Investors would be better off by investing in CSR conscious companies than other companies otherwise equivalent from a risk perspective and investors should view CSR as a pricing factor in their investment decisions.

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List of Abbreviations

2SLS	Two stage least squares
ACE	Award for corporate excellence
AC	Accrual
ADOP	Auditors Opinion
ADTR	Auditors trust
AIMR	Association for Investment Management and Research
ANCOV	Analyst coverage
ANREC	Analyst recommendation
BOD	Board of directors
CEO`s	Chief executive officers
CERES	Coalition for Environmentally Responsible Economies
CG	Corporate governance
CSM	Corporate social marketing
CSR	Corporate social responsibility
CSRE	Equally weighted CSR
CSRF	First component PCA CSR
CSRR	Raw CSR
CSRW	Weighted CSR
DAC	Discretionary Accruals
DD	Distance to default
DivD	Dividends payment dummy
BEBA	Bureau of Economic and Business Affairs
EPA	Environmental Protection Agency
Esg	Eniironmental, Social and Governance
FC	Financial crisis
GMM	Generalized method of moment
HCFC`S	Hydrochlorofluorocarbons
I-Crisis	Internet Crisis/Dotcom crisis of 2002
ICSR	Institutional corporate social respomsibility
INFO	Informativeness
IVA	Intangible value assessment
KLD	Kinder, Lydenberg Domini
LEV	Leverage
MB	Market-to-book ratio
MNE	Multinational enterprise
M&A	Merger and Acquisition
NDAC	Non discretionary accruals
NEBT	Net earnings before taxes
OECD	Organization of economic cooperation and development
OLS	Ordinary least squares
PCA	Principle component analysis
PD	Probability of default
PPE	Property plant and equipment

R & D	Research and development
R^2	Coefficient of determination
REC	Receivables
ROA	Return on assets
ROE	Return on equity
TA	Total assets
TCSR	Technical corporate social responsibility
VA	Market value of firm
VE	Market value of equity

Part--I

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1   Background of the study

Over the last few decades' corporate social responsibility (CSR) has gained the attention

of both academia and practitioners. For a firm's sustainable and long-term economic growth,

environmental, social, and governance (ESG) issues are top of the agenda for most CEOs, recently

surveyed by Price Waterhouse Coopers[1]. Maximizing the wealth of its shareholders is considered

the primary goal of a corporation. However, along with achieving this goal, corporations have a

responsibility to protect the long-term interests of society in terms of environmental, social, and

governance matters.

Adhering to CSR-related ethical matters affects society in a positive way but how does it

affect the corporation? One may argue that engagement in CSR-related activities is merely an

expense that management may use to promote their image at the expense of shareholders. This

reflects an agency problem whereby management uses corporate resources for personal gains. On

the other hand, engagement in CSR may also be considered as a long-term investment with the

view to developing and sustaining social capital which can benefit society at large and, ultimately,

corporate shareholders in the long-run.

These contradictory arguments lead to the question of whether engagement in CSR

activities is merely an expense or can corporations obtain long-term benefits from this

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[1] Survey results are available at http://www.pwc.com/gx/en/ceo-survey/2014/sustainability-perspective.jhtml

engagement? This implies that catering for ESG/CSR concerns may have a positive or a negative impact on the financial performance of firms.[2] Although there is a plethora of academic literature available on the association of CSR with corporate performance, its impact on firms is still not completely understood. In terms of positive effects of engagement in CSR, academic literature explores two important functions related to CSR activities. One is a wealth enhancing function and the other is a wealth protection function.

Literature exploring the wealth enhancing function considers engagement in CSR activities as an investment and investigates its potential contribution to the firm in the form of better firm valuation. The empirical evidence on the association of CSR and wealth enhancement ranges from positive (Hillman and Keim, 2001), to neutral (Renneboog et al., 2008; Bauer et al., 2005) to negative association (Brammer, et al., 2006). The wealth protection function of CSR suggests that investment in socially responsible activities not only fosters a positive relationship among businesses, governments, and communities but also reduces the relative riskiness of firms. Studies based on this argument find that engagement in CSR result in better credit ratings (Jiraporn et al., 2014), lower financial risk and lower cost of raising new capital (El Ghoul et al., 2011; Goss and Roberts, 2011) mainly due to the lower probability of an occurrence of adverse events.

Although the wealth protection function of CSR has very important implications for firms and interested stakeholders, this function of CSR has not been researched as deeply. There are several dimensions of the risk reduction function that still need to be explored. This study identifies three important dimensions of the wealth protection function of CSR that are not well researched

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[2] In the empirical literature, ESG-related issues are generally researched under the broader term of corporate social responsibility (CSR). For the purposes of this thesis, I use the term CSR as a synonym for ESG.

and are presented in this thesis. The first essay of the thesis explores the association of CSR with credit default risk. The second essay explores the role of CSR in reducing stock price asymmetry by increasing stock price informativeness. The final essay investigates whether firms engaged in CSR activities reflect the same level of responsibility while reporting their financial results to investors. Apart from the basic objective of identifying and empirically testing the new dimensions of the wealth protection function of CSR, a more rigorous approach is used to define various variables and perform econometric estimation techniques for data analysis.

One of the important issues that arise in the CSR literature is how to determine the level of engagement in CSR activities in a systematic manner that helps provide for a meaningful comparison across firms. The existing literature often uses a net CSR score method where a net of the strengths and weaknesses of CSR are taken as the level of CSR engagement. However, this CSR score is heavily biased towards the number of occurrences of a specific CSR dimension. To overcome this difficulty, this study uses a CSR index developed by using the principle component analysis (PCA) approach. The PCA approach is based on the internal correlation of various CSR dimensions hence it is not biased to any specific dimension. The CSR index based on a PCA approach not only provides a relative performance matrix but also explains the maximum variation by assigning weights to each component based on relative correlation (Goss and Roberts, 2011). Besides the development of a better CSR index, this thesis contributes to the growing literature on the wealth protection function of CSR in three essays.

The first essay investigates the impact of CSR on the probability-of-default as a proxy for credit default risk using the Merton (1974) model[3]. The wealth protection function suggests that firms with higher CSR scores may face a lower probability-of-default. Jiraporn et al., (2014) investigated the relationship between CSR and credit ratings (proxy for credit default risk) of firms by hypothesizing that higher levels of CSR engagement may help firms to gain better credit ratings. Their findings suggest that firms with better CSR scores enjoy higher credit ratings from the same industry and geographic region. However, the use of credit ratings as a proxy for credit default risk may not be appropriate due to the simplified approach for ratings based on publicly available information that does not include information on systematic risk and uncertainty (Hilscher and Wilson, 2013; Heitfield and Böcker, 2010). Furthermore, the use of credit ratings as a proxy for credit default risk not only reduces the number of observations but also does not take into consideration the dynamic nature of a firm's behavior over a period. Rösch and Scheule (2014) and Ashraf and Goddard (2012) also suggest that credit ratings are incorrect measures of credit risk because they failed to predict corporate failure during the recent global financial crisis. The first essay uses the Merton (1974) methodology for the calculation of probability-of-default. Merton (1974) model uses the market information for the computation of the probability-of-default and takes into consideration all firm and market specific available information. Moreover, the probability of default based on Merton model uses the volatility of assets as input which considers both firm specific as well as market specific risks.

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[3] To the best of the author's knowledge, there is no prior study that has investigated CSR and credit risk relationship by using the probability of default as a proxy of credit risk.

By using a sample of non-financial US firms from the period 2000 to 2012, engagement in CSR was found to help reduce credit default risk as measured by the probability-of-default. The empirical evidence contradicts the agency view of engagement in CSR activities and supports the wealth protection function of CSR activities. It was also found that the credit risk of firms increased substantially during the dotcom (2001-02) and financial (2007-08) crises. By splitting CSR into technical CSR (primary stakeholders related) and institutional CSR (secondary stakeholders related) robust evidence was found to suggest that technical CSR (TCSR) has a significantly negative relationship with credit default risk, however, there is no evidence that institutional CSR (ICSR) has any impact on credit default risk.

Since the participation in CSR can be viewed as a signal from the corporation to reduce information asymmetry, the stock price of corporations with higher levels of engagement in CSR activities should reflect higher alignment with market movements. Under stakeholder theory, CSR is used to reduce information asymmetry. According to stakeholder theory, CSR activities also reduce the cost of equity capital (Dhaliwal et al., 2011), provide more accurate forecasts by analysts (Dhaliwal et al., 2012). Furthermore, engagement in CSR generates more favorable recommendations by analysts (Ioannou and Serafeim, 2015), attracts more analysts for following (Hong and Kacperczyk, 2009), and provides more information about stock risk (Spicer, 1978).

The second essay investigates the association between the level of CSR and stock price informativeness and extends the existing literature by focusing on whether the size of a firm has any role in this relationship. Based upon legitimacy theory perspective, the moderating effect of size on the CSR-informativeness relationship is tested in this essay. Over or underestimation of the impact of CSR on the informativeness of stock prices may occur due to the omission of this

moderating effect. This essay also extends the literature by focusing on activities affecting primary stakeholders (technical CSR) and secondary stakeholders (institutional CSR) and use these two classifications separately when investigating the CSR-informativeness relationship.

Empirical findings suggest that stock prices of socially responsible firms are more informative as compared with firms scoring low of CSR index. However, this informativeness is not uniform across all firms. The size of firms plays a negative moderating role in the CSR-informativeness relationship suggesting that the marginal impact of CSR on informativeness decreases with an increase in the size of firms. The moderating role of the size of firms can be explained by the legitimacy theory suggesting that actions of firms larger in size are subject to higher scrutiny and societal pressure resulting in a lower stock price informativeness as compared with firms smaller in size. In terms of CSR activities, technical CSR positively affects informativeness while institutional CSR is negative among large firms. One of the important contributions of this study is the identification of the presence of persistence and an adjustment mechanism in informativeness of stock returns. This suggests that the use of dynamic panel models is the most appropriate method when conducting empirical investigations on stock price informativeness.

In the third essay, the relationship between the levels of CSR engagement is explored regarding the possibility of receiving unqualified opinions from external auditors[4]. The argument is that engagement in CSR is not merely a marketing gimmick rather it is an intentional decision to conform to the values of CSR by adhering to a more socially conscious behavior. Firms

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[4] Table 7.4.2 provides the details about the spread of opinion.

proactively seek to address concerns ranging from corporate governance to environmental issues, employee relations to managerial diversity, and product quality. Over time participation in CSR may result in developing social capital or franchise value. This final essay takes the argument a bit further and asks whether firms with higher levels of CSR engagement act more responsibly in their financial reporting and earn the highest level of external auditors' trust in the form of an 'unqualified opinion.'

By using a sample of non-financial US firms for the period from 2000 to 2012, we found robust evidence that more socially responsible firms deliver more transparent and accurate financial results as reflected by receiving an unqualified audit opinion. Results remained robust after using different estimation techniques and alternative reporting quality measures. The empirical findings hint to the existence of social capital that CSR-conscious firms attempt to protect while providing better disclosures related to CSR and maintaining higher auditors' ratings. This highlights some potential benefits to investors, management, and accounting professionals. Investors may consider the disclosures of a CSR-conscious firm as more reliable. Management can use the engagement in CSR activities as a mechanism to reduce information asymmetry. This study shows that firms engaged in CSR conform to higher standards of business practice and, in the process, grow their social capital.

After this comprehensive review of the rationale and contribution of the thesis, the next subsection formally develops the problem statement for this thesis.

1.2 Problem Statement

The existing literature on the impact of CSR engagement explores its benefits through wealth enhancement and wealth protection channels. Due to its visible impact, the wealth enhancement function has focused on value addition and has been researched extensively. However, the wealth protection function of CSR, in the form of risk reduction, has not been studied extensively. The sparse literature on the wealth protection function has investigated the impact of CSR engagement regarding receiving better credit and analyst ratings. However, there is no study that investigates the relationship between CSR and credit default risk, stock price informativeness and quality of financial reporting. Also, there is a gap in the identification of moderating role of size in CSR-informativeness relationship and difference in the marginal contribution of primary and secondary stakeholders' related CSR. There is a need to investigate the wealth protection function of CSR channeled through lower credit default risk, lower price uncertainty due to better information diffusion, and receiving higher auditor ratings. Moreover, there is a need to explore if all kinds of CSR-related activities, i.e., primary and secondary stakeholder related CSR engagements, have the same wealth protection benefits, as it can help management and a broad group of stakeholders in pricing and valuing different aspects of CSR engagements.

1.3 Objectives of the study

The main objective of this thesis is to contribute to the academic literature on the less explored wealth protection function of CSR and specifically by exploring:

- The association of engagement in CSR-related activities and its impact on the credit default risk of nonfinancial firms;

- The impact of CSR-related disclosures on stock price informativeness;

- The relationship between engagement in CSR activities and the probability of receiving the best auditor opinion (unqualified opinion) by producing quality financial reports; and

- Whether CSR activities related to specific stakeholders have different marginal effects in different wealth protection channels.

To explore the linkage between CSR and channels of wealth protection, there are several sub-objectives including:

- Identification of the less/unexplored areas of the wealth protection function of CSR by providing a thorough review of existing literature on related matters;

- Develop a more comprehensive index of CSR activities that take into consideration the correlation of various factor rather a simple additive; and

- Provide policy recommendation based on empirical findings.

1.4 Limitations

The data set used in this study to construct CSR measures is collected from the KLD STATS[5] database. Although this is one of the most comprehensive databases on CSR and is used in a large number of studies,[6] it has few limitations. Chatterji et al., (2009) analyzed the KLD database and found that although CSR ratings are capturing CSR issues reasonably well,[7] it is not using all publicly available data at an optimum level. Furthermore, the KLD database gives ordinal

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[5] Kinder Lydenberg Domini (KLD STATS) is created and maintained by KLD Research & Analytics, Inc. (KLD))
[6] See for example Oikonomou et al., (2012); Godfrey et al., (2009); Bae et al., (2011); Verwijmeren and Derwall (2010); and El Ghoul et al., (2011) all used an index of CSR activities to build on the additive rule.
[7] For instance, their analysis shows that firms with a large number concerns are having more pollution and environmental issues.

numbers which give the relative performance of firms but not the variations. This dissertation uses the principle component analysis (PCA) approach for relative ratings based on CSR activities. The PCA technique for the construction of a CSR index not only provides a relative performance matrix but also explains the maximum variation by assigning weights to each component based on relative correlation (Goss and Roberts, 2011).

Another limitation of this study is related to the generalization of results. Maignan and Ralston (2002) suggest that countries differ on perspectives of being socially responsible and which CSR issues should be emphasized, so generalization of results should be made carefully. This thesis, where possible, refrains from generalizing results. However, there may be incidents where interpretation would imply more general inferences are needed that may be used universally.

1.5   Significance of the study

This thesis significantly contributes to both theory and the practice. The empirical findings support the wealth protection role of CSR in the form of lower credit default risk, higher stock price informativeness and higher quality financial reporting. The wealth protection function of CSR, as demonstrated in this thesis, helps a larger set of stakeholders including management, creditors, investors, and regulators significantly to understand better and price/value the engagement of firms in CSR-related activities.

This study has significance for management as it validates the wealth protection benefits of CSR and nullify the agency theory perspective wherein CSR engagement is considered as a personal gain to the management. The empirical findings suggest that management should invest

in CSR activities related to primary stakeholders, as the risk mitigation benefits from these engagements are more pronounced as compared with investment in issues related to secondary stakeholders.

The significance of this study for regulators stems from a better understanding of corporate behavior. Regulators can use the findings to provide direction for future regulations related to CSR engagements and disclosures to it.

For investors, risk mitigation is an important function. Investors can benefit by investing in those firms that are more CSR-conscious to lower overall riskiness of their portfolio. Another important implication of this study for investors is to consider the role of CSR in risk mitigation and pricing while making the investment decision.

In summary, this thesis supports the notion that CSR can positively contribute to enhancing the long-term sustainability of businesses and society. The wealth protection function of CSR, as demonstrated in this thesis, can significantly help management, creditors, investors, and regulators to understand better and price/value the engagement of firms in CSR-related activities.

1.6   Summary

This study investigates the wealth protection role of engagement in CSR activities through three different channels: reduction in credit default risk, improved information diffusion, and

quality financial reporting. This study used novel[8] empirical methodologies to provide evidence on the arguments mentioned above and answered all the previously mentioned questions.

This study is presented in two parts spanning eight chapters. Chapter 2 discusses the theoretical framework and explains United States (US) and global perspectives on CSR. Relevant literature on CSR is provided in chapter 3. In chapter 4, data and research methodologies are discussed along with covariate development. Chapter 5 explores the association between CSR and probability-of-default. Chapter 6 discusses the impact of CSR on firm-specific information diffusion. Chapter 7 investigates the existence of social capital due to engagement in CSR and the relationship between CSR orientation and the quality of financial reporting. Chapter 8 summarizes and concludes this thesis and provides suggestions for future research.

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[8] Detailed discussion on the empirical methodology used in the empirical investigation of every research question has been provided in the methodology section of relevant essays.

CHAPTER TWO

THEORETICAL FRAMEWORK

Chapter two presents a theoretical framework for the quantitative analysis to investigate whether CSR engagement leads to wealth protection. Section 2.1 discusses the academic perspective of CSR, its various definitions and understandings, and recent advancements in this area. What follows next is a discussion on the mechanisms that motivate firms to become more aware of CSR issues. The final section of this chapter provides corporate and governmental perspectives regarding CSR and its practices in the US and from a global perspective.

2.1 Academic Perspective of CSR
2.1.1 What does CSR mean?

The term Corporate Social Responsibility (CSR) first appeared when Bowen (1953) wrote a book titled "Social Responsibilities of the Businessman." Bowen (1953 p.6) suggests that 'Corporate Social Responsibility' is the obligation '*to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society*.' After the publication of this book, several researchers attempted to explain the seemingly simple concept of CSR. However, with every new definition, it became even more confusing. Carroll (1999) documented more than 25 definitions of CSR since Bowen (1953).

In the 1970s the most debated statement about CSR was made by Friedman (1970) and which has since been cited by many researchers (see Lucas et al., 2001; Hopkins, 2003; Turner 2004; Carroll, 1999). According to Friedman (1970), a business entity should pursue only a single

goal - to use its resources to generate profits by following the rules and regulations and compete openly with competitors and without any involvement in fraudulent activities. Furthermore, Rappaport (1986) laid the concept of shareholders' value maximization and suggested seven[9] drivers within the business to create value for firms. This idea of shareholder wealth maximization became very famous in the US and later in the western economies. Freeman (1984) laid out the concept of stakeholders as a loose alliance of support groups necessary for the existence of any organization.

Corporate social responsibility refers to the moral and ethical behavior of corporations towards the society in which it operates. It refers to engagement in activities aimed at improving social welfare and achieving an economic, environmental, and social balance, while concurrently addressing the expectations of stakeholders, including primary stakeholder, i.e., shareholders (United Nations, 2015). Although, there are a number of CSR-related activities that can be traced back to the industrial revolution (Crane et al., 2008), the modern concept of CSR is broader and has multiple aspects. Carroll (1991) proposed one of the most comprehensive CSR frameworks and considered four zones of responsible corporate behavior: economic, legal, ethical, and philanthropic for engagement in CSR (see Figure 2.1).

Figure 2.1 depicts a hierarchal setup for CSR. Economic responsibilities are the core responsibilities of a business enterprise because it is the foundation on which all other responsibilities rest. The goal of shareholder wealth maximization can only be achieved when a

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[9] These drivers include a growth in sales; an increase in the operating profit margin; a reduction in the cash tax rate; a reduction in the working capital investment; a reduction in the fixed asset investment; a reduction in the weighted average cost of capital; an increase in the competitive advantage period.

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corporation is profitable. According to Carroll's framework, the economic and legal responsibilities are 'required,' ethical responsibilities are 'expected,' and the philanthropic responsibilities are 'desired' (Carroll and Shabana, 2010).

Be a good corporate citizen	Philanthropic responsibilities	Contribute resources to the community; improve quality of life.
Be ethical	Ethical responsibilities	Obligation to do what is right, just and fair. Avoid harm.
Obey the law	Legal responsibilities	Law is society's codification of right and wrong. Play by the rules of the game.
Be profitable	Economic responsibilities	The foundation on which all other rest.

Figure 2.1: Carroll's four-part model of CSR. Source: Carroll (1991)

As mentioned earlier, there exist considerable definitional variances for CSR, and opinions on CSR vary regarding the substance or scope of CSR. However, there are two characteristics common to the majority of these definitions. First, that engagement in CSR is voluntary and second, that it exceeds the minimum legal requirements. However, CSR engagement may not be voluntary rather corporations may act responsibly due to public pressure and image building (Porter and Kramer, 2006). The efforts to achieve (address) economic, social and environmental goals (concerns) with a balanced approach has gained acceptance and legitimacy among business managers and academics alike (Gjølberg, 2010).

2.1.2   Why do firms engage in CSR activities and how it protects the corporate wealth?

Schmitz and Schrader (2015) suggest two important rationales for firms to engage in CSR: welfare/moral rationale and profit-maximization. The next subsections explain these two arguments in detail.

2.1.2.1   Welfare/moral rationale for CSR engagement

Welfare oriented firms' engagements in CSR-related activities can be attributed to their strong social preferences following a moral argument approach (Carroll and Shabana, 2010). The moral argument states that the survival of business firms depends on the society in which it operates and since businesses cannot exist in isolation companies have a moral obligation to 'give back to society' (Assumpcao et al., 2008). Society provides a firm's infrastructure including a skilled workforce, intellectual property rights, and a consumer base all of which are large contributors to the value of a business enterprise (Handy, 2002). Therefore, advocates of CSR argue that the goal of any firm should not only be profit-maximization but should also aim to increase social welfare. Business enterprises should work for the social welfare of a wider range of stakeholder groups in contrast to the simple wealth maximization of a narrow range of stakeholders (shareholders) (Heath, 2006). In short, corporations have an ethical responsibility which 'includes' abiding the law but extends beyond simply obeying the law (Crane and Matten, 2004).

Donaldson's (1982) social contract theory is very relevant to the 'give back to society' expectation from corporations. According to social contract theory, society extends legitimacy to corporations but only while social benefits and costs break even. This theory, implicitly and

indirectly, obligates business firms to society. Social costs consist of negative externalities generated by business enterprises (Crane and Matten, 2004) and social benefits towards society should match these negative externalities.

Giving back to society results in the building of intangible social capital. According to Minor and Morgan (2011), the intangible social capital generated from investment in CSR can act as insurance in the face of adverse events and resultantly, corporate wealth can be protected under such negative circumstances. Morale rationalists, therefore, benefit from their moral standings from wealth protection function of CSR.

2.1.2.2 The profit-maximization /economic rationale for CSR activities

Companies viewing CSR as a tool to achieve the goal of wealth-maximization follow the concept of homo-eocnomicus under which CSR engagements help in gaining a competitive advantage or enhance the franchise value of firms with socially responsible behavior. The homo-eocnomicus argument is the basis of the stakeholder approach to CSR as introduced by Maignon and Ralston (2002). The stakeholder approach posits that businesses comply with CSR initiatives in order to conform to the norms of a broader range of stakeholder groups. The profit-maximizing approach for CSR justifies the engagement in CSR either as a 'business case' or as compliance with the demands of external stakeholders.

2.1.2.3 CSR as a business case

Friedman (1970) suggests that businesses should only consider costly social responsibility activities if it provides at least equal economic benefit. However, Porter and Kramer (2006) suggest that businesses, while helping society, achieve their business goals and gain competitive

advantages which have long-term benefits. Although both approaches are profit-maximising the major difference is that Friedman (1970) demands economic benefit regarding increased share price which is a short-term value maximization approach while Porter and Kramer (2006) focus on competitive advantages gained through CSR which pays off in the long-run. Value maximization benefits Friedman (1970) has been investigated by the relationship between firm performance, and CSR has been referred to as 'strategic CSR' or 'the business case for CSR' (Crane et al., 2008; McElhaney, 2009). Regardless of different and sometimes opposing results, there is an accepted understanding that demonstrated budgetary advantages of strategic CSR in the areas of human resource development, reputation and marketing, and cost effectiveness (McElhaney, 2009; Weber, 2008).

Porter and Kramer (2006) proposed that the engagement in CSR activities is based on 'shared value' theory which states that the success of a corporation and the social welfare of society are interdependent and an organization cannot be successful if it fails on social grounds. Likewise, 'the business case for CSR' revolves around the argument that organizations 'do well by doing great,' implying that firms can do financially better if they meet their obligations towards society (Crane et al., 2008). This 'business case rationale' provide economic justification for the wealth enhancing the function of CSR, in which researchers explicitly explore the benefits that ultimately contribute to shareholders' wealth maximization. Some of these studies explored the positive effects of CSR on stock returns (Jiao, 2010), maximizing shareholders' wealth (Benson and Davidson, 2010), affirmative buying intentions of consumers (Alniacik et al., 2011), favorable market reactions towards investment in CSR (Aktas et al., 2011) and better returns on investment during mergers and acquisitions (M&A) (Deng et al., 2013).

Second to wealth enhancing function, CSR also plays wealth protection function which is relatively less researched. Wealth protection function follows stakeholder theory. Under this function, CSR plays an insurance-like function and may result in lower perceived risk by investors. The lower perceived risk may result in a lower cost of capital (El Ghoul et al., 2011; Cooper and Uzun, 2015; Magnanelli and Izzo, 2017), and reduced losses in case of adverse events (Godfrey et al., 2009). Figure 2.2 exhibits how CSR benefits are channeled[10] using each of these functions.
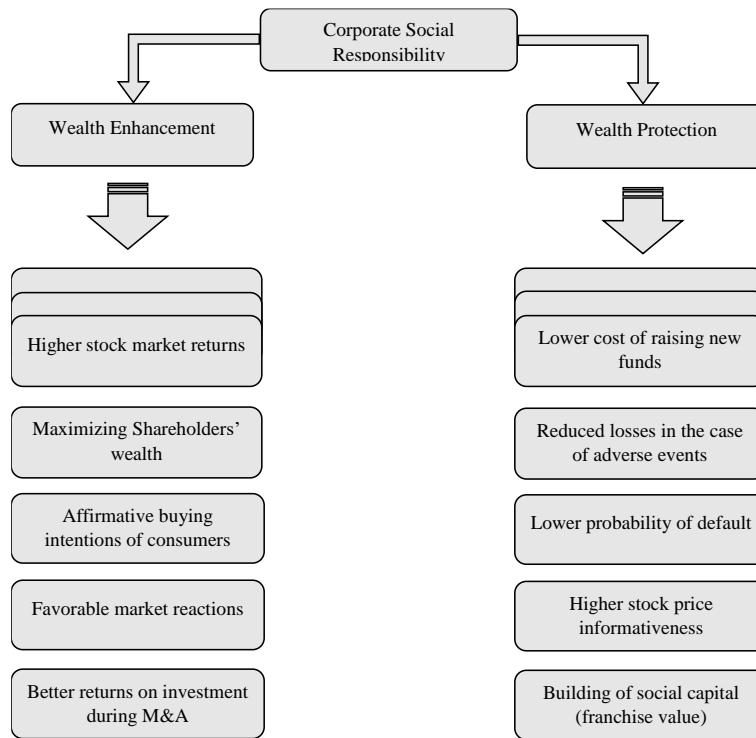
Figure 2.2: Depiction of channels through which CSR perform wealth enhancement and wealth protection functions.

In this thesis, the focus is to expand the literature on the wealth protection function of CSR by investigating three channels, i.e., lowering default risk, increasing stock price informativeness

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[10] Relevant literature providing evidence of these channels has been explained in the literature review chapter of this thesis.

and building of social capital through quality and accuracy of financial reporting. In the next subsection, we provide a theoretical framework for these three channels.

2.1.2.4   Theoretical Rationale of Wealth Protecting Channels

The theoretical framework of three wealth protection channels which we investigate in this thesis is discussed below. Stakeholder, agency, and legitimacy theories provide a rationale for the relationship between CSR and three wealth protection channels.

2.1.2.4.1   CSR and credit default risk

The stakeholder view of CSR asserts that the level of engagement in CSR-related activities depends on the activism of various stakeholders and firms will engage in CSR to comply with the demand of stakeholders to avoid unintended costs of noncompliance (Maignan and Ralston, 2002). Fiori et al. (2007) observe that the 'terrible' social effect of noncompliance to stakeholders' demands for greater CSR not only harms the firm's social image but also prompts financial losses. This implies that modern corporations are required to comply with societal demands, even if these are beyond minimum legal requirements, to avoid unintended losses and such loss avoidance can protect the shareholder wealth during negative shocks. This insurance like function of CSR can decrease the riskiness of firms and provide a theoretical rationale for the relationship between CSR and firm default risk.

On the contrary, agency theory challenges the effectiveness of CSR and consider it to be a potential conflict of interest between managers and shareholders. Barnea and Rubin (2010) argue that a firm's insiders (managers and large block-holders) over-invest in CSR for their private benefits improve their reputation as good global citizens. Furthermore, Sprinkle and Maines

(2010) suggest that CSR-related cash outflow requirements may result in opportunity costs that harm the profit maximization goal of an organization. Under such circumstances, CSR can have a positive association with firm default risk.

2.1.2.4.2 CSR and Stock Price Informativeness

Diverse stakeholder groups have diverse expectations from a firm's CSR program which makes the relative value of different CSR initiatives highly subjective as it depends on the perspective of a specific evaluating stakeholder (Lindgreen et al., 2012). The disclosure of CSR activities may mitigate the diverse expectations of stakeholders. Since business success depends to a certain degree upon the support from various stakeholders, CSR communication can be an effective tool to reduce information asymmetry. Morsing (2006), while examining stakeholders' identification with strategic CSR communication, found that strategic CSR communications profoundly influenced the willingness of managers and employees to identify themselves with their employer. This reduction in information asymmetry under stakeholder management provides a theoretical rationale for the relationship between CSR and stock price informativeness.

Legitimacy theory also has important implications for CSR-Informativeness relationship. According to legitimacy theory, there exists a social contract between an organization and the society in which it operates (Deegan and Unerman, 2011) and corporations try to legitimize their corporate actions by engaging in CSR engagements and disclosure to it. Because large firms are followed and scrutinized more, due to their scope and scale of operations, as compared to small size firms, it can lead to higher societal demands of legitimizing. Under such circumstances, small size firms can have higher marginal benefits of CSR engagement and disclosures in comparison

to large size firms. Therefore, size of the firm can have a moderating role in CSR and informativeness relationship.

2.1.2.4.3   CSR and Financial Reporting Practices

Stakeholder theory is also relevant in the relationship between CSR and quality of financial reporting. Caroll (1999) argues that socially responsible firms comply with a stronger set of superior business practices in a socially cautious manner to benefit a broader set of stakeholders. Firms working under stakeholder value maximization view achieve their commercial goals in a way that honors ethical values and respects people and communities (Jenkins, 2004). This ethical business practices to address broad stakeholders' demands can lead firms to avoid the engagement in dishonest, deceitful, and fraudulent practices while delivering their financial reports which can result in superior financial reporting practices.   The next two subsections discuss the strategic communications that corporations, government or private agencies provide related to the level of engagement in CSR in the US and around the world. The aim of these subsections is to understand which dimensions of CSR are relevant and how policy makers are initiating policies to shape the future of CSR.

2.2   CSR: The US perspective

Corporate philanthropy is considered to be the foundation stone of CSR in the US where corporations give to charity for specific causes. However, over a period the concept evolved both at the corporate and the US government levels. Below is a list of some of the corporate and governmental initiatives that have taken place in the recent past.

2.2.1 CSR and US Corporate initiatives

Kotler and Lee (2005) guide business managers, executives, and staff in their CSR-orientation, and recommend six CSR initiatives for American business managers. These include;

2.2.1.1 *Corporate Philanthropy*

Corporate philanthropy is the most traditional way by which US business managers engage in CSR. This initiative involves contributions by US firms to a specific cause primarily in the form of cash donations. However, companies can also contribute to the philanthropy initiative through product distributions, scholarships, provide services and expertise, etc.

2.2.1.2 *Cause Promotion*

The second way that US firms participate in CSR is by promoting a social cause with the objective to persuade other corporate entities or the general public to donate or take part in the promotion of a specific cause. Companies engaged in cause promotion' initiatives donate money to enhance the awareness of a specific cause.

