

AN EXPLORATION OF THE ASSOCIATIONS AMONG CORPORATE  
SUSTAINABILITY PERFORMANCE, CORPORATE GOVERNANCE,  
AND CORPORATE FINANCIAL PERFORMANCE

by

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Abstract

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This study examines the relationship between corporate governance and corporate sustainability performance (CSP), the relationship between corporate sustainability performance and corporate financial performance (CFP), and whether corporate governance moderates the CSP-CFP relationship. Corporate governance plays an important role in monitoring and counselling management's decision making including strategic sustainability investing. The study analyzes a sample of over 400 of the largest U.S. companies to examine corporate sustainability performance and corporate governance jointly. Four attributes of boards of directors are examined: board size, board independence, CEO duality, and female directors. The results show that all four board attributes are positively associated with CSP. Further analysis shows that firms with stronger corporate governance are more likely to have higher CSP. Both accounting-

based and market-based measures of CFP are used to investigate the relationship between CSP and CFP. The results show that CSP is positively associated with CFP for both one-year lag and two-year lags of CSP. This study also investigates how corporate governance moderates the CSP-CFP relationship. The results show that corporate governance contributes additional value to firm value. The impact of lagged CSP on CFP is higher for firms with stronger corporate governance.

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## Chapter 1

### Introduction

#### 1.1 Overview of the Study

“Sustainability” is a term that has emerged over time from the “triple bottom-line” consideration of (1) economic viability, (2) social responsibility, and (3) environmental responsibility. While environmental considerations are often the focus of attention, the triple-bottom-line definition of sustainability is a broad concept. In addition to preservation of the physical environment and stewardship of natural resources, sustainability considers the economic and social context of doing business and also encompasses the business systems, models and behaviors necessary for long-term value creation (AICPA, 2013a).<sup>1</sup>

The term “sustainability” evolved from the concept of corporate social responsibility (CSR) and for many years the relative effect of corporate sustainability performance (CSP) on corporate financial performance (CFP) has been debated. While many prior studies on corporate social responsibility mainly focused on the short-term impact, sustainability engagement focuses on a corporation’s long-term financial performance. However, because of the difficulty of finding an appropriate measure of sustainability performance, it is difficult to test the long-term effect of sustainability performance on a firm’s financial performance (Deloitte, 2013).

This study investigates the association between corporate sustainability performance and corporate financial performance, both in the short term and in the long

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<sup>1</sup> The term “sustainability” is often used interchangeably with “sustainable development”, “corporate social responsibility”, “corporate responsibility”, “corporate citizenship”, and “social enterprise”. For the purpose of this study and for analysis of empirical results in the broadest way, I use an inclusive definition of sustainability, without drawing distinctions between this and related terms.

term, over a 5-year period (2007-2011). The mixed results found in prior literature suggest that there is a possibility that firms react to stakeholders differently (Horváthová, 2012), because different stakeholders have different concerns. For example, environmental groups are concerned more about the reduction of air pollution, loss of land, depletion of forests, water usage, and the recycling of waste. Customers may pay more attention to production quality and safety. Thus firms adopt different strategies to respond to different stakeholders' needs.

Corporations are facing increasing pressure from stakeholders and governments to take action on sustainability-related issues. If corporations fail to respond proactively in the area of sustainability, they may suffer a loss of business, legitimacy, and profit (due to fines and penalties) and may even fail to exist (Bansal, 2005; Boerner, 2010). This raises questions about what role the board of directors plays and how it might influence corporate sustainability performance. Corporate governance (CGOV) plays an important role in ensuring a firm's business success. Research in the areas of sustainability and corporate governance is often treated separately with less attention paid to the interaction of both areas. This paper extends prior studies by examining corporate governance and corporate sustainability performance jointly. The research considers the role of corporate governance in corporate sustainability performance and the moderating effect of corporate governance on the CSP-CFP relationship. The study investigates board structure and composition of over 400 of the largest US corporations. This paper raises the following three research questions:

- (1) How does corporate governance affect corporate sustainability performance?
- (2) How does corporate sustainability performance affect corporate financial performance in the short term and in the long term?
- (3) How does the level of corporate governance moderate the relationship between corporate sustainability performance and corporate financial performance?

The impact of corporate sustainability performance (CSP) and corporate governance on corporate financial performance (CFP) has become an area of great interest to investors, scholars, practitioners and government regulators. This study examines different dimensions of sustainability performance from Kinder, Lydenberg, Domini (KLD) social ratings. Corporate governance is measured by four elements of board composition: board size, board independence, CEO duality, and female directors. Corporate financial performance is measured by Tobin's Q, market value of shares (MV), return on assets (ROA), and return on equity (ROE).

The results of the study show that (a) several board attributes (board size, board independence, CEO duality and female directors) are positively linked to sustainability performance; (b) corporate governance is positively associated with corporate sustainability performance; (c) a significant positive association exists between corporate sustainability performance and corporate financial performance both in the short term and in the long term; and (d) corporate governance positively moderates the CSP-CFP relationship.

## 1.2 Motivation for the Study

The world is facing problems of a growing population, rising energy prices, and increasing demand for water usage. Corporations are facing global competition.

Businesses need to make immediate and meaningful social and environmental improvements in order to win in the resource-constrained twenty-first century (Fleming, 2010). In the report *The 21<sup>st</sup> Century Corporation: The Ceres Roadmap for Sustainability*,<sup>2</sup> Mindy S. Lubber, president of the investor coalition Ceres,<sup>3</sup> made the following remarks:

Sustainability performance is fundamental for business success in the 21<sup>st</sup> century. If businesses deepen their efforts to solve social and environmental threats, it will position them to innovate and compete in the fast-changing, resource-constrained global economy. It is no longer enough for companies to have special projects or initiatives. Comprehensive sustainability strategies are expected. Companies should view sustainability as a competitive race. This is about understanding risk—including the risk of not seeing the opportunities your competitors see. We need accelerated performance improvements from companies that reflect the true scientific and economic impacts of unchecked carbon pollution, growing water scarcity and billions of people still living and working in poverty.

The message above suggests that companies need to embrace sustainability in their business to achieve competitive advantages in the future. Corporate social

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<sup>2</sup> The report includes a practical roadmap for firms to integrate sustainability into business. It lists over 200 specific activities firms have taken in the four key areas: stakeholder engagement, corporate governance, disclosure and performance. Within the performance category, corporations are encouraged to routinely and systematically improve sustainability performance across their entire operations.

<sup>3</sup> Ceres is a leading non-profit institution that advocates sustainability leadership. It works with environmental groups, investors, and other public interest organizations to address sustainability challenges such as global climate change.

responsibility will increasingly affect investment risk and opportunity as issues like climate change, water scarcity, and human rights become progressively more important to long-term performance and sustainability (US SIF, 2013).

In recent years, the debate about the value of corporate sustainability has intensified. Moser and Martin (2012) point out that “research in sustainability accounting could benefit significantly if accounting researchers were more open to the possibility that corporate social responsibility (CSR) activities are driven by both shareholders and non-shareholders constituents.” Some difficulties have existed in measuring the long-term effect of CSP on CFP. The sustainability literature lacks studies examining the impact of CSP over a large group of companies over a long period of time (Deloitte, 2013).

While the role of corporate governance on corporate financial performance is widely examined in the literature, research on the link between corporate governance and corporate sustainability performance has not been examined as much. Companies with strong corporate governance usually consider the trust of stakeholders, customers, and society to be of importance in ensuring mutual sustained development (Huang, 2010). Huang (2010) documents a significant positive association between corporate governance and corporate social responsibility. Board composition is an important component of corporate governance. The board plays an important role in creating a company’s overall sustainability strategy through advice and counsel to managers (Hillman et al., 2009) and monitoring the behavior of top management (Jo and Harjoto, 2011). While much prior

research has examined corporate governance and corporate sustainability performance independently, this study considers them jointly. The extant literature lacks empirical research on the link between corporate governance and corporate sustainability performance, especially studies examining the joint effect of corporate governance and corporate sustainability performance on corporate financial performance.

### 1.3 Organization of the Study

The rest of the study is organized as follows: Chapter 2 reviews related theories and prior literature studies and develops hypotheses. Chapter 3 describes the research methodology, variable measurement, data, and sample selection criteria. Chapter 4 analyzes the empirical results and Chapter 5 summarizes and concludes the study.

## Chapter 2

### Literature Review and Hypotheses Development

This chapter provides a review of relevant studies and theories, and develops hypotheses. The research framework is based on theoretical perspectives from disciplines such as management, economics, finance, and accounting. A literature review of studies and theories related to corporate governance, sustainability performance, and financial performance is presented below. First an overall literature review is provided, then research questions are raised based on flaws and gaps found in the prior literature. Finally hypotheses are developed based on the review of theories and literature studies.

Business sustainability practice involves several areas of bottom line performance: economic, social, ethical, and environmental. For the purpose of this paper, the focus is on social sustainability and environmental sustainability, because investors consider these two areas the most important (Deloitte, 2013). For example, about half of 2011 shareholder proposals in proxy statements have centered on social and environmental issues. In addition, the 2010 survey conducted by Institutional Shareholder Services shows that 83% of investors now believe environmental and social factors can have a significant impact on shareholder value over the long term (Ernst and Young, 2010).

This chapter is organized as follows. Section 2.1 briefly discusses the overall background of the current studies on sustainability performance, corporate governance, and financial performance. Section 2.2 discusses key issues in the prior literature.

Research questions are raised in Section 2.3. Section 2.4 presents a more thorough literature review relevant to environmental, social and corporate governance. Relevant theories are discussed along with the literature review. Finally hypotheses are formulated based on the review of previous studies and theories.

## 2.1 Overview of Sustainability Studies

### *2.1.1 Why do Firms Engage in Sustainability?*

Research on sustainability has attracted attention from both academics and practitioners. Gladwin et al. (1995) brought the public's attention to ecological (environmental) sustainability, arguing that traditional "technocentrism" and "ecocentrism" need to transform to "sustaincentrism" to maintain natural life-support systems.

Why do corporations engage in sustainability activities? There are a variety of motivations that drive corporations to engage in sustainability. Some firms engage in sustainability for economic considerations, ethical considerations, and regulatory compliance; some do so to respond to the increasing demands from investors or customers. A small number of firms use sustainability as a window dressing technique. These firms claim to improve sustainability but do little to enforce it.

#### 2.1.1.1 Sustainability Investing

The rapid growth in sustainable investing has driven the development of sustainability. There is no single term to describe sustainable investing. Investors often use such terms as "community investing," "ethical investing," "green investing," "impact

investing,” “mission-related investing,” “responsible investing,” “socially responsible investing,” “sustainable investing”, and “values-based investing” among others (Epstein, 2008). Spurred by factors such as rising institutional investor interest, there is a growing demand for transparency in non-financial reporting. These socially responsible investors are concerned about allocation of scarce resources, labor safety, executive pay, and the impact of new products. Sustainable investment in the U.S. has been growing very rapidly over the last two decades. Figure 1 presents this increasing trend.

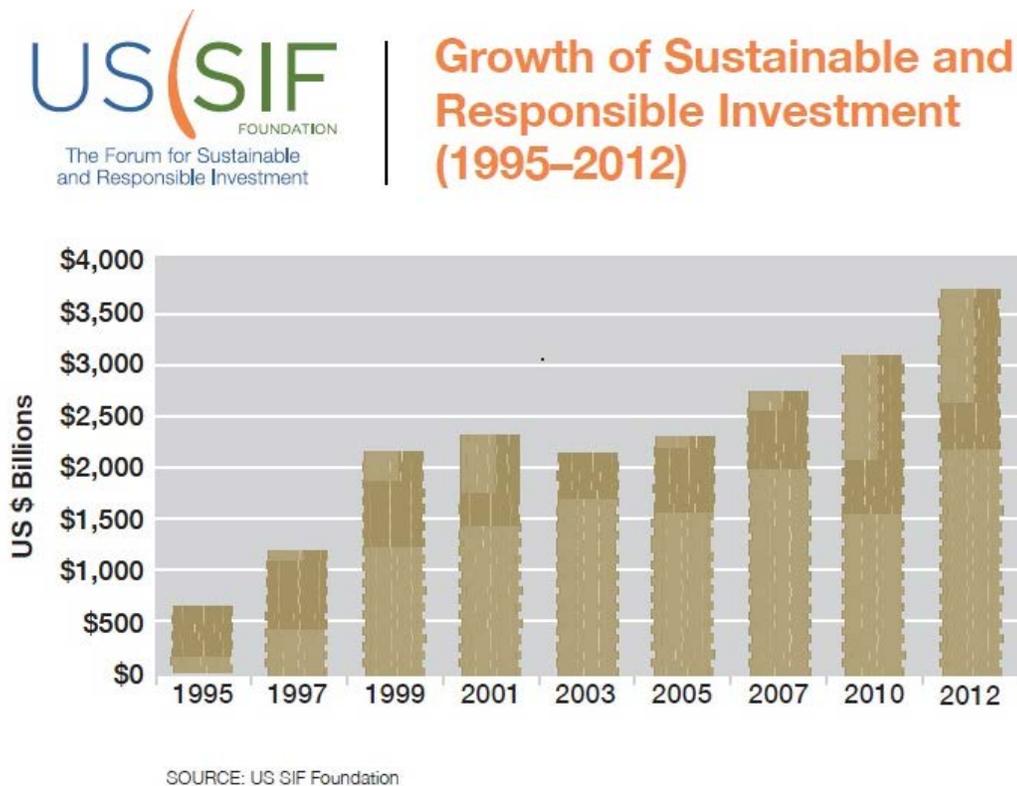


Figure 1. Growth of Sustainable and Responsible Investment (1995-2012)

Figure 1 shows the rapid growth in responsible investment, especially after the United Nations Principles for Responsible Investment were introduced in 2006. The

Forum for Sustainable and Responsible Investment 2012 Trends Reports identifies that responsible investment in the US had reached \$3.74 trillion in total assets under management, a 22-percent increase since year-end 2009 (US SIF, 2013). According to this survey, more than one out of every nine dollars under professional management in the United States today is involved in sustainable and responsible investing. Climate change, board issues, executive pay, and labor, have become major concerns for institutional investors.

#### 2.1.1.2 Greenwashing

As mentioned before, some companies are promoting environmentally friendly programs to distract public attention from an organization's environmentally unfriendly or less savory activities. The term "greenwashing" is used to describe this so-called "window dressing" phenomenon. Organizations reveal positive environmental attributes while concealing negative ones to appear more legitimate (Pfeffer, 1981; Oliver, 1991; Abrahamson and Park, 1994). This creates a misleading positive impression of their overall environmental performance (Delmas and Burbano, 2011; Marquis and Toffel, 2012).

#### 2.1.2 Sustainability Spending vs. Sustainability Benefits

When implementing sustainability strategies, a firm will have to incur some extra costs, for example, the adoption of new environmentally-friendly equipment. This new equipment is needed to reduce the polluting emissions in water and air, thus reducing the negative impact on the environment. Another example is firms that buy special supplies

in order to be sustainable (Barnett and Salomon, 2006). There are other intangible costs that are hard to estimate: human resources (consulting time with suppliers) or opportunity costs that relate to the non-alliance with profitable but not socially responsible partners. Support for sustainability has grown rapidly worldwide, and costs related to sustainability activities have increased in the last decade. According to “The Sustainability Yearbook 2013”, compiled by RobecoSAM, the external environmental cost of 11 key industry sectors rose by 50% from US\$ 566 billion in 2002 to US\$ 854 billion in 2010 (SAM, 2013). Figure 2 illustrates this trend.

