Antecedents and Consequences of CSR Reporting by Corporations: The Role of Management Strategy and Organization Characteristics

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ANTECEDENTS AND CONSEQUENCES OF CSR REPORTING BY CORPORATIONS:
THE ROLE OF MANAGEMENT STRATEGY AND ORGANIZATION CHARACTERISTICS

A DISSERTATION

Submitted to the Faculty of Montclair State University in partial fulfillment of the requirements for the degree of Doctor of Philosophy

by

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We hereby approve the Dissertation

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THE ROLE OF MANAGEMENT STRATEGY AND ORGANIZATION CHARACTERISTICS

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ABSTRACT

ANTECEDENTS AND CONSEQUENCES OF CSR REPORTING BY CORPORATIONS: THE ROLE OF MANAGEMENT STRATEGY AND ORGANIZATION CHARACTERISTICS

by Rosita G. Nuñez

As consumers have become increasingly aware of sustainability issues, corporations find themselves facing the dual task of demonstrating to customers and investors that they are capable of meeting the challenge of addressing environmental concerns while increasing profits. Many corporations provide corporate social responsibility (CSR) reports, despite challenges from shareholders questioning the benefits. Firms in different sectors may have unique challenges. This may mean that the same extent of reporting will not be applicable to all businesses.

The main objective of this dissertation is to determine which characteristics identify firms that engage in CSR and reporting, and how the firm benefits from reporting, then to determine if a firm can drive its performance benefits derived from reporting by focusing on internal environmental orientation. This will be accomplished by three studies.

The first study will examine the organizational and management characteristics that influence a firm’s decision to report on CSR. CSR reporting will be based on a standardized framework that allows different levels of adoption. We will assess the relationship between CSR reporting and two of its expected outcomes – financial
performance and reputation. A positive effect on these outcomes may encourage more firms to report on CSR activity.

The second study will focus on six industrial sectors to determine the role that industrial membership and environmental risk has on a firms’ decision to engage in voluntary reporting. Financial performance of the six sectors will be compared. The ability to demonstrate a positive outcome on financial performance from CSR reporting could support an expansion in CSR engagement by corporations, as well as encourage the inclusion of environmental liability as part of the analysis that investors use when assessing an opportunity. Additionally, a demonstration of positive performance relative to safe investments for environmentally sensitive firms can be encouraging to managers who are hesitant to embrace CSR reporting.

The third study will examine the relationship between firms’ environmental strategy and orientation and performance. This will allow us to determine how management’s intentions for environmental issues is perceived by employees who are tasked with implementing strategy, and how CSR strategy is adopted at the corporate level.

Keywords: Corporate social responsibility (CSR), Reputational risk, Firm characteristics, Managerial strategy, Financial performance, Environmental strategy, Environmental orientation
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DEDICATION

For Dante and Sophia, always in my heart.
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LIST OF ABBREVIATIONS

BP ........................................................................................................ British Petroleum
CDP .....................................................................................................Carbon Disclosure Project
CSR ....................................................................................................Corporate Social Responsibility
DJSI .................................................................................................... Dow Jones Sustainability Index
DJSWI ............................................................................................... Dow Jones Sustainability World Index
ESG .................................................................................................... Environmental, Social and Governance
ESI .................................................................................................... Ethibel Sustainability Index
FTSE .................................................................................................. Financial Times Stock Exchange
GRI ...................................................................................................... Global Reporting Initiative
HR ....................................................................................................... Human Resources
OECD ................................................................. Organization for Economic Co-operation and Development
RRI ..................................................................................................... RepRisk Index
UNGC .............................................................................................. United Nations Global Compact
CHAPTER 1

This chapter will provide an introduction to corporate social responsibility (CSR), the reasons why it is important, describe how it is measured and reported, a general background on how it is practiced by management and a brief description of scholarly research on CSR at this time. In this chapter, the research objectives and an outline of the dissertation will also be described.

1.1 Introduction

Since the Industrial Revolution, the activities of corporate entities have had an impact on the communities where they operate. As the human population has increased and societies have become more dependent on industry to provide needs, including food, shelter, transport and healthcare, businesses have expanded and harnessed the natural environment in order to meet market demand. Unfortunately, this expansion in industrialization has left a scar on the environment, from deforestation, to air pollution, to water and soil contamination. There has also been societal impacts from industrialization, with the deterioration of traditional extended family homesteads to urban developments. Industrialization can be described as having had economic, social and environmental impacts on our communities.