2.2.1.3 *Cause-related Marketing*

Under this initiative, companies donate money to some particular cause based upon the sales of a particular product. Companies can, for example, decide to donate a specified amount of money per unit of product sold to a particular social cause. Cause-related marketing is closely related to cause promotion because in both initiatives companies donate money for the promotion of some cause. The difference lies in the way that donations are generated. Under cause promotion initiatives companies donate money without linking the donations to the sale of a specific product.

2.2.1.4 Corporate Social Marketing (CSM)

To influence public opinion and behavior towards public health, safety, the environment or community well-being, firms indulge in corporate social marketing initiatives. Firms which are having CSM as their CSR initiative work in association with NGOs which are working on behavior change projects. The company's role is centered on supporting the work of the actual behavior change campaign. There are many ways in which a company can contribute in this respect including expertise, money, equipment, resources, etc. (Kotler and Lee, 2005).

2.2.1.5 Community Volunteering

The fifth CSR initiative of US firms as discussed by Kotler and Lee (2005) is community volunteering. Under this program, companies encourage their employees and business partners to voluntarily donate time and expertise to some specific organization such as an NGO, or for a specific cause. This initiative is different from other initiatives because under this program the company is not doing any philanthropic work instead the company is encouraging its employees and business partners to do so. However, in some cases, companies can also contribute financially by giving paid time off to employees if they are contributing voluntarily to a community cause.

2.2.1.6 Socially Responsible Business Practices

Socially responsible corporations can make discretionary investments to support social causes that improve community well-being and protect the environment (Kotler and Lee, 2005). These initiatives are related to superior business practices and are broader in nature whereby companies can develop and sustain social capital.

There are at least three points worth mentioning in the above definition of socially responsible business practices. First, the definition includes the word '*discretionary*' which means business practices are developed and maintained by the corporations which are well beyond minimum legal requirements and, in some cases, industry standards. Second, '*community*' includes not only the general public but also company employees, their suppliers, and business partners. Finally, '*well-being*' includes health and safety issues as well as physical and emotional needs.

2.2.2 CSR and the US government

Adhering to the new paradigm of CSR and its implications on local and global business environments the US Department of State formed 'The Corporate Social Responsibility' (CSR) team in the Bureau of Economic and Business Affairs (BEBA). They lead the department's engagement with US businesses in the promotion of responsible and ethical business practices. The mission of the CSR office is to:

i. Promote a holistic approach to CSR to complement the BEBA Bureau's mission of building economic security and fostering sustainable development at home and abroad.

ii. Provide guidance and support for American companies engaging in socially responsible, forward-thinking corporate activities that complement US foreign policy and the principles of the "Secretary of State's Award" for Corporate Excellence (ACE) program.

iii. Build on this synergy, working with multinational companies, civil society, labor groups, environmental advocates, and others to encourage the adoption of corporate policies that help companies 'do well by doing good.'

BEBA's CSR team coordinates a cross-functional, intra-departmental, and inter-agency team to provide support and guidance on major areas of responsible corporate conduct including:

a)   Good Corporate Citizenship

b)   Contribution to the Growth and Development of the Local Economy

c)   Innovation

d)   Employment and Industrial Relations

e)   Human Rights

f)   Environmental Protection

g)   Natural Resources Governance

h)   Transparency

i)   Anti-Corruption

j)   Trade and Supply Chain Management

k)   Intellectual Property

l)   Women's Economic Empowerment

The government and corporate sectors advocate the development of CSR in similar areas. This could be one of the reasons why US corporations are becoming more and more socially responsible over time as evidenced in this study.

2.3   Corporate Social Responsibility: A Global Perspective

Similar to US corporations, the scope of CSR has widened globally, and multinational corporations are more active in the social arena and have demonstrated a willingness to improve the world's social and environmental conditions (Windsor, 2001). There are several studies

discussing the evolution of CSR from a global perspective and, in some cases, comparing it with the US. In the international context, Maignan and Ralston (2002) compared the extent and content of business' communications about CSR in France, the Netherlands, the UK and the US. Furthermore, Aaronson (2003) theoretically describe how Britain and the US promote global corporate responsivity and compare the CSR orientation and initiatives of both countries. Perrini et al., (2009) study linkages between CSR and consumer trust Italy, and Lucas et al., (2001) reviewed the literature on CSR in an Australian context and concluded that achievement of social responsibility through corporate strategy is a matter of corporate governance. Kolk (2016), conducted a literature review on CSR in an international business context over the last fifty years, found three sub-themes in CSR: the (green) environment; ethics, rights, and responsibilities; poverty and (sustainable) development. The author suggested that the perception of international businesses about their CSR engagement should be explored in the context of human well-being, and 'what matters more' in eco-social systems.

There are several developments globally that help to mainstream the adoption of CSR. This includes the appointment of a Minister for Corporate Social Responsibility in the UK in March 2000; the issuance of a European Commission 2008 Green Paper, the promotion of a Corporate Social Responsibility Framework in Europe; and a global compact[11] for human rights, labor and the environment by the UN which indicates its significance in the international business arena.

One of the most important developments is the development of non-binding recommendations regarding responsible business practices for members of the Organization for

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[11] For detail see https://www.unglobalcompact.org/what-is-gc/mission/principles

Economic Cooperation and Development (OECD)[12]. These non-binding recommendations provide principles and guidelines for responsible business conduct in line with applicable laws and internationally recognized standards. These guidelines provide recommendations in the following domains:

2.3.1 Disclosures

Disclosure guidelines provide comprehensive requirements on the issue of disclosure of information on financial situations, performance, ownership, and governance. It also requires corporations to adhere to high quality accounting standards and practice.

2.3.2 Human Rights

These guidelines provide comprehensive recommendations on how an enterprise should adhere to local as well as internationally recognized human rights conventions. These include: how enterprises should treat its human resources, how to avoid infringement of human rights, how to prevent and avoid human right violations. It also provides recommendations on remedial measures in case of any human right violations at the company level.

2.3.3 Employment and Labor relations

The recommendations related to employment and labor relations are to ensure the rights of the workforce, abolition of child labor, and eradication of compulsory or forced labor. The recommended procedures are based on the principles of equal employment opportunity without

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[12] OECD regularly publishes reports related to responsible business practices, climate change and other economic, social and governance issues. For details: http://www.oecd-ilibrary.org/

any discrimination based on gender, race etc. These guidelines provide a comprehensive agenda through which a multinational enterprise (MNE) can ensure their responsible conduct towards their employees.

2.3.4   Environment

Guidelines related to the environment reflect the responsibilities of organizations towards the environment, and the health and safety impact of their operations. Under these guidelines, MNEs are required to develop targets for improvement in environmental performance and resource utilization. Evaluation of environmental risks and risk management is also recommended in the guidelines. Contingency planning to prevent, mitigate and control ecological and health damages is recommended and, in case of any such occurrence, reporting of such events to related authorities. Remedial measures are also suggested in these guidelines.

2.3.5   Combating bribery, bribe solicitation, and extortion

To promote higher standards of business ethics, it has been recommended in the guidelines that MNEs should not, directly or indirectly, indulge in offering, accepting, promising or demanding any sort of bribe or other such benefit that provides an undue advantage in the expansion or retention of business. Resistance has been recommended regarding solicitation of bribes and other extortions. It has been recommended that organizations should set strict control over such activities and maintain the highest standards of transparency when making deals and contracts.

2.3.6 Consumer Interests

It has been recommended that MNEs, while dealing with consumers, should act in accordance with fair business, marketing and advertising practices. Quality and reliability of goods provided and services rendered should comply with the highest standards. Recommendations include after sale services, information provision regarding products and services, and respecting consumer privacy. These recommendations provide a baseline for product-related CSR of MNEs.

2.3.7 Science and Technology

These guidelines talk about development, adaptation and transfer of technological advancements in accordance with intellectual property rights. MNEs should work for technological development and advancement of the host country. Also, MNEs are recommended to engage in practices during the granting of intellectual property rights which helps the long-term sustainable technological development of the host country.

2.3.8 Competition

MNEs are guided on how to deal with competition and taxation matters. MNEs should not enter into any anti-competition agreement. Agreements for fixing prices, making rigged bids, establishment of output quotas, sharing of dividing markets by customers, suppliers or on some other basis which hinders healthy competition, should be avoided.

2.3.9 Taxation

These guidelines talk about contributions of MNEs towards public financing of the host country. These guidelines recommend timely and accurate payment of taxes. MNEs are recommended to take tax governance and tax compliance into their broader risk management framework.

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CHAPTER THREE

LITERATURE REVIEW

Literature relating to the relationship between CSR and financial performance of firms, based on a stakeholder maximization view, suggests that a firm's voluntary participation in socially responsible activities not only maximizes shareholder value (wealth maximization) but also mitigates risk for a broader group of stakeholders including shareholders. This suggests that CSR has dual functions, one is a wealth enhancing function and the other is a wealth protection function.

The next section presents a brief review of the literature related to the wealth maximization role of CSR. This is followed by a more extensive literature review related to the wealth protection function of CSR focusing on credit default risk, firm specific information diffusion, and the role CSR plays in better financial reporting practices.

3.1 Wealth Maximization through CSR

The wealth maximization perspective of CSR suggests that socially responsible firms are rewarded for being socially responsible in the form of better returns on investments. The underlying hypothesis is that investors consider investment in CSR activities as a long-term investment and expect to capitalize it over the long run in the form of lower litigation costs related to social, environmental, and governance issues. In the process, firms engaged in CSR activities

develop intangible social capital through stakeholders' welfare maximization and through the enhanced value of firms.

By using a conceptual framework, Gardberg and Fombrun (2006) suggest that investment in CSR is strategic in nature and helps companies to penetrate international markets. They argue that CSR can result in the creation of intangible social capital which can facilitate to overcome the restrictive national barriers, ease globalization, and out-compete local competition. In an empirical paper, Jiao (2010) investigated whether there is any association between stakeholder welfare by organization (engagement in CSR activities) and a firm's stock values by using a 'stakeholder welfare score' constructed from KLD data. His empirical findings suggest that a one-point increase in stakeholder welfare scores leads to a 0.587 increase in Tobin's Q. However, the analysis reveals that the positive effect stem only from employees and environmental related issues. He argued that the positive effects of stakeholder welfare (specifically employee and the environment) create intangible social capital, which serves the organization and not the personal, social, or economic goals of managers.

By using CSR data from KLD stat, Benson and Davidson (2010) investigated whether the goals of shareholders' wealth maximization and stakeholders' welfare maximization conflict with each other and found a positive effect from engagement in stakeholder management on the value of firms. However, the impact of stakeholder management practices on CEO/executive compensation revealed that firms do not compensate executives for stakeholder welfare maximization. The empirical findings suggest that firms compensate managers for value maximization although managers can use stakeholder management practices to achieve this goal.

While investigating the impact of social and environmental issues on stock market performance during mergers and acquisitions, Aktas et al., (2011) used the Innovest's Intangible Value Assessment (IVA) ratings as a measure of firms' performance. They found that the market generates more favorable stock market reactions towards acquirers who are investing in socially responsible investments. They also found that the overall social and environmental performance of an acquirer increases after acquiring a socially and environmentally responsible firm.

Deng et al., (2013) studied announcement returns of acquirers during mergers and acquisitions. They found that acquirers with higher CSR scores gain higher announcement returns in comparison to acquirers with low CSR scores. Furthermore, acquirers with higher CSR scores enjoy better long-term performance after the acquisition of companies with higher CSR scores. The empirical findings suggest that acquirers with higher CSR scores realize positive stock returns in the long run suggesting that higher social responsibility performance is not rewarded in the short term. Overall, Deng el al., (2013) supports the stakeholder theory view of CSR in the context of mergers and acquisitions.

While assessing the impact of CSR on consumer behavior, Alniacik et al., (2011) used 'between-subject experimental design' methodology and found that, keeping every other aspect of the firm constant positive (negative), CSR enhances (diminishes) consumer intentions to purchase products. They also found a similar pattern in potential employees' intentions to seek employment and investors' intentions to invest in the stocks of a firm which are more socially responsible. However, Sprinkle and Maines (2010), in a theoretical paper, argued that although broad stakeholder groups demand socially responsible firms they are not in favor of firms abandoning their profit maximization aims. Cash outflow requirements of CSR may result in opportunity costs

that potentially harm the profit maximization goal of the organization. They concluded that decision-making regarding investments in CSR is as strategic in nature as other corporate level decisions and that decision to spend on CSR initiatives should base on cost and benefit analysis.

Barnea and Rubin (2010) argued that deploying a firm's resources in CSR initiatives can only be justified if they are consistent with the value maximization goal of the firm. However, if managers use CSR as a mask for their personal benefit, such as image building as good global citizens, then it is a source of agency conflict. By using the CSR measure constructed from the KLD database and linking it with ownership and capital structures of firms, Barnea and Rubin (2010) found that, on average, there is a negative association between CSR, ownership, and leverage. This suggests that engagement in CSR may cause a conflict of interest between management and shareholders. Management, as an insider, may gain from the positive aspects of CSR and may ignore the profit maximization objectives of a corporation. Moreover, they found a dampening effect of engagement in CSR on cash flows that can possibly limit a firm's ability to pay off its debt obligations.

3.2 Wealth Protection through CSR

Aside from a wealth-enhancing function, CSR may act as a risk mitigating tool in the form of lower business risks. By engaging in CSR, firms can reduce the chances of lawsuits and fines for socially irresponsible behavior. Furthermore, by engagement in CSR-related activities, management is signaling a long-term sustainable view of the firm; investment in CSR initiatives may be viewed as a responsible investment to avoid potential future losses. Alternatively, investors may view the investment in socially irresponsible firms to be riskier and may demand a higher

premium to counter for the possibility of lawsuits or fines from regulatory agencies. There are three possible channels for passing on the wealth protection benefit of engagement in CSR: reduction in credit default, better informed stock prices, and better financial reporting. The following subsection provides a review of the scant literature on the wealth protection function of CSR.

3.2.1 CSR and Credit Default Risk

The intangible social capital generated from investment in CSR can act like insurance in the face of adverse events (Minor and Morgan, 2011). Godfrey et al., (2009), by using a dataset of 178 negative legal/regulatory events from 91 firms between 1992 to 2003, found that engagement in CSR activities acts like an 'insurance' especially for negative events. Their empirical findings suggest that firms with better CSR engagement suffered lower losses during a negative event. Similarly, McGuire et al., (1988), by utilizing the Fortune magazine's reputation ratings, found that past performance and default risk are highly correlated with a firm's perception of social responsibility. They also found that firms low in social responsibility experience lower returns on their assets.

The market response of CSR engagement in the wealth protection function can be explained with respect to debt and equity holders. Goss and Roberts (2011), using loan contracts level data of US banks, investigated the effectiveness of the risk mitigation function of CSR on loan pricing. By using a sample of 3,996 loan contracts to US firms and CSR data from KLD Stat, they provided robust evidence that firms scoring low on socially responsible behavior pay seven to eighteen bases points more on their loans as compared with perceived socially responsible firms.

However, their findings indicate that lenders are more concerned with social concerns as compared with the social strengths of borrowers; low quality borrowers are charged with higher spreads and shorter maturities against discretionary CSR spending but lenders are indifferent to investment in CSR by high quality borrowers.

From an equity investors' perspective, El Ghoul et al., (2011) studied the relationship between CSR and the cost of equity based on the risk mitigation function of CSR. After using numerous measures of ex-ante cost of equity, they found that firms with better CSR performance, as measured by CSR scores using the KLD STATS[13] database, enjoy lower costs of equity. They suggest that improvement in social responsibility in terms of employee relations, environmental policies, product quality, and safety exert downward pressure on the cost of equity. Moreover, their result show that firm engagement in 'sin' industries such as tobacco and nuclear power, increases firms' cost of equity. Similarly, Oikonomou et al., (2012) investigated the relationship between the level of CSR engagement and financial risk by constructing a CSR index from the KLD stats database of US firms from 1991 to 2008. They used systematic risk (Beta) as a measure for financial risk. The empirical evidence suggests that engagement in CSR results in decreased financial risk.

Dhaliwal et al., (2014) also found negative association between CSR engagements and disclosures and cost of equity capital in sample of firms from 31 countries. Moreover, their categorization of countries based upon stakeholder orientation showed that negative association between CSR and cost of equity capital is more pronounced in stakeholder oriented countries.

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[13] Kinder Lydenberg Domini (KLD STATS) is created and maintained by KLD Research & Analytics, Inc. (KLD))

Oikonomou et al., (2012) argued that firms with a responsible outlook are less prone to financial risk hence investors demand lower risk premiums for socially responsible firms. Likewise, Bouslah et al., (2013) studied the relationship between the level of CSR engagement and idiosyncratic risk of US firm from 1991 to 2007 using CSR data from KLD stats. Their empirical findings suggest that idiosyncratic risk is positively related to employee, diversity, and governance concerns while negatively related to community strengths for the constituents of S&P 500. However, for non-constituents of S&P 500, environmental strengths have a negative effect on firms' risk.

Besides looking at the linkages between the engagement in CSR and overall firm risk, researchers have investigated the relationship between the level of CSR engagement and credit default risk. Sun and Cui (2014), using credit ratings as a proxy for credit default risk of 303 US companies from 2008 to 2010, found that firms with better CSR engagements enjoyed improved credit ratings. Moreover, they found a moderating role of environmental dynamism in the CSR-risk relationship. Their findings suggest that the effect of CSR on credit ratings is more pronounced for firms with more environmental dynamism as compared with firms with lower environmental dynamism.

Jiraporn et al., (2014) empirically investigated the effect of being socially responsible on credit ratings of US firms. They argued that by being socially responsible a firm helps a broader group of stakeholders which, ultimately, can reduce the chances of unexpected negative events. Based upon this argument they hypothesized that engagement in CSR should have a positive impact on credit ratings. Utilizing data from the KLD stats database they found robust evidence to suggest that socially responsible firms enjoy better credit ratings. However, Hilscher and Wilson

(2013) criticized the use of credit ratings as a proxy for the probability-of-default because credit ratings are based on a simple model of publicly available information and does not include information on systematic risk and uncertainty. To overcome this shortcoming this thesis uses the probability-of-default based on the Merton (1974) model and hypothesizes whether the active engagement in CSR-related activities leads to lower default risk or not.

3.2.2 CSR and stock price informativeness

Modigliani and Miller (1963) posit that the efficient market hypothesis assumes information symmetry. However, this assumption is very restrictive in the presence of management who has more information about the affairs of the firm than other stakeholders. To reduce information asymmetry, management provides disclosures and better quality financial reporting to communicate its performance and governance to outside parties including investors (Healy and Palepu, 2001).

Fieseler (2011) conducted a study whereby equity analysts were interviewed to determine how they perceive the engagement and disclosure of economic, legal, ethical, and philanthropic activities and found that CSR-related issues are part of mainstream investment analysis. However, he argued that to be considered for analysis, managers should consider market participants' perspectives in their strategic decision-making. Fieseler (2011) concluded that the disclosure of engagement in CSR activities may improve the flow of firm-specific information to outsiders thus mitigating information asymmetry.

Lee et al., (2015) studied the linkages between carbon emission disclosures and market responses to such disclosures. They investigated whether shareholder value is affected by firms' voluntary disclosures about carbon emissions. By using event study methodology with a sample of firms from CDP Korea in 2008-09, they found that voluntary CSR disclosures related to the environment does affect stock price movement. Furthermore, they found that adverse disclosures related to carbon emissions negatively affect stock prices. They suggest that negative market reactions can be mitigated if firms release information regarding carbon emissions through media and other informal sources well before formal carbon emission disclosures.

By using KLD stats data on CSR and annual averages of the ratio of daily closing bid-ask spreads to the closing stock price as a measure of information asymmetry, Cho et al., (2013) found that the level of engagement in CSR activities helps reduce information asymmetry. Their findings suggest that CSR performance rewards investors in the form of a reduction in information asymmetry. However, there is a need to further investigate whether this reduction in information asymmetry leads to higher stock price informativeness. Stock price informativness is the next step in informationally efficient price discovery and is important because of its direct implications to efficient capital allocation (Wurgler, 2000; Durnev et al., 2003), comprehending managerial decisions (Durnev et al., 2004; Chen et al., 2007; Frésard, 2012) and information gathering about firms" future earnings (Durnev et al., 2003; Jiang et al., 2009).

Jones and Murrell (2001) posit that the social performance of a firm can shape key stakeholders' views including employees, suppliers, investors and others, which in the long run affects decision-making and ultimately the performance of a firm. They tested the hypothesis of whether the image of a firm, as an exemplary corporate citizen, has any impact on stock prices. By

using an event study methodology, they found positive and significant abnormal returns associated with the stocks of companies who are included for the first on the list of "Most Family Friendly Companies" of *Mother's Magazine* between 1989 and 1994. They argue that investors, in the presence of information asymmetry, invest in those firms with better CSR scores assuming that only financially sound firms invest in CSR initiatives.

Chen et al., (2014) investigated the association between the CSR engagement of firms and the idiosyncratic volatility of stock returns and found that idiosyncratic volatility is higher for firms with superior performance in CSR. The higher idiosyncratic volatility suggests that CSR engagements and disclosure thereof plays a positive role in mitigating information asymmetry.

After reviewing the literature, it becomes evident that studies linking CSR with information asymmetry found that firms engaged in CSR practices are more open to the views of their stakeholders. For instance, Freeman et al., (2007) categorized corporate stakeholders into two groups: primary stakeholders – those who are necessary for the organization, and secondary stakeholders – those who can influence primary stakeholders. Mattingly and Berman (2006) used exploratory factor analysis to test the different typologies used in the classification of CSR performance. They provided empirical evidence to support the view that CSR constructs differ between primary and secondary stakeholders. Technical CSR (TCSR) is linked with primary stakeholders and includes employee relations, product quality, diversity, and governance. Institutional CSR (ICSR) is related to secondary stakeholders and includes environmental and community-related information disclosures. Both TSCR and ICSR potentially reduce information asymmetry and may have a positive impact on price informativeness. However, TCSR-related

disclosures seem more relevant in CSR-informativeness relationships and may act like insurance during times of adverse events (Godfrey et al., 2009).

Udayasankar (2008) theoretically analyzed the relationship between firm attributes, specifically size, and firm participation in CSR initiatives and reported a U-shaped relationship between firm size and CSR participation. Smaller and larger firms participate more in CSR activities as compared to medium sized firms. He argues that such a relationship is due to perceived expected benefits of CSR. The presence of this U-shape relationship suggests that to analyze the CSR-information diffusion relationship it is important to take into account firm size. Based upon the theoretical work of Udayasankar (2008) a moderating role of firm size in the CSR-information diffusion relationship is expected.

3.2.3 CSR and the quality of financial reporting

The theoretical literature on CSR activities asserts that socially responsible firms adhere to a stronger set of superior business practices in a socially cautious manner. Jenkins (2004) suggests that socially responsible firms achieve their commercial goals by adhering to stronger ethical values. The empirical literature suggests that CSR disclosures have implications for stakeholders. Kim et al., (2012) investigated whether firms with better CSR practices report their financial results any differently. More specifically, they investigated whether firms with better CSR scores refrain from earnings management and reported that firms with higher CSR scores do not indulge in discretionary accruals or earnings management and, as a result, do not become the subject of regulators' investigations. They suggest that the ethical superiority of managers enable them to provide accurate financial reporting.

A firm's quality of financial reporting can also influence a firm's value. Honest and voluntary reporting, whether or not on CSR-related issues, can influence the market value of firms. Generally, firms can reduce the severity of adverse market reactions by providing quality disclosures through superior financial reporting practices. By using event study methodology with a sample of firms from CDP Korea in 2008-09, Lee et al., (2015) provided evidence that voluntary disclosures related to environmental CSR affects stock price movement and concluded that disclosures related to carbon emissions negatively affect stock prices. They suggest that negative market reactions can be mitigated if firms release information regarding carbon emissions through media and other informal sources well before its formal carbon emission disclosures.

Since the outreach of financial reports is the highest among all corporate communications, it is used to as a signal ro provide information about a company's financial position and relevant disclosures to stakeholders including investors (Healy and Palepu, 2001). Furthermore, the disclosure of engagement in CSR activities may further improve the flow of firm-specific information to outsiders thus mitigating information asymmetry and portrays a better image of the firm as a responsible corporate citizen (Fieseler, 2011).

Gelb and Strawser (2001), in an empirical study, used disclosure rankings provided by the Association for Investment Management and Research Corporate Information Committee Report (AIMR Reports) and ratings provided by the Council on Economics Periorities as a measure for social responsibility. They found that companies that are engaged in socially responsible activities provide better and/or more extensive disclosures than companies that are less focused on advancing social goals. A firm's willingness to provide better and more extensive disclosures can reduce the chances that they hide/manipulate any information in the financial reporting process.

Chen et al., (2012) used the KLD stats database to measure CSR and linked CSR performance with the auditor's perception, on auditing reports. They found that auditors may perceive lower audit risk with firms engaged in CSR activities and may charge a lower fee as compared with similar, but with those firms scoring lower on CSR index. scores.

Lanis and Richardson (2012) and Watson (2011) found that socially responsible firms show lower tax aggressiveness as compared to socially irresponsible firms. Tighter controls on accruals and real earnings management with lower tax aggressiveness in financial reporting practices of socially responsible firms signal ethical and responsible financial reporting.

Elias (2002) studied earnings management ethics among accountants and suggests that the ethical interpretation of earnings management is different based on the belief of the accountant towards CSR. He suggests that accountants who believe CSR is a short-term profitability tool rated earnings management softly. However, accountants who view CSR as a long-term image-building tool, consider earnings management to be ethically wrong and rated it harshly. Since earning management can lead to window dressing, we can argue that CSR-conscious managers regard the long-term view and do not indulge in accounting manipulation. The financial statements of these firms provide a free, fair, and unbiased view of the financial affairs of such firm resulting in obtaining the trust of external auditors in the form of an unqualified opinion.

Management is responsible for producing financial reports based upon internally maintained accounting information and may have an information advantage over external parties and may cause agency conflict. Lee (1972) argues that the most important task of an external auditor is to vaidate the credibility of financial reports generated by internally produced accounting

information. If accounting information is not 'clean' and is found to have been manipulated, auditors have a duty to provide an opinion on the quality of the financial reporting process. Flint (1988), describe auditing is a social control mechanism for securing accountability.

Market participants view auditors reports as an indicator of the quality/accuracy of financial information contained in the financial reports and conseqently may consider auditors' opinions as a pricing factor. A study by Choi and Jeter (1992) found that audit reports have a potential impact on market responsiveness to earnings by adding noise or reducing persistency of reported earnings. Herbohn et al., (2007) studied Australian publically listed companies from 1999 to 2003 and found evidence that suggest audit reports are perceived and priced by markets hence fulfilling an attestation function and confirming the true financial condition of the firm. Taffler et al., (2004), using a sample of UK firms, found that firms receiving a negative going concern opinion from their auditor experienced a highly significant adverse price reaction during the next accounting period.

After reviewing the literature, it can be inferred that engagement in CSR activities is not simply an act of charity or philanthropy. Instead, it can be seen as a set of superior business practices that gain a competitive advantage and fulfill the demands of a broader range of stakeholder groups. These stakeholder groups depend on the financial information provided by firm's management to assist them in their decision-making processes. These stakeholder groups include not only investors but also suppliers, customers, and other related parties. Socially responsible firms should report their financial information accurately and without any errors, omissions, or fraudulent reporting.

The literature suggests that an auditor's opinion is the best measure for determining the accuracy of financial reports. After reviewing the literature, it is found that there is a gap in the literature that needs to be addressed namely, do CSR-conscious firms have superior financial reporting practices as reflected in an unqualified auditor's opinion?

3.3 Summary

This chapter provided a review of the literature on the financial implications of CSR and found that there is a need to evaluate the engagement in CSR activities of a firm as a risk mitigation function. Under this function, uncertainty of doing business reduces as firms become more socially responsible. The literature review encompassed three channels through which CSR can perform a risk mitigation function namely credit default risk, information asymmetry, and development of superior business practices.

There are three gaps in the literature that will be addressed in this thesis. First, the existing literature suggests that CSR-conscious firms have a lower cost of equity capital, reduced financial risk, and have favorable credit ratings. Following this strand of the literature, it is argued that CSR-conscious firms should have less default risk as compare to those firms that are not CSR-conscious. Second, the existing literature suggests that CSR-conscious firms are more open to stakeholders, have less information asymmetry, and are followed by more analysts. Following this strand of the literature, it is argued that there should be more firm-specific information diffusion in stock prices of CSR-conscious firms. Third, the literature suggests that CSR-conscious firms are more responsive to a broader range of stakeholder groups, and are keen to develop and maintain intangible social capital through superior business practices. Following this strand of the literature

it is argued that CSR-conscious firms should have accurate financial reporting practices mirrored by an unqualified auditor's opinion.

This thesis contributes to the literature by empirically investigating issues linking CSR with firms' default risk measured by probability-of-default, reduced stock price misalignment measured by firm-specific information diffusion, and development of social capital through superior business practices measured by auditors' opinions. The next chapter will discuss in detail the mechanism for measuring these covariates.

CHAPTER FOUR

DATA AND COVARIATES DEVELOPMENT

This chapter explains the sample used in this dissertation, data sources and covariate development. One of the most important elements when researching CSR is the development of a CSR index. The development of a CSR index based on principle component analysis (PCA) is one of the important contributions of this dissertation. This chapter also explains the methodology used to develop other variables of interest both endogenous and exogenous. A more detailed discussion on the constructs of control variables are given in the relevant chapters investigating the risk mitigation factors.

The next section provides a detailed description of the data used for empirical analysis. Section 4.2 develops the covariates used for analysis in the following chapters for empirical investigation. Section 4.3 summarizes the chapter.

4.1   Data sources and Sample size

Since this dissertation investigates three different dimensions of the wealth protection function of CSR it requires data that has been gathered from multiple sources. Table 4.1 provides a list of the data types and sources used to construct different variables that were used for analysis.

The firm-level data for engagement in CSR activities is sourced from KLD Research and Analytics Inc. KLD collects data on the various dimensions of CSR from different sources such as government agencies, non-governmental organizations, global media publications, annual reports, regulatory filings, proxy statements, and company disclosure. Waddock (2003) considered

KLD to be a standard database of CSR. A large number of research papers have utilized the KLD database for empirical analysis[14].

Table 4.1: Data sources

Variables	Data source
Corporate Social Responsibility (CSR)	KLD Research and Analytics Inc.
Financial and stock price data	Thomson Reuters DataStream
Auditors' opinion data	Audit Analytics
Analysts' recommendations data	Thomson Reuters DataStream

This table shows the data sources which have been accessed for the collection of data.

Annual financial statements data and daily stock price data is obtained from Thomson Reuters DataStream while data on auditors' opinions has been gathered from Audit Analytics. Analyst coverage data is obtained from Thomson Reuters DataStream which is a comprehensive database on analyst coverage data.

For empirical analysis, all non-financial US firms with reported CSR data on the KLD database was considered. The choice of non-financial firms is due to the regulatory nature of the finance industry. The KLD database consists of 32,232 firm-year observations with 660 firms reporting CSR-related disclosures in year 2000 that increased to 3,034 firms in 2012. After matching these firms with financial and stock price data, the final sample consists of more than 1,100 non-financial firms.

4.2 Development of covariates

we develop following covariates to test our hypotheses.

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[14] See for example Oikonomou et al., (2012), Godfrey et al, (2009), Bae et al., (2011), Verwijmeren and Derwall (2010) and El Ghoul et al., (2011).

4.2.1 Construction of CSR index

The main variable of interest in this study is the Corporate Social Responsibility (CSR) index to measure the level of CSR engagement. CSR-related data was obtained from KLD STATS, which is a statistical summary of KLD's data.

4.2.1.1 CSR dimensions and indicators

KLD ranks each of the companies listed on their database in thirteen different CSR dimensions. These dimensions are: community, diversity, governance, employee relations, human rights, environment, product, alcohol, gambling, firearms, military, tobacco, and nuclear power. From these dimensions, the first seven dimensions have data in the form of strengths and concerns while the remaining six dimensions are dichotomous variables having a score one if the company is involved in any of the above businesses and zero otherwise. Under the first seven dimensions, companies can receive 'strength' for better performance in a particular aspect of social responsibility while it can have 'weakness/concern' for socially irresponsible behavior in a particular aspect. The data on strengths and concerns are captured as an indicator in the form of one and zero. A company receives one in a particular indicator if it meets the minimum criteria for getting a strength or concern in a particular aspect while zero indicates that company is below the minimum level of good CSR (strength) or bad CSR (concern) in that area of CSR.