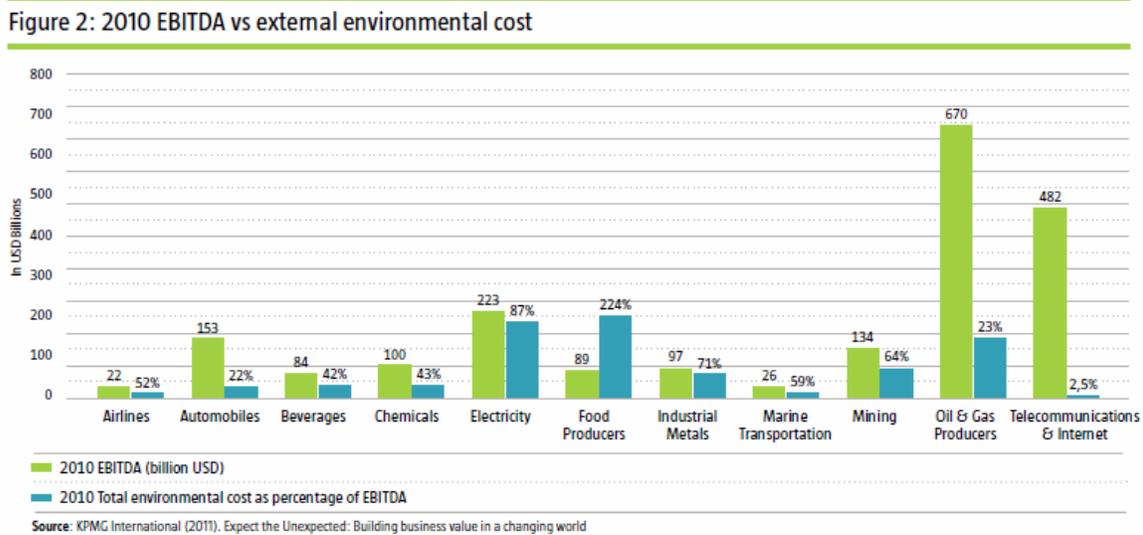


Figure 2. External Environmental Costs in 2010

The trends for total costs spent on environmental issues are expected to grow both domestically and globally. The total spent on energy, environment, and sustainability in the US is expected to rise to more than \$43 billion by 2017, and overall growth in energy, environment and sustainability market is forecasted to increase at an annual rate of 5%

from 2012 to 2017 (Verdantix, 2013). Global environmental costs are expected to reach US\$ 28.6 trillion, equivalent to 18% of GDP in 2050 (UNEP, 2013; Deloitte, 2013).

Above I discussed the costs related to sustainability, and now discuss what benefits companies can get from engaging in sustainability activities. One of the primary goals for operating a business is to make a profit. Without making a profit, a firm cannot exist. Firms that are involved in sustainability have to see that sustainability generates benefits, if not in the short run, then in the long run. An example is Campbell Soup's water-savings projects. The switch from sprinkler irrigation to drip irrigation is costly (it costs about \$1,000 per acre to install the drip system underground), however the benefits are significant: in addition to cutting water use by roughly 10 percent, it saves on fertilizer and helps farmers boost their tomato yields. Campbell Soup relies on the success of its tomato farmers (Fleming and Barton, 2013).

Engaging in sustainability can create potential benefits such as enhanced brand reputation and employee engagement. The benefit from engaging in sustainability is often long-term and appears in the form of "intangibles". Research shows that the proportion of intangible assets of S&P 500 market value has increased dramatically the last decade. The portion of market value attributable to intangible assets grew from 32% in 1985 to 80% in 2010 (AICPA, 2013b). Intangibles, such as innovation capacity, quality of management, people, and strategy, are the real sources of business value (AICPA, 2013b). The increasing trend of sustainability reporting is persuasive to show that executives know that their performance depends on nonfinancial data. According to

KPMG (2011) survey, ninety-five percent of the 250 largest public companies in the world issued sustainability reports in 2011. In the past two years, the number of sustainability reports in the U.S. has increased by 44 percent, outpacing the global growth of about twenty percent on average.

### 2.1.3 Corporate Governance and Stakeholders

The definition of corporate governance varies in different contexts. Generally, researchers, investors, and regulators have defined corporate governance from the perspective of either agency theory that emphasizes the conflict of interests between managers and shareholders, or a broader stakeholder’s approach that includes all participants of the firm’s operations. This study focuses on the stakeholder’s approach and considers corporate governance as a means to aligning interests of management with those of stakeholders. Gillan (2006) develops a corporate governance model from a stakeholder’s perspective (see Figure 3).

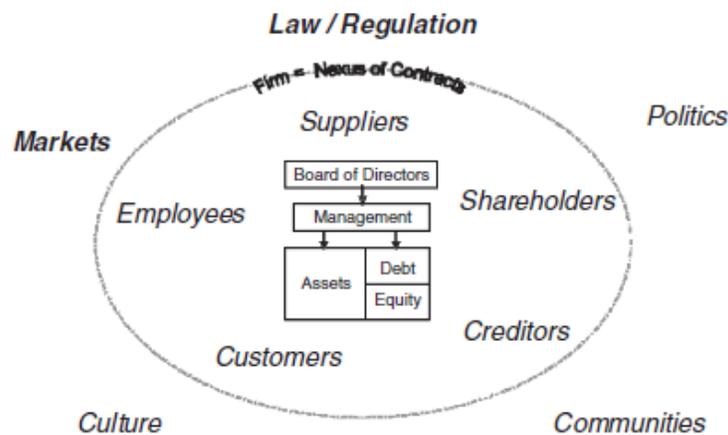


Figure 3. Corporate Governance and Stakeholders

Source: Gillan (2006)'s *Corporate governance: beyond the balance sheet model*

In the center of the ellipse in Figure 3 is the simplified balance sheet model developed by Ross et al. (2005), representing the internal corporate governance mechanisms that include boards of directors. The Board of Directors is at the top of the internal corporate governance mechanism. Elected by shareholders, directors are charged with duties of monitoring, advising, hiring, and firing corporate executives. Managers make operational and investment decisions as to which assets should be invested in and how to finance those investments in order to maximize investment returns. Other than boards, managers, shareholders, and debtholders, Figure 3 depicts other participants in the corporate structure, including employees, suppliers, and customers. Outside of the ellipse is the environment in which firms operate: communities, the political environment, laws and regulations, and the markets in general. While Jensen and Meckling (1976) view a firm as a nexus of contracts between the principal (shareholder) and agent (manager), Gillan (2006) considers a firm as nexus of contracts between a firm and its stakeholders.

#### *2.1.4 Summary of Corporate Sustainability Performance, Corporate Governance, and Corporate Financial Performance*

Previous literature on the empirical relation between sustainability performance and financial performance is complex, and the conclusions are often mixed. Jensen (2002) proposed the enlightened stakeholder theory. He asserts that the best strategy to advance social welfare is to maximize the firm's long-term value. As long as a firm's

objective function remains value maximization, financial economists have no problem with accepting sustainability.

Corporate governance affects corporate financial performance in different ways. The board of directors as an internal mechanism is important in providing resources and advice to senior executives (Hillman et al., 2009) and monitoring the behavior of top management (Jo and Harjoto, 2011). Fama and Jensen (1983) maintain that boards can be effective mechanisms to monitor top management on behalf of various stakeholders by making management appointments, dismissals, suspensions, and rewards.

## 2.2 Key Issues in Prior Research

Research investigating the relationship between CSP and CFP has traditionally utilized one or two conceptual frameworks. Patten (2002) states that there are three main reasons that have prevented researchers from getting a significant result on the CSP-CFP relationship: small sample sizes, performance measures, and failure to control for firm size and industry classification. To explain these inconclusive results, several meta-analytic reviews have attempted to identify methodological issues in the extant CSP-CFP relationship (Orlitzky et al., 2003; Allouche and Laroche, 2005; Margolis et al., 2009; Horváthová, 2010). In particular, Orlitzky et al. (2003) find a positive relationship between CSP and CFP. In addition, CSP reputation indices are more highly correlated with CFP than are other indicators of CSP. Allouche and Laroche (2005) document a strong correlation between CSP and CFP on average. They further find that

measurements and methods that characterize the research often moderate relationship strength between CSP and CFP. Finally, Margolis et al. (2009) meta-analyze 251 studies between 1972 and 2007 and conclude that the overall effect of CSP on CFP is positive but small. Consistent with findings from other researchers, Margolis et al. (2001 and 2009) point out that previous studies are subject to various flaws, such as measurement problems related to both sustainability performance and financial performance. Horváthová (2010) conducts a meta-regression analysis of 37 empirical studies and concludes that the empirical method used matters for the inconclusive results. Specifically, a negative link between environmental and financial performance significantly increases when using simple correlation coefficients instead of more advanced econometric analysis. Also, results indicate that the portfolio studies tend to report a negative link between environmental and financial performance.

Some scholars assert that many studies do not consider important variables that can influence the relationship (i.e. the omitted variable problems), such as R&D investments (McWilliams and Siegel, 2000), age of equipment, and capital expenditure (Clarkson et al., 2011a). Ruf et al. (2001) suggest a lack of theory. Jo and Harjoto (2012) and Godfrey and Hatch (2007) add to these problems the lack of necessary analyses of causality and/or endogeneity. Margolis et al (2009) suggest that the CSP-CFP relationship is affected by the number of industries in the examined sample. Today we have many studies that do not provide a clear answer to the topic.

Research on corporate governance and sustainability has drawn attention from different disciplines. Yet prior studies have often considered them separately. Prior sustainability and corporate governance literature lacks empirical studies that examine CSP and CGOV jointly and the moderating effect of corporate governance on the CSP-CFP relationship remains unclear.

### 2.3 Research Questions

Even though there are studies examining the CSP-CFP or CGOV-CFP relationship, there is less evidence regarding how corporate governance affects sustainability performance and how corporate governance and sustainability performance jointly affect firm value after controlling for confounding variables. Thus this study raises three questions: (1) How does corporate governance affect corporate sustainability performance? (2) How does corporate sustainability performance affect corporate financial performance in the short term and in the long term? (3) How does corporate governance moderate the relationship between corporate sustainability performance and corporate financial performance?

### 2.4 Literature Review and Hypotheses Development

The study examines three constructs: CSP, CGOV, and CFP. This section starts with a review of extant theories, and then moves to a review of related studies. Finally, hypotheses are formulated based on the theories and the literature review. The following sections provide a literature review on several links between corporate sustainability performance, corporate governance, and corporate financial performance.

### *2.4.1 Theories of Corporate Governance*

Three predominant theories in corporate governance research, namely agency theory, stewardship theory, and resource dependence theory, provide a broad theoretical understanding of how the board of directors influences a firm's sustainability performance. Agency theory provides the rationale for how a board monitors management on behalf of the shareholders (Fama and Jensen, 1983). Stewardship theory posits that a manager is the steward of a company's assets, rather than the agent in the agent-principal relationship described in agency theory. Resource dependence theory offers the rationale on how boards allocate limited critical resources including legitimacy, advice, and counsel (Hillman and Dalziel, 2003) to respond to different stakeholders' needs and better manage sustainability issues (Boyd, 1990). Pfeffer and Salancik (1978) theorize that boards of directors serve as a mechanism to access resources from the external environment. Prior literature suggests that while each theory can explain a particular case, no single theory explains the general role of corporate governance (Nicholson and Kiel, 2007). An effective board needs the appropriate mix of experience and capabilities to evaluate management and assess business strategies and their impact on sustainability policies.

#### *2.4.1.1 Agency Theory*

Agency theory has dominated the corporate governance research since the seminal theoretical paper by Jensen and Meckling (1976). Agency theory explores the relationship between managers (agents) and owners (principals). Agency theory assumes

managers are self-interested and risk averse. In the situation when managers do not hold 100% of the firm's wealth, they may not act to maximize the wealth of shareholders but to maximize their own personal interests. The separation of ownership and control leads to the misalignment of managers' interest to shareholders' interest.

#### 2.4.1.2 Stewardship Theory

Stewardship theory is a theory challenging the agency model to explain modern corporation structure and corporate governance. Stewardship theory posits that a manager is the steward of a company's assets, rather than the agent in the agent-principal relation described in agency theory. Stewardship theory advocates the duality of the CEO and chairman, because it is necessary for a corporation to focus the power and authority on a single individual. In contrast, agency theory argues that the position of CEO and chairman should be separated, since the board has the duty to monitor the managers (Boyd, 1995). Agency theory assumes that managers are self-interested and have an incentive to maximize their own interests, while stewardship theory suggests that managers often have interests similar to those of shareholders. In some situations, managers find acting to maximize shareholders' interests may also serve their own interests. For example, managers tie their personal reputation and capital to the firms' operational performance to maintain their reputation as a professional expert or decision maker (Fama, 1980). Significant reputational penalty is imposed to those managers and boards of directors in a failing company (Fama, 1980).

#### 2.4.1.3 Resource Dependence Theory

Another important theory exploring corporate governance, especially the role of boards of directors, is resource dependence theory. Resource dependence theory, first proposed by Pfeffer and Salancik (1978), has become one of the most influential theories in corporate governance research. After a comprehensive review of resource dependence theory, Hillman et al. (2009) conclude that resource dependence theory, although less commonly used to study boards than agency theory, is evidenced to be a more successful lens for understanding boards. Under resource dependency theory, corporations are characterized as an open system, dependent on contingencies in the external environment (Pfeffer and Salancik, 1978). Pfeffer and Salancik (1978) point out that one of the five actions that firms can take to minimize environmental dependence is the board of directors.

One of the major differences between agency theory and resource dependence theory is to which party the manager's interest is aligned. According to agency theory, the role of the directors is to alleviate agency problems that arise between the managers and shareholders through monitoring top management to act in the best interest of the shareholders. In contrast, resource dependence theory argues that directors are valuable resources to successful business operations and thus they may fulfill the monitoring and resource dependence roles simultaneously (Hillman et al., 2000).

In summary, although agency theory is the predominant theory used in corporate board governance research (Dalton et al., 2007), prior literature reviews of boards of

directors conclude that other competing theories are supported more often than agency theory (Johnson et al., 1996). Therefore, a multi-theoretical approach to empirical corporate governance is desirable to explore the dynamic nature of corporate governance mechanisms (Daily and Cannella, 2003; Ouyang, 2007; Hillman et al., 2009). Although the organizational theories noted above lead to opposing predictions on board size and CEO duality and appear to be in conflict, one of the important goals of this study is to develop a corporate governance measure showing how these theories are actually complementary from a stakeholder's perspective. Using a multi-theoretical approach, this study examines the link between corporate governance and CSP through one of the corporate governance mechanisms, boards of directors. To explore the influence of corporate governance on corporate sustainability performance, the study examines four board attributes: board size, board independence, CEO duality (where the CEO is also the chairman of the board) and female directors. The study further examines how CGOV moderates the CSP-CFP relationship.