The type and extent of impact is closely related to the type of operations that the corporation is engaged in. A firm that is engaged in banking or insurance may have more
economic and social impacts than a manufacturing firm, which is more likely to have environmental impacts. There may be both positive and negative impacts, as well. For example, a positive economic impact may be the addition of jobs, and an elevated standard of living for those in the community where the firm is located. Negative economic impact may be borne by smaller businesses in the community that are unable to successfully compete for resources from suppliers or in the labor market. Similarly, positive social impacts may include provision of employee training, health services for employees’ families and contributions to charities in the community. There may also be social impacts that are negative, such as when a firm is operating in an indigenous community without being sensitive to cultural norms. On the environmental front, industrial activity has historically had strong negative impacts, from deforestation, to air and water pollution, to excessive resource consumption.

Community leaders, regulators, activists and other stakeholders have voiced concerns about negative impacts and in some cases, governments have passed regulations that intend to address and correct these effects. However, there is an administrative and economic burden to the responsible government agency and taxpayers when enforcement and monitoring is required. As an example, in the United States, the Environmental Protection Agency (EPA) had a 2011 budget that was in excess of $8 billion and employed more than 17,000 personnel. These resources are directed towards enforcement, education, research, monitoring, and administrative costs. Many agencies have employed voluntary programs to reduce the fiscal burden of enforcing legislation. These programs can also encourage collaboration between corporations and the
communities where they operate, without the negative pressure of regulation. As the relationship between communities and corporations have progressed through the past ten decades or so, many firms have taken a proactive approach to addressing their impact on society.

1.1.1 What is CSR?

The term CSR is broadly used to capture the actions that an organization takes to meet corporate social responsibility (CSR) obligations. These actions are typically focused on actions by businesses to minimize their economic, social and environmental impact on communities. However, from an academic position, the term has no clear definition - scholars often mention the ambiguity of the field (Reinecke, Manning, & von Hagen, 2012; Valente, 2012; Montiel & Delgado-Ceballos, 2014). Despite the absence of a clear definition, most corporations today have to address CSR – for any number of reasons – good public relations, regulations, ethics, shareholder pressure, and community relations, to name a few. The study of CSR is not new to researchers. Firms’ social behavior and disclosure have been studied since the thirties (Berle, 1931).

Hartman et al. (2007) defined CSR as the responsibilities that businesses have to the societies within which these businesses operate. Porter & Kramer (2006) expanded the definition to include an economic dimension, by describing CSR as the policies and practices that enhance the competitiveness of a company while simultaneously advancing the economic and social conditions in the communities in which it operates. Bansal (2005) and Hart & Milstein (2003) included the environment in their definition of CSR as
policies that address economic, social and environmental dimensions. CSR has also been referred to as corporate conscience, corporate citizenship or sustainable responsible business (Montiel & Delgado-Ceballos, 2014).

In the context of this research, CSR will encompass actions that corporations engage in that address economic, social and environmental impacts of their operations. These actions will be measurable and reportable, moving beyond public relation messages and into quantifiable indicators of CSR. Many corporations are practicing what is termed as triple bottom line reporting, including performance on economic, social and environmental areas in their annual reports and other communication with stakeholders (Goel, 2010). Alternately, triple bottom line reporting is also described as addressing the 3 P’s of people, planet and profit.

1.1.2 CSR Reporting

In most countries, there is legislation that governs how a corporate entity complies with social, economic and environmental laws. Labor laws provide guidance to firms on how they may engage with the workforce in a manner that is acceptable to the society. Economic laws govern how the firm reports on performance and distributes value, in the form of taxes, wages, and investment returns. Environmental laws have been passed to address public health concerns about air pollution, water quality, soil contamination and noise levels. There are governmental mechanisms established to assess compliance and enforce laws where there are violations. These legislation have varied reporting requirements, whether to a government agency, shareholders, or the
general public in the form of tax filings, press releases or other disclosures. Reporting requirements also dictate the frequency, which could be annual or even quarterly.

CSR reporting goes beyond the mandatory reporting that corporations file to be in compliance with legislation that addresses labor, environmental protection, financial and social conduct. While lawmakers could attempt to ensure that businesses are good corporate citizens in all aspects of their operations, there is an administrative and economic burden to government and taxpayers for enforcement and monitoring of legislation. Most large companies have incorporated sustainability reporting with their investment reports voluntarily. KPMG reported in 2013 that more than 75% of global firms engage in CSR reporting (KPMG, 2013). The United Nations has made a recommendation that all large companies should be required to provide sustainability reports by 2030 (United Nations, 2013). Additionally, the European Commission has stated that being socially responsible means that firms must commit on a voluntary basis, beyond legal constraints, to sustainable practices on many dimensions, including labor and human rights, carbon footprint and governance issues (European Commission, 2001). This adds complexity to the challenge of defining and measuring CSR.