Details on the seven dimensions and the indicators to gauge CSR strengths and concerns are discussed next.

4.2.1.1.1 Community dimension

Groups of people living in the same place and sharing similar common characteristics are regarded as a community. Under this dimension the KLD gauges the social performance of a firm toward its commitments to the community it serves. This includes charitable giving to underprivileged people, support for housing and education, and other communal social issues discussed below.

4.2.1.1.1.1 Community-related CSR Strengths

   i. *Generous Giving*: A score of one is awarded to a company that has given 1.5 percent or more of its trailing 3-year net earnings before taxes (NEBT) for charitable purposes or has been known as a generously-giving corporation to charity; zero otherwise.

  ii. *Innovative Giving*: A company receives a score of one for supporting non-profit organizations using innovative programs, specifically those programs supporting self-sufficiency among economically underprivileged people. Companies that engage in non-traditional benevolent giving initiative in the surroundings of their facilities are frequently distinguished as a community related CSR strength.

 iii. *Support for Housing*: A firm receives a score of one if it participates in a government/non-governmental partnership that finances housing projects for the underprivileged, for example the Enterprise Foundation and/or National Equity Fund.

 iv. *Support for Education*: Under this indicator a score of one is given to those companies that support school education at primary and/or secondary levels, and specifically for programs that assist the economically poor, or the corporation has very good and effective job-training programs for the youth.

v. *Indigenous Peoples Relations*: A company receives a score of one if it has formed associations with native people and provide facilities on their premises or have existing work facilities that honor the independence, terrestrial, traditions, human rights, and intellectual property of native peoples.

vi. *Non-US Charitable Giving*: A score of one is assigned to a firm which has time-honored, extensive, ground-breaking, altruistic charitable giving programs outside the US.

vii. *Other Strengths*: This indicator includes any community service that is not covered in the above six indicators. An example may include outstandingly, unpaid training programs for the community, in-kind charitable giving programs, or other predominantly long-term community welfare programs.

4.2.1.1.1.2 Community-related CSR Concerns

i. *Investment Controversies*: If the company is a financial institution and is lending or investing in projects or areas which may lead to controversies, specifically one related to the Community Reinvestment Act (enacted in 1977, revised in May 1995 and updated again in August 2005).

ii. *Negative Economic Impact*: A corporation will receive a score of one if its actions have caused serious disputes regarding its financial effects on the community. These disputes could include matters related to ecological pollution, water rights quarrels, closing facilities, 'put-or-pay' agreements with waste kilns, or other company activities that unfavorably disturb the life, public finance base, or community asset values.

iii. *Indigenous Peoples Relations*: Is where a corporation is involved in any sort of serious conflict with native peoples in their operations, use of land or there is an indication that the corporation has not honored the autonomy, property, traditions and values, intellectual property and human rights of native people. The corporation will receive a score of one in case of any of these concerns, zero otherwise.

iv. *Other Concerns*: Any community-related concerns not covered in the above categories will be listed here and receive a score of one. The examples may include clear community disapproval of the commercial or non-commercial sides of a company's operations.

4.2.1.1.2 Corporate Governance

Although there are numerous meanings associated with the term corporate governance the most dominant is from the agency theory perspective (L'Huillier, 2014) which states that corporate governance refers to the mechanisms, processes, and relations through which firms are governed and controlled. Jurisdictions around the globe developed codes of corporate governance to address agency cost problems in corporations and to protect the rights of minority shareholders. The corporate governance aspect of CSR covers those areas of corporate governance which are, to some extent, not bounded by codes of corporate governance. Instead include those areas where firms try to do more than what are minimum requirements to ensure the rights of minority stakeholders. This aspect contains screens related to executive compensations, it's ownership in other corporations whether CSR-conscious or not, and tax disputes etc. What follows next is a detailed description of corporate governance-related screens.

4.2.1.1.1 Corporate Governance-related CSR Strengths

i. *Limited Compensation*: A score of one is given to those companies which have awarded markedly lower amounts of compensation to its top management or its board of directors. At the time of this write-up, a maximum annual compensation limit for the CEO was $500,000 or $30,000 for outside directors. Any compensation awarded beyond this will automatically receive a score of zero.

ii. *Ownership Strength*: This is where a company owns 20%-50% of a subsidiary that has been mentioned by KLD as being socially responsible or, is having greater than or equal to 20% ownership of another corporation which has a CSR strength score. A corporation possessing more than 50% of another company is deemed to have a controlling interest in which case the subsidiary is considered to be a division of the parent company by KLD.

iii. *Other Strengths*: Any other responsible behavior in terms of governance issues which is not part of the above screens can be regarded as strength.

4.2.1.1.2 Corporate Governance-related CSR Concerns

i. *High Compensation*: A company is awarded a score of one if it has recently compensated its top management or its members of the board of directors at markedly high levels. The threshold for awarding a one score is if the total compensation package is more than $10 million per year for a CEO or $100,000 per year for outside directors.

ii. *Tax Disputes*: If the corporation has recently been involved in tax disputes greater than $100 million with Federal, State, or local authorities.

iii.   *Ownership Concern*: This is where a firm owns between 20% and 50% of another firm which has been cited by KLD as having an area of social concern or, they themselves are 20% or more owned by a firm KLD has rated as having areas of concern.

iv.   *Other Concerns*: Any other irresponsible behavior in governance issues, which is not part of the above indicators, can be regarded as a concern and recorded as one under this indicator.

4.2.1.1.3   Diversity

Diversity refers to a corporation hiring employees from minority groups for key positions in the corporation and making provision in the workplace to cater for the diverse needs of such groups. Minority groups may include gender, ethnicity, and those with some form of disability. It is where a corporation tries to make their workplace one that embraces diversity in approach, in culture, and in opportunity for employment and advancement. Under this dimension KLD applies the following screens.

4.2.1.1.3.1 Diversity-related CSR Strengths

i.   *CEO*: A company is awarded a score of one if it has a female or a member of minority group as its chief executive officer (CEO).

ii.   *Promotion*: Company scores one if it has developed a program that enhances the promotion of women and minorities specifically to key decision making positions which can affect the profit-and-loss of the organization.

iii.   *Board of Directors*: A company gets a strength score of one in this indicator if there are more than three women or people from minority groups or disabled people (no

double counting) serving on the board of directors. If the board size is less than 12 then people from these groups need to make up a minimum of 1/3 of board members.

iv. *Family Benefits*: These are corporations that have exceptional employee welfare schemes or other programs resolving professional/personal issues e.g., childcare, eldercare, or leisure time.

v. *Women/Minority Contracting*: This is where 5% or more of company subcontracting is with women and/or minority-owned enterprises, or otherwise has a strong record on purchasing or contracting with these groups.

vi. *Employment of the Disabled*: A score of one is granted to the company that implements innovative hiring programs, other innovative human resource programs for the disabled, or otherwise has a superior reputation as an employer of the disabled.

vii. *Progressive Gay/Lesbian Policies*: This is where a company has instigated markedly broadminded policies towards its gay and lesbian employees. In particular, it provides benefits to the domestic partners of its employees.

viii. *Other Strengths*: This is where a company has made notable diversity achievements that do not fall under other KLD categories.

4.2.1.1.3.2 Diversity-related CSR Concerns

i. *Controversies*: This is where a company has either paid considerable fines or civil penalties as a result of disputes, or else has been involved in major disputes related to affirmative action issues.

ii. *Non-Representation:* This is where there are no women on a company's board of directors or among its top management.

iii.   *Other Concerns:* Any other notable diversity problems not covered under controversies and non-representation.

4.2.1.1.4   Employee Relations

Corporations are separate legal entities which deal with diverse groups of stakeholders including its employees. The relationship between a corporation and its employees should be equitable and based upon mutual respect, dignity, equity and fairness. Employees have an expectation that corporations will meet their material needs. In addition, an employee's self-esteem stems from social identity, feelings of belongingness, social validation of important values, existential meaning, and a deeper sense of purpose from their workplace. These issues are all highly correlated with a company's CSR and influences employee satisfaction (Bauman and Skitka, 2012). KLD gauge employee-related CSR under the following screens.

4.2.1.1.4.1 Employee-related CSR Strengths

i.   *Strong Union Relations*: This is where a company has allowed union rights and has a previously strong relationship with unions.

ii.   *Cash Profit Sharing*: This is where a corporation has a standing program for cash distributions to a large number of the workforce in a profit-sharing program.

iii.   *Employee Involvement*: This is where a company strongly advocates employee involvement and/or ownership through the following: stock options available to the majority of its employees, sharing of profits, stock ownership, sharing of financial information, or participation in management decision-making.

iv.   *Strong Retirement Benefits*: This is where a company has a very strong retirement benefits program in place.

v. *Health and Safety Strength*: This is where a company is known by the US Occupational Health and Safety Administration for its robust safety programs.

vi. *Other Strengths*: This includes any other item that reveals any other practice that a company is engage in for the workers' welfare.

4.2.1.1.4.2 Employees-related CSR Concerns

i. *Poor Union Relations*: This is where a company has notably poor union relations.

ii. *Health and Safety Concerns*: This is where a company has recently either paid substantial fines or civil penalties for willful violations of employee health and safety standards, or has been otherwise involved in major health and safety controversies.

iii. *Workforce Reductions*: This is where a company has downsized its personnel by 15% in the most recent year or by 25% during the past two years, or it has declared strategies for such downsizing.

iv. *Pension/Benefits Concerns*: This is where a firm has either a significantly underfunded benefit pension plan, or has an insufficient retirement benefits program.

v. *Other Concerns*: This is where a corporation has a prominent employee problem which has not been addressed by KLD's specific rating categories.

4.2.1.1.5 Environment

One of the most talked about CSR initiatives is the environmental aspects of CSR. This is where firms try to proactively participate in environmental friendly policies specifically related to energy efficiency, reduction of carbon emissions, renewable products, pollution reduction, and recycling etc. These initiatives are aimed at making the world an environmentally better place to

live. A corporation's behavior towards the environment is gauged by the KLD according to the following screens.

4.2.1.1.5.1 Environment-related CSR Strengths

i. *Beneficial Products and Services*: This is where companies earn substantial revenues (more than 4% of total revenues) from groundbreaking recyclable products, ecological services, or products that encourage the efficient use of energy, or has industrialized innovative products with ecological benefits. The term 'environmental service' does not include services with questionable environmental effects such as landfills, incinerators, waste-to-energy plants, and deep injection wells.

ii. *Pollution Prevention*: This is where firms have markedly strong contamination stoppage agendas including decreasing discharges into the environment and toxic chemical-use reduction agendas.

iii. *Recycling*: This is where a corporation is a significant user of recycled resources as raw materials in its production processes, or is a major force in the recycling industry.

iv. *Alternative Fuels*: This is where a company extensively uses alternative fuels for its energy needs. The term 'alternative fuels' comprises natural gas, wind power, and solar energy. It can also be where a company has revealed extraordinary assurances to energy efficiency agendas or the promotion of energy efficiency.

v. *Communications*: This is where a firm is a signatory to the CERES[15] principles, prints a notably substantive ecological report, or has remarkably active internal communications systems in place for environmental best practices.

vi. *Property, Plant, and Equipment*: whether the property, plant, and equipment are environmental friendly performance as compared with the rest of the industry.

vii. *Other Strengths*: This is where the company exhibits a strong ecological characteristic not covered by any other KLD rating category.

4.2.1.1.5.2 Environment-related CSR Concerns

i. *Hazardous Waste*: This is where the liabilities of a corporation for environmental rehabilitation surpass $50 million or, the corporation has lately paid extensive penalties or civil damages for waste administration defilements.

ii. *Regulatory Problems*: This is where the corporation has recently paid a significant amount as a penalty for damaging the environment, or breached the ecological codes of practice or, it has a history of regulatory disputes under the Clean Air Act (originally passed in 1973 and amended in 1990), Clean Water Act (1972) or other major ecological protocols.

iii. *Ozone Depleting Chemicals*: This is where the corporation is amongst the top producers of ozone-lessening compounds such as bromines, HCFCs, methylene chloride, methyl chloroform etc.

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[15] The Coalition for Environmentally Responsible Economies (CERES) is a non-profit organization based in the US which comprises investors, and environmental, religious, and public interest groups.

iv.   *Substantial Emissions*: If emissions of hazardous biochemical (as described by and notified to the EPA) from any single operational facility into the air and/or water are amongst the highest of the corporations rated by KLD.

v.   *Agricultural Chemicals*: A score of one is given to any firm if it is a significant manufacturer of agronomic chemicals, i.e., insecticides or chemical.

vi.   *Climate Change*: This is where a corporation generates sizeable revenues from the trade of coal or oil and its derivative fuel products, or the corporation earns extensive revenues from the burning of coal or oil and/or its derivative fuel products. Electric utilities, companies in transportation owning convoys of automobiles, auto and truck producers, and other conveyance apparatus corporations are examples of such business entities.

vii.   *Other Concerns*: This is where a corporation has ecological badly-behaved instances which are not precisely rated under any categories of KLD, frequently an environmental mishap.

4.2.1.1.6   Human Rights

Initially human rights-related issues were considered as a domain of the state government but focus has now shifted towards linkages between corporate entities and human rights because of the economic, social, and environmental aspects of corporate activity. For example, labor rights requiring companies to pay fair wages affects the economic aspect of a company's activities. Human rights such as the right to non-discrimination are relevant to the social aspect of a company's activities. The environmental aspects of corporate activity might affect a range of

human rights, such as the right to clean drinking water. The following screens gauge human rights-related CSR of corporations.

4.2.1.1.6.1 Human Rights-related CSR Strengths

    i.   *Positive Record in South Africa*: Where a corporation has reputable history of social positivity in South Africa.

    ii.   *Indigenous Peoples Relations*: Where a firm has time-honored relationships with native peoples in the areas of its planned or existing production facilities that respect the autonomy, terrestrial, ethos, intellectual property, and human rights of native publics.

    iii.   *Labor Rights Strength*: Where a corporation has an exceptionally good track record of observing labor rights both in the US and elsewhere.

    iv.   *Other Strengths*: Where a corporation's community, employee, product and environment relations, and technological work is acknowledged by a regulator.

4.2.1.1.6.2 Human Rights-related CSR Concerns

    i.   *South Africa*: This is where a firm has questionable operations in South-Africa.

    ii.   *Northern Ireland*: The firm has operations in Northern Ireland.

    iii.   *Burma*: Where the company has questionable operations in Burma.

    iv.   *Mexico*: This is where the corporation has questionable operations in Mexico specifically related to the treatment of employees, and environmental degradations.

    v.   *International Labor*: This is where the firm's non-US operations are involved in disputes related to labor and workforce relations.

vi.   *Indigenous Peoples Relations*: Firm has a conflict with indigenous peoples on matters such as autonomy, terrestrial, ecology, intellectual property and human rights living around their production facilities.

vii.   *Other Concerns*: This is where the non-US branch of the corporation is criticized due to any disputes related to product quality, environment, diversity, and community or product safety issues.

4.2.1.1.7   Product Quality

Product quality related CSR implies that products produced by a firm not only comply with the safety and quality control mechanism for safety, reliability and quality product but exceeds those standards. Provision of such a superior quality product is not only a key to business success but is also a highly expected social responsibility of firms. KLD rank firms on product quality CSR based upon the following screens.

4.2.1.1.7.1 Product Quality-related CSR Strengths

i.   *Quality:* This is where the corporation has a well-built organization-level quality platform, or it has a quality program documented as extraordinary by the US Department of Commerce.

ii.   *R&D/Innovation*: This is where the company is a front-runner in research and development (R&D) predominantly by introducing outstanding innovative products.

iii.   *Benefits to the Economically Disadvantaged*: This is where the provision of goods or services to economically challenged people is a part of the basic mission of the enterprise.

iv. *Other Strengths*: This screen includes any other exceptionally good practice in terms of product quality which has not been included in existing KLD ratings.

4.2.1.1.7.2 Product Quality-related CSR Concerns

i. *Product Safety*: This is where the company has recently paid extensive penalties or civil fines, or is involved in major disputes or regulatory actions relating to the safety of its products and services.

ii. *Marketing/Contracting Controversy*: This is where the corporation has been recently fined and questioned for some sort of marketing or contracting disputes, or has been involved in malpractices lawsuits related to publicity, customer deception, or government contracting.

iii. *Antitrust*: This is where the corporation has been substantially fined for a breach of antitrust regulations such as price-fixing, collusions, or unjustified price hikes or, has any recent involvement in disputes or governing actions connecting to antitrust accusations.

iv. *Other Concerns*: This includes all other instances of where the firm has been penalized for product faults, or has product problems not covered by any other category of KLD.

A composite index using all CSR dimensions is developed for this thesis. The following subsection explains the methodology used for the development of a CSR index. It starts with simple historical models followed by the PCI approach used in building a comprehensive CSR index. To the best of the author's knowledge the PCI approach has not been used before to build a CSR index.

4.2.2 CSR Index - Additive Approach

Most of the studies examining the possible wealth enhancing or wealth protection role of CSR have used a simple additive approach for building a CSR Index (See for example, Oikonomou et al., 2012; Godfrey et al., 2009; Bae et al., 2011; Verwijmeren and Derwall, 2010; and El Ghoul et al., 2011). Under the additive approach, strengths and concerns are added separately and a net score is obtained by subtracting concerns from strengths. This simple additive approach can be mathematically presented as:

$$CS_{i,d,t} = \sum IN_j \qquad \text{-for strengths} \qquad (4.1)$$

$$CC_{i,d,t} = \sum IN_j \qquad \text{-for concerns} \qquad (4.2)$$

$$CSR_{i,t} = \sum_{l=1}^{n} CS_{i,d,t} - \sum_{l=1}^{n} CC_{i,d,t} \qquad (4.3)$$

Where $CSR_{i,t}$ is the CSR index for company i at time t. $CS_{i,d,t}$ and $CC_{i,d,t}$ represent the cumulative score of indicators IN (where $IN = 1,\ldots,j$) and, in summation, denote the number of dimensions of CSR (community, diversity, governance, employee relations, human rights, environment, product) strengths and concerns for company i, dimension d, at time t respectively. A higher CSR index score shows that a corporation has a higher number of CSR strengths as compared with CSR concerns. One of the major concerns with this approach is that it simply takes a net score after adding concerns and strengths.

Deng et al., (2013) argued that the additive method of building a CSR index is biased towards the number of indicators in every aspect as a higher number of indicators receive a higher

weight in net score using the additive rule. For example, if environmental CSR has more indicators as compare to community CSR then adding both aspects with equal weights will result in a higher weightage from environmental CSR as compared with community related CSR. Deng et al., (2013) suggested an alternative methodology namely 'Weight Adjusted Additive approach' when constructing a CSR index.

4.2.2.1 Weight Adjusted Additive Approach

Under the weight adjusted additive approach, Deng et al., (2013) proposed a weighted average approach where the net CSR index is the difference of weighted average of strengths and weighted average of concerns as below:

$$\overline{CS}_{i,d,t} = \frac{\sum_{j=1}^{n} IN_j}{\# \ of \ IN_j} \qquad \text{-for strengths} \qquad (4.4)$$

$$\overline{CC}_{i,d,t} = \frac{\sum_{j=1}^{n} CC_j}{\# \ of \ IN_j} \qquad \text{-for concerns} \qquad (4.5)$$

$$CSR_{i,t} = \sum_{l=1}^{n} \overline{CS}_{i,d,t} - \sum_{l=1}^{n} \overline{CC}_{i,d,t} \quad \text{Composite CSR index} \qquad (4.6)$$

Where $\overline{CS}_{i,d,t}$ and $\overline{CC}_{i,d,t}$ are the weighted averages of the strengths and concerns for dimension d of company i at time t respectively while l in summation shows dimensions of CSR (community, diversity, governance, employee relations, human rights, environment, product). $CSR_{i,t}$ is the difference of the weighted averages for all dimensions. Although the weighted average method removes the additive bias this method still treats every indicator equally implying that the weighted average of a single indicator can override the overall results. To address this

problem, a more scientific approach is preferred than a simple additive approach. For this thesis, a CSR index is developed using principal component analysis.

4.2.2.2 Principal Component Analysis

Principal component analysis is a widely used data reduction technique which can be used to combine more than one indicator to form a new measure that is a linear combination of original variables. The newly formed measures, which have attributes of the original variables, are called Principal Components (PCs). PCs must fulfil the following criteria:

a) are linear combinations of original variables,

b) are orthogonal to each other and,

c) capture the comprehensive amount of disparity in the data.

Intuitively, PCA can be understood as fitting an n-dimensional ellipsoid to the data and in doing so each axis of the ellipsoid represents a principle component. Under such a setting a small sized axis in the ellipsoid has a very small variation in the data and if we omit that axis it will cause a very small loss of information from the dataset resulting in a smaller set of variables yet able to explain most of the information in the dataset.

To discover the axis of the ellipse Abdi and Williams (2010) recommend to first standardize the data by subtracting variable means from each value to center the data on the origin. Then, the covariance matrix, eigenvalues and analogous eigenvectors of this covariance matrix are calculated. Then, the set of eigenvectors are othogonalize, and are normalized to become unit

vectors. After doing so, every mutually orthogonal unit eigenvector can be interpreted as an axis of the ellipsoid fitted to the data. The eigenvalue of a particular eigenvector is divided by the sum of all the eigenvalues to find the proportion of variance which is being explained by that particular eigenvector.

Mathematical explanation of eigenvalues, eigenvectors and covariance are provided in the following subsections.

4.2.2.2.1 Eigenvalues and eigenvectors

In linear algebra the eigenvector of a square $(n \times n)$ matrix of covariance, in our case it is covariance matrix of all the dimensions of CSR, is a vector that does not change its direction under associated linear transformation. If q is a non-zero vector and is an eigenvector of a square matrix C then $C\boldsymbol{q}$ is a scalar multiple of q. In equation form this can be written as:

$$Cq = \lambda q \qquad\qquad (4.7)$$

In the equation λ is a scalar called eigenvalue of the associated eigenvector q. The number of non-zero eigenvalues of C is at best rank(C), which is the highest quantity of linearly independent columns or rows of C, respectively. Equation (4.7) can also be written as $(C - \lambda I_n) = 0$.

If C (as $(C - \lambda I_n)$) is an $n \times n$ square and full-rank matrix (i.e., C has at most n linearly independent eigenvectors), then the eigenvalues of C can be found for example, by solving the characteristic equation (also called the characteristic polynomial) $\det(C - \lambda I_M) = 0$, where

debt(*S*) denotes the determinant of the square matrix *S*. This method for solving the characteristic equation should be considered as a mathematical proof rather than as a state-of-the-art method. However, computational methods are not based on this representation (as is the case for algorithms) as shown below.

If *C* has *n* are linearly independent eigenvectors $q_1,...,q_n$, then *C* can be expressed by a product of three matrices

$$C = Q\Pi Q^{-1} \tag{4.8}$$

Where Π is a diagonal matrix whose diagonal entries are the eigenvalues of *C* in decreasing order $(\lambda_1,...,\lambda_n)$, and Q= ($\mathbf{q}_1$,...,$\mathbf{q}_n$) is the matrix of eigenvectors of *C* (the ith eigenvector corresponds to the ith largest eigenvalue). Equation (8) is called eigenvalue decomposition (or Eigen-decomposition) of *C*.

4.2.2.2.2   Covariance and correlation

The covariance of two attributes is a measure of how strongly these attributes vary. The covariance of a sample of two random variables **x** and **y** (in this case aspects of CSR) with mean $\bar{x}$ and $\bar{y}$ with a sample size *n* can be calculated as:

$$Cov\ (x,y) = \frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y}) \tag{4.9}$$

If *x=y*, then the covariance is equal to the variance. When **x** and **y** are normalized by their standard deviation σ_x and σ_y, then the covariance of **x** and **y** is equal to the correlation coefficient

of **x** and **y**, which indicates the strength and the direction of the linear relationship between **x** and **y**. The correlation coefficient can be calculated as:

$$Corr\ (x, y) = \frac{Cov\ (x,y)}{\sigma_x\ \sigma_y} \tag{4.10}$$

Given an *m x n* matrix *A*, whose m rows are data objects and whose n columns are attributes, the covariance matrix Cov(*A*), which is a square matrix constructed of the single covariance, can be calculated. If the values of each attribute of *A* are shifted such that the mean of each attribute is 0, then Cov (**A**) = A^{T}A.

4.2.2.2.3   Principal components

If the eigenvalue decomposition is performed on the square matrix Cov(*A*), then the original data matrix *A* can be transformed into another matrix $A' := AQ^*$, with Q=[**q**$_1$,…,**q**$_n$]. Each column of *A'* is a linear combination of the original attributes, the columns of *A'* are principal components and the variance of the ith new attribute is λ_i. The sum of the variances of all new attributes is equal to the sum of the variances of the original attributes.

A' from the above procedure satisfies the following properties:

1. Each pair of new attributes has covariance 0,

2. The new attributes are arranged in descending order with respect to their variance,

3. The first new attribute (i.e., the first principal component) captures as much of the variance of the data as possible by a single attribute and,

4. Each successive attribute captures as much of the remaining data as possible.

A practical approach to doing PCA is followed using the methodology used by Cutter et al., (2003) and Schmidtlein et al., (2008) in building a social vulnerability index. The approach used in this thesis for the construction of a CSR index based on PCA is discussed next.

1. The first step is to standardize all the input variables (CSR aspects in this case raw concern scores of every aspect were deducted from raw strength scores of that particular aspect) to z-score with mean value of zero and standard deviation one.

2. The second step was to perform PCA on the standardize aspect scores from step one.

3. Generate principal components based upon the PCA analysis conducted in the second step.

4. Principal components were selected based upon the following criterion:

    a. Using Kaiser (1960) criteria in which components with eigenvalues greater than one are selected.

    b. Horn's (1965) parallel analysis is similar to Kaiser (1960) criteria except, instead of setting a specific threshold of eigenvalues, components having greater eigenvalues than their expected eigenvalues are selected. Because of unknown expected eigenvalues, Horn's parallel analysis uses 100 randomly selected samples and compute PCA. After doing PCA on these datasets average eigenvalues is used as expected eigenvalue.

    c. Expert choice in which subjective decision of an expert has been used for selection of the components.

5. Combine selected principal components.

6. Standardized univariate components to z-score with zero mean and standard deviation of one.

As principal component analysis is very sensitive to input variables (Cutter et al., 2003) data standardization, in the first step is highly recommended. When standardization has been done the application of PCA gives orthogonal components which are linear combinations of all the input standardize variables. First principal components capture the maximum variation in the dataset. The second component is next in number and so on. Cutter et al., (2003) used Kaiser (1960) criterion to select a parsimonious subset of components (step 4). There are three options to form a univariate index:

1. Sum the selected components and hence give equal weight to every component to form a single variable.

2. Use the first component from the PCA as it explains maximum variation in the data.

3. Combine the selected/all the components by giving them weights according to the proportion of variation they explain.

For empirical analysis, the three options generate three different indexes and for better comparison, all subsequent estimations use these as a separate index for the level of CSR engagements.

Table 4.2.2.2.3.1: Eigenvalues and variation proportions

Components	Eigenvalue	Difference	Proportion	Cumulative
Comp1	1.6095	0.136683	0.2299	0.2299
Comp2	1.47282	0.544989	0.2104	0.4403
Comp3	0.927832	0.0196855	0.1325	0.5729
Comp4	0.908147	0.0980444	0.1297	0.7026
Comp5	0.810102	0.154603	0.1157	0.8183
Comp6	0.655499	0.039405	0.0936	0.912
Comp7	0.616094	.	0.088	1

This table shows eigenvalues and variation proportions of the components of PCA.

Table 4.2.2.2.3.1 shows eigenvalues and the proportion of variation explained by each component in the principal component analysis on standardized CSR aspects. As it can be seen

from Table 4.2.2.2.3.1 that the first two components have an eigenvalue greater than one so using

the Kaiser (1960) criterion, the first two components are used for analysis in the coming chapters.

Individual loadings of all the aspects are given in Table 4.2.2.2.3.2.

Table 4.2.2.2.3.2: Factor loadings of principal component analysis

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Comp7	Unexplained
Div.	0.313	-0.575	-0.022	0.038	0.087	0.218	0.718	0
Emp.	0.352	0.013	0.851	0.329	0.113	-0.140	-0.106	0
Env.	0.558	0.072	-0.187	-0.337	-0.176	-0.707	0.062	0
HR	0.257	0.455	-0.021	-0.350	0.729	0.249	0.107	0
Com.	0.536	-0.298	-0.157	-0.105	-0.129	0.465	-0.596	0
PQ	0.195	0.550	0.123	-0.067	-0.620	0.391	0.319	0
Gov.	0.274	0.258	-0.447	0.800	0.125	-0.049	0.030	0

This table shows the factor loadings of PCA. Div is Diversity, Emp. Is Employee Rights, Env. Is Environment, HR is Human Rights, Com. Is Community, PQ is Product Quality and Gov. is Governance related CSR activities.

Table 4.2.2.2.3.3 provides the summary statistics of the CSR index through PCA, equally

weighted PCA and weighted average PCA. These indices show a higher correlation (99%) among

each other while the first index, using the first component of PCA, has a low correlation with the

others; the direction of correlation is the same validating the consistency of all three measures. All

the CSR measures using PCA show a mean of zero due to standardization of the PCA index in the

final step.

Table 4.2.2.2.3.3: Descriptive Statistics of PCA measures

Variable	Obs.	Mean	Std. Dev.	Min	Max	Correlation		
First PCA	12630	0	1	-5.377	7.784	1		
SUM PCA	12630	0	1.414	-9.442	7.052	0.707*	1	
WGT PCA	12630	0	0.708	-4.746	3.606	0.737*	0.999*	1

This table shows eigenvalues and variation proportions of the components of PCA.

The following subsections develop the main dependent variables for the three empirical

studies of this thesis.

4.2.3 Probability-of-Default (PD)

Credit default risk is the probability that a firm may not be able to meet its obligations on time whether principal and/or interest. The empirical literature[16] often uses credit ratings as a proxy for default risk due to easy access and its wide usage by creditors and investors. During the recent global financial crisis, the use of credit ratings as a proxy for default risk was heavily criticized by regulators and investors due to its inability to predict corporate failures. In a few cases, regulators took action against credit rating agencies for example the US government sued S&P over pre-crisis fraud[17].

From the perspective of regulators, credit ratings have loopholes that can have an impact on investment decisions. As a result, regulators called for alternatives to credit ratings in such decisions (Hilscher and Wilson, 2013). Hilscher and Wilson (2013) found that ratings are poor predictors of corporate failure when they compared estimated default probabilities with the ability of failure prediction by credit ratings. Due to these shortcomings, this study used the probability-of-default as a proxy for credit default risk using the Merton (1974) model.

Merton (1974) suggests that the equity of a firm is equivalent to a long position in a call option on the assets of the firm. By using this equivalence, he derives asset volatility of a firm and associated market value of underlying assets. More accurately, Merton (1974) used the Black and Scholes (1973) framework to solve for underlying asset value and volatility indicated by the price and volatility of an option. Consequently, asset value and volatility can be combined into a risk

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[16] Credit ratings are often used as proxies for default probability. See for example West (1970), Blume et al., (1998), Krahnen and Weber (2001), Löffler (2004), Molina (2005), and Avramov et al., (2009).

[17] http://www.reuters.com/article/us-mcgrawhill-sandp-civilcharges-idUSBRE9130U120130205

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measure called 'distance-to-default' which is a measure of creditworthiness of an equity-issuing firm.

The Merton (1974) model attaches market values of equity and assets in the following way:

$$V_E = V_A \mathbb{N}(d_1) - e^{-r(T-t)}D\mathbb{N}(d_2) \qquad (4.11)$$

Here, V_E is market value of the equity, V_A is market value of a firm's assets, D is the total amount of a firm's debts, T-t is time to maturity of the debt, r is risk free rate, $\mathbb{N}(.)$ is cumulative normal distribution. d_1 and d_2 are defined as:

$$d_1 = \frac{\ln\left(\frac{V_A}{D}\right) + (r + \frac{1}{2}\sigma_A^2)(T-t)}{\sigma_A\sqrt{(T-t)}} \qquad (4.12)$$

$$d_2 = d_1 - \sigma_A\sqrt{(T-t)} \qquad (4.13)$$

In this model, the firm has a simple capital structure comprised of a single homogenous class of debt and leftover equity. The debt is to mature at time T. In addition, it can be shown that equity and asset volatility are related:

$$\sigma_E = \frac{V_A}{V_E} \mathbb{N}(d_1)\sigma_A \qquad (4.14)$$

Where σ_E represents the volatility of a firm's equity returns and σ_A is the volatility of a firm's asset returns.