#### *2.4.2 Theories of Sustainability and Financial Performance*

The triple-bottom-line nature of sustainability suggests that companies operate beyond "profit maximization". Corporations also respond to the environmental and social aspects of sustainability (Taylor, 2007; Ho and Taylor, 2007). According to Elkington (2006), a corporation's ultimate objective is not only to create value for shareholders, but to create economic, environmental, and social value (Galbreath, 2012). This requires that

business models and corporate governance mechanisms move beyond viewing the organization solely as an economic entity (Stubbs and Cocklin, 2008).

Ullmann (1985) suggests the need for a theory of corporate social performance because of the inconsistent findings that have resulted from studies of the interrelationships among social disclosure, social performance, and economic performance of U.S. companies. Of the theories that have been employed in prior literature, there are two views and three theories that have received much attention from investors. The two views are related to sustainability performance: the “traditionalist” view vs. the “revisionist” view. The three theories are related to sustainability investment and reporting: agency theory, legitimacy theory and stakeholder theory.

Agency theory provides a theoretical foundation for the “traditionalist” view. Agency theory as proposed by Jensen and Meckling (1976) states that one of the major functions of managers is to align companies’ interest with shareholders’ interest. Friedman and Allen (1970) use agency theory to examine companies’ activity in corporate social responsibility (CSR). Friedman and Allen (1970) assert that engaging in CSR is symptomatic of an agency problem or a conflict between the interest of managers and shareholders. He argues that managers use CSR as a means to pursue their own social, economic, political, and career goals. According to this view, investment in CSR would be more wisely used, from a social perspective, on the improvement to a company’s efficiency. He further argues that every penny used in CSR activities is just spending somebody else’s money and does not do much good for the company as a

whole. This theory represents the “traditionalist view.” Under this view, environmental costs used for environmental protection/improvement such as pollution abatement or air emission reduction are predicted to increase production costs and thus lower economic performance. Agency theory has been tested in several studies that examine the CSP and CFP relationship. For example, Wright and Ferris (1997) find that stock prices react negatively to announcements of divestment in assets in South Africa, which they interpreted as consistent with agency theory. Studies by Jaggi and Freedman (1992) and King and Lenox (2001) also find a negative relationship between environmental performance and economic performance.

Legitimacy theory and stakeholder theory provide some foundation for the “revisionist” view. The “revisionist” view, also called the Porter hypothesis, was initiated and developed mainly by Porter (Porter and van der Linde, 1995) who theorizes that pollution reduction provides future cost savings by increasing efficiency, reducing compliance costs, and minimizing future liabilities (King and Lenox, 2001), thus increasing firm value. Legitimacy theory, originated by Davis (1973), states that “society grants legitimacy and power to business. In the long run, those who do not use power in a manner which society considers responsible will tend to lose it (Davis 1973, page 314).” Legitimacy theory posits that organizations are continually seeking to ensure that they operate within the bounds and norms of their respective societies (Deegan and Unerman, 2006). Under legitimacy theory, corporations should be socially responsible and accountable to society in order to legally operate their business (Simnett et al., 2009;

Dowling and Pfeffer, 1975; Deegan, 2002; O'Donovan, 2002; de Villiers and Van Staden, 2006; Van Staden and Hooks, 2007; Cong and Freedman, 2011).

Stakeholder theory, first proposed by Freeman (1984), provides a discussion of the links between external stakeholders and company functions. Stakeholder theory predicts that managers conduct sustainability to fulfill their moral, ethical, and social duties for their stakeholders and strategically achieve corporate goals for their shareholders. Freeman (1984) defines stakeholders as “any group or individual who can affect or is affected by the achievement of the organization objectives”. The main stakeholders are customers, employees, local communities, suppliers and distributors, the public, regulators, government, policymakers, and shareholders (Friedman and Miles, 2006).

Extending the traditional stakeholder theory, Jensen (2002) proposes enlightened stakeholder theory (also called enlightened value maximization). Stakeholder theory suggests that managers should make decisions that take account of the interests of all the stakeholders in a firm. Stakeholders include all individuals or groups who can substantially affect, or be affected by, the welfare of the firm. The main stakeholders include not only shareholders and creditors but also employees, customers, communities, and regulators. Stakeholder theory is now popular and has received the formal endorsement of many professional organizations, special interest groups, and governmental bodies (Hillman et al. 2009). While corporate managers serve stakeholders,

there must be a tradeoff to reduce the conflicts between stakeholders and important constituencies (Hillman et al. 2009).

The major difference between traditional stakeholder theory and enlightened stakeholder theory is that the latter accepts the long-term value maximization as a firm's objective while the firm focuses its attention on meeting the demands of all important corporate constituencies (Jensen, 2010). Jensen (2010) argues that stakeholder theory as stated by Freeman (1984) contains no conceptual specification of how to make the tradeoffs between stakeholders that must be made.

Both legitimacy theory and stakeholder theory have developed from the broader political economy perspective (Gray et al, 1996; Deegan, 2002, Van der Laan, 2009). The two concepts overlap (Deegan, 2002; Gray et al., 1995). They both focus attention on the nexus between the organization and its operating environment (Neu et al., 1998). While the stakeholder approach is suggested as the best theory to explain managerial behavior, legitimacy theory deals with "perceptions and the processes" involved in the notions of power relationships (Moerman and Van der Laan, 2005).

#### *2.4.3 The Missing Link between Corporate Governance and Corporate Sustainability Performance*

Resource dependency theory argues that directors are appointed to boards to aid and support the firm (Pfeffer and Salancik, 1978). This support includes giving advice and counsel, lending an air of legitimacy, and gaining preferential access or support from important elements outside the corporation. Board support is critical with respect to

sustainability, because sustainability consists of considerable uncertainty due to the complexity of the problem, the difficulty of its resolution, and the changing expectations (Bansal, 2005). Management is subject to short-termism. A report reveals that a large majority (88%) of the 642 experts polled see pressure for short-term financial results as a barrier to businesses becoming more sustainable (SustainAbility, 2012). Monitoring mechanisms are needed to create a long-term focus, given that such a focus is necessary for the investment in and improvement of sustainability outcomes (Hahn et al., 2010). Jensen (2002) suggests that corporations conduct sustainability to meet the stakeholder's expectation by being ethical and socially supportive. Stakeholder theory predicts that managers conduct sustainability to fulfill their moral, ethical, and social duties for their stakeholders and strategically achieve corporate goals for their shareholders (Freeman, 1984). Cespa and Cestone (2007) describes the role of the corporation is subject to scrutiny by non-investing stakeholders. Jo and Harjoto (2011) hypothesize and find a positive association between the CSR engagement and corporate governance mechanisms.

Corporate boards play an important role in creating a company's overall sustainability strategy through monitoring the behavior of top management (Jo and Harjoto, 2011). Board composition is an important element in the ability of the board to influence firm outcomes. Broadly speaking, there are two categories of corporate governance devices: internal (ownership concentration and board structure) and external

(takeover pressures and external monitoring by institutional investors and security analysts) (Jo and Harjoto, 2012).

To answer my first question “How does corporate governance affect sustainability performance?”, the following four board attributes are examined: board size, board independence, CEO duality, and female directors. These four variables are related to the effectiveness of the board, the power of the board, the monitoring of the board, and diversity of the board.

Board size has drawn considerable attention in the corporate governance literature. Board size may affect the selection of strategies. According to resource dependence theory, a larger board provides more access external resources. A meta-analysis study conducted by Dalton et al. (1999) finds that board size, a variable related to the number of links the board has to its environment, is positively associated with firm performance. A large board may be optimal in some situations. A larger board is needed for a larger company with more external relationships and complex contracts (Coles et al., 2008). Cheng (2008) finds that larger board can reduce extremity in board decisions. Prior literature reviews suggest that firms that operate in multiple environments benefit from having a larger board that can provide the needed counsel in strategic decision-making situations (Hermalin and Weisbach, 1998). Forbes and Milliken (1999) show that a large board should result in more thorough and careful analysis of strategic alternatives. Because sustainability issues are in nature often complex and uncertain, a positive relationship is predicted between board size and corporate sustainability performance.

*Hypothesis 1a: Board size is positively associated with corporate sustainability performance.*

Another factor affecting board power is its status of independence from management. An insider dominated board is viewed as weak because a higher proportion of insiders (i.e., less independence) is ineffective in monitoring the CEO who has the power to determine compensation packets and continued employment. “Insider dominated board implies problematic self-monitoring, and particularly weak monitoring of the CEO, since the CEO is likely to be in a position to influence the insider directors’ career advancement within the firm” (Zajac and Westphal, 1994, p. 125).

In contrast, a higher portion of outsiders may be more effective in their monitoring role (Finkelstein and D’Aveni, 1994). An outside director is defined as a non-executive director who is not a member of management and who has not had a previous affiliation with the firm. Outsiders have external ties and bring external support to the firm on whose board they serve (Babysinger and Hoskisson, 1990). Their expertise and knowledge also bring advice and counsel to the firm (Lorsch and MacIver, 1989). The more independent a board, the more powerfully it will affect and be able to enforce its will. Therefore a positive sign is expected for this variable.

*Hypothesis 1b: Board independence is positively associated with corporate sustainability performance.*

CEO duality occurs when the CEO is also the chairman of the board. It is an indicator of CEO power over a board (Finkelstein and Hambrick, 1996). CEO duality increases board leadership. Stewardship theory advocates the duality of the CEO and chairman. Under stewardship theory, the duality of CEO and chairman establishes a unity of command at the top of the firm, with unambiguous leadership clarifying decision-making authority and sending reassuring signals to stakeholders (Finkelstein and D'Aveni, 1994). Stewardship theory argues that the reallocation of corporate control from owners to professional managers may be a positive development toward managing the complexity of the modern corporation. Having control empowers managers to maximize corporate profits (Muth and Donaldson, 1998). Some empirical studies find validity of the advocates for CEO duality. Muth and Donaldson (1998), for example, examine a sample of 145 firms in Australian Stock Exchange and find the CEO duality can bring higher returns to shareholders. Stewardship theory finds support in the sustainability literature. Jo and Harjoto (2011) find that firms with higher board leadership (CEO duality) are more likely to choose CSR engagement. Thus from stewardship perspective, it is expected that CEO duality will have a positive impact on the CGOV- CSP relationship.

*Hypothesis 1c: CEO duality is positively related to corporate sustainability performance.*

In addition to board power, the increase in female directors on the board in the U.S. has attracted scholars' attention over the last 10 years.<sup>4</sup> Rose (2007) suggests that female participation in boards is increasingly viewed as valuable. Female directors are more likely than male directors to have expert backgrounds outside of business and to bring different perspectives to the board (Hillman et al., 2002). Prior research suggests that firms with a higher percentage of female board members have a higher level of charitable giving (Williams, 2003), a better control over management (Fondas and Sasselos, 2000; Adams and Ferreira, 2009), and higher level of environmental CSR (Post et al., 2011). If female directors are more active (Eagly et al., 2003, Srinidhi, 2013), more democratic (Eagly and Johnson, 1990), and more communicative than male directors (Rudman and Glick, 2001), then having women on a board promotes more open and effective conversations board communication to investors (Joy, 2008). Recent studies show that female directors are more diligent in monitoring (Adams and Ferreira, 2009) and more independent in thinking and improving the monitoring process (Adams et al., 2010).

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<sup>4</sup> Maintaining a certain percentage of female directors on the board is required by law in some countries. For example, Norway requires 40 percent female board presentation. Spain and Sweden require a future female board presentation of 40 percent and 25 percent, respectively. France requires a 50 percent of female board presentation by 2015 (Srinidhi, 2013).

In summary, the addition of female directors to the board helps the board's effectiveness, communication, and, and monitoring function. A more gender-diverse board thus helps assess the needs of diverse stakeholders and enhance the board's ability to effectively address sustainability issues. Bear et al. (2010) find that there is a positive association between number of women on the board and corporate social responsibility and firm reputation. This study predicts that the presence of female directors on the board will have a positive impact on corporate sustainability performance.

*Hypothesis 1d: The presence of a female on the board is positively associated with corporate sustainability performance.*

One function of the board is to provide senior management with advice and counsel (Hillman and Dalziel, 2003). Therefore examination of board composition and its strategic outcomes, including sustainability performance, is essential to understanding the governance function of the board. Good corporate governance reduces both internal and external risks to a company or brings improved reputation (Galbreath, 2012). Thus an overall of hypothesis 1 is stated as follows:

*H1: The level of corporate governance is positively associated with the level of corporate sustainability performance.*

#### *2.4.4 The Link between Social Performance and Financial Performance*

Along with the increased in corporate governance issues and corporate social responsibility issues, one of the most significant and continuous corporate trends of the last decade is the growth of corporate sustainability. Agency theory posits that managers' interest may not always align with shareholders' interests. The board of directors also monitors management in the decision-making process in sustainability issues.

Carroll (1979) and Hill et al. (2007) create corporate social responsible models and provide three CSR principles in four categories: economic, legal, ethical, and philanthropy. Figure 4 visualizes the he three CSR principles: the principle of legitimacy at the institutional level (originated by Davis, 1973); the public responsibility at the organizational level (originated by Preston and Post, 1975); the principle of managerial discretion at the individual level (Carroll, 1979; Wood, 1990). Carroll's corporate social responsibility can be illustrated in Figure 4.



Figure 4. Carroll's Corporate Social Responsibility Pyramid

Carroll's CSR Pyramid in Figure 4 describes four levels of responsibility: economic, legal, ethical, and philanthropic. The bottom of the pyramid is economic responsibility. It is the foundation of the pyramid. The main duty of a firm is to produce goods and service for the community. The economic layer is supporting all the other layers on top. The second level is legal responsibilities. Firms operate within the certain framework of the law. The third level is ethical responsibility. This means firms operate their business in an ethical way even if no law requires. The top level is philanthropic responsibility. This is how companies return their profit to society. This is the highest level of responsibility that a company bears. Carroll states that these four levels of responsibility are not mutually exclusive. Only pursuing these four responsibilities simultaneously, can a company say it is really corporate socially responsible.

Studies examining the association between social performance and financial performance have documented mixed results: some studies found a positive correlation between social performance and economic performance (Bragdon and Marlin, 1972; Moskowitz, 1972; Sturdivant and Ginter, 1977), and some found a negative correlation (Vance, 1975; Spicer, 1978), and others found no correlation (Alexander and Buchholz, 1978). Sharma and Henriques (2005) find that stakeholders such as customers, environmental groups, and employees have a positive effect on levels of sustainability practices. More social responsible firms improve brand images and reputation (Sprinkle and Maines, 2010; Waddock and Graves, 1997; Fombrun and Shanley, 1990), help to motivate, recruit and retain employees (Turban and Greening, 1996), and reduce the likelihood of having defective product lines, or the risk of paying heavy fines for excessive wasting and pollution (Moskowitz, 1972). All of above suggest that firms benefit from socially responsible behavior in terms of production cost saving, increased productivity, and employee morale (Sprinkle and Maines, 2010; Moskowitz, 1972; Soloman and Hansen, 1985).