Voluntary CSR reporting can be used by businesses to communicate good corporate behavior to investors, the community, customers, employees and government. Corporate management can use voluntary reporting as a signaling tool to customers and competitors, about product positioning, resource use, innovation and other business accomplishments. The nature of voluntary CSR reporting, with its loose definition, provides more flexibility in which dimensions are reported than what is allowed through
mandatory reporting. Through CSR reporting, a firm can differentiate itself from its competitors, and improve the firm’s reputation with regulators, customers, employees and suppliers. The firm’s image can be tailored to specific market segments and strengths can be highlighted, while weaknesses can be downplayed or presented in a positive light. In this way, voluntary reporting allows the firm to demonstrate good corporate citizenship and to secure a competitive advantage in the marketplace.

CSR reporting is also expected to reduce the incidence of “greenwashing”, which has been defined as the practice by a business to deceptively promote the perception that its products, services or policies are environmentally friendly (Kahle & Gurel-Atay, 2014). Greenwashing has become more common as companies are under pressure to provide ecologically sensitive products in response to consumer demands. In the absence of reporting and reporting standards, firms could make claims on the sustainability of their products without evidence to support their claims. These firms could find themselves in trouble with regulatory agencies.

Voluntary CSR reporting in accordance with a standardized framework is widely considered as the best way to ensure that products and practices that claim to be sustainable are being monitored consistently and accurately. Furthermore, some investors use sustainability reports as a tool for analyzing the environmental liability associated with an investment. Inaccuracies in the report could expose the organization to legal action if the investment was found to not be as environmentally sound as represented by its management. An example of this risk was seen after the April 20, 2010 explosion on
the Deepwater Horizon rig operated by British Petroleum (BP). BP had promoted its environmental safety standard for decades, along with other sustainability activities. The company was included in the Dow Jones Sustainability Index (DJSI). After the explosion, BP was removed from the DJSI. The company was also taken to court by investors for misrepresenting its liabilities and operations in its sustainability reports (Macalister, 2014).

The use of CSR reporting as an investment research tool is further highlighted by research conducted by the Institutional Shareholder Services. In a survey completed in 2010, 83 percent of investors responded that they thought that environmental and social factors could have an important impact on shareholder value (Ernst & Young, 2011).

**CSR Reporting in practice**

CSR is often intertwined with the concept of sustainability in practice. Many corporations provide sustainability goals and updates within their CSR reports. The most widely accepted definition of sustainability is found in the Brundtland Report (1987) which states that ‘Sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs’. One of the ways in which this definition has been adopted by corporations is by implementation of measures designed to minimize or even eliminate negative environmental impacts.

In order to avoid the appearance of greenwashing and improve transparency on environmental, social and governance (ESG) issues, many firms have adopted the use of
sustainability reporting tools (SRTs) to standardize CSR reporting. The Brundtland Report has been criticized for being vague and providing ‘un-operationable’ definitions of sustainability (Bartlett, 1998; Wallner, 1999). SRT’s have been developed to bring metrics and standardization to sustainability. There are a number of widely used SRTs today, with two of the most popular being Global Reporting Initiative (GRI), and Carbon Disclosure Project (CDP) SRTs (Siew, 2015; Alonso-Almeida et al., 2014). These tools facilitate the dissipation of information relating to progress towards achieving CSR goals. However, each SRT has a different set of criteria and methodology which makes it difficult for stakeholders to compare ratings and indices for firms that may or may not be using the same framework, or may be applying the same framework differently. Ideally, a SRT should make it possible to measure progress and demonstrate consistency between activities, outcomes and goals. This would allow the tool to become reliable as an aid in decision making and for making comparisons between businesses in different areas (Singh et al., 2009; Kessler, 1998). A reliable tool would allow a broad range of stakeholders, including investors, policymakers, practitioners and the community to assess a firm’s sustainability goals and progress.