Solving a non-linear system of equations (4.12) and (4.14) gives V_A and σ_A and 'distance-to-default' (DD) as;

$$DD_M = \frac{\ln\left(\frac{V_A}{D}\right) + (r - \frac{1}{2}\sigma_A^2)(T-t)}{\sigma_A\sqrt{(T-t)}} \qquad (4.15)$$

DD is the distance-to-default and is the number of standard deviations that the value of the firm is from the point of default. A small value of DD reflects a higher probability-of-default. The distance-to-default can be delineated into a (risk neutral) probability-of-default or it can be used to categorize individual firms according to their creditworthiness.

DD from equation (4.15) contains more than two unknowns and needs to be solved through optimization. Byström (2003) suggested a simplified approach to solve equation (4.15) for the distance-to-default. The simplified version contains all determinable parameters hence distance-to-default can be measured without solving for unknown parameters. This simplification is based on three assumptions;

1) The magnitude of the drift term $(r - \frac{1}{2}\sigma_A^2)(T - t)$ is 'small'

2) It has been assumed that $\mathbb{N}(d_1)$ is 'close to one'

3) The face value of debt has been used to calculate the leverage ratio i.e. $\frac{D}{V_A}$

Byström (2003) provides the rationale behind each of these assumptions. Assumption one has two rationales. First, in most practical situations the 'drift term' turned out to be very small as compared to first term $\ln\left(\frac{V_A}{D}\right)$. Second, empirically it is very difficult to estimate the actual drift rate of stocks and other assets. Therefore, the 'drift-term' is usually assumed to be zero. The rationale for assumption two is based on the extreme event scenario where V_A is close to D (option is almost at-the-money) and the underlying volatility of assets is very high then $\mathbb{N}(d_1)$ is different from one. The third assumption is based on the view that the amount paid against debt settlement is the 'book value' and not the 'market value'.

Capitalizing on the first assumption that the 'drift term' is very small compared to the first term and by utilizing the common notion that time-to-maturity of the debt is one year, equation (4.15) can be reduced to:

$$DD = \frac{\ln(V_A/D)}{\sigma_A} \tag{4.16}$$

if σ_A is further replaced with $\frac{\sigma_E V_E}{V_A}$ and the third assumption of $\mathbb{N}(d_1)$ is close to one then:

$$DD = \frac{\ln(V_A/D)}{\sigma_E V_E/V_A} \tag{4.17}$$

Ultimately, if leverage is defined as $L = \frac{D}{V_A}$ then a simplified expression of distance-to-default can be written as:

$$DD = \frac{\ln(1/L)}{\sigma_E(1-L)} = \frac{\ln(L)}{(L-1)} X \frac{1}{\sigma_E} \tag{4.18}$$

Equation (4.18) contains all the observable parameters which can be used to estimate distance-to-default. Probability of default can be estimated from distance-to-default by:

$$PD = \mathbb{N}(-DD) \tag{4.19}$$

4.2.4 Firm specific information diffusion

The level of firm specific information diffusion increases as synchronicity of stock price with market index decreases (Morck et al., 2000). As informed investors react to new information quickly, stock prices reflect available information and, as a result, market efficiency improves.

Management attempts to synchronize the return of their stocks with the market providing important disclosures. Yu (2011) developed a measure of non-synchronicity by taking an inverse of the synchronicity measure of Morck et al., (2000). Following their methodology firm specific information diffusion can be calculated as:

$$\Gamma_{it} = \left(1 - \left(\frac{(\sum rc_{it} rm_t)^2}{\sum rc_{it}^2 \sum rm_t^2}\right)\right) \Big/ \left(\frac{(\sum rc_{it} rm_t)^2}{\sum rc_{it}^2 \sum rm_t^2}\right) \tag{4.20}$$

where Γ_{it} maps the non-synchronicity of stock price movement of firm i at time t, while rc_{it} and rm_{it} are given as;

$$rc_{it} = Rc_{it} - \left(\frac{\sum Rc_{it}}{n}\right) \tag{4.21}$$

$$rm_t = Rm_t - \left(\frac{\sum Rm_t}{n}\right) \tag{4.22}$$

where Rc_{it} is return of company i at time t, while Rm_t is return of market, in this case it is the S&P 500 index, and n is number of trading days in a year.

Alternatively, following Yu, (2011), Γ_{it} can be calculated by estimating the market model in the following form:

$$R_{i,t} = \alpha_0 + \beta R_{m,t} + \varepsilon_{it} \tag{4.23}$$

where $R_{i,t}$ is the return of company i at time t, $R_{m,t}$ is the value-weighted local market return in time t, the value of $1 - R^2$ where R^2 is estimated based on Equation (4.23), is a firm-specific stock

return variation. After estimating R^2 from equation 4.23 on daily returns of a firm in one year, a measure of firm-specific information diffusion for that year can be calculated as:

$$\Gamma_{it} = \frac{1-R^2}{R^2} \qquad\qquad (4.24)$$

where $(1 - R^2)$ is the level of variation in the stock price unexplained by the market hence is due to firm-specific information diffusion while R^2 is market explained return variation due to stock market momentum.

Finally, the $info_{it}$ measure of firm-specific information diffusion level in stock prices is developed by logistically transforming the non-synchronicity (Γ_{it}) as follows:

$$info_{it} = \log(\Gamma_{it}) \qquad\qquad (4.25)$$

This logistically transformed index of non-synchronicity of stock returns with market movement in comparison to synchronicity which captures the firm-specific information diffusion.

4.2.5　Quality of Financial Reporting

Market participants view auditors' reports as an indicator of the quality/accuracy of financial information contained in the financial reports and may consider auditors' opinions as a pricing factor. Capitalizing on the existing literature the auditor's opinion on the financial report is used as a proxy for the quality of financial reporting. To rigorously measure the accounting accuracy, we used a binary variable taking the value one if the auditor gave an unqualified auditor opinion and zero otherwise i.e.

$$ADOP_{it} = \begin{cases} 1 \text{ Unqualified auditor opinion} \\ 0 \text{ other than unqualified opinion} \end{cases} \qquad (4.26)$$

4.3 Summary

In this chapter a detailed desciption is provided as to the sample and data sources used for empirical analysis followed by the derivation and development of primary covariates. By using the data from KLD STATS a CSR index is developed using both traditional additive methods and the more advanced PCA method.

Since the objective of this thesis is to investigate the wealth protection role of CSR, three dependent variables are developed to test three different dimensions of the wealth protection function of CSR. The first empirical essay (chapter five) uses the probablity of default as a proxy for credit default risk. This study uses the Merton (1974) model to compute the probablity of default for each firm in the sample. The use probablity of default is preferred over credit ratings as a proxy for credit default risk due to its comprehensive coverage of information both from the market as well as from the financial statements of a company.

The second dependent variable relates to the study exploring the relationship of CSR with firm-specific information diffusion in chapter six. This measure has been generated using a non-synchronicity measure following Morck et al., (2000). This measure is based upon the seminal work of Roll (1988) in which he used the coefficient of determination (R^2) as a proxy for market synchronicity, and found that the explanatory power of widely used market models (capital asset pricing and arbitrage pricing) is limited when explaining individual stock returns. In an ideal situation when market returns can explain stock returns, R^2 of the model should be equal to one.

However, when R^2 is less than one, it implies that the stock price of a firm contains a portion of firm-specific information and that portion of stock price movement is not sensitive to market returns (Roll, 1988). Later, Morck et al., (2000) used the inverse of this synchronicity as a measure of firm specific information diffusion and since then it has been used in a large number of empirical studies[18].

Finally, the last endogenous variable is related to the quality of financial reporting. A measure of the quality of financial reporting used the auditors' opinion as a proxy. As an independent evaluator of financial reports the auditor's opinion provides the most useful feedback on report quality. This dependent variable has been used in chapter seven where the relationship between CSR and the quality of reporting has been explored.

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[18] See for example Kodres and Pritsker (2002); Kyle and Xiong (2001); Jin and Myers (2006); Barberis and Shleifer (2003), and Barberis et al., (2005).

Part -- II

CHAPTER FIVE

CORPORATE SOCIAL RESPONSIBILITY AND CREDIT DEFAULT RISK

5.1   Introduction

For a firm's sustainable and long-term growth, environmental, social, and governance (ESG) issues are top of the agenda for most CEOs recently surveyed by Price Waterhouse Coopers[19]. This implies that catering for ESG concerns can have an impact on the financial performance of firms.[20] Although there is a significant amount of research available on the relationship of CSR and corporate financial performance, its relationship with riskiness of firms is still not completely understood. Overemphasis on investigating the wealth enhancing function of CSR, for example CSR and profitability, has overshadowed another important aspect of CSR which is its wealth protection function.

Empirical evidence on the wealth-enhancing function of CSR is, at best, mixed. Findings range from a positive association (Hillman and Keim, 2001), to a negative association (Brammer, et al., 2006) to a neutral association (Renneboog et al., 2008; Bauer et al., 2005) between the level of CSR engagement and financial performance of firms. The sparse literature on the 'risk mitigating' function of CSR suggests that CSR, as moral goodwill, not only fosters a positive relationship among businesses, governments, and communities but also reduces the relative riskiness of firms. Kytle and Ruggie (2005) suggest that firms can reduce their level of riskiness

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[19] Survey results are available at http://www.pwc.com/gx/en/ceo-survey/2014/sustainability-perspective.jhtml

[20] In the empirical literature, ESG-related issues are generally researched under a broader term of corporate social responsibility (CSR). For the purposes of this paper, I use the term CSR as a synonym for ESG.

by pro-actively engaging in social risk management through CSR. In terms of financial risk, Jiraporn et al., (2014) found that firms with better CSR practices enjoy better credit ratings. Similarly, Oikonomou et al., (2012) found that CSR is negatively and strongly related to financial risk. There is also evidence that socially responsible firms enjoy a lower cost of equity capital (El Ghoul et al., 2011), and socially irresponsible firms are penalized with higher financing costs by banks (Goss and Roberts, 2011).

Proponents of agency theory challenge the effectiveness of CSR and consider it to be a potential conflict of interest between managers and shareholders. Barnea and Rubin (2010) argue that a firm's insiders (managers and large block-holders) over-invest in CSR for their private benefit to improve their reputation as good global citizens. Furthermore, Sprinkle and Maines (2010) suggest that CSR-related cash outflow requirements may result in opportunity costs that harm the profit maximization goal of an organization.

In a recent study Jiraporn et al., (2014) found a positive relationship between CSR and credit ratings. They found that firms with better CSR scores enjoy higher credit ratings from the same industry and geographic region. However, the use of credit ratings as a proxy for the probability-of-default is not considered as approproate due to its simplified approach based on publicly available information that does not include information on systematic risk and uncertainty (Hilscher and Wilson, 2013; Heitfield and Böcker, 2010). Furthermore, the use of credit rating as a proxy for credit risk not only reduces the number of observations but also does not take into consideration the dynamic nature of a firm's behavior over the period. Rösch and Scheule (2014) and Ashraf and Goddard (2012) also suggest that credit ratings are incorrect measures of credit risk because they failed to predict corporate failure during the recent global financial crisis. This

essay contributes to the literature on the impact of engagement in CSR-related activities on the credit risk of non-financial US firms using the probability-of-default as a proxy for credit risk using the Merton (1974) model[21]. Probability of default is considered a superior measure as compared to credit ratings or a simple credit score card approach (Hilscher and Wilson, 2013) when investigating the impact of CSR-related activities on credit risk. Credit ratings suffer from irregularity in updating while a simple credit score card approach relies on accounting information and, as such, are exposed to the possibility of manipulation. Probability of default capitalizes on market information which is frequently updated and is not exposed to any manipulations (Byström, 2003).

In this essay, we consider both risk mitigation and the agency theory view of CSR and develop our hypotheses accordingly. By using panel data methodology on a sample of 1,119 US non-financial firms for the period 2000 to 2012, we have found evidence that suggests that firms scoring high on CSR index have significantly lower credit risk as measured by their probability-of-default. The empirical evidence contradicts the agency view of engagement in CSR activities and supports the wealth protection function of CSR activities. we also found that the credit risk of firms increased substantially during the dotcom (2001-02) and financial (2007-08) crises. By splitting CSR into technical (primary stakeholders related) and institutional (secondary stakeholders related) CSR, we have found robust evidence to suggest that technical CSR (TCSR) has a significantly negative relationship with credit risk while institutional CSR (ICSR) has an insignificant relationship with credit risk.

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[21] To the best of the author's knowledge, there is no prior study that has investigated CSR and the credit risk relationship by using the probability of default as a proxy of credit risk.

This study extends the work of Jiraporn et al., (2014) by linking CSR and credit risk literature. we estimated the probability-of-default for non-financial US firms during a time-period spanning two crisis periods that provided an interesting comparison of magnitude and severity of both these crises. By using a beta regression model, we find evidence that suggests that a higher level of CSR engagement leads to lower probablity of default in the sample firms. In terms of severity, we have found that the probablity of default was considerably higher during the global financial crisis as compared with the dotcom bubble crisis. Furthermore, we investigated the effect of technical and institutional CSR separately and concluded that only technical CSR is significant and relevant in performing an insurance-type function.

In terms of policy implications, these findings are valuable for equity investors as well as bond investors. In addition to wealth protection benefits, engagement in CSR-related activities might help improve credit terms whereby investors may allow a discount for engagement in CSR-related activities when computing their required rate-of-return. Furthermore, management can view the engagement in CSR activities as a signal to mitigate default risk and reduce the cost of capital.

5.2   Related Literature

Literature relating to the relationship between CSR and financial performance of firms is based on several arguments. Those who argue about the positive impact of engagement in CSR-related activities on firms generally fall into two categories depending upon their ontological preferences. There are those that adopt the stakeholder maximization view of CSR from a wealth-maximization and risk mitigation perspective. Others view CSR as an agency problem whereby

management use CSR-related activities to build their own personal image rather than striving for the profit maximization goal of the firm (Reinhardt et al., 2008).

The stakeholder maximization view of CSR suggests that a firm's voluntary participation in socially responsible activities not only maximizes shareholder value (wealth maximization) but also helps a broader group of stakeholders (Jiraporn et al., 2014). Firms that are more socially responsible and who cater to the needs of other stakeholders enjoy better stock valuation (Jiao, 2010; Benson and Davidson, 2010), elicit more favorable stock market reactions (Aktas et al., 2011) and have higher acquisition announcement returns (Deng et al., 2013). Gardberg and Fombrun (2006) suggest that the improved reputation that is gained by investment in CSR is strategic in nature and helps companies to penetrate international markets. Godfrey et al., (2009), using a dataset of 254 negative events from 91 firms between 1992 to 2003, found that engagement in CSR activities acts like an 'insurance' during the negative events. Their empirical findings suggest that firms with better (low) CSR engagement suffered lower (more) losses during a negative event.

Aside from a wealth-enhancing function, social responsibility may act as a risk mitigating function in the form of lower financial risks. The risk mitigation view suggests that by engaging in CSR-related activities management is signaling a long-term sustainable view of the corporation. Any increase in perceived social responsibility may enhance the reputation of the firm and the market may perceive it as a risk mitigating factor. Alternatively, investors may view investment in socially irresponsible firms to be riskier and may demand a higher premium for the possibility of law suits or fines from regulatory agencies. McGuire et al., (1988), by utilizing Fortune magazine's reputation ratings, found that past performance and default risk are highly correlated

with the firm's perception of social responsibility. They also found that firms low in social responsibility experience lower returns on their assets.

El Ghoul et al., (2011) found that firms with better CSR performance, as measured by CSR scores using the KLD STATS database, enjoy lower costs of equity. They suggest that improvement in social responsibility in terms of employee relations; environmental policies, product quality, and safety exert downward pressure on the cost of equity. Similarly, Goss and Roberts (2011), using a sample of 3,996 loan contracts to large US firms and CSR data from KLD Stat, provided robust evidence that firms with lower CSR scores pay 7 to 18 bases points more on their loans as compared with perceived socially responsible firms.

The academic literature has primarily focused on the relationship between CSR and the measure of financial risk management such as the cost of capital (El Ghoul et al., 2011; Goss and Roberts, 2011) or variance in earnings and stock returns (Spicer, 1978). However, there is a little research on the impact of CSR on the probability-of-default of socially responsible firms.

Sun and Cui (2014), by using the credit ratings of 303 companies from Standard & Poors for the period 2008 to 2010, found that firms with better CSR engagements enjoyed improved credit ratings however, due to relatively small sample size from US, their findings have limitation in terms of generalization. Likewise, Jiraporn et al., (2014) reported a positive relationship between credit ratings and CSR scores. However, Hilscher and Wilson (2013) criticized the use of credit ratings as a proxy for the probability-of-default due to the fact that credit ratings are based on a simple model of publicly available information and does not include information on systematic risk and uncertainty. To overcome this shortcoming, we used the probability-of-default

based on the Merton (1974) model and hypothesize whether the active engagement in CSR-related activities leads to lower default risk or not.

H1: All else being the same, socially responsible firms have lower probability of default.

Freeman et al., (2007) categorized corporate stakeholders into two groups: primary stakeholders – those who are necessary for the organization and, secondary stakeholders – those who can influence primary stakeholders. Mattingly and Berman (2006) provided empirical evidence to support such a classification for CSR-related stakeholders into technical CSR and institutional CSR using the KLD database. Technical CSR (TCSR) is linked to employee relations, product quality, diversity and governance. Institutional CSR (ICSR) is related to secondary stakeholders and includes environmental and community-related CSR disclosures. Both TSCR and ICSR potentially reduce relative riskiness and may have a positive wealth protection impact on firms. However, TCSR that is related to primary stakeholders seem more relevant in CSR credit risk relationships and may act like insurance during times of adverse events (Godfrey et al., 2009). Based on this argument, we hypothesize that both TCSR and ICSR are negatively related to the probability-of-default. However, we anticipate that the effect of TCSR may have greater magnitude and significance. we hypothesize that:

H2: All else being the same, firms with higher TCSR and ICSR have lower probability of default.

The engagement in CSR may cause a conflict of interest between management and shareholders. Management, as an insider, may gain from the positive aspects of CSR and ignore the long-term profit maximization objectives of the corporation (Barnea and Rubin, 2010).

Sprinkle and Maines (2010) argued that although broad stakeholder groups demand socially responsible firms they are not in favor of firms abandoning their profit maximization aims. Cash outflow requirements of CSR may result in opportunity costs that potentially harm the profit maximization goal of the organization. Barnea and Rubin (2010) found a dampening effect of engagement in CSR on cash flows and it can limit a firm's ability to pay off its debt obligations. Based on agency theory we hypothesize;

H3: All else being equal, firms with higher engagement in CSR have higher probability of default.

5.3   Covariate definitions

For testing the hypotheses developed in section 5.2 above, we developed the following covariates.

5.3.1   Probability of Default (PD_{it})

To test the hypothesis, we used probability of default (PD_{it}) as the dependent variable. Construction of the probability of default has been explained in section 4.2.3 of chapter 4.

5.3.2   Corporate Social Responsibility (CSR_{it})

We used an index of CSR constructed in section 4.2.1 of chapter 4 as the independent variable.

5.3.3   Other Control Variables

Following the existing literature on default risk we used the following control variables that can affect the credit risk of a firm.

5.3.3.1   Size (SIZE$_{it}$)

The size of a firm can play an important role in terms of its stability. Bouzouita and Young (1998) found that managers of firms that are larger in size are usually more experienced, have better access to capital markets, and the firms can benefit from economies of scale. Their findings support the earlier work of Ben-Zion and Shalit (1975) who argued that since large firms grow over a long period of time it follows that firm size is a mirror of its past performance which is a potential indicator of future performance hence, its risk. To control for the size of a firm, we use the log of Total Assets (*SIZE$_{it}$*). We expect a negative coefficient of *SIZE$_{it}$* with probability-of-default.

5.3.3.2   Leverage (LEV$_{it}$)

Merton (1974) suggests that highly leveraged firms have a higher probability-of-default especially during periods of stress. To control for the impact of leverage, we use the long-term debt to book value of liabilities and market value of equity as measure of leverage[22] (*LEV$_{it}$*). We anticipate a positive coefficient of *LEV$_{it}$* with probability-of-default.

5.3.3.3   Profitability (ROA$_{it}$)

Firms with higher profitability may have lower probability-of-default on their obligations. Higher profitability may lead to higher cash flows that can be used to pay for the financial obligations of firms resulting in a lower probability-of-default. Following Jiraporn et al., (2014)

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[22] Leverage measured by total debt as a ratio of total assets have also been used in the estimation and results are available with the author. there are no significant changes in the results. As thesis focuses on long-term sustainability of firm, long-term leverage ratio has been used as control variable.

we control for profitability by taking the return of assets (ROA_{it}) as a measure to gauge profitability. We anticipate a negative coefficient of ROA_{it} with PD_{it}.

5.3.3.4   Future Growth (MB$_{it}$)

Improving future prospects of a firm's growth and profitability decrease the likelihood that the firm's value will hit the default threshold. Empirical literature usually applies the ratio of market-value equity to book-value of equity (market-to-book) to identify companies with positive future growth potentials. Murcial et al., (2014) reported a positive association between market-to-book ratio and credit ratings of firms. Similarly, Pástor and Veronesi (2003) provided theoretical as well as empirical evidence that the market-to-book ratio of firms increase as expected profitability increase. Following Pástor and Veronesi (2003) we used the market-to-book ratio (MB_{it}) as a measure of future growth potential of a firm. We anticipated a negative coefficient of MB_{it} with probability-of-default.

5.3.3.5   Systematic Risk (BETA$_{it}$)

Johnson et al., (2011) suggest that there is a negative relationship between default risk and expected stock returns. Variation in stock returns reflects the market view of relative riskiness of firms relative to the market. Investors require higher returns from those firms with higher systematic risk that can lead to bankruptcy. To control for the impact of systematic risk, we use the beta of each stock calculated from the capital asset pricing model using the S&P500 index as a benchmark. We expected a positive coefficient of $BETA_{it}$ with the probability-of-default.

5.3.3.6 Dotcom and Financial Crises (I.Crisis and F.Crisis)

The dotcom crisis in 2002 and the economic meltdown during the 2007-09 financial crisis increased risk specifically for those firms operating in the IT and financial sectors and linked industries generally. We anticipated a dampening effect of both these crises on a firm's credibility and hence an increase in the credit risk of firms. We control for the dotcom and financial crisis with dummies taking values of one during 2002 and 2007-09, zero otherwise

5.4 Descriptive Statistics

KLD database consists of a total of 32,232 firm-year observations with 660 firms reporting CSR-related disclosures in year 2000 that increased to 3,034 firms in 2012. After matching these firms with financial and stock price data, we got a final sample of 1,154 firms. As the sample has large positive or negative outliers, we winsorized its covariates at the 1st and 95th percentile of
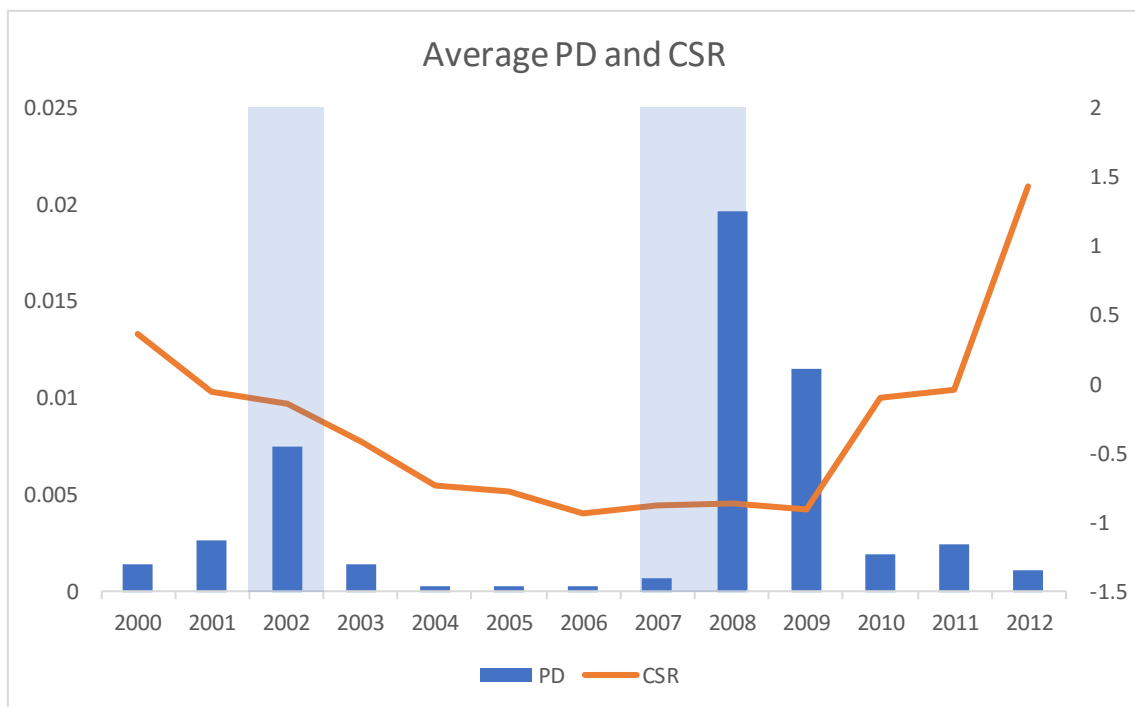
Figure 5.4.1:The average probability of default and mean CSR score of sample firms

their respective distributions. To avoid the survivorship bias entry into, and exit from, the sample was not restricted.

Figure 5.4.1 displays the average PD_{it} and CSR_{it} scores for sample firms over the period 2000-2012. It is evident that before the dotcom crisis average CSR_{it} has a decreasing trend while average PD_{it} is increasing. There are spikes during the two time-periods which need some discussion. The first spike pertains to the commonly known 'dotcom crisis' of 2002. During this crisis both the indicators are almost touching each other. After the dotcom crisis, a decreasing trend of CSR_{it} persisted while PD_{it} reached its minimum values. The second spike pertains to the financial crisis of 2007-09. During this crisis, average probability-of-default is at its highest levels while CSR_{it} is at its minimum level. It can be inferred from this depiction is that firms before and during the financial crisis showed irresponsible behavior, e.g. irresponsible behavior in investing activities leading to higher risk of failure, which leads to higher default risk. After the financial crisis firms are becoming more responsible and probability-of-default is decreasing. Moreover, it is also observed that the financial and economic reforms to mitigate the negative externalities of the crisis are successful as indicated by declining probability-of-default after the financial crisis.

Figure 5.4.2 displays year-wise probability-of-default for all the firms instead of showing only average values as shown in Figure 5.4.2. Once again, there are obvious spikes in the probability-of-default. During crisis time periods of 2002 and 2007-08 there are many firms on a higher scale of probability-of-default. Moreover, this depiction shows that the recent financial crisis has a severe effect on the riskiness of firms as compared to the dotcom crisis as shown by

the higher spikes in the figure 4. This graphical presentation of probability-of-default necessitates the use of dotcom and financial crises.

By-year Probability-of-Default (PD)
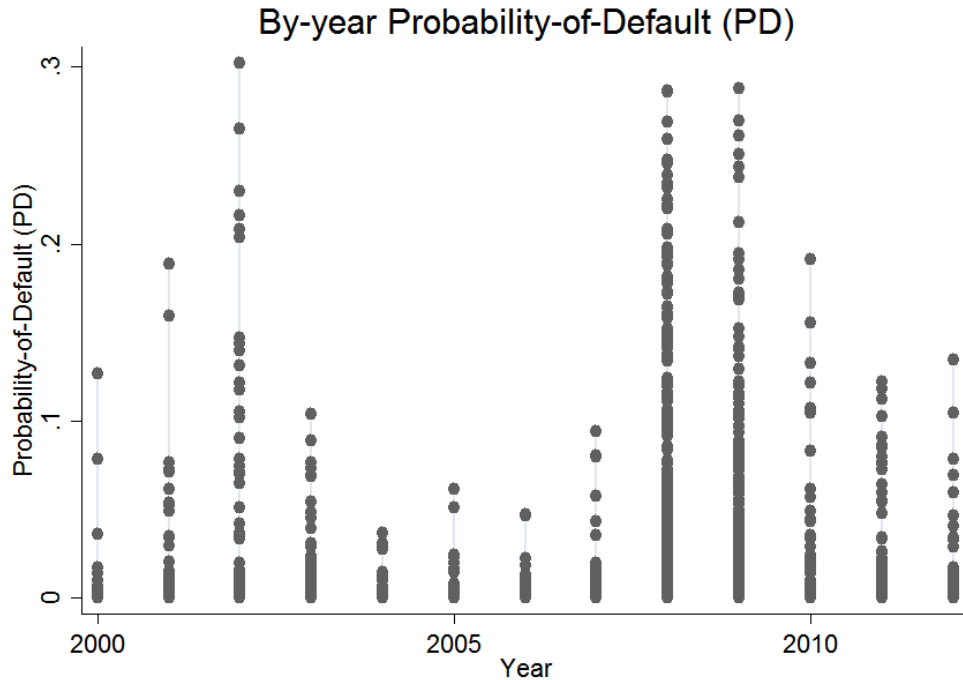
Figure 5.4.2: Year-wise probability of default of non-financial US firms

Table 5.4.1 reports the descriptive statistics with quantiles detail for variables used in this study. On average, the probability-of-default (PD_{it}) of firms in the sample is 0.38% and ranges from 0 to 30.00% with a very low median value showing the skewed nature as depicted in probability density diagram in Figure 5.5.1[23]. The mean of CSR, based on simple arithmetic (CSR_{raw} and CSR_{adj}), is negative. While the average CSR using the PCA method is much smaller it reflects similar variations suggesting a diversity of CSR practices within the sample. The lower CSR scores based on the PCA method confirms the suitability of using the PCA approach for the computation of CSR indices.

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[23] Detailed discussion on Figure 5.5.1 is given in the next section.

Among other control variables, the average of market multiples (MB_{it}) stands at 2.86 suggesting that most companies are trading at higher multiples than the book-value of their equity. On average, firms in the sample have leverage (LEV_{it}) of about 16% ranging from no long-term liabilities to 59% long-term liabilities as compared with the sum of the book-value of liabilities and market-value of equity. A lower long-term leverage ratio reflects the conservative nature of the sample firms. This can be confirmed with the level of systematic risk assumed by the sample firms as measured by the $BETA_{it}$. On average, firms in the sample have a $BETA_{it}$ of 0.89 which shows that systematic risk of firms is very close to market risk. However, there are firms with $BETA_{it} > 1$ showing higher risk as compared with the market. Firms in the sample on average have profitability, measured by return-on-assets (ROA_{it}), of 3%. The lower average profitability can be attributed to high losses during internet and global financial crisis of 2007-8 as shown by -54% minimum value.

Table 5.4.2 shows a correlation of all the variables. CSR_{it} and PD_{it} have a negative correlation irrespective of the CSR measure used. The correlation matrix provides a crude indication of the risk mitigation function of CSR through the negative association with default risk. The signs of other control variables are generally in line with expectations. MB_{it}, $SIZE_{it}$, ROA_{it} and $ADTR_{it}$ are negatively correlated with PD_{it}, while LEV_{it} and $BETA_{it}$ are positively correlated with PD_{it}.

The descriptive statistics and graphical representation of the PD-CSR relationship in Figure 5.4.1 and correlation matrix Table 5.4.2 provides support for the risk mitigation function of CSR and requires further investigation.

Table 5.4.1: Descriptive Statistics of variables used.