#### *2.4.5 The Link between Environmental Performance and Financial Performance*

Studies examining the relationship between environmental performance and financial performance have shown inconclusive results: one stream of research has documented that the high environmental performance of corporations increases firms' financial performance; another stream of research has provided that financial

performance is negatively associated with environmental performance such as pollution performance; and others find no association at all.

#### 2.4.5.1 Negative Association between Environmental Performance and Financial Performance

Traditionally, it has been argued, environmental regulation has been associated with additional costs to firms due to complying with environmental laws. Firms have to invest in new more environmentally friendly equipment or cleaners to decrease the environmental impacts of factories (Horváthová, 2012). The early studies (1970s and 1980s) were based on the pollution data using a simple correlation coefficients method to explore the relationship between environmental and financial performance. The first study provided by Bragdon and Marlin (1972) documents a U-shaped relationship between environmental performance (measured by a pollution index) and financial performance (measured by earnings growth). Spicer (1978) tests the relationship between pollution indices and five financial indicators (profitability measured as the ratio of income available to common stock equity; size, measured as the total assets; total risk measured as the standard deviation of periodic stock returns; individual security systematic risk; and the price/earnings ratio) and concluded that a moderate to strong association exists. This assertion was challenged by Chen and Metcalf (1980) who use the same data as Spicer (1978) does. After controlling for firm size and using a regression method, Chen and Metcalf (1980) find that the positive correlation disappeared. Mahapatra (1984) compare pollution control expenditures with market returns and found

a negative correlation. Jaggi and Freedman (1992) find a negative relationship between the pollution performance index and economic performance of firms in the pulp and paper industry. Cordeiro and Sarkis (1997) show a negative relationship between environmental performance (measured by the Toxic Release Inventory data and 1-and 5-year financial performance (measured by analyst earnings per share forecasts) for a sample of 523 US firms in 1992. Molloy et al. (2002) analyze 339 S&P 500 companies mainly from the manufacturing sector and find that poor (good) environmental performance has a statistically significant positive (negative) impact on returns. Horváthová (2012) analyzes the link between environmental performance (measured by 93 pollutants releases to air, water and land from the Czech Republic) and financial performance (ROA) and finds a negative correlation for environmental performance lagged by one year and a positive correlation for environmental performance lagged by two years, suggesting the Porter hypothesis holds in the long-run. However, Rassier and Earnhart (2011) find that lower emissions improve firm financial performance both in the short and long run, with a stronger effect in the long run.

The literature review in this subsection represents the neoclassical economics theory that supports the short-run perspective hypothesis which states that firms in industries with higher environmental compliance costs face a competitive disadvantage, because compliance costs of production activities outweigh the value added to the firm.

#### 2.4.5.2 Positive Association between Environmental Performance and Financial Performance

The other stream of environmental studies, however, argues that improved environmental performance is a potential source for competitive advantage as it can lead to more efficient processes, improvements in productivity, lower costs of compliance and new market opportunities. According to Hart (1995), sustainability requires firms to minimize any environmental degradation imposed by value creation activities and address the social need from the community. Hart and Ahuja (1996) examine the relationship between one, two, and three years lagged environmental performance (measured by emissions reduction from the Toxic Release Inventory) and financial performance (measured by ROA and ROE) and find a positive association between environmental performance and financial performance. Russo and Fouts (1997) use the cross-sectional pooled data of 243 companies from 1991-1992 and find that better environmental performance (measured by environment performance ratings and expenditures on waste reduction) is associated with better financial performance (measured by ROA and firm growth). Bhat (1998) examines the impact of environmental compliance (measured with the penalties imposed for violation of environmental regulations) on financial performance (measured by profit margin), suggesting a positive relationship between the degree of environmental compliance and profit margin. Cormier et al. (1993) investigate the relationship between the market valuation of publicly listed corporations and a pollution index and find a positive relationship between environmental performance and financial performance. Diltz (1995) analyzes 28 common stock portfolios and finds a positive correlation between environmental performance and stock

market returns. In a portfolio analysis of S&P companies, Cohen et al. (1997) do not find a positive relationship between environmental and financial performance (measured by the Sharpe and Treynor index). In contrast, White (1996) finds that a portfolio that includes more environmentally responsible companies outperforms the market portfolio from environmentally less responsible companies.

While studies conducted in the 1990s typically employ cross-sectional or pooled estimates, more recent studies employ a variety of environmental as well as financial variables and use more advanced statistical techniques (Horváthová, 2012). Sroufe (2003) finds the earnings management system (EMS) is positively linked to environmental practices and performance using survey data. Konar and Cohen (2001) conclude that poor environmental performance (measured by the toxic emissions obtained from the Toxic Release Inventory) decreases the intangible asset value for the S&P 500 manufacturing firms. Based on monthly data from 1996 to 2002, Guenster et al. (2006) use Strategic Value Advisors ratings as a proxy for environmental performance, and find a positive relationship between eco-efficiency and firm value. Montabon et al. (2007) document a significant positive relationships between environmental management practices (EMPs) and measures of performance (ROA, sales growth, return on investment, and operating earnings). Lo and Sheu (2007) find that the Tobin's Q of US companies in the Dow Jones Sustainability Index are greater than those of non-sustainable companies. However, Rassier and Earnhart (2011) find that lower emissions improve firm financial performance both in the short and long run with a stronger effect in the long run.

Horváthová (2012) examines the intertemporal effect of environmental performance on financial performance and the results suggest that the effect of environmental performance on financial performance is negative for the 1 year lagged environmental performance variable, but it becomes positive for a 2 year lagged environmental performance, indicating that the Porter hypothesis holds in the long-run.

Simultaneous equations models (SEMs) are applied by several recent studies (Wagner et al., 2002; Al-Tuwaijri et al., 2004; and Clarkson et al., 2011a; Wagner, 2005) and results are still inconclusive. While Wagner et al. (2002) find a negative and insignificant relationship between environmental performance and financial performance, Al-Tuwaijri et al. (2004) and Clarkson et al. (2011a) find a positive one. Wagner (2005) finds a negative (for the emission-based index) and no (for the inputs-based index) relationship between environmental and economic performance.

The measurement of environmental and economic performance in the literature is discussed below. Al-Tuwaijri et al. (2004) use the ratio of toxic waste recycled to total toxic waste generated to proxy for environmental performance and market price per share to proxy for economic performance. Clarkson et al. (2011a) use performance data from four of the most polluting industries (pulp and paper, chemical, oil and gas, and metals and mining) in the US and change in ROA as the economic performance measure. Wagner et al. (2002) focus only on the European paper industry. In this study, environmental performance is measured by an environmental index of emissions (SO<sub>2</sub> emissions, NO<sub>x</sub> emissions and Chemical Oxygen Demand emissions) and economic

performance is measured by return on sales (ROS), return on equity (ROE) and return on capital employed (ROCE). Wagner (2005) uses the same measures for economic performance as Wagner et al. (2002) do, but adds an energy input and a water input (called input-based index) to SO<sub>2</sub>, NO<sub>x</sub> and Chemical Oxygen Demand emissions (called emission-based index).

To summarize the literature review on environmental studies, the majority of the studies are based on US and European data. Few studies analyze emerging or Asian countries. The US studies are commonly based on the Environmental Protection Agency's Toxics Release Inventory data.

#### 2.4.5.3 No Association between Environmental Performance and Financial Performance

A small group of research studies find no relationship between environmental and financial performance. Cohen et al. (1997) conduct a portfolio analysis of S&P companies and do not find a positive relationship between environmental and financial performance. Molloy et al. (2002) examine 339 S&P 500 firms from the manufacturing sector and find that Toxic Release Inventory emissions have no statistically significant impact on one-year holding period returns. Using the Pearson Correlation method, Yu et al. (2009) examine 51 European companies from 14 industries across 15 countries to investigate the possible relationship and find there is no correlation. Environmental performance is measured by sustainable value, sustainable value margin, and return to cost ratio. Financial performance is measured by return on sales (ROS), return on assets (ROA), earnings per share (EPS) and income before interest and taxes (IBIT)/asset.

Although no positive association is found between environmental performance and financial performance, Yu et al. (2009) state that being perceived as a green company may improve a company's image and reputation, thus attracting more talented workers and green-conscious customers. Because of mixed results found in the literature, the short-term effect of CSP on CFP is stated as in the null form:

*H2a: There is no relationship between corporate sustainability performance and corporate financial performance in the short-term.*

Prior literature documents inconclusive results regarding the relationship between sustainability performance and financial performance. Even a meta-analysis technique fails to give consistent results and explanation. Most studies mentioned above focus on the short term financial impact. Fewer studies in the literature investigate the impact of sustainability performance on financial performance in the long run. Prior studies are less concerned about the possibility that the effect of sustainability performance on financial performance is time-evolving. It is possible that the direction of the effect is different in the short-term than in the long-term (Horváthová, 2012). More social responsible firms are perceived as less risky than less socially responsible firms (McGuire et al., 1988). Comincioli et al. (2012) finds a positive CSP-CFP relationship in the long run. In the long run, a socially responsible firm will achieve a gain although initial practices may be

expensive. Therefore, from a long run perspective, CSP will improve CFP. Hypothesis H2b is stated below:

*H2b: There is a positive relationship between corporate sustainability performance and corporate financial performance in the long-term.*

Hypothesis 2 is illustrated in Figure 5 below:

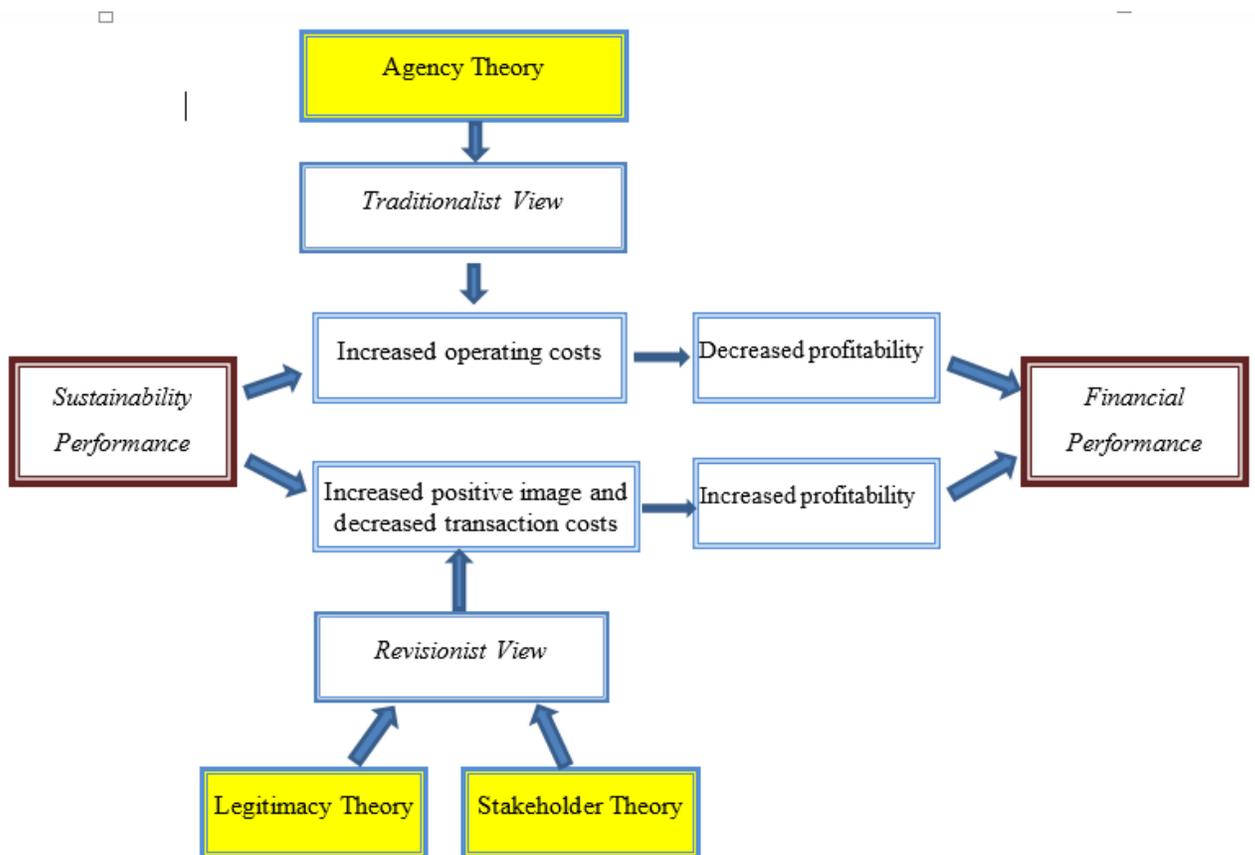


Figure 5. Theories of Corporate Sustainability Performance and Corporate Financial Performance

A positive association could imply that only successful companies can afford the luxury of above-average sustainability performance. On the other hand, a positive association could also indicate that a company's management is dealing effectively with the firm's external stakeholders and their multiple demands.

#### *2.4.6 The Missing Link of Corporate Governance on the Relationship between Corporate Sustainability Performance and Corporate Financial Performance*

The impact of corporate sustainability performance and corporate governance on corporate financial performance has become a topic of great interest to investors, scholars, practitioners and government regulators. However, there are only limited empirical studies that examine them jointly. This paper aims to fill the gap by examining the moderating effect of corporate governance on the CSP-CFP. Jo and Harjoto (2012) examine the effects of corporate governance and monitoring mechanisms on the choice of corporate social responsibility engagement and the value of firms engaging in CSR activities. They find that CSR choice is positively associated with the internal and external corporate governance and monitoring mechanisms, including board leadership, board independence, institutional ownership, and analyst following. In addition, Jo and Harjoto (2012) find that CSR engagement is positively associated with firms' Tobin's Q. They further find that board leadership and board independence play a relatively weaker role in enhancing firm value, compared to analyst following. Jo and Hajoto (2011) find the lag of corporate governance variables positively affects a firm's CSR engagement,

but the lag of CSR does not affect corporate governance variables. Rather than examining the missing link of CSR on the corporate governance-firm value, this study explores the missing link of the corporate governance effect on enhancing the CSP and CFP relationship and argues that sustainability performance has an impact on financial performance through corporate governance. It is expected that corporate governance will enhance the CSP-CFP relationship. Therefore, the third hypothesis is stated below:

*Hypothesis 3: Corporate governance enhances the relationship between corporate sustainability performance and corporate financial performance.*

The three hypotheses in this chapter can be summarized in Figure 6.