1.2 Literature Review

There is a wide range of published studies on SRTs and CSR. Generally, much of the literature discusses the diffusion and adoption of SRTs in corporate practice (Alonso-Almeida et al., 2014), comparisons of SRTs (Siew, 2015), and CSR communication to key stakeholders (Hartman et al., 2007). In order for CSR to gain support internally and
with external investors, management may be pressured to demonstrate a tangible benefit to the firm for engaging in and reporting on sustainability activities. Empirical studies of the relationship between CSR and corporate financial performance have yielded mixed results, with some studies finding a positive relationship (Bragdon & Marlin, 1972; Moskowitz, 1972, Sturdivant & Ginter, 1977); some studies finding a negative relationship (Vance, 1975; Spicer, 1978); and some studies showing no significant relationship (Alexander & Buchholz, 1978; Lu & Taylor, 2016).

CSR has received criticism from investors and managers that it is a distraction away from profit optimization, and is not within the primary responsibility of a corporate entity. Literature on CSR has mainly pointed to three theories: agency theory, legitimacy theory, and stakeholder theory.

Friedman (1970) examined CSR activities in the context of agency theory, arguing that CSR engagement represented a conflict between the firm’s management and its shareholders. Corporate resources that are used to support CSR are deflected away from other activities that would enhance shareholder value. In this view of agency theory, CSR is in contrast to the position of Jensen & Meckling (1976) who proposed that one of the primary functions of corporate management is to align the firm’s interests with those of its shareholders.

Legitimacy theory proposes that firms should always try to operate within the norms of their respective businesses, in order to continue to have the power to be in business that is granted by society (Deegan & Unerman, 2006). This theory supports the position that firms should engage in CSR to demonstrate accountability to society and to
be allowed to continue to be in business (de Villiers & van Staden, 2006; Simnett et al., 2009; Deegan, 2002).

Stakeholder theory describes the associations between company management and external parties, including customers, employees, suppliers, distributors, policymakers, investors, and the community-at-large (Friedman & Miles, 2006). Stakeholders are described as “any group or individual who can affect or is affected by the achievement of the organization objectives” (Freeman, 1984).

These theories have been used to support CSR and to argue against it. The use of resources to support CSR has been supported by stakeholder and legitimacy theory, while opponents of CSR have cited that it is in violation of agency and stakeholder theory from the position of the investor. There is no unanimous management theory on CSR, but nonetheless, contemporary management recognizes that it is emerging as a necessary part of doing business (Wang & Berens, 2015), with KPMG reporting in 2013 that more than 75% of large firms were engaging in CSR and providing reports to stakeholders (KPMG, 2013).

One of the SRTs that has been widely adopted is the framework provided by the GRI (Skouloudis et al., 2009; Prado-Lorenzo et al., 2009; Tsang et al., 2009; Brown et al., 2009; Rasche, 2009; Levy et al., 2010; Roca & Searcy, 2012; Christofi et al., 2012; Marimon et al., 2012). GRI is a global non-profit founded in 1997 with the objective of standardizing CSR reporting by organizations (http://www.globalreporting.org). The GRI guidelines provide economic, environmental, social and governance performance metrics. Companies using the guidelines are required to declare the level at which guidelines are
being adopted – and the reporting level is assigned a rating of A, B, or C, with the reporting criteria in each level corresponding to an increasing application of the framework.

1.3 Research Gaps

As CSR has become more prominent in business practice, scholars have studied its effects on business performance and other benefits that firms may realize by engaging in CSR. Research has been focused mainly on whether or not a firm engaged in and reported on CSR, without differentiating for the level at which disclosure occurred. The first study in this dissertation will use GRI reporting level as a differentiator to examine the predictors and outcomes from CSR reporting. An expansion in our understanding of which firms are likely to report on CSR and what the outcomes may be will support the adoption of reporting by encouraging firms with similar characteristics to start reporting, and by demonstrating the benefits that may be gained.

The second study will continue to use GRI reporting level as a differentiator, with a focus on six sectors that are engaged in reporting, with differing environmental risk profiles, and the relationships between CSR and financial performance. The ultimate purpose of the firm’s existence is to increase its profits, according to shareholder theory (Friedman, 1970). In the absence of a positive relationship between reporting and financial performance, the value of CSR will continue to be scrutinized and challenged. Studies examining the role of CSR on firm performance across various sectors have yielded vague results (Daszynska-Sygadlo et al., 2016). Some of the reasons that have
been cited for this ambiguity include problems with CSR measurement, narrow regional focus and model misspecification (Rowley & Berman, 2000; Elsayed & Paton, 2005). This study will include firms from the global GRI reporting database to reduce the regional bias, and provide a level of consistency in CSR measurement. Investors may consider expanding their use of CSR reports as an analysis tool if there is a clear link between environmental risk and the relationship between reporting and financial performance.