Variable	Definition	Obs.	Mean	S.D.	Min	0.25	Median	0.75	Max
						----Quantiles----			
PD_{it}	Probability of default	10787	.0038	0.02	0	1.2e-28	3.4e-14	6.4e-07	0.30
DD_{it}	Log of Distance to default	10787	1.96	0.65	-0.65	1.57	2.01	2.40	6.44
$CSRR_{it}$	CSR-Raw score	10787	-0.42	2.69	-7.00	-2.00	-1.00	1.00	9.00
$CSRA_{it}$	CSR-Adjusted score	10787	-0.17	0.67	-1.67	-0.53	-0.20	0.07	2.50
$CSRF_{it}$	CSR-First component of PCA	10787	-0.01	0.99	-2.63	-0.45	-0.06	0.30	3.70
$CSRE_{it}$	CSR-Equally weighted components of PCA	10787	-0.06	1.39	-5.14	-0.53	0.20	0.67	3.46
$CSRW_{it}$	CSR- Weighted components of PCA	10787	-0.03	0.7	-2.54	-0.26	0.10	0.32	1.77
$TCSRE_{it}$	Technical CSR- Equally weighted components of PCA	10787	-0.02	2.16	-4.66	-1.49	-0.03	1.25	6.59
$ICSRE_{it}$	Institutional CSR- Equally weighted components of PCA	10787	-0.11	2.24	-7.81	-0.07	-0.07	-0.07	7.73
$TCSRR_{it}$	Technical CSR- Raw Score	10787	-0.39	1.99	-5.00	-2.00	-1.00	1.00	6.00
$ICSRR_{it}$	Institutional CSR- Raw Score	10787	-0.01	1.32	-4.00	0	0	0	5.00
$TCSRA_{it}$	Technical CSR- Adjusted Score	10787	-0.17	0.49	-1.26	-0.5	-0.20	0.02	1.51
$ICSRA_{it}$	Institutional CSR- Adjusted Score	10787	0.01	0.31	-0.88	0	0	0	1.33
$SIZE_{it}$	Size of Firm-Log of Total Assets	10787	7.76	1.55	2.68	6.64	7.65	8.78	13.59
LEV_{it}	Leverage	10764	0.16	0.13	0	0.06	0.14	0.24	0.59
ROA_{it}	Return of Asset	10787	0.03	0.10	-0.54	0.01	0.05	0.08	0.24
MB_{it}	Market to Book Ratio	10764	2.8	1.85	0.85	1.41	2.13	3.36	8.02
$BETA_{it}$	Systematic Risk using Market Model (S&P 500)	10787	0.89	0.4	0.05	0.61	0.86	1.13	2.12

This table shows the descriptive statistics of the variables used in the study. Data is from 2000-2012. Second column define the variables.

Table 5.4.2: Correlation Matrix

	PD_{it}	DD_{it}	$CSRR_{it}$	$CSRA_{,it}$	$CSRF_{it}$	$CSRE_{it}$	$CSRW_{it}$	$SIZE_{it}$	LEV_{it}	ROA_{it}	MB_{it}
DD_{it}	-0.4912*	1									
$CSRR_{it}$	-0.0659*	0.1870*	1								
$CSRA_{,it}$	-0.0578*	0.1605*	0.9114*	1							
$CSRF_{it}$	-0.0612*	0.1724*	0.9447*	0.8758*	1						
$CSRE_{it}$	-0.0381*	0.0403*	0.6128*	0.6550*	0.7012*	1					
$CSRW_{it}$	-0.0404*	0.0493*	0.6438*	0.6798*	0.7316*	0.9990*	1				
$SIZE_{it}$	-0.0185*	0.0689*	0.1175*	0.0623*	0.0548*	-0.3550*	-0.3362*	1			
LEV_{it}	0.3430*	-0.6605*	-0.1373*	-0.1011*	-0.1350*	-0.0878*	-0.0925*	0.1861*	1		
ROA_{it}	-0.2419*	0.3527*	0.0736*	0.0660*	0.0632*	-0.0129	-0.0085	0.1744*	-0.1961*	1	
MB_{it}	-0.0918*	0.2224*	0.1158*	0.0794*	0.1060*	0.0219*	0.0274*	-0.0200*	-0.2344*	0.0818*	1
$BETA_{it}$	0.2328*	-0.4617*	-0.1151*	-0.0782*	-0.0798*	0.1350*	0.1243*	-0.3419*	0.0660*	-0.2435*	-0.0807*

This table shows the correlation matrix of the variables used in the study. * shows significant correlation at 5 percent level of significance. Data is from 2000-2012.

5.5 Empirical Methodology

Selection of a suitable statistical technique is the Achilles heel for data analysis. Considering the importance of this fact, we did a preliminary analysis on the distributional properties of probability-of-default. Figure 5.5.1 shows the probability density diagram of probability-of-default. Two distinctive features can be observed from Figure 5.5.1; probability-of-default is bounded between 0 and 1 and probability distribution is highly positively skewed toward zero. We carefully consider these distinctive features when choosing an econometric model. For situations where the dependent variable is bounded between zero and one there are multiple options available including Logit, Probit and Tobit models.
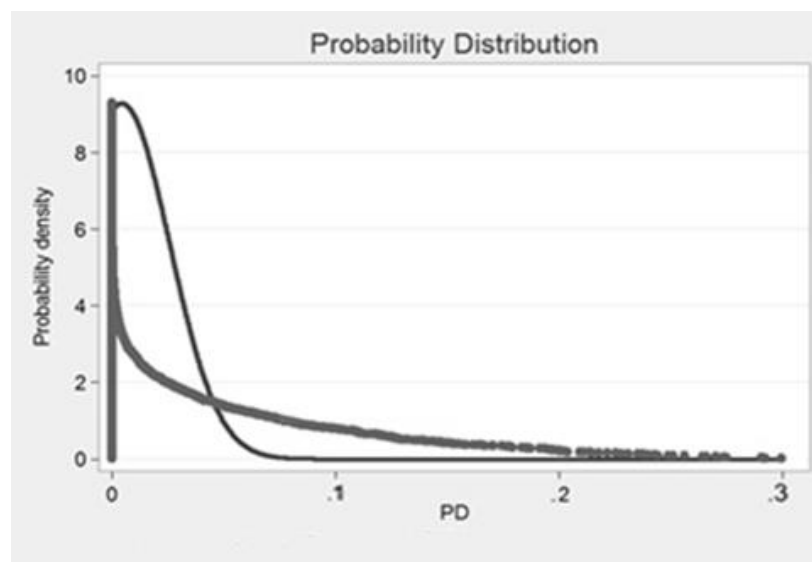
Figure 5.5.1: The probability density of the probability-of-default of non-financial US firms

Although, probability-of-default is bounded between zero and one, Logit and Probit models are not suitable because probability-of-default has fractional values. Under such a condition where the dependent variable is bounded between zero and one and has fractional values, Tobit model

can be used. However, the use of a Tobit model on highly skewed data is criticized due to the underlying normality assumption.[24] Ferrari and Cribari-Neto (2004) argued that the linear regression model is not appropriate for situations where the dependent variable is bounded (0<y>1) since it may yield fitted values of variable-of-interest that may exceed lower and upper limits and instead proposed a beta regression model.

Smithson and Verkuilen (2006) compared different models which can be used in bounded-dependent variable situations and found that beta regression models are better suited. In financial and credit risk literature Navarro-Martinez et al., (2011) used a beta regression model for the analysis of consumer debt repayment decision.

The Beta regression model uses the beta density function of distribution.[25] The beta density with shape parameters p and q is given by:

$$\pi(y:p,q) = \frac{\Gamma(p+q)}{\Gamma(p)\Gamma(q)} y^{p-1}(1-y)^{q-1}$$
(5.1)

with 0<y<1, p, q >0 and $\Gamma(.)$ denoting the gamma function. Due to difficulty in interpretation of shape parameters with regard to conditional expectations in regression framework Paolino (2001), Ferrari and Cribari-Neto (2004), and Smithson and Verkuilen (2006) proposed a substitute parameterization for beta regression. In this alternative parameterization shape parameters p and q are parameterized into location and dispersion (or precision) parameters when $p=\mu\phi$ and $q=(1-\mu)\phi$. By replacing the values of p and q in equation (5.1) we get:

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[24] See, for example; Angrist and Pischke (2008).
[25] Although operational mechanism of beta regression has been explained here, for development and derivation detail on beta regression see Paolino (2001), Ferrari and Cribari-Neto (2004), and Smithson and Verkuilen (2006). We used the *betafit* module of STATA developed by Buis et al., (2012).

$$f(y; \mu, \phi) = \frac{\Gamma(\mu\phi)}{\Gamma(\mu\phi)\Gamma((1-\mu)\phi)} y^{\mu\phi-1}(1-y)^{(1-\mu)\phi-1} \qquad (5.2)$$

with $0<y<1$, and $\phi >0$. The dependent variable y is now $\sim B(\mu, \phi)$ and $E(y) = \mu$ with $var(y) = \frac{\mu(1-\mu)}{1+\phi}$.

If Y is a random variable with $y_i \sim B(\mu, \phi)$ and $i=1,\ldots,n$ the beta regression model is:

$$g(u_i) = x_i\beta \qquad (5.3)$$

where β is a vector of regression parameters and x_i is the vector of covariates. Logit link function has been used for $g(.)$ to ensure that the dependent variable lies between zero and one which transforms equation (5.3) so that it now reads:

$$\ln(\frac{\mu}{(1-\mu)}) = x_i\beta \qquad (5.4)$$

5.6   Empirical Results and Discussion

Before discussing the results of this study, it is pertinent to discuss the validity of our estimation technique. We perform the Shapiro and Wilk (1965) test with the null hypothesis of normality in residuals. The null hypothesis is rejected at one percent significance confirming the violation of normality assumption. Under such circumstances, the beta regression model is preferred as it works with non-normal distribution of residuals. Error terms are clustered at firm level to control for unobserved firm effects. Wald test using Chi2, reported in Tables 7 and 8 confirms the validity of the model.

Table 5.6.1 reports the estimation results based on five alternative CSR measures: unadjusted (Raw) CSR ($CSRR_{it}$), adjusted CSR ($CSRA_{it}$), first component PCA CSR ($CSRF_{it}$), equally weighted PCA CSR ($CSRE_{it}$) and weighted average PCA CSR ($CSRW_{it}$) from panels 1 to

5 respectively. As anticipated, the coefficient of CSR is negative and significant irrespective of the CSR measure used. This suggests that a higher level of involvement in positive CSR activities is linked with lower default risk of a firm. The negative relationship between CSR and probability-of-default is more pronounced in the first component of the PCA CSR index ($CSRF_{it}$). This further confirms that the magnitude of the relationship depends on how the CSR score is calculated.

Table 5.6.1: Estimation results using the Beta Regression estimation technique

VARIABLES	(1) $CSRR_{it}$	(2) $CSRA_{it}$	(3) $CSRF_{it}$	(4) $CSRE_{it}$	(5) $CSRW_{it}$
CSR_{it}	-0.00885**	-0.0737***	-0.0212**	-0.0382***	-0.0744***
	(0.00372)	(0.0140)	(0.0101)	(0.00679)	(0.0135)
$SIZE_{it}$	-0.0348***	-0.0352***	-0.0358***	-0.0482***	-0.0473***
	(0.00904)	(0.00894)	(0.00897)	(0.00899)	(0.00897)
LEV_{it}	5.361***	5.360***	5.365***	5.386***	5.383***
	(0.110)	(0.110)	(0.110)	(0.109)	(0.109)
ROA_{it}	-0.463***	-0.455***	-0.463***	-0.458***	-0.458***
	(0.168)	(0.168)	(0.168)	(0.167)	(0.167)
MB_{it}	-0.0240***	-0.0239***	-0.0241***	-0.0250***	-0.0249***
	(0.00597)	(0.00600)	(0.00596)	(0.00597)	(0.00597)
$BETA_{it}$	1.309***	1.311***	1.310***	1.317***	1.317***
	(0.0347)	(0.0347)	(0.0348)	(0.0349)	(0.0349)
$Icrisis$	0.385***	0.382***	0.383***	0.382***	0.382***
	(0.0293)	(0.0294)	(0.0293)	(0.0294)	(0.0293)
$Fcrisis$	0.456***	0.450***	0.456***	0.446***	0.446***
	(0.0136)	(0.0136)	(0.0137)	(0.0137)	(0.0137)
Constant	-8.051***	-8.060***	-8.040***	-7.955***	-7.962***
	(0.111)	(0.111)	(0.110)	(0.110)	(0.110)
Observations	8,644	8,644	8,644	8,644	8,644
Firm Cluster	YES	YES	YES	YES	YES
Wald test Chi^2	0.000	0.000	0.000	0.000	0.000
Shapiro-Wilk Test (on residuals)	0.000	0.000	0.000	0.000	0.000
Number of firms	1115	1115	1115	1115	1115

Table 5.6.1 reports the regression results under beta regression estimation. The dependent variable in all the estimated models is probability-of-default. Raw CSR score, adjusted CSR score, first component of principle component as CSR index, equally weighted PC components and Weighted PC components as CSR index are used as CSR variable from column (1) to (5) respectively. P-values of Wald and Shapiro-Wilk tests are reported. Standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Among other control variables, the coefficient on $SIZE_{it}$ is negative and significant irrespective of the CSR measure used, suggesting that the probability-of-default decreases with an

increase in the size of firms. This may be attributed to the ability of management skills and the ability of firms to access financial markets during distressed time periods results in lower probability of default.

Our findings are in line with Bouzouita and Young (1998) suggesting that credit ratings of firms improve with an increase in size since it reduces the likelihood of default. The coefficient on LEV_{it} is positive and significant in all models. This suggests that leverage increases insolvency risk. These results are in line with Gray et al., (2006) and Ashbaugh-Skaife et al., (2006) who found that highly leveraged firms are associated with higher failure expectations.

The coefficient of ROA_{it} is negatively significant showing that increased returns enable firms to pay their debt so their probability-of-default decreases. These results are in line with Jiraporn et al., (2014) who found a positive relationship between profitability and credit rating. Among market-based control variables, MB_{it} is negative and significant irrespective of the CSR measure used showing that firms with growth-oriented future prospects are less exposed to default risk. These findings are in line with Murcial et al., (2014) who found that firms with 'brighter' future prospects are given higher credit ratings by rating agencies. The coefficient of systematic risk ($BETA_{it}$) is positive and significant showing that as systematic risk increases, chances of default risk also increases.

The dummy variables to capture the impact of the two crisis periods, the dotcom bubble and the global financial crisis, are positive and statistically significant at 1% suggesting that overall default probabilities increased during each crisis. However, a point worth mentioning is that the financial crisis (F_{crisis}) had a stress effect almost one and half times higher than that of the dotcom crisis.

To test whether there is any dissimilarity on the impact of technical and institution-related CSR activities on the probability-of-default, we estimated equation (5.4) with two distinctive CSR variables namely $TCSR_{it}$ and $ICSR_{it}$. Estimation results of re-estimated equation (5.4) are given in Table 5.6.2. We used 'Raw summation' measurement of $TCSR_{it}$ and $ICSR_{it}$, adjusted and first component of PCA from panel (1) to (3) respectively. Interestingly coefficients of institutional CSR ($ICSR_{it}$) are insignificant irrespective of which CSR measure is used. On the other hand,

Table 5.6.2: Estimation results using a Beta Regression technique with TCSR and ICSR

VARIABLES	(1) $CSRR_{it}$	(2) $ACSR_{it}$	(3) $CSRF_{it}$
$TCSR_{it}$	-0.0159***	-0.118***	-0.0228***
	(0.00517)	(0.0188)	(0.00447)
$ICSR_{it}$	0.00588	0.0169	0.00535
	(0.00764)	(0.0300)	(0.00457)
$SIZE_{it}$	-0.0331***	-0.0336***	-0.0322***
	(0.00907)	(0.00895)	(0.00903)
LEV_{it}	5.364***	5.367***	5.364***
	(0.110)	(0.109)	(0.109)
ROA_{it}	-0.462***	-0.451***	-0.457***
	(0.169)	(0.169)	(0.169)
MB_{it}	-0.0244***	-0.0246***	-0.0245***
	(0.00597)	(0.00600)	(0.00598)
$BETA_{it}$	1.307***	1.309***	1.306***
	(0.0346)	(0.0346)	(0.0346)
$Icrisis$	0.390***	0.387***	0.392***
	(0.0295)	(0.0296)	(0.0295)
$Fcrisis$	0.458***	0.452***	0.457***
	(0.0137)	(0.0136)	(0.0137)
Constant	-8.066***	-8.080***	-8.067***
	(0.111)	(0.111)	(0.111)
Observations	8,644	8,644	8,644
Firm clustering	YES	YES	YES
Wald test Chi^2	0.000	0.000	0.000
Shapiro-Wilk Test (on residuals)	0.000	0.000	0.000
No. of Firms.	1115	1115	1115

This table show the estimation results of equation (5.4) estimated using Beta Regression technique. Data is from 2000 to 2012. PD_{it} is probability of default. $TCSR$ and $ICSR$ measured by CSRR is a CSR index constructed adding Raw scores (1), CSRA is adjusted CSR (2), CSRF is CSR using first component of PCA (3). Variables are defined in second column of Table 5.4.1. P-values of Wald and Shapiro-Wilk tests are reported. Standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1.

technical CSR (*TCSR_it*) shows a significant negative coefficient for all models. These results are in line with those of Godfrey et al., (2009) about the insurance-like function of CSR related to primary stakeholders which i.e., technical CSR. There are no major differences among other control variables in terms of signs or statistical significance as compared with results from Table 5.6.1.

Overall, we found support for the alternative hypotheses suggesting that a higher level of CSR engagement is significantly negatively related to the probablity of default. An enagagement in technical CSR helps reduce the probablity of default more than institutional CSRs. Furthermore, the impact of the global financial crisis was more severe on US firms as compared with the dotcom bubble crisis. These findings are in line with Jiraporn et al., (2014) and Godfrey et al., (2009) that CSR has a positive effect on credit ratings of a firm.

5.7   Robustness check

Smithson and Verkuilen (2006) used transformation to shift the observations at the margin 0 and 1 into the unit of interval in response to the fact that beta regression does not use values on the margin in the analysis and use $y' = [y(N-1) + 0.5]/N$ where N is sample size. Bittschi et al., (2015) also performed this transformation because the major portion of their data lays on the margin 0 and 1 (more than 50%). Although in our case only 15% of data is at margin 0 we still did this transformation and generated *PD_trans* as a robustness check to test whether our results still hold.

For robustness purposes, we report empirical results based on the raw CSR index (*CSRR_it*) only. Table 5.7.1 column 1 reports the empirical results based on the Smithson and Verkuilen

(2006) PD transformation. There is no change in the sign of CSR probability-of-default relationship and is significant at 5% level of significance. Results of other control variables generally, are also robust after the transformation.

To further confirm our results, we did robustness checks by using an alternative risk variable and replaced probability-of-default with distance-to-default. We logarithmically transformed the distance-to-default due to the presence of extreme outliers. A longer 'distance-to-default' implies lower chances of default. Since DD_{it} is an inverse of probability-of-default, we expect the opposite relationship of CSR and other control variables as compared with PD_{it}.

Since DD_{it} is not bounded, linear regression analysis can be used in the estimation. An unobservable heterogeneity problem may arise due to the unobservable differences among firms that do not vary over time and directly affect the levels of riskiness of each firm. The panel data model offers useful opportunities for taking these latent characteristics of firms into account by modeling it as an individual effect which is then eliminated by taking the first difference of variables. For testing the proposed hypotheses, we estimate a dynamic panel model, specifically, the Generalized Method of Moments (GMM) estimator developed by Arellano and Bond (1991). The GMM model allows for the control of unobservable heterogeneity problems as well as possible endogeneity between dependent and independent variables.

The estimation results based on DD_{it} are reported in the second column of Table 5.7.1. Similar to the previous estimation results, CSR_{it} is positive and significant. This further confirms

the robustness of the risk-mitigating evidence of CSR. Signs of other control variables are as expected with no major difference.

Table 5.7.1: Robustness check with alternative measures of risk and estimation techniques

VARIABLES	(1) PD_{trans}	(2) DD_{it}	(3) IG_{it}
DD_{it-1}		0.400***	
		(0.0123)	
$CSRR_{it}$	-0.0141**	0.0485***	0.135***
	(0.00554)	(0.00640)	(0.0519)
$SIZE_{it}$	0.0302***	-0.0309	2.665***
	(0.00663)	(0.0236)	(0.126)
ROA_{it}	-0.387**	0.933***	-0.00652
	(0.161)	(0.0883)	(0.680)
MB_{it}	-0.0183***	0.150***	0.188***
	(0.00417)	(0.00800)	(0.0399)
$BETA_{it}$	0.409***	-0.616***	-0.549***
	(0.0290)	(0.0247)	(0.190)
$Icrisis$	0.0687***	-0.260***	0.262
	(0.0215)	(0.0175)	(0.190)
$Fcrisis$	0.175***	-0.410***	0.229*
	(0.0105)	(0.00904)	(0.125)
Constant	-6.152***	1.664***	-25.87***
	(0.0904)	(0.194)	(1.156)
Observations	10,035	7,582	10,035
First level clustering	YES		
Wald test Chi^2	443.9	6441	493.6
Number of Firms	1032	1,025	1,032
Loglikelihood test			-2253***
Abond 2nd order		-1.116	
Shapiro-Wilk Test (on residuals	0.000		

Estimation results of equation (5.4) estimated using the Dynamic Panel Data estimation technique. Data is from 2000 to 2012. (1) Results using transformed PD as dependent variable. (2) Distance to Default as riskiness measure and (3) IG as credit worthiness measure. Variables are defined in the second Column of table 5.4.1. Standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Although we have provided adequate literature support to the notion that credit ratings are not good measures of credit risk yet, to have a robustness check for CSR default risk relationship and to know the relationship of estimated probability of default with credit ratings, we used credit rating as an alternative measure of credit risk. Following Hsu and Chen (2015) we construct CSR

rating score (CRSCORE) by assigning 1 to firms with AAA rating, 2 to AA and so on up-to C rated firms with score 22 (detail is given in Table 5.7.2). This measure is opposite to distance-to-default in a sense that higher the value of CRSCORE, higher is the credit default risk of firm. CRSCORE shows significantly positive correlation with probability of default with correlation coefficient of 16.3%.

To check the robustness of regression analysis, we generated a dummy variable IG_{it} with value 1 if firm 'i' is of investment grade (credit rating above BBB) and '0' otherwise. Reason for doing this dichotomous treatment is the categorical/ordinal nature of credit ratings. Generating a continuous variable (CRSCORE discussed above) from a categorical outcome may leads to biased results in regression analysis and therefore, generation of single dichotomous variable based upon frequently used industry classification is safe way to do robustness check and avoid any biases. This dichotomous variable has been used in logistic regression analysis. As IG_{it} takes value 1 for firm with lower credit risk, we expect positive coefficient of CSR. Estimation results are provided in column 3 of table 5.7.1. As shown in the result CSR is significantly positive in the results with

Table 5.7.2: Scoring scheme to construct CRSCORE measure of credit risk.

Rating	CRSCORE	Rating	CRSCORE
AAA	1	BB+	12
AA+	2	BB-	13
AA-	3	BB	14
AA	4	B+	15
A1+	5	B-	16
A+	6	B	17
A-	7	CCC+	18
A	8	CCC-	19
BBB+	9	CCC	20
BBB-	10	CC	21
BBB	11	C	22

This table explains the scoring scheme to construct CRSCORE measure of credit risk. Higher score shows higher credit risk.

a coefficient of 0.135 which means that firm scoring 1 unit higher in Raw CSR index is 14.75% more likely to be having odds of having investment grade credit rating.

5.8   Summary and Conclusion

This essay investigates the impact of CSR activities as disclosed by non-financial US firms on the probability-of-default. Socially responsible firms enjoy better credit ratings (Jiraporn et al., 2014; Sun and Cui, 2014), and lower cost of equity capital and financing (Oikonomou et al., 2012; El Ghoul et al., 2011; Goss and Roberts, 2011) that represents the risk-mitigating function of CSR.

To proxy overall CSR-related activity this study used a PCA approach to construct a CSR index following Schmidtlein et al., (2008). The PCA approach is preferred over additive index and weighted additive index approaches used in recent studies. Under additive approaches, CSR scores are ordinal and provide only the relative performance score of every firm but not the variation. By using the PCA approach of assigning weights to each component based on the relative correlation, not only does it provide a relative performance matrix but also helps explain the maximum variation (Goss and Roberts, 2011). After considering criticism on the use of credit ratings as a measure of credit risk this study used probability-of-default as a measure of credit risk.

We found evidence that suggests that the probability-of-default for firms with higher CSR score is less than firms with lower CSR score. Moreover, after splitting CSR into primary (Technical) and secondary (Institutional) stakeholders, we have found that technical CSR negatively affects the default risk while institutional CSR has an insignificant affect. These empirical findings are in line with literature showing that CSR plays a risk-mitigating function.

Apart from our core findings, we also found that the dotcom bubble and financial crisis had a negative effect on the solvency of firms.

These results indicate the importance of engagement in CSR activities and have important policy implications for management and investors alike. Management can use CSR-related activities to reduce the credit risk of their firms. For shareholders to benefit, they have to be conscientious investors who value firms that engage in socially responsible behavior.

CHAPTER SIX

CSR AND STOCK PRICE INFORMATIVENESS

6.1   Introduction

For an efficient capital market, it is important that stock prices reflect all available firm-specific information. Modigliani and Miller (1963) suggested that firm management and investors have the same level of information. However, in the presence of information asymmetry managers often have more information about a firm's affairs than other stakeholders. To facilitate the dissemination of information, firms provide disclosure through formal communications such as financial reporting or informal communications such as management forecasts, analyst presentations, and voluntary disclosures about activities related to corporate social responsibility (CSR). By providing these disclosures, management attempts to reduce information asymmetry.

Stock price informativeness is the extent of information that stock prices contain about future earnings and firm fundamentals (Durnev et al., 2003). Information diffusion in stock prices results in efficient price discovery and is mainly caused by public news and is also attributable to the availability of firm-specific private information by investors (Ferreira & Laux, 2007). Stock price informativeness has direct implications for efficient capital allocation (Wurgler, 2000; Durnev et al., 2003), understanding managerial decisions (Durnev et al., 2004; Chen et al., 2007; Frésard, 2012) and incorporation of firms' future earnings prospects (Durnev et al., 2003; Jiang et al., 2009)

In the presence of information asymmetry, stock price informativeness can be severely affected. Aside from regulated financial reporting, the voluntary disclosure of engagement in CSR activities may play a pivotal role in increasing firm-specific information diffusion. Fieseler (2011) argued that engagement and disclosure of CSR activities can increase information flow from management to outside investors, and this information dissemination can improve stock price informativeness. Cho et al., (2013) found an inverse relationship between a firm's engagement in CSR and its level of information asymmetry. Investors incorporate CSR-related disclosures in stock prices by penalizing socially irresponsible behavior and rewarding those firms that engaged in socially responsible behavior (Krüger, 2009).

CSR-related activities can be viewed by investors from a stakeholder theory perspective or from an agency theory perspective. Under stakeholder theory, CSR activities result in a reduction in the cost of equity capital (Dhaliwal et al., 2011), more accurate forecasts by analysts (Dhaliwal et al., 2012), favorable recommendation by analysts (Ioannou and Serafeim, 2015), attract more analysts for following (Hong and Kacperczyk, 2009), and more information about stock risk (Spicer, 1978). Sprinkle and Maines (2010) argued that from an agency theory perspective CSR may result in immediate cash outflows resulting in an opportunity cost. Barnea and Rubin (2010) argued that in circumstances under which CSR activities do not increase firm value then, potentially, valuable resourses are wasted. These findings agree with Mahapatra (1984) who found that the efficiency of CSR is questionable from an investor perspective.

The contradictory view about the impact of CSR-related activities raises the question of whether CSR contributes to price informativeness and, if it is the case, whether better informativeness is uniform regardless of the size of the firm. Although the relationship between

CSR and information asymmetry has been studied extensively, the linkage between CSR and informativeness linkage has not yet been explored. This study attempts to answer this question by empirically exploring the CSR-informativeness relationship. We used a sample consisting of all US listed companies on the KLD CSR disclosure database from 2000 to 2012.

This study also extends the existing literature on the CSR-Informativeness relationship by focusing on whether the size of a firm has any role in this relationship. Theoretcial rationale for this moderating effect comes from legitimacy theory which suggests that large size firms are required to 'do more' in terms of their social image and legitimacy due to higher societal pressures and scruitiny. This can leads to lower marginal benefits of CSR engagements and disclosure for large firms in comparison to small size firms. We test the moderating effect of size on the CSR-informativeness relationship. Over or underestimation of the impact of CSR on informativeness of stock prices may occur due to the omission of this moderating effect. Second, we used principal component analysis (PCA) for CSR index construction for better estimation results as compared with the raw estimation technique for construction of the CSR index. We extend the literature by focusing on activities affecting primary stakeholders (technical CSR) and secondary stakeholders (institutional CSR). Mattingly and Berman (2006) linked stakeholder classification provided by Freeman et al., (2007) with CSR activities and classified CSR into technical and institutional CSR. We used these two classifications separately in this investigation of the CSR-Informativeness relationship. To the best of the author's knowledge this linkage has not been explored in the CSR-informativeness context. This study contributes to the literature by identifiying the presence of persistency and an adjustment mechanism in informativeness of stock returns. This suggests that the use of dynamic panel models is the most appropriate method when conducting empirical investigations on stock price informativeness.

Empirical findings suggest that stock prices of socially responsible firms are more informative however this informativeness is not uniform among all firms. The size of firms plays a negative moderating role in the CSR-informativeness relationship suggesting that the marginal impact of CSR on informativeness decreases with an increase in the size of firms. In terms of technical and institutional CSR activities, we have found that technical CSR positively affects informativeness while institutional CSR is negative among large firms.

Our results indicate the importance of engagement in CSR activities and have important policy implications for management and investors alike. Management can use CSR-related activities to reduce information asymmetry. However, for shareholders, they need to be conscientious investors who value firms that are engaged in socially responsible behaviors.

6.2   Related Literature

Modigliani and Miller (1963) advocated that the efficient market hypothesis assumes information symmetry. However, symmetric information assumption is violated when management has more information about the firm's affairs than other stakeholders. Management use financial reporting and disclosures to communicate its performance and governance to outside parties including investors (Healy and Palepu, 2001). The disclosure of engagement in CSR activities may further improve the flow of firm-specific information to outsiders thus mitigating information asymmetry (Fieseler, 2011).

By using event study methodology with a sample of firms from CDP Korea in 2008-09, Lee et al., (2015) provided evidence that voluntary disclosures related to environmental CSR effects stock price movement and concluded that negative disclosures related to carbon emissions

negatively affect stock prices. Cho et al., (2013) provided evidence that the level of engagement in CSR activities helps reduce information asymmetry. Jones and Murrell (2001) earlier illustrated these findings by using a framework of an informed investor, wherein investors in the presence of information asymmetry, invest in firms with better CSR scores assuming that only financially sound firms invest in CSR activities. Alniacik et al., (2011) used 'between-subject experimental design' methodology and concluded that keeping every other aspect of the firm constant positive (negative) CSR enhances (diminishes) consumer intentions to purchase products from, and employees intention to seek employment and investors intention to invest in the stocks of a company.

By using KLD statistical data on CSR for US firms from 1992 to 2007, El Ghoul et al., (2011) found that companies with good CSR practices benefit from a cheaper cost of capital. They further argued that engagement in CSR activities is likely to reduce future uncertainty due to environmental or other concerns resulting in the company being held in higher regard by investors and having a lower cost of capital. Dhaliwal et al., (2011) found similar evidence that disclosure of engagement in CSR activities resulted in lower costs of equity. Aside from a lower cost of capital, Hong and Kacperczyk (2009) reported that CSR also plays a role in increasing the effectiveness of corporate governance and firm value. Ioannou and Serafeim (2015) found that socially responsible firms attract more coverage from analysts. This suggests that investors view engagement in CSR activities as a positive signal for a firm's value and this is referred as the stakeholder theory view of CSR.

On the other hand engagement in CSR activities may cause an agency problem. Sprinkle and Maines (2010) argued that although stakeholder groups demand socially responsible firms,

they are not in favor of firms abandoning their profit maximization aims. Cash outflow requirements of CSR may result in opportunity costs adversely affecting the profit maximization goals of organizations. Barnea and Rubin (2010) suggest that CSR is a source of conflict among different shareholders and in most cases, managers take additional benefits at the cost of other stakeholders. This implies that the benefit of engagement in CSR activities should be reflected in stock prices. However, there is limited literature examining the linkage between stock price informativeness and engagement in CSR activities. In a recent paper, Chen et al., (2014) reported that engagement in CSR increases idiosyncratic volatility of stock returns. Based on these studies, we propose the first hypothesis as:

H4: All else being the same, disclosure of CSR activities increase stock price informativeness.