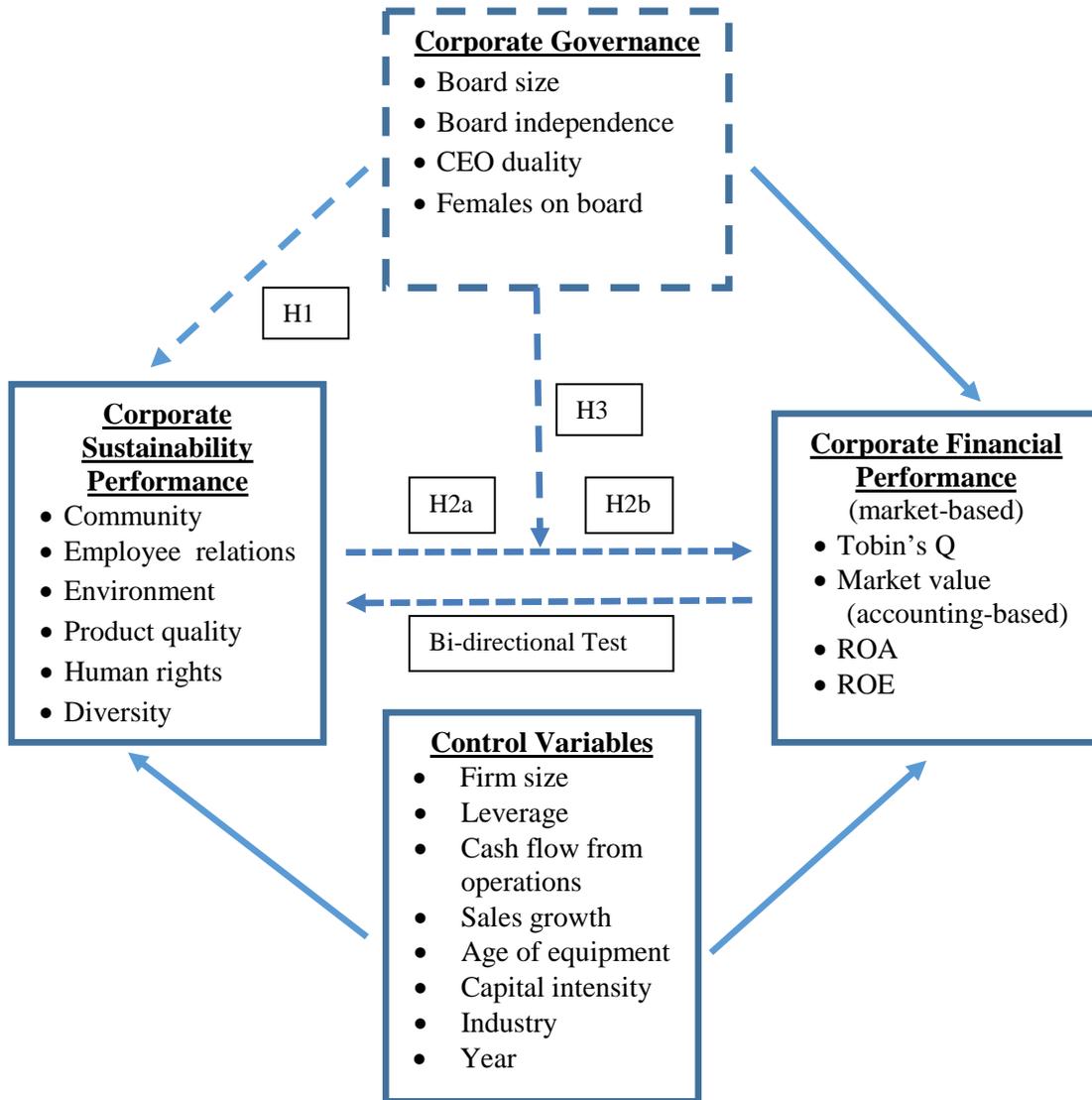


Figure 6. Research Framework

In Figure 6, the solid arrow represents an evidenced link and the dashed box or dashed arrow indicates a missing link or the link tested in this study. The research framework suggests that corporate governance, a missing link, can affect corporate sustainability performance and further moderates the relationship between corporate

sustainability performance and corporate financial performance. In addition, the relationship between corporate sustainability performance and corporate financial performance may be bi-directional.

## Chapter 3

### Data, Methodology, and Variable Measurement

This section discusses research design, methodology, and variable measurement in section 3.1, followed by data and sample selection in section 3.2.

#### 3.1 Research Design and Methodology

Due to the nature of this study and extreme outliers and skewedness of the data distribution, I conduct an econometric technique, using a median (least absolute deviation) regression, to estimate the models. Because a firm may not have all the data available for all years, the panel data is unbalanced panel data covering five years from 2007 to 2011. To control for the industry heterogeneity issue, errors are clustered by industry. A 1-year and 2-year lags of CSP are used to test the short-term and long-term effects of the CSP-CFP relationship in Equation 3. Using lags also controls for endogeneity that might arise from the panel data.

##### *3.1.1 Models for Hypothesis 1*

Equations 1 and 2 are used to test H1 which predicts a positive relationship exists between corporate sustainability performance and corporate governance.

$$\begin{aligned}
CSP_{it} = & \beta_0 + \beta_1 BSIZE_{it} + \beta_2 BIND_{it} + \beta_3 CEODUAL_{it} + \beta_4 FEMALE_{it} \\
& + \beta_5 SIZE_{it} + \beta_6 LEV_{it} + \beta_7 CFO_{it} \\
& + \beta_8 SG_{it} + \beta_9 NEWNESS_{it} + \beta_{10} CAPIN_{it} + \beta_{11} \sum_2^{10} INDUSTRY \\
& + \beta_{12} \sum_{2008}^{2011} YEAR + \varepsilon_{it}
\end{aligned}$$

(Equation 1)

In Equation 1, the variables of interest are BSIZE, BIND, CEODUAL and FEMALE. BSIZE is board size, measured as total number of board members (Galbreath, 2012; Ahmed et al., 2010). BIND is board independence, measured as the proportion of outside (independent) directors relative to total number of board members (Herda et al., 2013; Ahmed et al., 2010). CEODUAL is CEO duality, coded 1 if the CEO is also the chairman of the board, 0 otherwise. FEMALE is the female director binary variable, coded 1 if there is at least one female director on the board; 0 otherwise.

In Equation 2, a composite score measure, CGOV, is used to test the relationship between corporate sustainability performance and corporate governance. CGOV is calculated from four board attributes: board size (BSIZE), board independence (BIND), CEO duality (CEODUAL), and female directors (FEMALE).

$$\begin{aligned}
CSP_{it} = & \beta_0 + \beta_1 CGOV_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 CFO_{it} \\
& + \beta_5 SG_{it} + \beta_6 NEWNESS_{it} + \beta_7 CAPIN_{it} + \beta_8 \sum_2^{10} INDUSTRY \\
& + \beta_9 \sum_{2008}^{2011} YEAR + \varepsilon_{it}
\end{aligned}$$

(Equation 2)

Where,

CGOV is a composite corporate governance score. Following the method of Ahmed et al. (2010), CGOV is calculated from four boards attributes: board size (BSIZE), board independence (BIND), CEO duality (CEODUAL), and female directors (FEMALE). A score of 1 is assigned to a variable if strong board control, monitoring, or effectiveness is believed to be present. For example, BSIZE receives a score of 1 if the board size is above the median size and 0 if below the median score of the sample in a particular year<sup>5</sup>. Similarly, BIND receives a value of 1 if the board independence ratio is above the median and 0 if below the median of the sample in a particular year. CEODUAL is assigned 1 if the CEO and chairman are separate individuals and 0 if they are the same person. FEMALE is assigned 1 if a board has at least 1 female director and 0 if no female is on the board. CGOV is then calculated as the sum of the four scores from above four variables. It ranges from 0 to 4.

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<sup>5</sup> Relevant literature review on the four board attributes are presented in Sections 2.4.1 and 2.4.3.

CSP is the sum score of social performance from six dimensions of KLD social ratings. It is calculated as  $CSP = \sum_{m=1}^6 (STRENGTH - CONCERN)$ . The six dimensions are community, employee, environment, human rights, product quality, and diversity issues. Because of the nature of the study, scores of CEO and female directors are excluded from the calculation of the diversity score. A more detailed description of the variable metrics is provided in Appendix A on page 88.

Prior studies use different dimensions to measure CSP depending on the research question and research context. Some studies use all seven dimensions to measure CSP (Dhaliwal et al., 2011 and 2012; Linthicum et al., 2010; Graves and Waddock, 1994; and Boesso et al., 2013); some studies use six dimensions (Cho et al., 2012; Dhaliwal et al., 2011); some studies use five dimensions (Kim et al., 2012; Bear et al., 2010; Jo and Harjoto, 2011 and 2012).

Following prior studies (Waddock and Graves, 1997; Chatterji et al., 2009; Kim et al., 2012; Jo and Harjoto, 2011), in this study, I construct a CSP score, calculated as total strengths minus total concerns in KLD's six social rating categories: community, employee relations, environment, product quality, human rights, and diversity, excluding corporate governance category. In addition, for the diversity dimension, two indicators (the woman CEO rating and gender of directors) are excluded from the calculation of the diversity score due to the nature of this study. Appendix A on page 88 presents all the indicator variables used to calculate CSP score.

This paper reviewed extant research and selected control variables that relate to a firm's corporate governance, financial performance, and sustainability performance. These variables include firm size (SIZE), leverage (LEV), Cash flow from operations (CFO), sales growth (SG), new equipment (NEWNESS), Capital intensity (CAPIN), industry (INDUSTRY) and year (YEAR) dummies.

Firm size (SIZE) is measured in several ways: for example, total assets (Inoue and Lee, 2011; Brammer and Millington, 2008); total sales (Hillman and Keim, 2001; Lee and Park, 2009; Inoue and Lee, 2011); and total employees (Inoue and Lee, 2011). There is no overwhelming theoretical or empirical evidence supporting the use of a particular measure (Galbreath, 2012). Large firms have abundant resources to invest in innovation, pursue more aggressive growth strategies and achieve better performance. Large firms benefit from economies of scale, scope and learning (Huang, 2010; Eisenberg, et al., 1998). In this study, SIZE is measured as the natural logarithm of total assets. Leverage (LEV), capturing the capital structure of a firm, is measured as the ratio of total debt to total equity (Inoue and Lee, 2011). It is calculated as  $LEV = (\text{current debt} + \text{long-term debt}) / \text{total shareholders' equity}$ . A high leverage ratio indicates a high risk. Firms with high leverage may behave differently from those with low leverage ratio in terms of CSR investment because of different levels of risks involved in CSR investment (Waddock and Graves, 1997), and thus affect the link between CSP and CFP. CFO represents cash flow from operations. CFO is calculated as net cash flow from operating activities divided by total assets. It reflects a firm's liquidity (Clarkson et al., 2011a). CFO is an

important control variable, because CSP involves cash outflows for innovative equipment. SG is sales growth measured as the change in sales divided by beginning of period sales. It reflects management proactive investment strategy in intangibles (Clarkson et al., 2011a). NEWNESS is the age of equipment, measured by net property, plant and equipment divided by annual depreciation, assuming all firms use straight-line depreciation. Newer equipment is expected to employ less polluting technologies (Clarkson et al., 2011a). CAPIN is the capital intensity, measured as capital expenditures divided by total assets. Firms with high sustaining capital expenditures are expected to have newer equipment (Clarkson et al., 2011a).

INDUSTRY is the industry dummy. It controls for industry-specific effects. Prior literature shows that a firm's sustainability performance is affected by the industry in which it operates (Horváthová, 2012). There are 10 industries identified according to Global Industry Classification Standard (GICS): energy (code 10), materials (code 15), industrials (code 20), consumer discretionary (code 25), consumer staples (code 30), health care (code 35), financials (code 40), information technology (code 45), telecommunication services (code 50), and utilities (code 55). Energy (code 10) is the base industry. YEAR is the year dummy variable, representing a set of 4 years of dummy variables that control for year-specific effects from 2007 to 2011 (2007 is the base year).

Variables description and measurement are summarized in Table 1.

Table 1. Variable Definition and Measurement

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<u>Corporate Sustainability Performance Measures</u>	
CSP	= corporate sustainability score. $CSP = \sum(\text{STRENGTH-CONCERN})$ from six dimensions of KLD social ratings.
HIGHCSP	= indicator variable set equal to 1 if CSP score is greater than 0, and 0 otherwise.
<u>Corporate Financial Performance Measures</u>	
lnQ	= logarithm of Tobin's Q. It is calculated as $[\text{Total assets (AT)} + \text{Market value of equity (CSHO*PRCC\_F)} - \text{total common equity (CEQ)} - \text{Deferred taxed (Balance sheet) (TXDB)}] / \text{total assets (AT)}^a$ .
lnMV	=logarithm of market value, calculated as $\log(\text{CSHO*PRCC\_F})$ . CSHO is common shares outstanding and PRCC_F is annual close price at fiscal yearend.
lnROA	=logarithm of return on assets, calculated as $\log(1 + \text{OIBDP/AT})$ . OIBDP is operating income before depreciation and amortization.
lnROE	=logarithm of return on equity, calculated as $\log(\text{OIBDP/SEQ})$ . OIBDP is operating income before depreciation and amortization. SEQ is total shareholder's equity.
<u>Corporate Governance Measures</u>	
BSIZE	= total number of directors on the board.
BIND	=total number of independent directors divided by total number of board members.
CEODUAL	= indicator variable, set equal to 1 if the CEO is also the chairman, and 0 otherwise.
FEMALE	= indicator variable, set equal to 1 if at least one woman director is on the board, 0 otherwise.
CGOV	= corporate governance score, calculated as the sum of scores from BSIZE, BIND, CEODUAL, and FEMALE variables according to their presence of effectiveness of the board. CGOV ranges from 0 to 4.
SGOV	= indicator variable, set equal to 1 if CGOV is greater than 2 (the median of the sample) in a particular year.

Table 1- Continued

<u>Control Variables</u>	
SIZE	= logarithm of total assets (AT)
LEV	= total debt divided by total shareholders' equity.
CFO	= cash flow from operations divided by fiscal year-end total assets.
SG	= sales growth, calculated as the percentage change in sales during the year.
NEWNESS	= newness of equipment, calculated as net property, plant and equipment divided by annual depreciation expense, which assumes all firms use straight-line depreciation method.
CAPIN	=capital intensity, calculated as capital expenditure divided by fiscal year-end total assets
INDUSTRY	= a set of 9 industry dummy variables. Energy (code 10) is the base industry.
YEAR	= a set of 4 year dummy variables: 2007-2011 (2007 is the base year).

<sup>a</sup> Variable names in the COMPUSTAT database.

### 3.1.2 Model for Hypothesis 2

To test H2, the association between CSP and CFP in the short term and the long term, the following model is specified. I use a one-year lag of CSP to test the short-term effect, and a two-year lag of CSP to test the long-term effect on corporate financial performance.

$$\begin{aligned}
 CFP_{it} = & \beta_0 + \beta_1 CSP_{it-n} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 CFO_{it} \\
 & + \beta_5 SG_{it} + \beta_6 NEWNESS_{it} + \beta_7 CAPIN_{it} + \beta_8 \sum_2^{10} INDUSTRY \\
 & + \beta_9 \sum_{2008}^{2011} YEAR + \varepsilon_{it}
 \end{aligned}$$

(Equation 3)

Where,

n=1, 2. Two lags of CSP are separately included in the model.

CFP is measured as the logarithm of Tobin's Q, which is calculated as [Total assets (AT)<sup>6</sup> + Market value of equity (CSHO\*PRCC\_F) – Total common equity (CEQ) – Deferred taxes (Balance sheet) (TXDB)]/Total assets (AT).