Expanding on the application of stakeholder theory in CSR, the third study will focus on a group of stakeholders that is critical to the firm’s success, the employees. Results of studies that examine how employees react to CSR suggest that it could be a competitive tool (Azim, 2016) as the firm’s reputation improves and it is able to attract and retain better employees. Other studies point to evidence that CSR can contribute to positive employee attitudes (Glavas & Kelly, 2014); and job satisfaction (De Roeck et al., 2014). However, there is little evidence that any of these support employee perceptions of performance. The third study will examine the role of environmental strategy and culture on firm performance from the perspective of the employee. This is a ground level assessment of CSR performance, based on the observation of an important group of stakeholders, the employees. Employees are an important resource for the firm and success towards sustainability goals is dependent on a workforce that is engaged and committed to CSR. From the employee perspective, an employer with better financial, social and environmental performance may be considered better able to provide competitive wages and a positive work experience.
While the CSR report is oftentimes the most visible display of a firm’s commitment to sustainability, the decision to be responsible in business begins earlier in the business and reporting cycle. In “Business Strategy for Sustainable Development: Leadership and Accountability for the 90s,” a collaborative publication by Deloitte & Touche and the World Business Council for Sustainable Development, the authors outline the seven phases that a firm should complete when creating a sustainable business. These are (1) stakeholder analysis, (2) setting sustainable development policies and objectives, (3) designing and executing an implementation plan, (4) developing a supportive culture, (5) developing performance metrics, (6) preparing reports and (7) internal monitoring. These phases are presented in Figure 1.1.
The first and second studies in this dissertation will be examining secondary data that is accessible from corporate websites in the form of CSR and annual reports. However, since the reporting step is towards the end of the firms’ process towards CSR, we would like to gain more insight into the earlier phases of the process. For this reason, the third study will examine the relationships between environmental strategy, orientation, and performance. This will address the third and fourth steps of the process outlined above. In order to understand these internal processes, primary data will be collected from corporations.
1.4 Research Objective

While CSR reporting is widely adopted by many firms, there is little literature to indicate which firm characteristics or strategies may support a reporting culture. Furthermore, results of previous studies have provided inconsistent results regarding the benefits of CSR reporting. Some of the reasons that have been named for the inconsistencies include the adoption of various metrics, small samples, and variability by region or industry. The main objective of this dissertation is to determine which characteristics may identify firms that engage in CSR and reporting, and what the benefits of reporting may be to the firm, then to determine if a firm can drive its performance benefits derived from reporting by focusing on internal environmental orientation.

1.4.1 Research Questions

As we reviewed the literature on CSR reporting, it was not clear or consistent which firms were employing SRTs, and what benefits were being realized from reporting. This led to the first research question in the dissertation:

➢ What are the antecedents and consequences of CSR reporting?

In order to address this, data from the GRI database was screened to select for-profit organizations that completed CSR reports in 2012 according to this framework. Firm characteristics, strategy indicators, performance and reputational data was then gathered for these firms from multiple sources. Analyses were conducted to determine
the significance of relationships between antecedents and CSR reporting, and between CSR reporting and consequences.

Data from the first study indicated that there were some significant predictors and outcomes from CSR reporting. Results also suggested a sector influence on which firms were likely to engage in CSR reporting. The top two sectors that reported according to the GRI framework were the financial services and the mining sectors, two industries with vastly different exposures to environmental liability. Expanding the analysis to include the top three high environmental risk and the lowest three environmental risk sectors identified mining, energy and utilities as high risk, and financial services, real estate and food and beverage sectors as low risk. The second study was designed to afford a closer look at the relationship between reporting level and financial performance for these two types of risk profiles, with financial performance being measured by return on investment ratios. The following research question was addressed in the second study:

- How different are the relationships between GRI reporting level and financial performance for firms in high environmental risk sectors compared to those in low environmental risk sectors?

In order to determine if the empirical results from the first two studies conformed to observation in the corporate setting, the third study was designed to examine the relationship between environmental strategy and performance based on primary data. The role of organizational orientation towards CSR issues on this relationship was also assessed. The third study was formulated to address the following research questions:
Is the relationship between environmental strategy and performance significant and is CSR orientation mediating the relationship?

Results that provide answers to these questions will contribute to the literature on CSR and performance and provide support for more firms to engage in and report on CSR.

Figure 1.2 provides an outline of the overall research project.