Stakeholder theory suggests that disclosure of engagement in CSR activities help in the reduction of information asymmetry and thus increase price informativeness. However, the impact of such disclosures is not the same for large and small firms. For larger firms, CSR-related disclosures may not be seen as a strong positive signal by investors due to the availability and sheer volume of other disclosures. In the case of smaller firms, CSR-related disclosures may be seen as a positive signal for future performance and therefore, CSR may resolve the agency problem.

According to legitimacy theory, there exists a social contract between an organization and the society in which it operates (Deegan and Unerman, 2011) and corporations try to legitimize their corporate actions by engaging in CSR activities and disclosure thereto. Because large firms are followed and scrutinized more, due to their scope and scale of operations, as compared to small size firms, it can lead to higher societal demands of legitimizing. Under such circumstances, small

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size firms can have higher marginal benefits of CSR engagement and disclosures in comparison to large size firms. Therefore, size of the firm can have a moderating role in CSR and informativeness relationship. Moreover, theoretical work by Udayasankar (2008) suggests that firm size and motivations for CSR participation has U-shaped relationship due to perceived expected benefits from such participation. Different size firms may have different benefit expectations from engagement in CSR. We test this notion through our analysis to find out if information diffusion benefits of CSR differ according to firm size? Based upon these arguments, we expect a moderating role of the firm size in the CSR-informativeness relationship. We hypothesize:

H5: All else being the same, the size of the firm has a moderating role in CSR-informativeness relationship.

Freeman et al., (2007) categorised corporate stakeholders into two groups: primary stakeholders – those who are necessary for the organization and secondary stakeholders – those who can influence the primary stakeholders. Mattingly and Berman (2006) provided empirical evidence to support such a classification for CSR-related stakeholders using the KLD database. Technical CSR (TCSR) is linked with primary stakeholders and include employee relations, product quality, diversity and governance. Institutional CSR (ICSR) is related to secondary stakeholders and includes environmental and community related information disclosures. Both TSCR and ICSR potentially reduce information asymmetry and may have a positive impact on price informativeness. However, TCSR-related disclosures seem more relevant in CSR-informativeness relationships and may act like insurance during times of adverse events (Godfrey

et al., 2009). Based on this argument, we hypothesize that both TCSR and ICSR are positively related to stock price informativeness.

H6: All else being same, Technical CSR significantly increases stock price informativeness.

H7: All else being same, Institutional CSR significantly increases stock price informativeness.

6.3   Covariate definitions

6.3.1   Firm-specific information diffusion (INFO$_{it}$)

To test our hypothesis, we used firm-specific information diffusion (INFO$_{it}$) as dependent variable. Construction of the firm-specific information diffusion measure has been explained in section 4.2.3 of chapter 4.

6.3.2   Corporate Social Responsibility (CSR$_{it}$)

we used an index of CSR constructed in section 4.2.1 of chapter 4 as the independent variable.

6.3.3   Other Control Variables

The literature on the impact of CSR activities on stock price informativeness identifies several control variables. We divided these variables into three groups: market value-based control variables, expert opinion-based control variables, and firm-specific control variables. These are discussed next.

6.3.3.1 Systematic risk (BETA$_{it}$)

Among market value based control variables, we used the systematic risk (*BETA$_{it}$*) of a stock. Investors with fully diversified portfolios assume only systematic risk. A drift from market risk is not compensated by investors. This may result in a decrease of firm-specific information diffusion. We control for investor diversification through the use of *BETA$_{it}$* estimated by using the market model as developed in Equation (4.23). A negative relationship of *BETA$_{it}$* with informativenss suggests that the capital market compensates only for the systematic risk.

6.3.3.2 Market-to-book ratio (MB$_{it}$)

Market-to-book ratio (*MB$_{it}$*) shows the optimism of investors towards the future growth potential of a particular stock. A firm with a high market-to-book ratio shows that investors are more optimistic about the future growth potential of the firm hence it increases the investor base and more information diffusion. We expect a positive relationship of *MB$_{it}$* with informativeness.

6.3.3.3 Dividend payments (DivD$_{it}$)

Dividend payment can also affect the informativeness of a stock. Companies paying consistent dividends are considered as stable companies. On the other hand, investors looking for growth may avoid dividend paying companies assuming that firms that pay dividends do not have future potential growth. To proxy for dividend payments, *DivD$_{it}$* is a dummy variable equal to unity if firm *i* paid dividend in year *t*, zero otherwise.

6.3.3.4 Analyst coverage (ANCOV$_{it}$)

For expert opinion-based variables, we used industry analysts and auditors as experts to control for CSR-informativeness relationship. The level of firm-specific informativeness can increase as the number of analysts covering an individual firm increases. Also, positively recommended firms by analysts may catch the attention of investors and hence stock price informativeness increase. We control analyst coverage (ANCOV$_{it}$) by taking a log of one plus the number of analysts' covering a firm in a particular year.

6.3.3.5 Analyst recommendations (ANREC$_{it}$)

We measure analyst recommendations (ANREC$_{it}$) by taking the average of inverted analysts' recommendation score. Analyst recommendation score coded from 1 for "strong buy", 2 for "buy", 3 for "hold", 4 for "underperform", and 5 for "sell". Following Jegadeesh et al., (2004) we inverted this score by subtracting it from 6 which resulted in a series showing a large number as an indicator of good performance and vice versa so that the result can be viewed and interpreted with ease.

6.3.3.6 Auditors' trust in financial reporting (ADTR$_{it}$ and ADOP$_{it}$)

Auditors' trust in the financial reporting process can affect the informativeness of the stock price. Informativeness increases as investors' trust on financial reporting increases while collecting, processing and incorporating firm-specific information into the stock price. We control for the auditor's opinion on financial reporting and the auditor's opinion on the robustness of the internal controls. Auditor opinion (ADOP$_{it}$) is coded 0 for "unaudited", 1 for "unqualified opinion", 2 for "qualified opinion", 3 for "Disclaimer or No opinion", 4 for "Unqualified opinion"

with explanatory language. We restructured this coding by giving a minimum number to "No opinion or Disclaimer" and a maximum number to an "unqualified opinion" and then took log of 1+number. We restructured this coding so that a larger score shows more auditor trust and vice versa and results can be presented and interpreted with clarity. we used two variables related to the auditors' opinion: auditor trust on financial reporting ($ADOP_{it}$) and auditor opinion on internal controls ($ADTR_{it}$).

6.3.3.7   Profitability (ROE$_{it}$)

As profitable firms are more attractive to investors profitability can increase the amount of firm-specific information diffusion. We measure profitability using a ratio of net income to book value of equity (ROE_{it}). We expect a positive relationship of ROE_{it} with informativeness.

6.3.3.8   Leverage (LEV$_{it}$)

Leverage increases the overall riskiness of firms. Investors may have negative sentiments about highly leveraged firms and may refrain or forego a particular investment due to the high level of leverage. The ratio total debt to total assets (LEV_{it}) is used to proxy for leverage. A negative association is expected between leverage and informativeness. We measured leverage by taking long term liabilities as a ratio of total assets.

6.3.3.9   Size of firm (SIZE$_{it}$)

Merton (1987) suggests that in the presence of information asymmetry investors' focus on a subset of securities available in the market. The selection of this subset of securities may depend on the ease of information availability and the size of the firm. Similarly, investors' response to

firm-specific information may differ based on the size of firms. Several studies have identified the size of a company as being a key determinant of the informativeness level in stock prices.[26] We use a log of market capitalization as a proxy for the size of a firm ($SIZE_{it}$). For formally examining the moderating effect of size with the CSR-Informativeness, we used an interactive term of size and CSR and expect a negative moderating effect of size on CSR-informativeness relationship implying that price informativeness increases with a decrease in the firm size.

6.3.3.10   Dotcom crisis (ICRISIS) and Global Financial crisis (GFC)

To control for the impact of the Internet crisis of 2002 and global financial crisis (GFC) on the stock price informativeness, dummy variables ICRISIS (1 if year is equal to 2002, 0 otherwise) and GFC (1 if year is equal to 2007-9, and 0 otherwise) are used. We expect a negative coefficient of both of the dummy variable because during sharp decline of stock market, stock prices usually move in tandem with broader market movement and hence a decline in firm specific information diffusion expected.

6.4   Descriptive Statistics

For the empirical analysis, the sample is divided into three subsamples following the seminal work of Fama and French (1992) on portfolio construction. We sort firms on the basis of market capitalization by year in ascending order. The top 33% firms are small firms, while the bottom 33% are large firms and mid-range firms are medium size firms.

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[26]See Morck et al., (2000); Cho et al. (2013); Ioannou and Serafeim (2015).

Table 6.4.1: Descriptive statistics of sample firms

Variable	Obs.	Mean	St. Dev.	Min.	25th Perc.	Median	75th Perc.	Max.
INFO	12606	1.019	1.122	-1.809	0.307	0.887	1.521	16.774
CSRR	12606	-0.414	2.593	-7.000	-2.000	-1.000	1.000	9.000
CSRA	12606	-0.169	0.647	-1.667	-0.533	-0.200	0.050	2.500
CSRF	12606	0.001	0.941	-2.629	-0.414	-0.064	0.297	3.704
CSRW	12606	0.002	0.707	-4.746	-0.213	0.100	0.317	3.607
CSRE	12606	0.007	1.332	-5.142	-0.433	0.226	0.669	3.462
TCSR	12606	-0.396	2.012	-8.000	-2.000	0.000	1.000	11.000
TCSRW	12606	0.004	0.707	-4.705	0.720	0.072	0.339	3.525
TCSRW	12606	-0.036	0.917	-5.363	-0.017	-0.017	-0.017	5.155
ICSR	12606	-0.003	1.320	-8.000	0.000	0.000	0.000	9.000
ICSRA	12606	0.010	0.327	-1.690	0.000	0.000	0.000	3.000
ICSRP	12606	0.126	1.141	-0.353	-0.353	-0.353	-0.353	6.995
BETA	12606	0.914	0.418	-0.351	0.636	0.878	1.149	3.622
MB	12606	2.823	1.911	0.856	1.467	2.173	3.483	8.018
ROE	12606	0.076	0.180	-0.433	0.031	0.106	0.175	0.348
LEV	12606	0.191	0.166	0.000	0.026	0.179	0.296	0.929
SIZE	12606	7.547	1.564	2.111	6.408	7.377	8.500	13.348
ADOP	12606	1.174	0.458	0.693	0.693	1.609	1.609	1.792
ADTR	12606	1.425	0.111	0.000	1.386	1.386	1.386	1.609
ANCOV	7746	2.192	0.738	0.693	1.609	2.197	2.708	4.290
ANREC	7746	1.267	0.155	0.000	1.179	1.281	1.371	1.609

Descriptive statistics of all the sample firms containing data from 2000 to 2012. *INFO* is informativeness constructed using equation (4.25). *CSRR* is CSR index constructed adding Raw scores, *CSRA* is adjusted CSR, *CSRF* is CSR using first component of PCA, *CSRE* is CSR using equally weighted selected components of PCA, *CSRW* is CSR using weighted scores of selected components of PCA. *BETA* is systemic risk, *MB* is Market-to-Book ratio, *ANCOV* is analyst coverage, *ANREC* is analyst recommendations, *ADOP* is auditor opinion on internal controls, *ADTR* is auditor opinion on reporting, ROE is return on equity, *LEV* is leverage, *SIZE* is size,

Table 6.4.1 shows descriptive statistics of overall sample firms. Average logarithmically transformed value of informativeness is 1.019 with standard deviation of 1.122. Average CSR score (raw) is -0.414. All other variables are in normal range.

To better understand the descriptive properties of data Table 6.4.2 reports the summary of descriptive statistics of size-based subsamples. In Table 6.4.2 from Panel A to C, small firms, medium firms and large firms along with the Kruskal and Wallis (1952) difference in mean test of all the variable for three subsamples are given. Kruskal and Wallis (1952) test results highlight the

significant differences among the three subsamples. All variables are significantly different in three subsamples except Auditors' opinion and few measures of CSR validating our approach to analyze our data on a size-based subsample. Aside from the raw CSR score, all three subsamples report a different behavior in terms of TCSR and ICSR. In line with legitimacy theory, larger firms report a higher score in CSR while medium and small firms lag behind each other which shows larger firms engage more in CSR activities to gain higher legitimacy. In terms of control variables, future growth potential is measured by market-to-book ratio and is highest among large firms. Small firms reported a zero return-on-equity during the sample period. Large firms were more profitable as compared to medium sized firms during the same time-period. Large size firms have more leverage, as measured by long-term debt, as compared with medium and small sized firms.

Systematic risk of small firms is slightly higher than the average risk of the market while medium and large sized firms show lower systematic risk as compared with the benchmark. Audit opinion scores show that small firms have a higher level of auditors' trust as compared with medium and large sized firms. In terms of analyst coverage, large firms enjoy more coverage as compared with medium and small firms while analyst recommendation score shows an almost similar pattern across subsamples.

These descriptive statistics support our arguments regarding the differences in variable behavior for small medium and large firms as shown by the Kruskal and Wallis (1952) test.

Table 6.4.2: Descriptive statistics of small, medium, large size firms, and K-Wallis test results

Variable	Small Size Firms			Medium Size Firms			Large Size Firms			K-Wallis test (Chi^2 value)		
	Obs.	Mean	St.Dev.	Obs.	Mean	St.Dev.	Obs.	Mean	St.Dev.	S vs M	S vs L	M vs L
INFO	4305	1.19	1.13	4160	0.85	1.04	4141	1.01	1.16	231.1***	73.3***	39.7***
CSRR	4305	-0.65	1.70	4160	-0.68	2.10	4141	0.10	3.55	1.5	63.2***	74.3***
CSRA	4305	-0.21	0.45	4160	-0.20	0.53	4141	-0.10	0.88	0.03	0.6	0.9
CSRF	4305	-0.04	0.52	4160	-0.08	0.72	4141	0.13	1.37	13.9***	5.3**	20.6***
CSRW	4305	0.17	0.38	4160	0.04	0.51	4141	-0.22	1.01	204.8***	654.5***	234.4***
CSRE	4305	0.37	0.75	4160	0.10	1.01	4141	-0.46	1.85	223.5***	740.8***	272.2***
TCSR	4305	-0.61	1.50	4160	-0.62	1.68	4141	0.05	2.61	0.6	113.7***	119.7***
TCSRA	4305	-0.21	0.41	4160	-0.20	0.44	4141	-0.12	0.63	0.1	18.3***	14.5***
TCSRW	4305	0.18	0.48	4160	0.03	0.57	4141	-0.21	0.94	220.5***	672.8***	219.3***
ICSR	4305	-0.04	0.60	4160	-0.07	0.97	4141	0.10	1.99	1.5	21.6***	26.7***
ICSRA	4305	-0.04	0.60	4160	-0.07	0.97	4141	0.10	1.99	1.4	0.9	2.9*
ICSRW	4305	-0.04	0.42	4160	-0.07	0.69	4141	0.00	1.38	8.7***	0.4	5.8**
BETA	4305	1.06	0.43	4160	0.95	0.40	4141	0.73	0.36	180.4***	1460.8***	772.8***
MB	4305	2.30	1.73	4160	2.79	1.80	4141	3.40	2.04	360.6***	1006.8**	237.6***
ROE	4305	0.00	0.20	4160	0.09	0.16	4141	0.15	0.14	568.5***	1643.2***	406.6***
LEV	4305	0.16	0.18	4160	0.20	0.17	4141	0.21	0.14	176.3***	360.4***	14.7***
SIZE	4305	6.00	0.70	4160	7.40	0.49	4141	9.30	1.05	5382.7***	6330.6***	5712.7***
ADOP	4305	1.23	0.45	4160	1.18	0.46	4141	1.11	0.46	24.2***	114.4***	32.9***
ADTR	4305	1.42	0.12	4160	1.43	0.11	4141	1.43	0.10	0.2	0.4	0.0
ANCOV	2418	1.74	0.65	2481	2.13	0.67	2847	2.64	0.59	397.2***	1866.7***	766.9***
ANREC	2418	1.28	0.18	2481	1.27	0.16	2847	1.26	0.12	4.6**	31.6***	15.6***

Descriptive statistics small, medium, and large size sample firms containing data from 2000 to 2012. *INFO* is informativeness constructed using equation (4.25). *CSRR* is CSR index constructed adding Raw scores, *CSRA* is adjusted CSR, *CSRF* is CSR using first component of PCA, *CSRE* is CSR using equally weighted selected components of PCA, *CSRW* is CSR using weighted scores of selected components of PCA. *ICSR, ICSRA* and *ICSRW* is institutional CSR from Raw, Adjusted and weighted component of PCA respectively. *TCSRR, TCSRA* and *TCSRW* is technical CSR from Raw, Adjusted and weighted component of PCA respectively. *BETA* is systemic risk, *MB* is Market-to-Book ratio, *ANCOV* is analyst coverage, *ANREC* is analyst recommendations, *ADOP* is auditor opinion on internal controls, *ADTR* is auditor opinion on reporting, ROE is return on equity, *LEV* is leverage, *SIZE* is size.

6.5   Empirical Methodology

The relationship between CSR activities and stock price informativeness persists over time and is contemptuously correlated[27]. Unobservable heterogeneity problems may arise due to the unobservable differences among firms that do not vary over time and which directly affect the levels of informativeness of each firm. The panel data model offers useful opportunities for taking these latent characteristics of firms into account by modeling them as individual effects which can then be eliminated. To test the proposed hypotheses, we used the Generalized Method of Moments (GMM) estimator developed by Arellano and Bond (1991). The GMM model can be specified as:

$$INFO_{it} = \alpha + \partial INFO_{it-1} + \beta_1 CSR_{it} + \beta_2 SIZE_{it} + \beta_3 CSR \times SIZE_{it} + \sum_{i=1}^{n} \gamma_i X_{it} + \varepsilon_{it} \qquad (6.1)$$

where the dependent variable $INFO_{it}$ measures price informativeness, and the estimated non-synchronicity of stock returns, for firm i at time t, with $i = 1, \dots, N$ and $t = 1, \dots, T$. N denotes the number of cross-sectional observations and T the length of the sample period. The model further consists of a constant term, measured by the scalar α, and of a vector of $k \times 1$ slope parameters (β) that estimates the size of the explanatory variables. The explanatory variables are divided into $1 \times k$ vectors of firm-specific, market-specific and expert opinion-specific variables, where k refers to the number of slope parameters for the different variable classes. The coefficient (β_0) of the 'one-period lagged dependent variable' measures the adjustment speed of stock price informativeness to equilibrium. A value of ∂ between 0 and 1 implies that informativeness will eventually return to their equilibrium but some degree of informativeness persistence exists.

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[27] The level of informativeness of a stock is inversely related to the stock price momentum. The persistence or momentum in stock prices is tested extensively in finance literature. See for example, Fama and French (1988), Lo and MacKinlay (1988), Poterba and Summers (1988), and Jegadeesh (1990).

The choice of Arellano and Bond (1991) as an estimation technique is superior because of following issues;

a) There are multiple independent variables (treated as control variables) in equation (6.1) and are all treated as exogenous. But there are possibilities that one or more independent variable become endogenous resulting in a correlated error term with potential endogenous variables.

b) Time in-variant characteristics of firms, such as demography and geography, may be correlate with explanatory variables. These fixed effects are enclosed in the error term ε_{it} in equation (6.1), which comprises of firm-specific unobservable effects, ϵ_i, and observation-specific errors, v_{it}.

$$\varepsilon_{it} = \epsilon_i + v_{it} \tag{6.2}$$

c) The presence of persistence and adjustment of information diffusion (lagged variable of dependent variable) may result in autocorrelation.

d) The dataset has less number of years, T, in comparison to the number of firms, N.

To deal with issue (a) the first choice is to use two-stage least square (2SLS) estimation using fixed-effect instrumental variable estimation. 2SLS estimation is very sensitive to the choice of exogenous instruments. If exogenous instruments are weak then a fixed-effect instrumental variable approach gives biased estimates just like the OLS approach. In such situations, Arellano and Bond (1991) difference GMM estimator is suitable and give unbiased estimates. Arellano and Bond (1991) GMM estimation uses first-difference of all the independent variables as instrumental variables resulting into optimal remedy for potential endogenous explanatory variable problem.

To deal with issue (b) (fixed effects) the difference GMM uses first difference of equation (6.1) into;

$$\Delta INFO_{it} = \partial \Delta INFO_{it-1} + \beta_1 \Delta CSR_{it} + \beta_2 \Delta SIZE_{it} + \beta_3 \Delta (CSR \times SIZE)_{it} +$$

$$\sum_{i=1}^{n} \gamma_i \Delta X_{it} + \Delta \varepsilon_{it} \tag{6.3}$$

By transforming the equation to first difference firm-specific fixed affects are removed because in this situation it does not vary with time. From equation (6.2) we get;

$$\Delta \varepsilon_{it} = \Delta \epsilon_i + \Delta v_{it} \tag{6.4}$$

Or;

$$\varepsilon_{it} - \varepsilon_{it-1} = \epsilon_i - \epsilon_i + v_{it} - v_{it-1} = v_{it} - v_{it-1} \tag{6.5}$$

To deal with problem (c) first-difference lagged dependent variable is also instrumented with its past levels.

Problem (d) is specifically addressed and resolved Arellano and Bond (1991) GMM approach which deals with small T and large N problems. In panels where T's are large and N's are small a shock in firm's specific effect will ultimately be diminished over time. But this cannot be happening in panels where T's are small and N's are large (as in the dataset under this study). Similarly, the autocorrelation of the dependent variable will be insignificant (see Roodman, 2009). Therefore, the use of Arellano and Bond (1991) GMM is not necessary for samples with large T's and small N's.

6.6 Empirical estimation and results

This section reports the estimation results for the empirical model as developed in Equation (6.1) on the impact of engagement in CSR activities on stock-price informativeness. To test the suitability of Arellano-Bond dynamic panel model, Arellano-Bond (1991) suggested a test for serial correlation in the first-differenced residuals. Following Arellano-Bond, we tested the null hypothesis that there is no serial correlation in first difference error terms (AR (1) statistics in lower panel of Table 6.6.1, 6.6.2 and 6.6.3) and there is no serial correlation in second difference error terms (AR (2) statistics in lower panel of Table 6.6.1, 6.6.2 and 6.6.3). For suitability of the model estimation there should be significant first order autocorrelation but there should not be second order autocorrelation. Test results are presented in last three rows of tables 6.6.1, 6.6.2 and 6.6.3. Test results indicate a significant first order autocorrelation however, there is no evidence of second order autocorrelation as reported by insignificant test results for all the models. The significance of the first order autocorrelation and absence of second order correlation suggesting that model choice is suitable for this dataset. Significant Chi-2 value of Wald test (given in lower panel of Table 6.6.1, 6.6.2 and 6.6.3) also provide evidence of model significance in all the estimations.

Table 6.6.1 reports the estimation results based on five alternative CSR measures: unadjusted (Raw) CSR, adjusted CSR, first component PCA CSR, equally weighted PCA CSR and weighted average PCA CSR in Panels A to E respectively. The coefficient of $INFO_{it-1}$ is positive and significant with values between the range of zero and one suggesting the presence of persistency in the level of informativeness. This further confirms the appropriateness of using dynamic panel data estimation methodology for empirical analysis.

Among the results, the coefficient of CSR is positive and significant irrespective of the CSR measure used. This suggests that a higher level of involvement in positive CSR may leads to higher stock prices informativeness. Coefficient of CSRRit shows value of 0.449 showing that 1 unit increase in raw CSR score may leads to .449% increase in the logarithmically transformed measure of stock price informativeness. This shows that CSR engagements help mitigate information asymmetry between shareholders and management and results in higher stock price informativeness. The coefficient of SIZE×CSR interaction is negative and significant irrespective of what CSR measure is used for estimations. In line with legitimacy theory, this suggests that the size of firm impacts the relationship between CSR and stock price informativeness; marginal contributions of CSR in stock price informativeness declines as firms get bigger during the sample period. This can also be explained by the fact that firms larger in size are usually followed by more analysts and also disseminate more information as compared with small and medium sized firms. Therefore, the stock price of larger firms is more aligned with that of the market. This result also validates the theoretical claim by Udayasankar (2008) that expected benefits of CSR participation differs according to size. Our result show that indeed this is true in the case of the CSR-informativeness relationship. Financial crisis dummy is negative and significant which supports the argument that during the financial crisis overall stock price informativeness declined.

Among market-based control variables, the coefficient of $BETA_{it}$ is negative and significant showing that as systematic risk increases, firm-level information diffusion decreases. MBit is positive and significant in small size firms irrespective of the CSR measure used, validating the argument that growth stocks grab more investor attention and thus spreads more firm-specific information. The coefficient of $DivD_{it}$ is positive and significant suggesting that dividend-paying firms exhibit higher levels of price informativeness.

Table 6.6.1: Regression results with interactive term of CSR and Size under Arellano-Bond

VARIABLES	(1) $INFO_{it}$	(2) $INFO_{it}$	(3) $INFO_{it}$	(4) $INFO_{it}$	(5) $INFO_{it}$
CSR index	$CSRR_{it}$	$CSRA_{it}$	$CSRF_{it}$	$CSRE_{it}$	$CSRW_{it}$
$INFO_{it-1}$	0.278***	0.286***	0.279***	0.281***	0.280***
	(0.0177)	(0.0180)	(0.0176)	(0.0176)	(0.0176)
$CSRR_{it}$	0.449***	1.590***	0.997***	0.527***	1.039***
	(0.0387)	(0.123)	(0.129)	(0.0761)	(0.147)
$CSR \times SIZE_{it}$	-0.0483***	-0.160***	-0.111***	-0.0587***	-0.115***
	(0.00434)	(0.0137)	(0.0139)	(0.00827)	(0.0159)
$BETA_{it}$	-1.874***	-1.892***	-1.876***	-1.870***	-1.871***
	(0.0749)	(0.0739)	(0.0756)	(0.0759)	(0.0759)
MB_{it}	0.102***	0.104***	0.104***	0.107***	0.107***
	(0.0185)	(0.0184)	(0.0186)	(0.0186)	(0.0186)
ROE_{it}	-0.169*	-0.134	-0.168*	-0.173*	-0.173*
	(0.0956)	(0.0950)	(0.0966)	(0.0967)	(0.0968)
LEV_{it}	-0.242	-0.330	-0.212	-0.221	-0.220
	(0.243)	(0.242)	(0.245)	(0.245)	(0.245)
$SIZE_{it}$	-0.0803*	-0.107**	-0.0601	-0.0628	-0.0625
	(0.0435)	(0.0431)	(0.0437)	(0.0438)	(0.0438)
$ADOP_{it}$	-0.0701***	-0.0923***	-0.0654***	-0.0735***	-0.0725***
	(0.0228)	(0.0225)	(0.0228)	(0.0227)	(0.0228)
$ADTR_{it}$	0.238**	0.269**	0.262**	0.287**	0.285**
	(0.120)	(0.119)	(0.119)	(0.120)	(0.120)
$ANCOV_{it}$	0.113***	0.110***	0.117***	0.121***	0.120***
	(0.0266)	(0.0265)	(0.0269)	(0.0271)	(0.0271)
$ANREC_{it}$	-0.276***	-0.275***	-0.297***	-0.304***	-0.303***
	(0.0711)	(0.0714)	(0.0702)	(0.0695)	(0.0695)
$DivD_{it}$	0.154**	0.146**	0.166***	0.177***	0.177***
	(0.0617)	(0.0625)	(0.0638)	(0.0655)	(0.0653)
$ICRISIS$	-0.203***	-0.207***	-0.190***	-0.184***	-0.184***
	(0.0485)	(0.0485)	(0.0485)	(0.0487)	(0.0486)
GFC	-0.382***	-0.382***	-0.378***	-0.369***	-0.370***
	(0.0203)	(0.0201)	(0.0202)	(0.0200)	(0.0201)
Constant	2.606***	2.830***	2.364***	2.279***	2.282***
	(0.382)	(0.380)	(0.383)	(0.385)	(0.385)
Observations	5,990	5,990	5,990	5,990	5,990
Number of Firms	777	777	777	777	777
AR(1)	-13.92***	-13.87***	-14.13***	-14.20***	-14.18***
AR(2)	0.861	0.599	0.998	0.927	0.980
Chi^2	1370***	1441***	1335***	1318***	1322***

Regression results of equation (6.3) with interactive term of CSR and Size under Arellano-Bond dynamic panel-data estimation. Standard errors are robust and clustered on firm level. The independent variable CSR in Panel A to E is CSRR, CSRA, CSRF, CSRE and CSRW. Variable description has been provided in label of Table 6.4.2. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 6.6.2: Regression results of Arellano-Bond dynamic panel-data estimation and without interactive term