This specification of Tobin's Q was first used by Kaplan and Zingales (1997), and subsequently used by Gompers et al. (2003), and others. Tobin's Q is a long-term measure of firm value. Tobin's Q is measured as the ratio of the market value of assets to the book value of assets, where the market value of assets equals the book value of assets plus the market value of common equity less the sum of the book value of common equity and balance sheet deferred taxes. This definition of Tobin's Q is common in economics, finance, law, and accounting literature (Yermack, 1996; Brown and Caylor, 2006; Kaplan and Zingales, 1997; Gompers et al., 2003; Bebchuk and Cohen, 2005). Prior literature finds that this measure, as well as simpler ones that drop deferred taxes, has a very high correlation with those more sophisticated measures (Chung and Pruitt, 1994), suggesting this definition of Tobin's Q is a good proxy of CFP (measured as firm value).

Measurement of other variables are defined the same as in Table 1.

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<sup>6</sup> AT is the variable name of total assets in the COMPUSTAT database. Other financial variables are described in the same way in COMPUSTAT.

### 3.1.3 Model for Hypothesis 3

Hypothesis 3 examines the moderating effect of different levels of corporate governance on the CSP-CFP relationship. In order to test the moderating effect, two variables are added to Equation 3: CGOV and the interaction term CSPL1\*CGOV. CSPL1 represents a one year lag of CSP and is used because a company's sustainability report is often released with one year lag of its financial statement. Because board composition tends to be stable from one year to the next, CGOV of the current period is used to interact with CSPL1. The interaction term is used to measure how different levels of corporate governance moderate the CSP-CFP relationship. The coefficient of CSPL1\*CGOV is expected to be positive. It predicts that stronger corporate governance enhances the relationship between CSP and CFP. The following model is used.

$$\begin{aligned} CFP_{it} = & \beta_0 + \beta_1 CSPL1 + \beta_2 CGOV + \beta_3 CSPL1 * CGOV + \beta_4 SIZE_{it} + \beta_5 LEV_{it} \\ & + \beta_6 CFO_{it} + \beta_7 SG_{it} + \beta_8 NEWNESS_{it} + \beta_9 CAPIN_{it} \\ & + \beta_{10} \sum_2^{10} INDUSTRY + \beta_{11} \sum_{2008}^{2011} YEAR + \varepsilon_{it} \end{aligned}$$

(Equation 4)

Where,

CSPL1 is the one year lag of CSP.

CGOV is a composite corporate governance score, calculated from four board attributes: BSIZE, BIND, CEODUAL, and FEMALE. Other control variables are defined as in section 3.1.1.

## 3.2 Data and Sample Selection

### *3.2.1 Data Source*

The data used in this study come from several sources. First, the 500 largest public companies (based on capitalization, employees, and revenue) are obtained from the 2012 Green Rankings list produced by Newsweek magazine. Second, corporate sustainability performance data are obtained from MSCI ESG STATS ratings<sup>7</sup> (Formerly known as Kinder, Lydenberg, Domini (KLD) and financial performance data are from COMPUSTAT North America annual fundamental data. Finally, board of directors data are from RiskMetrics Director Data (Formerly known as Investor Responsibility Research Center or IRRC). The sample data in this study covers five years from 2007 to 2011. The year 2007 was chosen as the starting year because RiskMetrics changed the methodology for collecting data in 2007 to follow Investors Shareholder Services specifications. RiskMetrics is a leader in corporate governance data. RiskMetrics delivers three types of data: director data, voting results data, and shareholder proposal data. The director data includes a range of variables related to individual board of directors (e.g., name, age, tenure, gender, committee memberships, independence classification, primary

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<sup>7</sup> In 2009, the KLD research and Analytics Inc. was sold to RiskMetrics, which was subsequently acquired by Morgan Stanley Capital International (MSCI) in 2010. MSCI renamed KLD STATS to MSCI ESG STATS. In this paper, the name of KLD is used due to its popularity in academic research.

employer and title, number of other public company boards the director is serving on, shares owned, etc.). This data is updated annually. The current company coverage is the S&P 1500 companies. According to RiskMetrics FAQ, a company missing from certain years in RiskMetrics is due to two reasons: either the company does not have an annual shareholder meeting during the specified calendar year, or it is not in one of the covered S&P indices in the specified calendar year (RiskMetrics, 2012).

KLD uses a combination of survey, reports and articles in the popular press and academic journals, to assess social performance along seven dimensions such as community, employee relations, environment, product, corporate governance, human rights, and diversity.<sup>8</sup> Within each dimension, there are indicators with strength and concern ratings. KLD assigns a binary score, 1 or 0, for each strength or concern rating applied to a company. A value of "1" indicates the presence of that rating and a "0" indicates the absence of the rating. The absence of a rating indicates that the company has not met the criteria established for that individual rating (MSCI, 2012). KLD began compiling information on social performance beginning 1991, and updates it annually. Over the years, KLD has made some modifications to its ratings system, including adding new strength and concern ratings. The number of companies covered increased from 650 in 1991 to more than 3,000 in 2011. KLD currently covers all companies on the S&P 500

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<sup>8</sup> These seven dimensions are called "inclusionary categories". KLD database also includes exclusionary screen categories, namely alcohol, gambling, military contracting, nuclear power, and tobacco. The exclusionary categories are only evaluated on concern indicators, not strength indicators. This study only considers six dimensions from "inclusionary categories", excluding corporate governance dimension due to the nature of this study.

and Domini 400 Social Index, Russell 1000, and Russell 3000 (MSCI, 2012). To view six dimensions and historical addition or removal of indicators from KLD STATs, please see Appendix A.

KLD data is considered the best single source of social and environmental performance data (Graves and Waddock, 1994, Linthicum et al., 2010; Kim et al., 2012; Dhaliwal et al., 2012; Bear et al., 2010; Bird and Smucker, 2007; Hong and Andersen, 2011; Jo and Harjoto, 2011 and 2012; Padgett and Galan, 2010).

Recent research confirms the validity of KLD ratings in measuring CSR performance (Mattingly and Berman, 2006; Deckop et al., 2006). Szwajkowski and Figlewicz (1999) analyze the validity and reliability of the KLD database and conclude that KLD ratings have substantial and discernible validity with especially strong internal discriminant validity. KLD data are among the most influential and the most widely accepted CSR measures used by academics (Chatterji et al., 2009; Chen et al., 2012). To date, KLD is “the largest multidimensional corporate social performance database available to the public” (Deckop et al., 2006, p. 334).

Financial data used to measure CFP and control variables are from COMPUSTAT provided by Wharton Research Data Services (WRDS). COMPUSTAT North America provides the U.S. and Canadian fundamental and market information on active and inactive publicly held companies. The data file includes 300 annual and 100 quarterly Income Statement, Balance Sheet, Statement of Cash Flows, and supplemental data items. Fiscal year end data are downloaded from year 2007 to 2011 for 500 companies.

### 3.2.2 Data Collection

The data is collected in three steps. The first step is to select a list of the 500 largest U.S. companies. The 2012 Green Rankings released by *Newsweek* in October provided a list of 500 largest U.S. companies based on sales, the number of employees and market capitalization. These 500 companies represent more than 80% of the United States market capitalization. After the list of 500 companies was obtained, the unique company identifier, TICKER, is identified using the code lookup box in COMPUSTAT. This was verified with the company website to make sure the downloaded company name from COMPUSTAT matched the name provided by the Green Rankings list. Financial data was collected for 500 companies over five years from 2007 to 2011. The total firm-year observations are 2,488 with 498 unique firms (two companies were dropped because of their acquisition by other companies).

The second step of data collection is related to social rating data from the KLD database. From 2007 to 2011, a total of 2,384 firm-year observations and 492 unique firms are identified. CSP score is calculated as the sum of scores from six dimensions, namely community connections, employee relations, environment, human rights, product quality, and diversity issues. The score of each dimension is computed as the difference between the STRENGTH score and the CONCERN score.

The third step of data collection is to obtain director data from RiskMetrics. A board includes several directors. From 2007 to 2011, a total of 459 firms and 22,781

firm-year-director observations are identified. Necessary calculation and coding are conducted for four board attributes: BSIZE, BIND, CEODUAL, and FEMALE.

The fourth step is to combine the data from the above three sources. First, director data from RiskMetrics needs to be transferred to the board (or firm) level. All the necessary calculations for board composition are made before duplicate firm-year data is dropped. Each firm thus has only one board of directors data available for each particular year. A total of 459 unique firms and 2,119 firm-year observations are obtained. This is saved as “directors” data. Second, the “directors” data is matched with the KLD data, and then with COMUSTAT data, resulting in a 2,098 firm-year observations, including some missing values for some variables. This is saved as “allmerged” data. Third, some calculations are made for variables within “allmerged” data. Fourth, data validity for all variables is checked. For example, sales and total assets should be positive numbers. After all these procedures are done, “clean” data is ready to be used to estimate the models and test the three hypotheses. Due to unbalanced panel data, the total number of observations may vary from one regression to another while testing the three hypotheses.

## Chapter 4

### Empirical Results

#### 4.1 Descriptive Statistics

Table 2 reports the descriptive statistics. All continuous variables in Panel B (CFP measure) and Panel D (control variables) are winsorized at the top and bottom 1 percentile of their distribution. Statistics reported here are after winsorizing.

Table 2. Descriptive Statistics

Variables	Obs.	Mean	Median	Std. Dev.	Minimum	Maximum
Panel A: CSP Measures						
CSP	2098	1.1301	1	3.84546	-9	17
HIGHCSP	2098	0.5214	1	0.49966	0	1
Panel B: CFP Measures						
lnQ	1878	0.4329	0.3471	0.4353	-0.2434	1.7376
lnMV	2094	9.3364	9.2358	1.1155	7.1099	12.2033
Panel C: Corporate Governance Measures						
BSIZE	2098	10.7507	11	2.1281	5	20
BIND	2098	0.8092	0.8333	0.1046	0.3333	1
FEMALE	2098	0.8985	1	0.3021	0	1
CEODUAL	2098	0.6859	1	0.4643	0	1
CGOV	2098	2.2102	2	0.7965	0	4
SGOV	2098	0.3513	3	0.4775	0	1
Panel D: Control Variables						
SIZE	2095	9.6200	9.4274	1.3391	7.2671	13.8742
LEV	2089	0.2343	0.2133	0.1592	0	0.6882
CFO	2095	0.1087	0.1018	0.0663	-0.0276	0.3141
SG	2095	0.0675	0.0623	0.1755	-0.4313	0.8149
NEWNESS	2034	7.3778	5.8019	5.5335	0.9626	27.7607
CAPIN	2092	0.0419	0.0318	0.0380	0	0.1961

Table 2 shows a statistics summary of the main variables used in this study. About 68% of the firms have a CEO who is also chairman on the board. Eighty-nine percent of corporations have at least one female on the board. The median board size is 11. The minimum and maximum are 5 and 20, respectively. The mean of BIND is 0.8, indicating for an average firm, about 81% of board members are outside (independent) directors.

Further data analysis shows that the variables for financial performance, lnQ and lnMV, are significantly skewed ( $Pr(\text{skewness}) = 0.0000$ ). Thus a non-parametric estimation method, median regression, seems appropriate.

Firm industry distribution is illustrated in Table 3. The data merging process results in a total of 456 firms.

Table 3. Industry Distribution

	GIC Sector	Frequency	Percent	Cum.
Energy	10	30	6.58	6.58
Materials	15	30	6.58	13.16
Industrials	20	70	15.35	28.51
Consumer Discretionary	25	85	18.64	47.15
Consumer Staples	30	42	9.21	56.36
Health Care	35	50	10.96	67.32
Financials	40	55	12.06	79.39
Information Technology	45	61	13.38	92.76
Telecommunication Services	50	6	1.32	94.08
Utilites	55	27	5.92	100
	Total	456	100.00	

They are from 10 sectors, according to the Global Industry Classification Standard (GIC). The sample firms are mostly from industrials and consumer discretionary, and are least represented by utility and telecommunication services. A total of 85 firms are from consumer discretionary and 6 firms are from telecommunication services.

#### 4.2 Correlation Matrix

Table 4 illustrates the correlation coefficient matrix. CSP is positively associated with lnQ. CSP is positively correlated with all four variables of interest in Equation 1 and significant at the 5% level except for CEODUAL when no control variables are present. CSP is also positively correlated with CGOV, but not significant at the 5% level. lnQ is positively correlated with both CSP and CGOV, significant at the 5% level.

The Variance Inflation Factor (VIF) table (not shown here) indicates that the multicollinearity of independent variables is not an issue (the value of VIF of each independent variable is below 5 with an average of 1.31). Table 4 presents the correlation coefficients of the main variables used in this study.

Table 4. Table of Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 lnQ	1													
2 CSP	0.1727*	1												
	0.0000													
3 BSIZE	-0.2349*	0.1243*	1											
	0.0000	0.0000												
4 BIND	-0.1314*	0.1128*	0.0480*	1										
	0.0000	0.0000	0.0278											
5 CEODUAL	-0.0978*	0.032	0.0612*	0.2387*	1									
	0.0000	0.1430	0.0051	0.0000										
6 FEMALE	-0.0672*	0.1514*	0.3219*	0.1335*	0.0547*	1								
	0.0036	0.0000	0.0000	0.0000	0.0122									
7 CGOV	0.0707*	0.0239	-0.3708	0.3614*	-0.4907*	0.2255*	1							
	0.0022	0.2735	0.0000	0.0000	0.0000	0.0000								
8 SGOV	0.0835*	0.0005	-0.3540*	0.2430*	0.1647*	-0.4356*	0.8452*	1						
	0.0003	0.9801	0.0000	0.0000	0.0000	0.0000	0.0000							
9 SIZE	-0.3989*	0.1539*	0.5042*	0.2055*	0.1541*	0.2043*	-0.2756*	-0.1489*	1					
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						
10 LEV	-0.1705*	-0.0694*	0.1170*	0.0835*	0.0515*	0.0901*	-0.0587*	-0.0140	0.0797*	1				
	0.0000	0.0015	0.0000	0.0001	0.0187	0.0000	0.0073	0.5222	0.0003					
11 CFO	0.6837*	0.0646*	-0.2519*	-0.1298*	-0.0499*	-0.1003*	0.1217*	0.0351	-0.3985*	-0.1933*	1			
	0.0000	0.0031	0.0000	0.0000	0.0223	0.0000	0.0000	0.1082	0.0000	0.0000				
12 SG	0.1523*	-0.0141	-0.0314	-0.0265	-0.022	-0.027	0.0201	0.0006	0.0159	-0.0527*	0.0701*	1		
	0.0000	0.5200	0.1508	0.2260	0.3151	0.2165	0.3567	0.9766	0.4659	0.0159	0.0013			
13 NEWNESS	-0.2222*	-0.2400*	0.0573*	0.0548*	0.0757*	0.0556*	-0.0788*	-0.0381	0.1082*	0.2660*	-0.1195*	0.0107	1	
	0.0000	0.0000	0.0097	0.0135	0.0006	0.0122	0.0004	0.0861	0.0000	0.0000	0.0000	0.6298		
14 CAPIN	0.0539*	-0.1476*	-0.1150*	-0.0584*	0.0236	-0.0705*	-0.0061	-0.0490*	-0.1478*	0.0732*	0.3587*	0.0362	0.3629*	1
	0.0196	0.0000	0.0000	0.0076	0.2803	0.0012	0.7804	0.0250	0.0000	0.0008	0.0000	0.0975	0.0000	

\* Significant at the 5% level

### 4.3 Test of Hypothesis 1

In this section, median regressions are used to test hypothesis 1 which predicts a positive relationship between corporate governance and corporate sustainability performance. The dependent variable is CSP. In model (1), four board attributes are included as independent variables. They are BSIZE (board size), BIND (board independence), CEODUAL (CEO duality), and FEMALE (female directors). In model (2), CGOV is used to capture the overall impact of board effectiveness on a firm's sustainability performance. The results from median regressions are shown in Table 5.