	(1)			(2)			(3)			(4)			(5)		
Dep. Var.	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$
CSR index	CSRR	CSRR	CSRR	CSRA	CSRA	CSRA	CSRF	CSRF	CSRF	CSRE	CSRE	CSRE	CSRW	CSRW	CSRW
Firm Size	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large
$INFO_{it-1}$	0.148***	0.122***	0.289***	0.152***	0.144***	0.297***	0.160***	0.109***	0.286***	0.159***	0.108***	0.289***	0.159***	0.108**	0.289***
	(0.0352)	(0.0422)	(0.0300)	(0.0356)	(0.0428)	(0.0305)	(0.0371)	(0.0420)	(0.0297)	(0.0380)	(0.0419)	(0.0298)	(0.0379)	(0.0420)	(0.0298)
$CSRR_{it}$	0.210***	0.117***	-0.0280**	0.697***	0.507***	0.0207	0.627***	0.207**	-0.101***	0.295***	0.108**	-0.0594***	0.583***	0.212**	-0.116***
	(0.0234)	(0.0236)	(0.0128)	(0.0692)	(0.0745)	(0.0450)	(0.0901)	(0.0864)	(0.0287)	(0.0533)	(0.0453)	(0.0213)	(0.105)	(0.0915)	(0.0405)
$CSR{\times}SIZE_{it}$	-1.515***	-1.300***	-2.296***	-1.555***	-1.332***	-2.272***	-1.521***	-1.303***	-2.307***	-1.537***	-1.305***	-2.286***	-1.540***	-1.304***	-2.290***
	(0.131)	(0.149)	(0.199)	(0.127)	(0.146)	(0.195)	(0.136)	(0.153)	(0.196)	(0.142)	(0.154)	(0.198)	(0.142)	(0.154)	(0.198)
$BETA_{it}$	0.0911**	0.0976**	0.0876***	0.0756**	0.0936**	0.0952***	0.0818**	0.104**	0.0817***	0.0893**	0.103**	0.0824***	0.0901**	0.104**	0.0812***
	(0.0355)	(0.0438)	(0.0297)	(0.0368)	(0.0425)	(0.0301)	(0.0359)	(0.0445)	(0.0293)	(0.0382)	(0.0447)	(0.0297)	(0.0383)	(0.0447)	(0.0295)
MB_{it}	0.225	-0.561***	-0.149	0.211	-0.548***	-0.187	0.234	-0.568***	-0.101	0.248	-0.573***	-0.124	0.255	-0.576***	-0.116
	(0.216)	(0.215)	(0.243)	(0.218)	(0.205)	(0.247)	(0.223)	(0.219)	(0.241)	(0.240)	(0.219)	(0.241)	(0.239)	(0.219)	(0.240)
ROE_{it}	-0.0552	-0.320	-0.457	-0.204	-0.324	-0.580	-0.0229	-0.397	-0.353	-0.0918	-0.378	-0.386	-0.106	-0.383	-0.376
	(0.307)	(0.559)	(0.506)	(0.308)	(0.532)	(0.516)	(0.309)	(0.580)	(0.503)	(0.336)	(0.586)	(0.504)	(0.336)	(0.586)	(0.505)
LEV_{it}	-0.108	0.00119	0.0203	-0.0978	-0.00177	-0.0134	-0.0908	-0.0217	0.0433	-0.117	-0.0255	0.0425	-0.118	-0.0257	0.0450
	(0.0755)	(0.0901)	(0.0907)	(0.0773)	(0.0891)	(0.0929)	(0.0792)	(0.0916)	(0.0907)	(0.0812)	(0.0927)	(0.0911)	(0.0810)	(0.0930)	(0.0912)
$SIZE_{it}$	0.00643	-0.0384	-0.0735	0.0108	-0.0510	-0.107*	-0.0193	-0.0448	-0.0609	-0.0210	-0.0552	-0.0641	-0.0198	-0.0552	-0.0612
	(0.0526)	(0.0471)	(0.0544)	(0.0511)	(0.0468)	(0.0549)	(0.0552)	(0.0475)	(0.0535)	(0.0582)	(0.0479)	(0.0541)	(0.0580)	(0.0480)	(0.0542)
$ADOP_{it}$	-0.258	-0.0619	0.750***	-0.213	-0.0466	0.737***	-0.252	0.0151	0.756***	-0.193	0.0269	0.770***	-0.192	0.0254	0.769***
	(0.268)	(0.231)	(0.245)	(0.259)	(0.227)	(0.244)	(0.272)	(0.229)	(0.245)	(0.289)	(0.228)	(0.243)	(0.288)	(0.228)	(0.243)
$ADTR_{it}$	0.142***	0.154***	0.00234	0.141**	0.143***	-0.0100	0.171***	0.155***	0.00834	0.180***	0.161***	0.00852	0.178***	0.161***	0.0100
	(0.0546)	(0.0556)	(0.0643)	(0.0556)	(0.0536)	(0.0641)	(0.0559)	(0.0574)	(0.0633)	(0.0598)	(0.0578)	(0.0640)	(0.0596)	(0.0578)	(0.0637)
$ANCOV_{it}$	-0.0474	-0.275**	-0.485**	-0.0766	-0.260**	-0.502**	-0.125	-0.258*	-0.483**	-0.195	-0.249*	-0.475**	-0.189	-0.248*	-0.475**
	(0.132)	(0.130)	(0.215)	(0.132)	(0.130)	(0.214)	(0.129)	(0.136)	(0.213)	(0.132)	(0.137)	(0.212)	(0.132)	(0.137)	(0.212)
$ANREC_{it}$	0.210*	0.0414	0.0801	0.226**	0.0524	0.0611	0.233**	0.0314	0.0748	0.242*	0.0319	0.0699	0.240*	0.0328	0.0791
	(0.109)	(0.124)	(0.152)	(0.112)	(0.124)	(0.153)	(0.117)	(0.127)	(0.151)	(0.129)	(0.130)	(0.151)	(0.129)	(0.130)	(0.149)
$DivD_{it}$	-0.171*	-0.214***	-0.0864	-0.199*	-0.198**	-0.105	-0.220**	-0.208***	-0.0772	-0.264***	-0.203**	-0.0732	-0.265***	-0.203**	-0.0757
	(0.102)	(0.0782)	(0.0744)	(0.102)	(0.0773)	(0.0746)	(0.108)	(0.0794)	(0.0744)	(0.0993)	(0.0792)	(0.0750)	(0.0996)	(0.0792)	(0.0746)
$ICRISIS$	-0.266***	-0.223***	-0.397***	-0.279***	-0.238***	-0.383***	-0.267***	-0.218***	-0.410***	-0.244***	-0.213***	-0.404***	-0.245***	-0.213***	-0.406***
	(0.0419)	(0.0432)	(0.0361)	(0.0421)	(0.0426)	(0.0364)	(0.0432)	(0.0433)	(0.0361)	(0.0440)	(0.0432)	(0.0359)	(0.0439)	(0.0433)	(0.0360)
Constant	3.243***	2.001**	1.587	3.265***	2.067***	1.994*	3.106***	2.009**	1.353	3.109***	1.985**	1.282	3.119***	1.990**	1.253
	(0.578)	(0.779)	(1.001)	(0.581)	(0.775)	(1.019)	(0.589)	(0.795)	(1.000)	(0.613)	(0.793)	(1.012)	(0.611)	(0.796)	(1.015)
Observations	1,567	1,855	2,568	1,567	1,855	2,568	1,567	1,855	2,568	1,567	1,855	2,568	1,567	1,855	2,568
No. of firms	392	441	348	392	441	348	392	441	348	392	441	348	392	441	348
AR(1)	-5.842***	-6.160***	-9.021***	-5.711***	-6.080***	-9.104***	-5.904***	-6.334***	-9.034***	-6.086***	-6.386***	-9.037***	-6.089***	-6.382***	-9.039***
AR(2)	-0.752	-0.237	0.266	-0.850	-0.261	-0.187	-0.653	0.0392	0.629	-0.579	0.0378	0.513	-0.598	0.0606	0.577
Chi^2	301.1***	168.4***	433.5***	345.5***	200.6***	435.7***	261.6***	147.2***	440.9***	226.3***	148.7***	435.7***	226.6***	148.3***	436.9***

This table depicts regression results of equation (6.3) under Arellano-Bond dynamic panel-data estimation and without interactive term. Standard errors are robust and clustered on firm level. (1) Raw, (2) adjusted, (3) first PC, (4) equally weighted PC and (5) weighted PC measures of CSR are given in Panels 1 to 5 respectively. $INFO_{it-1}$ is lag of dependent variable under dynamic settings. *BETA* is systemic risk, *MB* is Market-to-Book ratio, *DivD* is dividend payment dummy, *ANCOV* is analyst coverage, *ANREC* is analyst recommendations, *ADOP* is auditor opinion on internal control, *ADTR* is auditor opinion on reporting, *ROE* is return on equity, *LEV* is leverage, *SIZE* is size, *ICRISIS* and *GFC* are dummies for dotcom and financial crisis respectively. Sample period is 2000-2012. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Among financial statement-based control variables, the coefficient ROE_{it} is negative and slightly significant suggesting that firm-specific information diffusion decreases with the increase in profitability. This also suggest that when firms become less profitable investors do higher scrutiny and incorporate more firm specific information in stock prices. The coefficient on LEV_{it} is insignificant among all models. This suggests that stock informativeness is not highly sensitive to the 'financial statement-based risk' variable. This can be attributed to the historical nature of this information. The coefficient on $SIZE_{it}$ is negative, albeit slightly significant depending upon which CSR measure has been used, suggesting that stock price informativeness decreases with an increase in the size of firms. This also indicates that smaller firms can send positive signals to the market by involvement in CSR activities. To further understand the size of CSR relationships, we used an interactive term which is a product of CSR measure and size. The coefficient of $SIZE_{it}$-CSR_{it} interaction is also negative confirming that information diffusion is inversely related with the size of firms. Financial crisis and internet crisis dummy is negative and significant thus supporting the argument that during the crises time periods overall stock price informativeness declines due to market panic.

The direction and significance of covariates on 'expert opinion' control variables are generally consistent with expectations. The coefficient of 'analyst coverage' (ANCOVit) is positive and significant suggesting that high analyst coverage results in better information dissemination. This can be attributed to the fact that information collection and processing increases as the number of analysts covering the firm increase. The coefficient of $ANROC_{it}$ is negative and significant irrespective of what CSR measures are used implying that investors do not see strong recommendations by analysts as a mitigating factor. A plausible explanation for the negative coefficient may be the diversity of recommendations by analysts. Surprisingly, the

auditors related variables ($ADOP_{it}$ and $ADTR_{it}$) to capture the impact of quality of internal controls and financial reporting showed mixed results. Auditors' opinion on financial reports ($ADOP_{it}$) is negative while auditors' trust on reporting $ADTR_{it}$ is positively significant. Combining both the results it can be suggested that investor incorporate internal control related information but quaility of financial reporting does not necessarily reflect better information diffusion. The negative association can be attributed to the free access to auditors' reports available to all investors. It also suggests that investors' access to reliable public information improves price efficiency.

In summary, the empirical results suggest that a higher level of CSR engagement (and disclosure) significantly increases firm-specific price informativeness. However, it is unclear whether such a relationship is uniform among all firms irrespective of size especially in the presence of a negative significant relationship of informativeness with interactive term (CSR×Size). These findings warrant further investigation as to how the level of CSR activities affect the price informativeness based on the size of firms. To test our third hypothesis, we repeat our estimations by dividing the sample into three subsamples: large, medium and small firms and results are reported in Table 6.6.2. Similar to our results for overall firms, we used five different measures to construct a CSR index.

One of the major differences in estimation results of the subsample from that of the overall sample is the change in sign and level of significance for coefficients of CSR_{it} with informativeness of large firms. From Table 6.6.2 it is evident that magnitude of CSR coefficient is higher in small size firms as compared to medium size firms while there is a shift in the direction of CSR coefficient from positive to negative in large size firms. This highlights the role of CSR in increasing stock price informativeness in small and medium size firms while decreasing in large

size firms. This suggest that as CSR engagement by large size firms results in higher synchronization of large companies with the market. It can also be argued that higher CSR engagement by large size firm leads to legitimization of their businesses which results reduced scrutiny and increases market synchronization. Findings also can be attributed to the coverage that large companies usually receive from media and analysts. This is further confirmed by the insignificance of analyst recommendation variables (ANRECit) for small and marginally significant for medium firms irrespective of the CSR measure used. This suggests that small and medium firms, by engaging in CSR activities, send positive signals to investors and thus reduce information asymmetry. These highly significant results validate our argument that the size of firms play a moderating role in the CSR-informativeness relationship. Magnitude of the positive effect of CSR on informativeness is high for smaller firms in comparison to medium size firms indicating that with the increase in firm size, the positive effect of CSR on informativeness diminishes and even reach negative for large size firms.

Overall, empirical estimation found in Table 6.6.2 highlights important differences on the level of informativeness based on the size of firms. The impact of engagement in CSR is more pronounced for smaller firms as compared with larger firms. The level of informativeness is positively associated with the return-on-equity for smaller firms while analyst recommendations are significant for medium and larger firms only.

For testing our third and fourth hypothesis, we regress technical and institutional CSR on informativeness along with all control variables. our equation is as follows:

$$Info_{it} = \alpha + \beta_0 Info_{it-1} + \beta_1 TCSR_{it} + \beta_2 ICSR_{it} + \sum_{i=1}^{n} \gamma_i X_{it} + \varepsilon_{it} \qquad (6.6)$$

where TCSRit is technical CSR while ICSRit is institutional CSR and X_{it} is vector of control variables. Table 6.6.3 presents the estimation results based on Equation 6.6. With additive CSR measures, TCSRit is positively increasing firm-specific information diffusion while ICSRit is significantly decreasing stock price informativeness irrespective of which CSR measure has been used. By reading these two findings together it suggests that TCSRit is more relevant in CSR-informativeness relationships while ICSRit is assumed by investors as less value generating as indicated by the agency theory perspective of CSR.

Table 6.6.3: Regression results under Arellano-Bond dynamic panel-data estimation

	(1) CSRR			(2) CSRA			(3) CSRW		
Dep. Var.	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$	$INFO_{it}$
Firm Size	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large
$INFO_{it-1}$	0.137***	0.132***	0.271***	0.145***	0.136***	0.291***	0.148***	0.119***	0.270***
	(0.0316)	(0.0320)	(0.0226)	(0.0327)	(0.0323)	(0.0233)	(0.0329)	(0.0317)	(0.0226)
$TCSR_{it}$	0.222***	0.162***	0.0506***	0.740***	0.552***	0.132***	0.582***	0.391***	0.175***
	(0.0180)	(0.0150)	(0.0124)	(0.0515)	(0.0581)	(0.0486)	(0.0556)	(0.0402)	(0.0301)
$ICSR_{it}$	-0.209***	-0.159***	-0.140***	-0.375**	-0.184	-0.162***	-0.263***	-0.218***	-0.216***
	(0.0609)	(0.0295)	(0.0123)	(0.186)	(0.141)	(0.0626)	(0.102)	(0.0442)	(0.0178)
$BETA_{it}$	-1.637***	-1.357***	-2.469***	-1.650***	-1.368***	-2.482***	-1.635***	-1.382***	-2.484***
	(0.112)	(0.107)	(0.126)	(0.111)	(0.107)	(0.130)	(0.116)	(0.111)	(0.128)
MB_{it}	0.0745**	0.0869***	0.0659***	0.0722**	0.0889***	0.0883***	0.0795**	0.0892***	0.0705***
	(0.0343)	(0.0334)	(0.0191)	(0.0344)	(0.0335)	(0.0194)	(0.0340)	(0.0335)	(0.0192)
ROE_{it}	0.0991	-0.479***	-0.0905	0.113	-0.523***	-0.176	0.0681	-0.525***	-0.0873
	(0.158)	(0.130)	(0.152)	(0.158)	(0.135)	(0.155)	(0.154)	(0.129)	(0.153)
LEV_{it}	-0.110	-0.147	-0.446	-0.215	-0.197	-0.625*	-0.0758	-0.142	-0.501
	(0.281)	(0.510)	(0.309)	(0.284)	(0.511)	(0.321)	(0.291)	(0.503)	(0.312)
$SIZE_{it}$	-0.0972	0.0388	0.00874	-0.101	0.0118	-0.0500	-0.101	0.0202	-0.0201
	(0.0633)	(0.0650)	(0.0626)	(0.0635)	(0.0658)	(0.0653)	(0.0637)	(0.0659)	(0.0639)
$ADOP_{it}$	-0.00202	-0.0554*	-0.0415	-0.0107	-0.0661**	-0.104***	-0.0367	-0.0844**	-0.0633*
	(0.0429)	(0.0330)	(0.0347)	(0.0416)	(0.0333)	(0.0363)	(0.0438)	(0.0331)	(0.0350)
$ADTR_{it}$	-0.217	-0.241	0.712***	-0.181	-0.191	0.795***	-0.227	-0.242	0.627***
	(0.205)	(0.172)	(0.182)	(0.200)	(0.165)	(0.179)	(0.217)	(0.167)	(0.183)
$ANCOV_{it}$	0.154***	0.143***	0.0433	0.165***	0.140***	0.0264	0.184***	0.150***	0.0427
	(0.0444)	(0.0369)	(0.0380)	(0.0442)	(0.0369)	(0.0391)	(0.0451)	(0.0376)	(0.0376)
$ANREC_{it}$	-0.125	-0.268***	-0.320**	-0.144	-0.281***	-0.382***	-0.212**	-0.282***	-0.302**
	(0.109)	(0.0837)	(0.131)	(0.109)	(0.0870)	(0.133)	(0.103)	(0.0848)	(0.131)
$DivD_{it}$	0.202**	0.0484	0.0587	0.182**	0.0643	0.0607	0.254***	0.0225	0.0251
	(0.0865)	(0.103)	(0.0964)	(0.0889)	(0.0958)	(0.0967)	(0.0903)	(0.105)	(0.0965)
$ICRISIS$	-0.140	-0.191***	-0.156***	-0.169	-0.196***	-0.182***	-0.181*	-0.206***	-0.182***
	(0.115)	(0.0598)	(0.0598)	(0.111)	(0.0579)	(0.0614)	(0.106)	(0.0597)	(0.0602)
Constant	-0.296***	-0.240***	-0.445***	-0.292***	-0.247***	-0.403***	-0.249***	-0.213***	-0.433***
	(0.0369)	(0.0344)	(0.0261)	(0.0368)	(0.0339)	(0.0265)	(0.0369)	(0.0346)	(0.0262)
	3.427***	2.028***	1.612**	3.469***	2.215***	2.191***	3.255***	2.131***	2.071***
	(0.469)	(0.576)	(0.697)	(0.469)	(0.579)	(0.724)	(0.482)	(0.575)	(0.707)
Observations	1,567	1,855	2,568	1,567	1,855	2,568	1,567	1,855	2,568
No. of firms	392	441	348	392	441	348	392	441	348
AR(1)	-6.784***	-6.465***	-9.772***	-6.633***	-6.470***	-9.810***	-6.855***	-6.444***	-9.693***
AR(2)	-0.703	0.324	1.210	-0.751	-0.0875	0.0838	-0.527	0.166	0.767
Chi^2	507.6***	429.0***	1060***	571.8***	405.8***	918.0***	456.7***	391.9***	1069***

This table shows regression results of equation (6.6) under Arellano-Bond dynamic panel-data estimation. Standard errors are robust and clustered on firm level. TCSR is technical CSR, ICSR is Institutional CSR, (1) shows Raw CSR score, (2) adjusted CSR and (3) CSR through weighted components of PCA. BETA is systemic risk, MB is Market to Book ratio, DivD is dividend payment dummy, ANCOV is analyst coverage, ANREC is analyst recommendations, ADOP is auditor opinion on internal controls, ADTR is auditor opinion on reporting, ROE is return on equity, LEV is leverage, SIZE is size of firm in logarithmic term, ICRISIS and GFC are dummies for dotcom and financial crisis respectively. Sample period is 2000-2012. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

6.7   Summary and conclusion

The economic consequences of corporate social responsibility on firm valuation is quite contentious issue. For some, the voluntary participation in CSR-related activities may be considered as philanthropic activities to enhance management influence (agency-problem view). For others, by involvement in CSR activities, management is sending a signal to the market and is seeking to reduce information asymmetry. This essay contributes in this debate and sheds light on the informativeness function of CSR. We argue that by disclosing socially responsible activities, firms attempt to increase stock price informativeness and thus mitigate information asymmetry.

To proxy overall CSR-related activity this study used a PCA approach to construct a CSR index following Schmidtlein et al., (2008). The PCA approach is preferred over the additive index and weighted additive index approaches used in recent studies[28]. Under additive approaches, CSR scores are ordinal and provide only the relative performance score of every firm but not the variation. By using the PCA approach of assigning weights to each component based on the relative correlation, not only does it provide a relative performance matrix but also helps explain the maximum variation (Goss and Roberts, 2011).

A sample of US firms for the period 2000-2012 is drawn with CSR-related data to study the CSR-informativeness relationship. We found evidence that stock prices of socially responsible firms are more informative however this informativeness is not uniform among all firms. The size of firm plays a negative moderating role in CSR-informativeness relationships suggesting that the marginal impact of CSR on informativeness decreases with an increase in the size of firms. After

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[28] Oikonomou et al., (2012); Godfrey et al., (2009); Bae et al., (2011); Verwijmeren and Derwall (2010); and El Ghoul et al., (2011) used an index of CSR activities built on the additive rule.

splitting CSR into primary (technical) and secondary (institutional) stakeholders, we have found that technical CSR positively affects informativeness while institutional CSR has negative association with informativeness. These empirical findings are in line with literature showing that CSR helps reduce information asymmetry.[29] One of the major contributions of this study is the identification of the moderating effect of firm size that has not been tested earlier. Ignoring the size of firms may cause over-estimation bias among large firms and under-estimation bias among small firms.

Our results indicate the importance of engagement in CSR activities and have important policy implications for management and investors alike. Management can use CSR-related activities to reduce information asymmetry. However, for shareholders to benefit they have to be conscientious investors who value firms that engage in socially responsible behavior.

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[29] Cho et al., (2013) and Jones and Murrell (2001) provide evidence that CSR helps reduce information asymmetry.

CHAPTER SEVEN

CSR AND THE QUALITY OF FINANCIAL REPORTING

7.1   Introduction

This essay explores whether socially responsible firms are any better in accurately presenting their financial results. Organizations and societies have experienced a paradigm shift in terms of developing and engaging in more responsible behaviors since the 1980s (Ackers and Eccles, 2015; Bhattacharya and Kaursar, 2016; Carroll and Shabana, 2010; Koh, 2013; McWilliams and Siegel, 2001; Moreira, Santa-Eulalia, Ait-Kadi and Wood-Harper and Wang 2015; Waddock, 2008; Taneja and Gupta, 2011; Searcy and Buslovich, 2014; Schere and Palazzo, 2011). As noted by Ackers and Eccles (2015, p. 518) many companies are now bowing to societal pressure and have changed their "operating paradigm from 'exploiting' to 'sustainably utilizing' resources" effectively illustrating a "shift in philosophical corporate morality". It is in this context that corporate social responsibility (CSR) is associated with contributing to a better society thus seeking to implement a form of triple bottom line reporting (economic, social and environmental) as advocated by Elkington (1998) (Aguinis and Glavas, 2012; Anholon, Quelhas, Filho, Souza Pinto, and Feher, 2016; Ferraz and Gallardo-Vazquez, 2016; Fehre and Weber, 2016).

Research by Falck and Heblich (2007) found that the core premise of Corporate Social Responsibility (CSR) is for businesses to voluntarily fulfill social expectations that go above and beyond what is required under the law or their economic function of profit-making. Being a CSR conscious firm should not simply mean to showcase charitable donations to social causes. Rather, it is more about adhering to a more socially conscious behavior whereby firms proactively seek to address concerns ranging from corporate governance to environmental, employee relations to

managerial diversity and product quality. We take this argument a bit further and ask whether CSR firms act responsibly and do not engage in dishonest, deceitful, and fraudulent practices while delivering their financial reports. If it is the case, this must be reflected through the auditors' opinion.

One of the most important functions of external auditors is to provide a fair, unbiased and independent opinion about the quality and accuracy of the financial reports of the company being audited as evident from the U.S. Supreme Court remarks in the landmark case of U.S. v. Arthur Young[30]: "The SEC requires the filing of audited financial statements in order to obviate the fear of loss from reliance on inaccurate information, thereby encouraging public investment in the Nation's industries." Since both internal and external stakeholders of firms use the audited financial statements to assist in their decision-making process, there is a need for accuracy and credibility in the financial reporting process.[31] Linking this argument with the earlier discussion that firms with superior CSR track records maintain a transparent and accurate financial reporting system. Firms also earn the auditor's trust in their financial reporting as reflected through an unqualified audit report[32].

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[30] For details see United States v. Arthur Young & Co. 465 U.S. 805 (1984): https://supreme.justia.com/cases/federal/us/465/805/

[31] External stakeholders, like investors analyze the financial reports to make their investment decisions; suppliers analyze the financial position of firms' to determine the level of future dealings, while customers analyze financial information to assess the sustainability of the firms in provision of supplies and any after-sale services. Internally, employees also use the financial information of the company so that they can decide if their future is secure and what should be their future expectations regarding job security, promotion, bonuses and other job-related issues.

[32] I am not implying by any means that auditors form their opinion based on firms' engagement in CSR activities. I strongly believe that auditors work independently and follow and appropriate audit plan with due diligence.

Figure 7.1.1: Conceptual framework demonstrating the linkage between CSR and the auditor's opinion.

Figure 7.1.1 illustrates how the financial reporting cycle of socially responsible firms differs from that of socially irresponsible firms and its ultimate impact on the auditors' opinion. This conceptual framework is based upon stakeholder theory under which firm managers do not benefit one stakeholder at the expense of another. As financial reports are the main source of information and affect almost all related stakeholders, firm management should not manipulate these reports for the sole benefit of shareholders (owners). We assume that a CSR-conscious firm, as compared with a socially irresponsible firm, follows responsible business practices that include, among others, maintaining proper financial records according to the practices of the profession. Auditors independently test the accuracy of these financial records and provide an independent opinion to all stakeholders as to the accuracy of the financial statements. We hypothesize that CSR

firms do not engage in accounting manipulation and pay more attention to the accuracy of financial records thus financial reports produced by responsible firms receive an unqualified opinion by auditors. If we assume auditors' opinion as a proxy for accounting accuracy we can say that, other things remaining unchanged, accounting reports of socially responsible firms are less likely to receive a qualified auditor's opinion.

Academic literature suggests that engagement in CSR-related activities benefit those firms through wealth enhancement and wealth protection channels. The wealth protection function states that firms with better CSR practices earn higher credit ratings (Sun and Cui, 2014) and enjoy less cost of capital (El Ghoul et al., 2011) because investors perceive fewer chances of firms failing in the near future. The provision of reliable and transparent financial reporting can be linked with CSR through the wealth protection channel of CSR. Kim et al., (2012), while examining whether socially responsible firms behave any differently in their financial reporting, found that socially responsible firms place strict constraints on both accruals and real earnings management and are more likely to provide high-quality financial disclosures. By using the 'unqualified opinion' as an indicator of the reliablity and accuracy of financial reporting, this study examines whether engagement in CSR activities helps firms to receive an 'unqualified opinion' from external auditors[33].

By using a sample of 1,219 non-financial US firms from 2000 to 2012, we found a robust evidence that more socially responsible firms deliver more transparent and accurate financial results as reflected by receiving an unqualified auditors' opinion. Results remained robust to different estimation techniques and alternative reporting quality measures. The empirical findings

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[33] To the best of author's knowledge, there is no published study that has tested the association between engagement in CSR and the auditor's opinion.

suggest the existence of social capital that CSR firms attempt to protect while disclosing public information and maintaining higher auditors' ratings. This highlights some potential benefits to investors, management and accounting professionals. Investors may consider the information of a CSR firm more reliable. Management can use the engagement in CSR activities as a mechanism to reduce information asymmetry. Furthermore, this study shows that CSR firms conform to higher standards and in the process grow their social capital.

7.2   Related Literature

The theoretical literature on CSR activities asserts that socially responsible firms comply with a stronger set of superior business practices in a socially cautious manner to benefit a broader set of stakeholders (Caroll, 1999). Jenkins (2004) suggests that socially responsible firms achieve their commercial goals in a way that honors ethical values and respects people and communities. Similarly, Morsing (2006) argues that business success is dependent upon, to a certain degree, the support from and collaboration with different stakeholder clusters. Cho et al., (2013) provided evidence that the level of engagement in CSR activities helps reduce information asymmetry. Similarly, by using an event study methodology with a sample of firms from CDP Korea for the period 2008-2009, Lee et al., (2015) provided evidence that voluntary disclosure related to environmental CSR affect stock price movement.

Healy and Palepu (2001) argue that financial reports are used to provide information about the financial position and relevant disclosures to stakeholders including investors. According to Fieseler (2011) the disclosure of engagement in CSR activities may further improve the flow of firm-specific information to outsiders thus mitigating information asymmetry and portray a better image of the firm as a responsible corporate citizen. Gelb and Strawser (2001), in an empirical

study, found that companies that are engaged in socially responsible activities provide better and/or more extensive disclosures than companies that are less focused on advancing social goals.

Kim et al., (2012), while comparing the financial reporting of CSR-conscious firms with other firms, found that CSR firms are less likely to engage in earnings management, manipulate real operating activities and be subject to regulatory investigations. Similarly, Chen et al., (2012) found that auditors may perceive lower audit risk with CSR-conscious firms and as a result may charge a lower fee as compared to firms with lower CSR performance. Furthermore, research by Lanis and Richardson (2012) and Watson (2011) showed that socially responsible firms demonstrate lower tax aggressiveness as compared to socially irresponsible firms. Tighter controls on accruals and real earnings management with lower tax aggressiveness in financial reporting practices of socially responsible firms signal ethical and responsible financial reporting.

Elias (2002) studied earnings management ethics among accountants and suggests that the ethical interpretation of earnings management is different based on the belief of the accountant towards CSR. He suggests that accountants who view CSR as a short-term profitability tool rated earnings management softly. However, accountants who view CSR as a long-term image-building tool consider earnings management to be ethically wrong and rated harshly. Since earnings management can be one of the ways for reporting manipulations, we can relate these findings with our argument that if managers take CSR as a long-term image-building tool they will avoid engagement in earnings management in their financial reporting to obtain an unqualified auditor opinion.

Market participants view audit reports as an indicator of the quality/accuracy of financial information contained in the financial reports and may consider the auditor's opinion as a pricing factor. An earlier study by Choi and Jeter (1992) found that audit reports have a potential impact

on market responsiveness to earnings by adding noise or reducing persistency of reported earnings. Herbohn et al., (2007) studied Australian listed firms from 1999 to 2003 and found evidence that audit reports are perceived and priced by markets because auditors' reports fulfil an attestation function and confirm the true financial condition of the firm.

Lee (1972) argues that the most important task of an external auditor is to increase the credibility of financial reports. If accounting information is not 'clean' and is found to be manipulated by agents, auditors have a duty to indicate this in their audit opinion. Flint (1988) argues that auditing is a social control mechanism for securing accountability.

Based upon our conceptual model given in Figure 7.1.1 and after reviewing related literature we hypothesize that;

H8: All else being the same, firms with higher CSR score have higher probability of getting an unqualified audit opinion.

7.3   Covariate definitions

To test our hypothesis, we develop the following covariates.

7.3.1   Auditor Opinion on Financial Reporting (ADTR$_{it}$)

To test our hypothesis, we used auditor opinion on Financial Reporting (ADOPit) as a dependent variable. The construction of the Auditor Opinion on a Financial Reporting measure has been explained in section 4.2.4 of chapter 4.

7.3.2   Corporate Social Responsibility (CSR$_{it}$)

We used an index of CSR constructed in section 4.2.1 of chapter 4 as an independent variable.

7.3.3 Other Control Variables

We used following variables to control for other firm-specific factors that can affect auditor's opinion.

7.3.3.1 Size

Firm size can potentially influence an auditor's opinion ranging from positive (Ireland, 2003) to negative (Ziegenfuss, 1996; Beasley et al., 1999). Ireland (2003) provided two arguments for a possible relationship between size and the auditor's opinion. First, large firms can have robust accounting systems and internal controls so it is less likely to have errors in the financial reports which has a positive effect on the auditor's opinion. Second, larger firms have an implicit threat for switching auditors hence the auditor might have a tendency of giving an unqualified auditor opinion to retain the business. Based upon the research of Ireland (2003) a positive impact of size can be expected. However, Ziegenfuss (1996) and Beasley et al., (1999) argue that overstating and misappropriation are typical financial statement frauds and size may increase the possibility of a disagreement between auditor and the firm as to the accuracy of financial reports. Based upon this argument we expect a negative effect of size on the possibility of an unqualified auditor opinion.

7.3.3.2 Market Growth

Firms with a higher growth rate may be subject to accounting manipulations to keep the market multiples on track. Raoli (2013) found that firms with growth in market value as compared with the previous year indulge more in earnings management, especially in cases where firms are overvalued because managers of such firms try to sustain overvaluation. However, companies with higher growth potential are also cautious to avoid malpractice claims to maintaining their clean accounting record. To control for the impact of growth in market multiples, we use the ratio of the market-value of equity to the book-value of equity (MB_{it}).

7.3.3.3   Profitability

It is generally agreed that less profitable firms usually receive qualified audit opinions (Loebbecke et al., 1989; Summers and Sweeney, 1998; Beasley et al., 1999; Spathis, 2002; Spathis et al., 2003). As Spathis (2002, p. 185) points out "... the profitability orientation is tempered by the manager's own utility maximization defined (partially) by job security." Management may engage in earnings manipulation for personal gain such as reporting higher earnings to increase their compensation through formal and informal compensation plans (Healy, 1985), reduce the likelihood of job loss (DeAngelo, 1988; Pourciau, 1993) and avoid the likelihood of violation of debt covenants (Sweeney, 1994; DeFond and Jiambalvo, 1994). To control for the impact of profitability, we use the ratio of net income to total assets (ROA_{it}). We expect a positive coefficient of profitability with the auditor's opinion implying that lower profitability might entice firms to engage in accounting manipulations.

7.3.3.4   Firm Risk

Ireland (2003) used financial leverage (gearing) as a financial risk measure and argued that highly geared firms are more likely to receive a modified auditor's opinion as compared with the previous year. We used two different measures of firm's riskiness: leverage (LEV_{it}) and systematic risk ($BETA_{it}$) as risk parameters. LEV_{it} is the ratio of long-term debt to total assets[34] while $BETA_{it}$ is the beta from the standard CAPM model where the MSCI Global Index is used as the benchmark. However, we expect a negative coeffecient of LEV_{it} however, sign of $BETA_{it}$ can be positive or negative due to its market rather than financial reporting orientation.

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[34] Leverage measured by total debt as a ratio of total assets have also been used in the estimation and results are available with the author. There are no significant changes in the results. As thesis focuses on long-term sustainability of firm, long-term leverage ratio has been used as control variable.

7.3.3.5   Financial and Dotcom Crisis

Extreme events are non-normal and can affect almost every aspect of a firm. The sample period encompass two extreme events namely the dot com crisis 2001-2002, and the global financial crisis 2007-2008. To isolate the impact of these two events, we use dichotomous variables. *Icrisis* takes the value of one for time period 2001-02 and zero otherwise while *Fcrisis* take the value of one for the period 2007-08 and zero otherwise.

7.4   Descriptive Statistics

The KLD database consists of a total of 32,232 firm-year observations with 660 firms reporting CSR-related disclosures in the year 2000 that increased to 3,034 firms in 2012. After matching these firms with financial, stock price data and auditor opinion's data, the final sample consists of 1,219 firms. As our sample has large positive or negative outliers we winsorized its covariates at the 1st and 95th percentile of their respective distributions. To avoid survivorship bias entry into and exit from the sample was not restricted.

Table 7.4.1 reports the descriptive statistics for variables used in this study. The mean of CSR, based on simple additive scores (CSR_{raw} and CSR_{adj}), are negative. While the average CSR using the PCA method is much smaller and reflects similar variations suggesting a diversity of CSR practices within the sample. The lower CSR scores based on the PCA method confirms the suitability of using the PCA approach for the computation of CSR indices.