Table 5. Median Regression Results of Hypothesis 1

VARIABLES	(Model 1) CSP	(Model 2) CSP
Bsize	0.1898*** (0.0433)	
BIND	1.7669** (0.7980)	
CEODUAL	0.6668*** (0.1746)	
FEMALE	0.7730*** (0.2710)	
CGOV		0.3174*** (0.0781)
SIZE	0.3110*** (0.0800)	0.5324*** (0.0707)
LEV	-0.1786 (0.5393)	-0.0637 (0.5217)
CFO	10.7389*** (1.4520)	9.5270*** (1.4168)
SG	-0.8610* (0.4662)	-0.9794* (0.4555)
NEWNESS	-0.0559*** (0.0202)	-0.0618*** (0.0197)
CAPIN	-2.1131 (2.7783)	0.6938 (2.6922)
INDUSTRY	included	included
YEAR	included	included
Constant	-10.4507*** (1.0428)	-8.9407*** (0.8492)
Observations	2,025	2,025
Pseudo R <sup>2</sup>	0.1828	0.1714

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

In Model (1) of Table 5, all four board attributes, BSIZE, BIND, CEODUAL, and FEMALE, are included as independent variables. The coefficients of BSIZE, CEODUAL, and FEMALE are 0.1898, 0.6668, and 0.7730, significant at the 1% level. The coefficient of BIND is 1.7669, significant at the 5% level. All four variables are positively associated with CSP. Hypotheses 1a through hypothesis 1d<sup>9</sup> are supported. The empirical results show that multiple organization theories work complementary in the sustainability performance. In model (2), a composite score, CGOV, is used to test whether the level of corporate governance is positively associated with the level of corporate sustainability performance. The coefficient of CGOV is 0.3174, significant at the 1% level, suggesting that the higher the level of corporate governance, the higher the CSP. Hypothesis 1 is supported.

#### 4.4 Test of Hypothesis 2

To examine the short-term and long-term impacts of corporate sustainability performance on corporate financial performance, a one-year lag of CSP and two-year lags of CSP are separately included in the models. Model (1) of Table 6 includes a one-year lag of CSP and Model (2) of Table 6 includes two-year lags of CSP.

The median regression is used to estimate Equation 3. Results are reported in Table 6.

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<sup>9</sup> Similar results are obtained if using relative portion of female directors to total size of a board.

Table 6. Median Regression Results of Hypothesis 2

Variables	(Model 1) CFP (lnQ)	(Model 2) CFP (lnQ)
CSPL1	0.0142*** (0.0025)	
CSPL2		0.0210*** (0.0040)
SIZE	-0.0356*** (0.0072)	-0.0484*** (0.0106)
LEV	0.0713 (0.0544)	0.0594 (0.0816)
CFO	4.6222*** (0.1460)	4.7918*** (0.2330)
SG	0.0722* (0.0432)	0.0838 (0.0613)
NEWNESS	0.0024 (0.0020)	0.0037 (0.0030)
CAPIN	-1.2645*** (0.2521)	-1.8710*** (0.4048)
INDUSTRY	Included	Included
YEAR	Included	Included
Constant	0.0399 (0.0887)	0.3940*** (0.1310)
Observations	1,408	1,041
Pseudo R <sup>2</sup>	0.3871	0.4122

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Where,

CSPL1 is a 1-year lag of CSP and CSPL2 is 2-year lags of CSP. While CSPL1 is used to test the short-term effect, CSPL2 is used to test the long-term effect of CSP on CFP.

Table 6 presents the main results of hypothesis 2. CFP is positively associated with 1-year and 2-year lags of sustainability performance (coefficients are 0.0142 and 0.0210, respectively and both significant at the 1% level), suggesting that when CSP ratings change by one unit, Tobin's Q will increase by 1.42% and 2.10%, respectively in one year and two years from now. Both the long-term effect of CSP on CFP is supported. The percentage increase in Tobin's Q is statistically significant, suggesting that stakeholders value firms' sustainability improvement.

#### 4.5 Test of Hypothesis 3

This section shows the results of hypothesis 3 which hypothesizes that corporate governance has a moderating effect on the relationship between CSP and CFP. In order to test the moderating effect, the interaction term CSPL1\*CGOV is created. CSPL1 represents one year lagged CSP. One year lagged CSP is used because a company's sustainability report is often released with one year lag of its financial statement. Because board composition tends to stabilize from one year to the next, the current period of CGOV is used to interact with CSPL1. The coefficient of the interaction term CSPL1\*CGOV is expected to be positive if corporate governance contributes additional value to the association between CFP and lagged CSP. If the coefficient of the interaction term is positive, the hypothesis 3 is supported. The median regression results of hypothesis 3 are presented in Table 7.

Table 7. Median Regression Results of Hypothesis 3

VARIABLES	CFP (lnQ)
CSPL1	0.0124*** (0.0050)
CGOV	0.0118 (0.0088)
CSPL1*CGOV	0.0011* (0.0024)
SIZE	-0.0342*** (0.0077)
LEV	0.0760 (0.0571)
CFO	4.8927*** (0.1627)
SG	0.0733* (0.0494)
NEWNESS	0.0033 (0.0021)
CAPIN	-1.6166*** (0.3102)
INDUSTRY	Included
YEAR	Included
Constant	-0.2022 (0.9410)
Observations	1,408
Pseudo R <sup>2</sup>	0.3907

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Where,

CGOV is a composite corporate governance score, calculated from four boards attributes: board size (BSIZE), board independence (BIND), CEO duality (CEODUAL), and female directors (FEMALE). It ranges from 0 to 4. The calculation of CGOV is presented in Section 3.1.1.

If the level of corporate governance enhances the CSP-CFP relationship, a positive coefficient of the interaction term is expected. The coefficients of the interaction term  $CSPL1*CGOV$  is 0.0011, significant at the 10% level, indicating that corporate governance contributes additional value towards to the firm value. The impact of 1-year lag of CSP on CFP is higher for firms with better corporate governance. H3 is supported.

#### 4.6 Robustness Tests

##### *4.6.1 Different Measures of Corporate Financial Performance*

In this section, different measures of CSP and CFP are utilized, because prior studies document that different measures for CSP and CFP can affect the CSP-CFP relationship differently. To get a comprehensive understanding of the CSP-CFP relationship, the logarithm of market value (lnMV), the logarithm of ROA (lnROA) and logarithm of ROE (lnROE) are used to estimate Equation 3. Median regression results are shown in Table 8.

Table 8. Robustness Tests – Different CFP Measures to Test Hypothesis 2

VARIABLES	(Model 1) lnMV	(Model 2) lnMV	(Model 3) lnROA	(Model 4) lnROA	(Model 5) lnROE	(Model 6) lnROE
CSPL1	0.0249*** (0.0052)		9.41e-05 (0.0002)		0.0054 (0.0035)	
CSPL2		0.0344*** (0.0069)		0.0001 (0.0003)		0.0075** (0.0035)
SIZE	0.8843*** (0.0152)	0.8700*** (0.0193)	-0.0039*** (0.0007)	-0.0038*** (0.0009)	-0.0012 (0.0103)	0.0049 (0.0099)
LEV	-0.6833*** (0.1140)	-0.5647*** (0.1479)	0.0180*** (0.0054)	0.0166** (0.0072)	2.0121*** (0.0805)	2.0053*** (0.0784)
CFO	7.9976*** (0.3193)	7.8320*** (0.4268)	0.8170*** (0.0152)	0.8150*** (0.0212)	4.7158*** (0.2219)	4.5853*** (0.2232)
SG	0.3458*** (0.0985)	0.2997** (0.1226)	0.0216*** (0.0047)	0.0194*** (0.0061)	0.0483 (0.0661)	-0.0294 (0.0637)
NEWNESS	0.0139*** (0.0043)	0.0126** (0.0054)	-0.0005** (0.0002)	-0.0005* (0.0003)	-0.0168*** (0.0029)	-0.0163*** (0.0028)
CAPIN	-2.4540*** (0.6370)	-2.6976*** (0.8514)	0.0749** (0.0300)	0.0877** (0.0417)	0.8937** (0.4281)	1.1874*** (0.4413)
INDUSTRY	Included	Included	Included	Included	Included	Included
YEAR	Included	Included	Included	Included	Included	Included
Constant	0.0267 (0.1867)	0.4359* (0.2362)	0.0780*** (0.0089)	0.0658*** (0.0116)	-1.8768*** (0.1272)	-2.0103*** (0.1203)
Observations	1,569	1,165	1,569	1,165	1,526	1,139
Pseudo R <sup>2</sup>	0.5590	0.5638	0.5534	0.5577	0.2887	0.2949

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Where,

$\ln MV$  = logarithm of market value, calculated as  $\log(CSHO * PRCC\_F)$ . CSHO is common shares outstanding and PRCC\_F is annual close price at fiscal yearend.

$\ln ROA$  = logarithm of ROA. Following Inoue and Lee (2011), ROA is measured as operational income before depreciation and amortization divided by fiscal year-end assets.

$$\ln ROA = \log(1 + OIBDP/AT)$$

$\ln ROE$  = logarithm of return on equity (ROE). Following Inoue and Lee (2011), ROE is calculated as operational income before depreciation and amortization (OIBDP) divided by fiscal year-end total shareholder's equity (SEQ).

Table 8 shows the median regression results of hypothesis 2 using lnMV, lnROA, and lnROE as one measure of CFP. Results of the analysis using lnMV are similar to the ones using lnQ, suggesting that CSP is positively associated with CFP both in the short term and in the long term. However, when using an accounting-based measure, only model 6 (lnROE is the dependent variable) shows a significant positive coefficient for the 2 lags of CSP, supporting the long term hypothesis of the CSP-CFP relationship. Using lnROA as a dependent variable does not show a significant coefficient for either a 1 lag or 2 lags of CSP, even though the coefficients are positive. These results supplement the debate in prior literature that a market-based measure (either Tobin' Q or market value) is a better measure of the long term relationship between CSP and CFP than an accounting-based measure (Chung and Pruitt, 1994).

#### *4.6.2 Different Measures of Corporate Sustainability Performance*

In this section, I use a CSP dummy variable, HIGHCSP, to replace the categorical dependent variable CSP in Equations 1 and 2. I also use a corporate dummy variable, SGOV, to replace CGOV in Equation 2. HIGHCSP is set equal to 1 if the CSP score is greater than 0, and 0 if the CSP score is smaller than 0. Because the dependent variable is a binary variable, probit regression method is used to test hypothesis 1 which predicts a positive relationship between corporate governance and corporate sustainability performance. In model (1), four board attributes are included as independent variables. They are BSIZE (board size), BIND (board independence), CEODUAL (CEO duality),

and FEMALE (female directors). In model (2), an indicator variable, SGOV, is used to capture the overall impact of board effectiveness on a firm's sustainability performance.

The probit regression results are shown in Table 9.

Table 9. Robustness Tests – Probit Regression Results of Hypothesis 1

VARIABLES	(Model 1) HIGHCSP	(Model 2) HIGHCSP
BSIZE	0.0561*** (0.0180)	
BIND	0.7470** (0.3261)	
CEODUAL	0.3459*** (0.0723)	
FEMALE	0.2638** (0.1116)	
SGOV		0.2379*** (0.0775)
SIZE	0.1271*** (0.0336)	0.2069*** (0.0301)
LEV	-0.2019 (0.2182)	-0.1298 (0.2161)
CFO	2.6267*** (0.5891)	2.5626*** (0.5828)
SG	-0.4596** (0.1963)	-0.4641** (0.1937)
NEWNESS	-0.0310*** (0.0084)	-0.0335*** (0.0083)
CAPIN	0.3134 (1.1464)	0.2095 (1.1283)
INDUSTRY	Included	Included
YEAR	Included	Included
Constant	-3.9649*** (0.4458)	-3.1325*** (0.3767)
Observations	2,025	2,025
Pseudo R <sup>2</sup>	0.2005	0.1858

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Where,

**HIGHCSP** = dummy variable, set equal to 1 if CSP score is greater than 0, and 0 otherwise. CSP score ranges from -9 and 17.

**SGOV** = strong board governance, a dummy variable that sets equal to 1 if CGOV score is greater than 2 (median of the sample), 0 otherwise. Recall, CGOV is a composite score, calculated from four board attributes: board size (BSIZE), board independence (BIND), CEO duality (CEODUAL), and board diversity (FEMALE). It ranges from 0 to 4. The calculation of CGOV is discussed in Section 3.1.1.

In model (1) of Table 9, all four board attributes, BSIZE, BIND, CEODUAL and FEMALE, are included as independent variables, the coefficient of BSIZE is 0.0561, significant at the 1% level. The coefficients of BIND and FEMALE are 0.7470 and 0.2638, respectively, significant at the 5% level. The coefficient of CEODUAL is 0.3459, significant at the 1% level. All four variables are positively associated with HIGHCSP, H1a through H1d are supported when using HIGHCSP dummy variable as a dependent variable in equation 1. In Model (2) of Table 9, the dummy variable, SGOV, is used to test whether strong corporate governance is positively associated with high corporate sustainability performance (HIGHCSP). The coefficient of SGOV is 0.2379, significant at the 1% level, suggesting that the stronger the board, the higher the CSP, consistent

with results of testing H1 in the main analysis. Hypothesis 1 is supported when HIGHCSP is used as a dependent variable in equation 2.

Table 9 supports hypothesis 1 both at an individual level of board attribute and at an aggregate level (SGOV). Board size, board independence, CEO duality, and female directors are positively associated with CSP. Firms with stronger corporate governance tend to have higher sustainability performance.

To test the robustness of the CSP measure in equation 3, dummy variables HIGHCSPlag1 and HIGHCSPlag2 are used instead of using CSPL1 and CSPL2. HIGHCSPlag1 and HIGHCSPlag2 are the one-year lag and two-year lags of HIGHCSP. Table 10 presents the median regression results using one lagged and two lagged HIGHCSP dummy variables as independent variables to test hypothesis 2.

Table 10. Robustness Tests – Different CSP Measures to Test Hypothesis 2

VARIABLES	(Model 1) lnQ	(Model 2) lnQ
HIGHCSPlag1	0.0865*** (0.0166)	
HIGHCSPlag2		0.1080*** (0.0197)
SIZE	-0.0341*** (0.00695)	-0.0476*** (0.00817)
LEV	0.115** (0.0525)	0.0865 (0.0625)
CFO	4.914*** (0.149)	4.944*** (0.187)
SG	0.0960** (0.0457)	0.145*** (0.0534)
NEWNESS	0.000654 (0.00197)	0.00168 (0.00229)
CAPIN	-1.734*** (0.284)	-1.916*** (0.353)
INDUSTRY	Included	Included
YEAR	Included	Included
Constant	-0.00783 (0.0856)	0.290*** (0.0985)
Observations	1,408	1,041
Pseudo R <sup>2</sup>	0.3885	0.4115

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Where,

HIGHCSP = dummy variable, set equal to 1 if CSP score is greater than 0, 0 otherwise. The range of the CSP score is from -9 to 17.

In model (1) of Table 10, the coefficient of HIGHCSPlag1 is 0.0865, significant at the 1% level. In model (2) of Table 10, the coefficient of HIGHCSPlag1 is 0.1080, also significant at the 1% level. When dummy variables are used, the coefficients become bigger compared to those in Table 6 when lagged CSPs are used. This is not surprising, because dummy variables, with a value of either 1 or 0, are supposed to capture the CSP-CFP relationship more vigorously compared to categorical variables. With categorical variables, one unit change of CSP from low level (for example from -1 to 0) may not have the same effect on CFP with one unit change of CSP from high level (for example, from 12-13). With dummy variables, however, samples are divided into two groups, thus it is easier to compare the impact of CSP on CFP between low CSP group and high CSP group. The results are consistent with those in the main analysis when lagged CSP are used.

#### *4.6.3 Bi-directional Test*

There are different opinions about the causal relationship between CSP and CFP. Does CSP influence CFP or is it influenced by CFP? The empirical research has not reached a consensus. To answer this question, following Scholtens (2008) and Ameer and Othman (2012), I use a distributed-lag model. Two lags of Tobin's Q (lnQ) are included to measure the lag effect of past financial performance on CSP. Using Equation 3, CSP is used as dependent variable (rather CFP as a dependent variable) and a one-year lag and a

two-year lag of lnQ are used as independent variables. Median regression estimation results are presented in Table 11.

Table 11. Robustness Tests – Bi-directional Test of the CSP-CFP Relationship

VARIABLES	(Model 1) CSP	(Model 2) CSP
lnQlag1	1.098*** (0.214)	
lnQlag2		1.191*** (0.269)
SIZE	0.636*** (0.0566)	0.677*** (0.0735)
LEV	0.223 (0.427)	0.238 (0.555)
CFO	3.708** (1.508)	3.100 (1.938)
SG	-1.259*** (0.372)	-1.711*** (0.485)
NEWNESS	-0.0497*** (0.0160)	-0.0327 (0.0209)
CAPIN	3.009 (2.199)	2.416 (3.013)
INDUSTRY	Included	Included
YEAR	Included	Included
Constant	-9.414*** (0.700)	-10.06*** (0.910)
Observations	1,817	1,410
Pseudo R <sup>2</sup>	0.1857	0.1809

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

In Table 11, the coefficients of 1-year lag and 2-year lags of  $\ln Q$  are 1.098 and 1.191, both positive and significant at the 1% level, suggesting that past financial performance has a positive effect on corporate sustainability performance, consistent with Clarkson et al. (2011a) and Al-Tuwaijri et al. (2004). This result supports the “virtuous circle” theory proposed by Waddock and Graves (1997). Investments in corporate sustainability activities have a positive return on the firms’ financial performance. A positive financial performance brings companies more resources. Once a company accumulates enough resources, it is likely that the company will invest them in sustainability, making the circle start again. The finding of bi-directional relationship between CSP and CFP is consistent with findings of Preston and O’Bannon (1997) and Ghelli (2013) where the CSP-CFP correlations are explained either by positive synergies or by “available funding”.

## Chapter 5

### Summary and Conclusions

This section summarizes the empirical findings, discusses the managerial implications, potential limitations, and contributions to both sustainability and corporate governance literature. Finally it points out directions for future research.

#### 5.1 Discussion

This study explores three broad corporate constructs: corporate sustainability performance (CSP), corporate governance (CGOV), and corporate financial performance (CFP). Specifically, the study examines the relationship between CGOV and CSP, the relationship between CSP and CFP, and whether CGOV moderates the CSP-CFP relationship. Corporate board governance plays an important role in monitoring and counselling management's decision making including strategic sustainability investing. The study analyzes a sample of over 400 of the largest U.S. companies to examine corporate sustainability performance and corporate governance jointly. Four attributes of boards of directors are examined: board size, board independence, CEO duality, and female directors. The results show that all four board attributes are positively associated with CSP.

Further analysis shows that firms with stronger corporate governance are more likely to have higher CSP. Both accounting-based and market-based measures of CFP are used to investigate the relationship between CSP and CFP. The results show that CSP is positively associated with CFP for both a one-year lag and two-year lags of CSP. This study also investigates how corporate governance moderates the CSP-CFP relationship. The results show that corporate governance contributes additional value to firm value. The impact of lagged CSP on CFP is higher for firms with stronger corporate governance.

## 5.2 Limitations

The limitations of this study include the assumption underlying the measurement of corporate sustainability performance and corporate governance. The availability of accurate data is another constraint. In examining the long-term effects of sustainability performance and financial performance, a number of years of data are needed and this information is often not available. But even if available, the data may not be consistent over a long period of time. The database, KLD, has merged and this sometimes leads to changes in the metrics for calculating a particular variable.

The current research is hindered by the limitations of stakeholders' data for the measurement of sustainability performance. Although there is a wide use of social ratings in the corporate social responsibility literature, the KLD database has the problem of inaccurate weight of the variables. The evaluation practice of assigning a mostly binary value to each sustainability activity may not capture the effect of a company's

sustainability performance. Furthermore, some indicators from the KLD diversity category may be more appropriately classified with corporate governance category. For example, a female or minority CEO, and female directors may better be classified with the corporate governance category, since they are related to board members. For this reason, a female or minority CEO and female directors are excluded from the calculation of the diversity score (one component of the CSP score) in this study. Successful research relies on meaningful data. Thus it is necessary to explore potential solutions, although the validity issue may not be solved in the short term. Despite these limitations, this study contributes to the corporate governance and sustainability literature by additional insight to management, investors, researchers, practitioners, as well as regulators regarding corporate governance and corporate sustainability performance.

### 5.3 Contributions

This study makes the following contributions to the corporate governance and sustainability literature. First, it adds to the sustainability management literature by examining both the short-term and long-term effect of CSP on CFP. Many studies examine the CSP-CFP relationship in the short run. Fewer studies have examined long-term effect of sustainability. Knowing that sustainability is a time-varying concept has important implications for top management, regulators, and other decision makers to design their long-term strategy plans.

Second, this study contributes to the corporate governance literature by exploring the effect of corporate governance on corporate sustainability performance, and whether

corporate governance moderates the CSP-CFP relationship. The results show that board structure and composition play an important role in corporate sustainability performance. Besides board size, board independence, and CEO duality, the diversity of the board is also important. The role of female directors is important. The results obtained from Equation 1 which tests the relationship between board governance and corporate sustainability performance show that there is a positive relationship between the presence of female directors and sustainability performance. Firms with female directors on the board have higher sustainability performance than firms without female directors on board. Finally this study finds that the impact of CSP on CFP is higher for the firm with stronger corporate governance. The study is robust to several measures of corporate sustainability performance and corporate financial performance.

#### 5.4 Future Research

Sustainability is a broad concept. It includes many aspects and many studies. The associations among corporate sustainability performance, corporate governance, and corporate financial performance are complex. Globalization of production requires companies to manage their operations ethically and eco-efficiently while pursuing a profit. Communication becomes important for success. An open conversation between management and board members, and communication with various stakeholders can help managers implement sustainability strategies not only within the firm, but with suppliers, customers, and employees as well. Today's world is facing a rapid growth in population, water usage, and energy demands. To be successful, a corporation must be sustainable

financially, socially, and environmentally. Strong corporate governance will enhance firm value in the long run. This study focuses on one internal corporate mechanism, the board of directors to examine the role of corporate governance in the CSP and CFP relationship. Future studies may explore external corporate governance, as institutional ownership and shareholder proposals are related to sustainability. Some companies are even establishing a “Sustainability Committee” within the board to oversee the area of corporate social responsibility. Future studies can explore the role of Sustainability Committee in the CSP-CFP relationship.

This paper focuses on large U.S companies. Future studies can also investigate sustainability performance issues for small-and-medium enterprises (SMEs), since they are also facing sustainable development issues, and are dealing with these sustainability issues in an unobservable way. Studies on SMEs can add to the sustainability literature from a new perspective.

Another future research direction is to extend sustainability performance to sustainability reporting (disclosure) areas, because sustainability performance and sustainability reporting are closely related. To evaluate whether a company is sustainable or not, a company needs to disclose its sustainability performance to the public.

## Appendix A

### Strength and Concern Areas for Six KLD Dimensions with Historical Changes

## Appendix A

### Strength and Concern Areas for Six KLD Dimensions with Historical Changes

KLD Dimensions	Strengths	Concerns
Community	<ul style="list-style-type: none"> <li>• Charitable giving (1991-2011)</li> <li>• Innovative giving (from 1991)</li> <li>• Support for housing (1991-2009)</li> <li>• Support for education (1994-2009)</li> <li>• Non-US charitable giving (1994-2009)</li> <li>• Volunteer programs (2005-2009)</li> <li>• Community engagement (from 2010)</li> <li>• Other strengths (1991-2011)</li> </ul>	<ul style="list-style-type: none"> <li>• Investment controversies (1991-2009)</li> <li>• Community impact (from 1991)</li> <li>• Tax disputes (1991-2009)</li> <li>• Other concerns (1991-2009)</li> </ul>
Employee Relations	<ul style="list-style-type: none"> <li>• Union relations (from 1991)</li> <li>• No-layoff policy (1991-1993)</li> <li>• Cash profit sharing (from 1991)</li> <li>• Employee involvement (from 1991)</li> <li>• Retirement benefits strength (1991-2009)</li> <li>• Employee health and safety (from 2003)</li> <li>• Supply chain labor standards (from 2002)</li> <li>• Compensation and benefits</li> <li>• Employee relations</li> <li>• Professional development</li> <li>• Human capital management</li> <li>• Other strength (1991-2011)</li> </ul>	<ul style="list-style-type: none"> <li>• Union relations (from 1991)</li> <li>• Employee health and safety (from 1991)</li> <li>• Workforce reductions (1991-2009)</li> <li>• Retirement benefits concern (1992-2009)</li> <li>• Supply chain (from 1998)</li> <li>• Child labor</li> <li>• Labor-management relations</li> </ul>

<p>Environment</p>	<ul style="list-style-type: none"> <li>• Environment opportunities (from 1991)</li> <li>• Waste management (from 1991)</li> <li>• Packaging materials and waste (from 1991)</li> <li>• Climate change (from 1991)</li> <li>• Property, plant, and equipment (1991-1995)</li> <li>• Environmental management systems (from 2006)</li> <li>• Water stress</li> <li>• Biodiversity and land use</li> <li>• Raw material sourcing</li> <li>• Other strengths (from 1991)</li> </ul>	<ul style="list-style-type: none"> <li>• Hazardous waste (1991-2009)</li> <li>• Regulatory compliance (from 1991)</li> <li>• Ozone depleting chemicals (1991-2009)</li> <li>• Toxic spills and releases (from 1991)</li> <li>• Agriculture chemicals 1991-2009)</li> <li>• Climate change (from 1991)</li> <li>• Impact of products and services (from 2010)</li> <li>• Biodiversity and land use (from 2010)</li> <li>• Operational waste (from 2010)</li> <li>• Supply chain management</li> <li>• Water management</li> <li>• Other concerns</li> </ul>
<p>Human Rights</p>	<ul style="list-style-type: none"> <li>• Positive record in South Africa (1994-1995)</li> <li>• Indigenous people relations strength (from 2000)</li> <li>• Labor rights strength (2002-2009)</li> <li>• Human Rights Policies and Initiatives (from 1994)</li> </ul>	<ul style="list-style-type: none"> <li>• South Africa (1991-1994)</li> <li>• Northern Ireland (1991-1994)</li> <li>• Support for controversial regimes (from 1994)</li> <li>• Mexico (1994-2001)</li> <li>• Labor rights concern (1998-2009)</li> <li>• Indigenous people relations concern (2000-2009)</li> <li>• Operations in Sudan (2010-2011)</li> <li>• Other concerns (from 1994)</li> </ul>

Diversity Issues	<ul style="list-style-type: none"> <li>• CEO (1991-2009)*</li> <li>• Promotion of women or minority employees (1991-2011)</li> <li>• Board of directors-Gender (from 1991)*</li> <li>• Work-life benefits (1991-2011)</li> <li>• Women and minority contracting (from 1991)</li> <li>• Employment of the disabled (1991-2009)</li> <li>• Gay and lesbian policies (1995-2011)</li> <li>• Employment of underrepresented groups (from 2010)</li> <li>• Other strengths (from 1991)</li> </ul>	<ul style="list-style-type: none"> <li>• Workforce diversity (from 1991)</li> <li>• Non-representation of women or minorities on (1993-2011)</li> <li>• Board of directors-Gender (from 1991)*</li> <li>• Board of directors-minorities (from 1991)</li> <li>• Other concerns (1991-2009)</li> </ul>
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\* CEO and Board of directors-gender are not included in the calculation of diversity scores. Director data are from RiskMetrics due to the nature of the study.

Following prior literature, corporate sustainability performance (CSP) is measured at an aggregate level using the Kinder, Lydenberg, Domini (KLD) social ratings database. This study uses strengths and concerns ratings from six dimensions from KLD dataset:

community, employee, environment, human rights, product quality, and diversity issues.

Due to the nature of this study and CSP is calculated as  $CSP = \sum_{m=1}^6 (STRENGTH - CONCERN)$ .

Appendix B  
Abbreviations and Acronyms

## Appendix B

### Abbreviations and Acronyms

#### General Acronyms

CFP: Corporate Financial Performance

CSP: Corporate Sustainability Performance

CSR: Corporate Social Responsibility

CGOV: Corporate Governance

SGOV: Strong Corporate Governance

MV: Market Value of Shares

ROA: Return on Assets

ROE: Return on Equity

#### Data Acronyms

COMPUSTAT: Compustat North America database

IRRC: Investor Responsibility Research Center

KLD: Kinder, Lydenberg, Domini

MSCI: Morgan Stanley Capital International

RiskMetrics: Risk Metrics

WRDS: Wharton Research Data Services

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Wenxiang (Lucy) Lu obtained her Ph.D. in Accounting from the University of Texas at Arlington (UTA). She holds Masters of Science in Accounting from University of Nevada, Las Vegas (UNLV), and a Bachelor of Arts in English from Gansu University of Technology. Before joining the doctoral program at UTA, Wenxiang worked in several industries including public accounting. Her research interests include corporate governance, corporate sustainability, and international accounting. Wenxiang has accepted a part-time instructor position in Department of Accounting at UTA for Spring 2014.