Table 7.4.1: Descriptive statistics

Variable	Definition	Obs.	Mean	Std. Dev.	Min	Max
CSRRit	CSR-Raw score	12629	-0.426	2.596	-7	9
CSRAit	CSR-Adjusted score	12629	-0.171	0.650	-1.667	2.5
CSRFit	CSR-First component of PCA	12629	-0.002	0.941	-2.628	3.704
CSREit	CSR-Equally weighted components of PCA	12629	0.002	1.333	-5.142	3.461
CSRWit	CSR- Weighted components of PCA	12629	0.001	0.666	-2.541	1.768
SIZEit	Size of Firm-Log of Total Assets	12612	7.523	1.606	2.67	13.589
LEVit	Leverage	12590	0.193	0.160	0	0.531
ROAit	Return of Asset	12624	0.027	0.152	-4.583	1.913
BETAit	Systematic Risk using Market Model (S&P500)	12629	0.912	0.401	0.047	2.118
MBit	Market-to-Book Ratio	12582	2.799	1.880	0.856	8.017
DACit	Discretionary Accruals (Jones (1991) Model)	11229	0.0001	0.100	-2.960	1.166

Descriptive statistics: This table describes the covariates used for empirical estimations based on a sample of non-financial US firms reporting in the KLD Stat for the period 2000 to 2012.

Among other control variables, size of firm ($SIZE_{it}$) has a mean value of 7.5 and ranges from 2.6 to 13.5. The average of market multiples (MB_{it}) stands at 2.86 suggesting that most companies are trading at higher multiples than the book-value of their equity. On average, firms in the sample have leverage (LEV_{it}) of about 19.3% ranging from no long-term liabilities to 53% long-term liabilities as compared with the total assets.

A lower leverage ratio reflects the conservative nature of the sample firms. This can be confirmed with the level of systematic risk assumed by the sample firms as measured by the $BETA_{it}$. On average, firms in the sample have a $BETA_{it}$ of 0.91 which shows that systematic risk of firms is very close to market risk. However, there are firms with $BETA_{it} > 1$ showing higher risk as compared with the market. Firms in the sample on average have profitability, measured by return-on-assets (ROA_{it}), of 3%.

Table 7.4.2: Descriptive statistics and difference in means test

| | $ADTR_{it} = 1$ | | | $ADTR_{it} = 0$ | | | χ^2 | t-test |
| | | | | | | | | t-value |
Variable	N	Mean	Std. Dev.	N	Mean	Std. Dev.		
$CSRR_{it}$	6660	-0.2356	2.5848	5969	-0.6386	2.5913	57.08***	-8.73***
$CSRA_{it}$	6660	-0.1041	0.7111	5969	-0.2469	0.5650	79.76***	-12.39***
$CSRF_{it}$	6660	0.1003	0.9153	5969	-0.1163	0.9561	144.93***	-13.00***
$CSRE_{it}$	6660	0.2502	1.1928	5969	-0.2734	1.4246	492.17***	-22.46***
$CSRW_{it}$	6660	0.1237	0.5979	5969	-0.1359	0.7096	472.45***	-22.29***
$SIZE_{it}$	6660	7.3231	1.5743	5965	7.7465	1.6123	207.72***	14.92***
LEV_{it}	6640	0.1804	0.1600	5951	0.2069	0.1590	96.764***	9.326***
ROA_{it}	6660	0.0302	0.1584	5964	0.0244	0.1453	35.61***	-2.13**
MB_{it}	6638	2.8734	1.9372	5944	2.7172	1.8120	13.644**	-4.594*
$BETA_{it}$	6660	0.9323	0.4115	5969	0.8912	0.3886	40.12***	-5.75***

Descriptive statistics and difference in means test: This table describes the covariates used for empirical estimations based on a sample of non-financial US firms reporting in the KLD Stat from 2000 to 2012. Difference in means analysis is based on Kruskal Wallis (1952) test where means are compared based on the auditors' opinion as reported in Auditor Analytics with unqualified auditor opinion (ADTR=1) and other than unqualified auditor opinion (ADTR=0). The last column shows χ^2 statistics of the Kruskal and Wallis (1952) test showing *** p<0.01, ** p<0.05, * p<0.1.

To further understand the dynamics of the data, we performed two tests, i.e, T-test and Kruskal and Wallis (1952) difference in mean test of all the variables based on an unqualified auditors' opinion. Test results are reported in Table 7.4.2. Univariate test results show that mean of all the independent variables for firms with an unqualified auditor's opinion are significantly different from firms without an unqualified auditor's opinion at one percent level of significance. Specifically, all the measures of CSR have more (less) positive (negative) mean scores for firms receiving an unqualified audit opinion in comparison to firms with other than an unqualified opinion. It is also evident that firms with an unqualified opinion are smaller in size, less leveraged, more profitable, have higher systematic risk, and have greater market prospects.

Table 7.4.3 shows a correlation of all variables. CSR_{it} and $ADTR_{it}$ have a positive correlation irrespective of the CSR measure used. The correlation matrix provides a crude indication that firms with better CSR scores engage in responsible reporting and get higher scores on auditor's trust. The signs of other control variables are generally in line with expectations.

Table 7.4.3: Correlation Matrix

	$ADTR_{it}$	$CSRR_{it}$	$CSRA_{,it}$	$CSRF_{it}$	$CSRE_{it}$	$CSRW_{it}$	$SIZE_{it}$	LEV_{it}	ROA_{it}	MB_{it}
$CSRR_{it}$	0.08*	1.00								
$CSRA_{,it}$	0.12*	0.91*	1.00							
$CSRF_{it}$	0.12*	0.94*	0.87*	1.00						
$CSRE_{it}$	0.21*	0.60*	0.63*	0.70*	1.00					
$CSRW_{it}$	0.21*	0.63*	0.66*	0.73*	1.00*	1.00				
$SIZE_{it}$	-0.10*	0.21*	0.14*	0.15*	-0.28*	-0.26*	1.00			
LEV_{it}	-0.07*	-0.12*	-0.08*	-0.12*	-0.13*	-0.13*	-0.06	1.00		
ROA_{it}	0.02	0.07*	0.06*	0.06*	-0.01	0.00	0.28*	-0.17*	1.00	
MB_{it}	0.01	0.11*	0.08*	0.10*	0.03	0.03	0.22*	-0.21*	0.09	1.00
$BETA_{it}$	0.08*	-0.12*	-0.09*	-0.09*	0.14*	0.13*	-0.41*	0.03	-0.22*	-0.08*

This table show the correlation between the covariates used for empirical estimations based on a sample of non-financial US firms reporting in the KLD Stat from 2000 to 2012. * shows significant correlation at 5% of significance.

$SIZE_{it}$ and LEV_{it} are negatively correlated with $ADTR_{it}$, while ROA_{it}, MB_{it} and $BETA_{it}$ are positively correlated with $ADTR_{it}$.

The descriptive statistics, correlation matrix, and differences in mean analysis provide support for our hypothesis but these are univariate analysis and do not control for other factors hence require further investigation.

7.5 Empirical Methodology

Following the discussion in the previous section, we argue that auditors' opinion can be seen as an indicator of the quality/accuracy of financial reporting of a firm. Based upon the conceptual famework given in figure 6, we hypothesize that firms which are more engaged in CSR activities, use responsible financial reporting practices which in turn improve the quality of financial reporting as measured by the auditor's opinion. We transformed our conceptual model into an empirical model as follows:

$$ADTR_{it} = \alpha_0 + \beta_1 CSR_{it} + \beta_2 X_{it} + \varepsilon_{it} \tag{7.1}$$

where $ADTR_{it} = 1$ if firm i receives an unqualified opinion from the auditors in year t and zero otherwise. CSR_{it} is an index of engagement in CSR activities for firm i at time t. X_{it} is a vector containing all exogenous variables and $\varepsilon_{it} \sim N(0, \sigma_v^2)$ is the error term. A direct application of a standard technique such as OLS in the case of (1) would produce biased and inconsistent estimates of the coefficients. Two possible alternatives are a logistic distribution model (logit) or a probability distribution model (probit). Although logit and probit models are equally good, the logit model is preferred over the probit model because of its mathematical simplicity. Following Gaganis and Pasiouras (2007), who studied the determinants of auditors' opinion, we use the logit model for empirical estimations. The details of logit model are discussed next.

In this essay we argue that the auditor's opinion ($ADTR_{it}$), a measure of transparent and accurate financial reporting at time t, is a function of X_i dependent variables hence under logit form it can be written as;

$$\Pr\left(ADTR_{i1}, \ldots\ldots, ADTR_{in_i} \middle| X_{i1}, \ldots\ldots, X_{in_i}\right) = \int_{-\infty}^{\infty} \frac{e^{-v_i^2/2\sigma_v^2}}{\sqrt{2\pi\sigma_v}} \left\{\prod_{t=1}^{n_i} F(ADTR_{it}, X_{it}\beta + v_i)\right\} dv_i$$

(7.2)

where;

$$F(ADTR, z) = \begin{cases} \frac{1}{1+\exp(-z)} & if\ ADTR \neq 0 \\ \frac{1}{1+\exp(z)} & \text{Otherwise} \end{cases}$$

(7.3)

where ADTR = 1 if the auditor issued an unqualified opinion and zero otherwise. For testing the above hypothesis, there are several factors to be included in the list of control variables.

7.6   Empirical estimations and results

This section reports the estimation results for the empirical model as developed in Equation (7.1) on the impact of engagement in CSR activities on auditor's opinion on financial reporting. Table 7.6.2 reports the estimation results based on five alternative CSR measures: unadjusted (Raw) CSR, adjusted CSR, first component PCA CSR, equally weighted PCA CSR and weighted average PCA CSR in Panels A to E respectively. All the models from Panel A to E are statistically significant as their log-likelihood and χ^2 values are high enough to be significant at one percent level of significance.

Among the most notable results, the coefficient of CSR is positive and significant irrespective of the CSR measure used. More precisely, interpretation of the coefficient of Raw CSR with value 0.833 shows that a one unit increase in Raw CSR score increased the odds of having unqualified auditor opinion by 8.45%[35]. CSR measure has been constructed using different index building techniques show greater magnitude This validates the argument that to analyze the financial implications of CSR special care is required in index building. Overall significance of all the measures of CSR validates our hypothesis that as firms' engages in CSR activities they adopt responsible practices which result in increased auditor's trust. These results are in line with Chen et al., (2012) who found that firms with higher CSR performance are less likely to get a negative going concern opinion from an auditor.

Among control variables, $SIZE_{it}$ has a significantly negative coefficient with auditors' trust indicating that larger firms lack auditors trust on financial reporting. These results are in line with Ziegenfuss (1996) and Beasley et al., (1999) who found that larger firms do overstate their assets

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[35] Interpretation of logit coefficient goes as, %Δ in odds of scoring 1 = $(e^{\beta_{CSR}})$-1=$e^{0.0811}$-1=1.0845-1=8.45%.

which leads to auditor's disagreement. These findings also personify the independence of auditors as these results are in contrast with switching threat argument which questions the independent opinion of the auditor.

Risk parameters LEV_{it} and $BETA_{it}$ show interesting results. The negative and significant coefficient of a higher leverage ratio (LEV_{it}) indicates that the probability of receiving an unqualified auditor's opinion decreases with higher leverage. While on the other hand, the positive and significant coefficient of systemic risk ($BETA_{it}$) suggest that firms with higher systemic risk usually receive an unqualified auditor opinion. We do not see these results as contradictory as the focus of auditors are on the financial reports and LEV_{it} reflects the relative riskiness based on the financial statements. Furthermore, the results of LEV_{it} is in line with Ireland (2003) suggesting that highly leveraged firms are more likely to get a modified auditor's opinion.

Our results show that profitability measured by ROA_{it} does not have any significant effect on the auditor's opinion. Both crisis dummies are significantly negative suggesting that the dot com and financial crisis harmed overall reporting practices of firms resulting in strong negative opinions from auditors.

Our results on the association of engagement in CSR activities and possible auditors' opinion validate the ethical interpretation of earnings management as provided by Elias (2002) suggesting that people who view CSR as a long-term image building tool rate earnings management very harshly. Our findings provide an empirical test on real firms' level data stating that managers do not use CSR for short term gains instead they incorporate responsible behavior in their business practices and improve their financial reporting. The positive and significant coefficient of $BETA_{it}$ is an indication that risky firms (from the market perspective) try to save

themselves from market punishment by improving their reporting quality and gain an unqualified opinion.

Table 7.6.1: Estimation results using the Random effect panel logit model

VARIABLES	(1) $CSRR_{it}$	(2) $CSRA_{it}$	(3) $CSRF_{it}$	(4) $CSRE_{it}$	(5) $CSRW_{it}$
CSR_{it}	0.0811***	0.413***	0.301***	0.301***	0.597***
	(0.00904)	(0.0349)	(0.0255)	(0.0192)	(0.0382)
MB_{it}	0.00567	0.00686	0.00512	0.0115	0.0110
	(0.00702)	(0.00704)	(0.00705)	(0.00708)	(0.00708)
$SIZE_{it}$	-0.157***	-0.155***	-0.154***	-0.0619***	-0.0673***
	(0.0182)	(0.0182)	(0.0183)	(0.0191)	(0.0191)
LEV_{it}	-0.497***	-0.541***	-0.481***	-0.641***	-0.628***
	(0.160)	(0.161)	(0.161)	(0.162)	(0.162)
$BETA_{it}$	0.197***	0.191***	0.199***	0.146**	0.149**
	(0.0595)	(0.0597)	(0.0598)	(0.0602)	(0.0601)
ROA_{it}	0.138	0.123	0.126	0.0345	0.0388
	(0.156)	(0.156)	(0.156)	(0.155)	(0.155)
Icrisis	-0.438***	-0.421***	-0.416***	-0.412***	-0.413***
	(0.0728)	(0.0730)	(0.0732)	(0.0736)	(0.0736)
Fcrisis	-1.836***	-1.828***	-1.821***	-1.799***	-1.799***
	(0.0580)	(0.0581)	(0.0582)	(0.0584)	(0.0584)
Constant	1.586***	1.615***	1.524***	0.885***	0.922***
	(0.158)	(0.158)	(0.159)	(0.164)	(0.164)
Observations	12,579	12,579	12,579	12,579	12,579
Number of Firms	1,219	1,219	1,219	1,219	1,219
log-likelihood	-7841***	-7808***	-7746***	-7747***	-7841***
Wald Test-chi2	1205***	1243***	1316***	1315***	1205***

This table shows estimation results of equation (7.1) using the random effect panel logit model. Data is from 2000 to 2012. Variable definition is provided in Table 7.4.1. The dependent variable is $ADTR_{it}$ with value 1 for an unqualified opinion and 0 otherwise. Model 1 through 5 use five alternative CSR measures as provided in the row beneath the model numbers. Icrisis is dummy for dotcom bubble crisis; F. crisis is dummy for the global financial crisis. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

7.7 Robustness Check

One may argue that a dichotomous variable may not capture the dynamics of auditors' opinions since the auditor's opinion is not binary in nature. As a robustness check, we developed a continuous variable ($ADOP_{it}$) that takes into account the spread of auditors' opinion. $ADOP_{it}$ is the logistic transformation of one plus the audit opinion category where audit category is equal to one for "unaudited", two for "Qualified", three for "No opinion or Disclaimer", four for "Unqualified with Explanatory Language" and five for "Unqualified" as auditors' opinion.

Table 7.7.1 presents the empirical results based on $ADOP_{it}$ as a dependent variable using a GMM dynamic panel model. This model is preferred over static panel data models because of its ability to deal with possible firm-specific omitted variables bias, endogeneity and simultaneity problems of explanatory variables, persistency of dependent variable and firm-specific heterogeneity (Boubakri et al., 2009). For the sake of brevity, we report the empirical results based on Raw CSR score ($CSRR_{it}$) only. There is no major difference in our empirical findings as reported in Table 7.4.3. The coefficient of $CSRR_{it}$ is positive and significant validating our earlier findings using a logit estimation. Among the notable differences are the change in sign of the market multiple (MB_{it}) and book leverage (LEV_{it}) suggesting that the probability of receiving an unqualified opinion increases as the market value and book leverage of firm increase. These results are not surprising as the mean leverage of the sample firms is very low at only 19 percent.

To further confirm the findings of this study, an alternative dependent variable: earnings management (DAC_{it}) is used in lieu of auditors' opinion. Since earning management is one of the many reasons which can affect an audit opinion it would be worthwhile to study whether earnings management is affected by engagement in CSR-related activities. Alternatively, if firms are

engaged in CSR-related activities to build a long-term positive image ideally, they should not indulge in earnings management practices.

To test this hypothesis, a proxy is developed for earnings management following Jones (1991) using discretionary accruals as per below:

$$DAC_{it} = \frac{AC_{i,t}}{TA_{i,t-1}} = \alpha_i \left(\frac{1}{TA_{i,t-1}} \right) + \beta_{1,i} \left(\frac{\Delta Sale_{i,t}}{TA_{i,t-1}} \right) + \beta_{2,i} \left(\frac{PPE_{i,t}}{TA_{i,t-1}} \right) + \varepsilon_{i,t} \qquad (7.4)$$

where AC_{it} is total accruals, TA_{it} stands for total assets, $\Delta Sale$ is change in sale, $PPE_{i,t}$ is property plant and equipment. Nondiscretionary accruals are gauged by estimating coefficients;

$$\frac{NDAC_{i,p}}{TA_{i,p-1}} = \alpha_i \left(\frac{1}{TA_{i,p-1}} \right) + \dot{\beta}_{1,i} \left(\frac{\Delta Sale_{i,p}}{TA_{i,p-1}} - \frac{\Delta Rec_{i,p}}{TA_{i,p-1}} \right) + \beta_{2,i} \left(\frac{PPE_{i,p}}{TA_{i,p-1}} \right), \qquad (7.5)$$

where $NDAC_{i,p}$ represents nondiscretionary accruals and $\Delta Rec_{i,p}$ is change in accounts receivable. Discretionary accruals are then estimated by subtracting equation (7.4) from (7.5);

$$\frac{DAC_{i,p}}{TA_{i,p-1}} = \frac{AC_{i,p}}{TA_{i,p-1}} - \frac{NDAC_{i,p}}{TA_{i,p-1}} \qquad (7.6)$$

Estimation results based on DAC_{it} as the dependent variable are reported under column 2 in Table 7.7.1 using a GMM-based dynamic panel model. Similar to previous robustness checks, reported estimation results based on the Raw CSR measure ($CSRR_{it}$). We do not find any significant association between $CSRR_{it}$ and DAC_{it} suggesting that CSR do not have any significant impact on earning management practices by the management of firms.

Table 7.7.1: Robustness check results using the GMM system under panel data estimation

VARIABLES	(1) $ADOP_{it}$	(2) DAC
$ADOP_{t-1}/DAC_{t-1}$	0.235***	0.00175
	(0.0169)	(0.0280)
$CSRR_{it}$	0.0288***	-0.000220
	(0.00292)	(0.000582)
MB_{it}	-0.00574**	-0.000862
	(0.00260)	(0.00158)
$SIZE_{it}$	0.124***	-0.0568***
	(0.0195)	(0.0200)
LEV_{it}	0.0434	0.0397
	(0.0839)	(0.0383)
$BETA_{it}$	0.0674***	-0.00254
	(0.0227)	(0.00554)
ROA_{it}	-0.0957*	0.501***
	(0.0529)	(0.0407)
Icrisis	-0.0703***	-0.00155
	(0.0176)	(0.00814)
Fcrisis	-0.251***	-0.00522**
	(0.0113)	(0.00225)
Constant	-0.0223	0.419***
	(0.150)	(0.151)
Observations	9,887	8,602
Number of Firms	1,218	1,206
AR(2)	-8.149	0.411
Chi^2	2091***	336.5***

This table shows results using the GMM system under panel data estimation. Data is from 2000 to 2012. Variable definition is provided in Table 1. The dependent variable is Discretionary Accruals (DAC_{it}). Raw CSR measure has been used as dependent variable. Icrisis is dummy for dotcom bubble crisis; Fcrisis is dummy for the global financial crisis. Standard errors are in parenthesis. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

7.8   Summary and Conclusion

The participation in CSR-related activities is not merely charitable giving. Instead it has been treated as a means to build a firm's social capital, firms receive higher credit ratings, pay lower costs of capital and enjoy higher share prices due to their commitment/engagement in CSR-related activities. This essay examined whether management of socially responsible firms comply

with the highest standards of financial reporting, proxy by an unqualified auditor opinion. Socially responsible firms achieve their commercial goals in a way that honors ethical values and respects people and communities (Jenkins, 2004). It is, therefore, legitimate to argue that management of socially responsible firms act responsibly and do not engage in dishonest, deceitful, and fraudulent practices while delivering their financial reports. If so, this must be reflected through the auditors' opinion.

To proxy overall CSR-related activity this study used a PCA approach to construct a CSR index following Schmidtlein et al., (2008). The PCA approach is preferred over additive index and weighted additive index approaches used in recent studies. Under additive approaches, CSR scores are ordinal and provide only the relative performance score of every firm but not the variation. By using the PCA approach of assigning weights to each component based on the relative correlation, not only does it provide a relative performance matrix but also helps explain the maximum variation (Goss and Roberts, 2011). We used auditor opinions on financial reports as a measure of reporting accuracy of firms because it is auditors who ultimately validate the financial reporting process.

The empirical findings suggest that as firms engage in socially responsible activities their probability of getting an unqualified auditor opinion increases. These findings are in line with the existing literature that suggest that auditors issue less negative going concern opinions to socially responsible firms. These findings are also in line with Elias (2002) who studied ethical interpretations of earnings management by accountants and found that accountants who view CSR engagement as a long-term image building tool rated earnings management harshly and considered it unethical. These findings remained robust to different measures and econometric models.

The empirical findings suggest the existence of a social a capital that CSR-conscious firms attempt to protect while disclosing information and maintaining higher auditors' ratings. This highlights some potential benefits to investors, management and accounting professionals. Investors may consider that information from a CSR-conscious firm is more reliable. Management can use the engagement in CSR activities as a mechanism to reduce information asymmetry. Furthermore, this study shows that CSR-conscious firms conform to a higher professional standards and in the process grow the social capital.

CHAPTERS 8

SUMMARY CONCLUSIONS AND RECOMMENDATIONS

8.1 Introduction

Engagement in CSR is considered to be an investment in the long-term sustainability and well-being of a firm by a wide range of stakeholders including the shareholders of firms. CSR can affect the financial performance of firms through two complimentary functions. The wealth enhancement function assumes a direct benefit whereby the value of the firm is increased due to higher revenues and higher share prices. The wealth protection function of CSR assumes engagement in CSR acts like an insurance to mitigate financial risk. This dissertation investigates the wealth protection function of CSR and address three different dimensions in separate papers.

This chapter reviews and summarizes the major findings of the empirical investigations conducted for this dissertations. Section two of this chapter reports the major findings and their interpretation followed by a discussion on the implication of the empirical results for stakeholders. While section four concludes the dissertation by providing some directions for future research.

8.2 Interpretation of the Findings

This section provides an overview of the major finding of this dissertation and links these findings with the holistic question: whether investment in CSR has wealth protection benefits or not? Existing literature mainly focuses on evaluating the wealth enhancing function of CSR. The focus of this study is to empirically investigate the extent to which CSR can contribute to wealth protection and present CSR as a business case. Three dimensions of CSR as a wealth protection function has been investigated in this study including:

1)   Reduction in credit default risk,

2)   Increase in firm-specific information diffusion and,

3)   Development and sustainment of social capital in the shape of superior and responsible business practices.

The following subsections provide an interpretation of each of these dimensions.

8.2.1   CSR and Credit Default Risk

Credit default risk is one of the major risks that firms face especially when financing its investment projects through debt financing. Lenders consider and evaluate the ability of a firm to pay back principal and interest according to predetermined term and conditions. A firm's ability to payback its debt obligations depends largely on their financial capability. The long-term sustainable view of an organization requires a holistic approach encompassing not only economic issues but also environmental, social, and governance (ESG) issues. Irresponsible behavior arising from ESG concerns may result in a publish backlash, lawsuits and/or other regulatory actions that ultimately can have serious consequences for the existence of a firm. Capitalizing on this argument and reviewing the literature on this issue we investigated the impact of CSR on a firm's credit default risk.

For the purpose of this study the credit default risk is linked with the probability-of-default calculated by using the Merton (1974) model. Taking into account distributional properties of probability-of-default we modeled default probability against CSR using beta regression models. Results showed that on average a one-unit increase in raw CSR score decreases the probability-of-default by 10 bps hence null hypothesis of no relationship between CSR and PD has been rejected suggesting that firms with higher score on CSR index have a lower probability of default. While a CSR index constructed using PCA showed consistent results. Further investigation on the

relationship of different aspects of CSR with PD reveals that firms with higher score on technical CSR (TCSR) have significantly lower probability-of-default but institutional CSR showed insignificant results. Hence, we found partial support for second alternative hypothesis (H2). These findings suggest that CSR plays a wealth protection function by decreasing the risk of default. These findings are in line with the existing literature[36] showing the positive effects of CSR on credit ratings of firms and therefore, we reject third hypothesis (H3) which was based upon agency problem that higher engagement in CSR may results in higher probability-of-default.

8.2.2   CSR and firm-specific information diffusion

For an efficient capital market, it is important that stock prices reflect all available information. Information asymmetry results in misalignment of stock prices. Firms attempt to reduce this information asymmetry by sending credible signals (information diffusion) to the market regarding their financial and social performance. However, a lack of firm-specific information diffusion may result in a lack of interest by major investors (King et al., 2011). This essay investigates whether disclosures related to CSR help in better information diffusion or higher stock price informativeness.

Measurement of stock price informativeness is related to its alignment with the wider capital market. For this essay, firm-specific information diffusion is calculated by using a non-synchronicity measure as proposed by Morck et al., (2000). Univariate analysis of three subsamples according to their size suggest that firms smaller in size, on average reflect higher levels of information diffusion as compared with medium and large firms. Difference in means analysis also reveals on average a significant difference in information diffusion according to the

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[36] Sun and Cui (2014) and Jiraporn et al., (2014) for example

size of firms. This validates our argument that size can play a moderating role in the CSR-information diffusion relationship.

Using the Generalized Method of Moment (GMM) framework, we found a significant positive association between the level of CSR and stock price informativeness which provide significant evidence to accept alternative hypothesis (H4). This finding suggests that stock prices of CSR conscious firms reflect lower information asymmetry, hence conforms to the wealth protection hypothesis.

Based upon the results of the interaction term CSR and Size fifth alternative hypothesis (H5) has been accepted showing that size of a firm has negative moderating role between CSR and informativeness relationship. This suggests that the informativeness function of CSR disclosures is more pronounced among smaller firms. This finding is not surprising, as information diffusion is much faster for larger firms due to the sheer amount of disclosure whether regulatory or voluntary, analysts' following and media coverage. To further understand the role of size in price informativeness, the sample is divided in three subsamples based on the size of firms to determine if the marginal effect of CSR is more pronounced to any specific size. The empirical evidence suggests that CSR disclosures significantly enhance price informativeness for smaller firms. In addition to the size, we found empirical support for sixth alternative hypothesis (H6) that CSR disclosures related to primary stakeholders (technical CSR) has positive contribution towards stock price informativeness however, empirical evidence on seventh alternative hypothesis about relationship of institutional CSR (related to secondary stakeholders) and informativeness is mixed and inconclusive.

Based on the empirical findings regarding the role of size and technical CSR on stock price informativeness, a recommended policy for smaller firms would be to engage in technical CSR to improve stock price informativeness.

8.2.3 CSR and quality of financial reporting

The wealth protection view suggests that firms engage in CSR to address the needs of broader range of stakeholders and in the process develop an intangible social capital that reflects their dealings with all stakeholders. This essay investigated whether or not socially responsible firms engage in dishonest, deceitful, and fraudulent practices while preparing their financial statements. Specifically, the third essay explores the likelihood of socially responsible firms receiving an unqualified opinion from auditors for accurately presenting their financial results.

By using a unique dataset of auditors' opinion, we found the evidence suggesting that the firms most likely to receive an 'unqualified opinion' from auditors are those with higher rankings on the CSR index. These findings provide empirical support in favor of alternate hypothesis (H8) that firms with higher CSR score have higher probability of getting unqualified auditors' opinion. The multivariate analysis showed that as a firm's involvement in CSR increases the likelihood of receiving an unqualified audit opinion increases by .08 in raw measure. CSR constructs through PCA showed even higher probability.

As a robustness check, we investigated whether firms with a higher CSR score use discretionary accruals, which is one of the sources of accounting manipulation, and did not find any association between the CSR index and discretionary accruals. These findings suggest that socially responsible firms develop and sustain intangible social capital through superior business practices and are more likely to earn the trust of auditors.

8.3   Implications of findings: policy implications

This study highlights the wealth protection role of engagement in CSR and adds several important contributions to the scant literature on this role. The empirical findings have several policy implications for a diverse set of stakeholders including firm management, shareholders, regulators, and policy makers.

The inverse relationship between the probability-of-default and CSR suggests that firms with a higher score on the CSR index face lower credit default risk. This risk-mitigating role of CSR not only protect the debtors of firms but also protects suppliers, customers, employees, and shareholders from losses due to the failure of firms. These findings also refute arguments related to the agency problem that challenge the social responsibility view of investment in CSR as merely a mechanism to aid a self-serving agenda on the part of the management.

Similarly, the positive association of CSR with stock price informativeness further confirms the wealth protection role of CSR, especially for smaller firms where shareholders often face information asymmetry. Furthermore, stock price informativeness does increase with disclosures related to immediate (primary) stakeholders.

Findings related to the likelihood of receiving an unqualified auditors' opinion with higher engagement in CSR activities indicate the presence of intangible social capital. Since an adverse auditors' opinion is detrimental to shareholder value, the likelihood of receiving the best of the auditors' opinion is an evidence of the wealth protection role of CSR.

Below are some of the important policy implications of the study:

   a) For management, especially of smaller firms, investment in CSR provides an important risk mitigation function that acts like an insurance against credit default risk, provides informative stock prices, and builds intangible social capital that

ultimately benefits various stakeholders of the firm. Furthermore, in the presence of scarcity of funds, management can focus on CSR activities related to primary stakeholders as the risk mitigation benefits from these engagements are more pronounced as compared with investment in issues related to secondary stakeholders;

b) For regulators, the findings of this study can provide a direction for future regulation whereby firms may have disclosure requirements related to CSR issues. By incorporating CSR-related disclosures in the routine filings of reporting firms, regulators make it easier for investors to determine the level and kind of CSR engagements by reporting firms;

c) For investors, risk mitigation is an important function and CSR can play an important role in risk-management. Investors would be better off investing in CSR-conscious firms, otherwise equivalent from risk perspective. Investors should view CSR as a pricing factor in their investment decision.

In short, this thesis supports the notion that CSR can positively contribute in enhancing the long-term sustainability of businesses and society.

8.4   Limitations and Future Research Directions

This study opens up multiple avenues for future research despite some data related limitations. The data set used in this study to construct CSR measures has been collected from the KLD STATS database. Although this is one of the most comprehensive database on CSR and is used in large number of studies, there are a few shortcomings in this database.

Chatterji et al., (2009) analyzed the KLD database and found that although the CSR ratings are capturing CSR issues reasonably well[37], it does not use public to an optimum level. Furthermore, the KLD database gives ordinal numbers which gives the relative performance of firms but not the variations. In this dissertation, principle component analysis (PCA) approach is used to circumvent this problem. The CSR index based on a PCA approach not only provides a relative performance matrix but also explains the maximum variation by assigning weights to each component based on relative correlation (Goss and Roberts, 2011).

Another limitation of this study is related to the generalization of the results. This study uses data from US non-financial firms. Maignan and Ralston (2002) suggest that what is deemed to be socially responsible differs considerably between countries. The researcher's choice of which CSR issues to emphasize may lead to a generalization of results. A comparative study from different countries/regions can provide a better understanding of CSR perspectives and may be a good avenue for future research.

Furthermore, as social issues in developing countries are more severe as compared with developed countries, it will be fruitful to conduct a study on developing versus developed countries' the perspectives of corporate social responsibility subject to the data availability.

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[37] For instance, their analysis shows that firms with a large number concerns are having more pollution and environmental issues.

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