**Figure 1.2**: Research model
1.5 Organization of Dissertation

This dissertation will examine the relationship between CSR and corporate performance. There will be four additional chapters. The second, third and fourth chapters will address the research questions described earlier. The second chapter, “Antecedents and Consequences of GRI Reporting Level,” uses a secondary dataset to examine the relationships between CSR reporting and its antecedents and consequences. In that chapter, analyses will be conducted to determine if firm characteristics and management strategy can be used to predict reporting level for firms that used the GRI framework in 2012 to report on CSR. Additionally, two expected outcomes of CSR, intangible reputation and financial performance, will be examined to determine if reporting level can predict these.

The third chapter, “Sector Influence on GRI Reporting Level and Financial Performance,” will also use secondary data to examine the relationships between CSR Reporting and financial performance for six sectors that have extremes of environmental risk – three high environmental risk sectors and three low environmental risk financial sectors. While firms in both of these risk categories engage in CSR frequently, their motivation and the extent to which they disclose on CSR activities vary and the study will determine if the financial benefit from CSR is different for the two risk profiles.

The fourth chapter, “The Role of Environmental Orientation on the Relationship between Environmental Strategy and Performance,” uses primary data collected via an online survey to determine how corporate environmental strategy is related to
environmental orientation and how these affect performance, as determined by social, financial, and environmental constructs.

Lastly, Chapter 5 will provide conclusions from the studies and implications for management and environmental managers. Recommendations for future studies to expand on the findings will be included.
1.6 Definitions

i. **Carbon Disclosure Project (CDP):** a not-for-profit organization that manages the global disclosure system that investors, companies, cities, and states use to manage their environmental impacts (www.cdp.net)

ii. **Corporate Social Responsibility (CSR):** actions that corporations engage in that address economic, social and environmental impacts of their operations.

iii. **Environmental Orientation:** an attitude towards the environment that recognizes the impact that a firm has on the environment and the need to minimize such impact (Banerjee, 2002).

iv. **Environmental Strategy:** the degree of integration of environmental issues into strategic planning (Banerjee, 2002).

v. **Global Reporting Initiative (GRI):** a sustainability reporting tool founded by a global non-profit that standardizes economic, environmental, social and governance performance metrics (www.globalreporting.org).

vi. **Sustainability:** development activity that meets the needs of the present generation without compromising the ability of future generations to meet their own needs (Brundtland, 1987).

vii. **Sustainability Reporting Tools (SRTs):** frameworks that are used to standardize the collection, measurement and reporting of environmental, social and governance metrics.
1.7 References


CHAPTER 2

Antecedents and Consequences of GRI Reporting Level

The concept presented in this chapter has been accepted for publication in the Journal of the Society for the Advancement of Management

Abstract

Sustainability has become a hot button topic for corporations over the past few decades. The accessibility of information that the internet provides has increased consumers’ awareness of how firms are responding to sustainability issues, such as climate change and fair trade. Corporations have responded by becoming more engaged in corporate social responsibility (CSR) activities. Since these activities consume corporate resources, management is sometimes challenged by shareholders as to how beneficial these activities are to the firm’s performance. Corporations have a responsibility to report on their CSR activity to internal and external stakeholders to demonstrate that they are meeting the dual challenge of being good corporate citizens and growing shareholder value through increased sales and market presence. However, voluntary CSR reporting can place a firm at risk if it requires disclosing sensitive information to regulators or competitors, and the act of preparing the report can be a distraction away from other management duties. Investors may question the value of CSR and voluntary reporting if there is not a clear benefit to firm performance. Research on
the relationship between CSR and performance has yielded conflicting results, partly due to inconsistent approaches to reporting activity and performance.

The research being presented here will examine how organizational characteristics and management strategic types can influence a firm’s decision to engage in voluntary CSR reporting. The relationship between CSR reporting and two of the expected outcomes – financial performance and reputation will also be determined. A positive relationship between CSR reporting and these outcomes would support voluntary disclosure and also suggest the use of CSR reporting as an investment analysis tool.

**Keywords:** Corporate social responsibility (CSR), Global Reporting Initiative (GRI), Reputational risk, Firm characteristics, Managerial strategy, Financial performance
2.1 Introduction

Sustainability is in the consciousness of consumers, businesses, regulators and scholars in almost every facet of our lives. In many business sectors, firms are engaging in sustainability efforts with the objective of reducing the environmental impact of their operations on the community, improving the quality of life of employees and customers, and improving their reputation with regulators, suppliers, investors and customers.

Corporate sustainability activities represent an investment on the part of the firm, in manpower, material resources, and intangibles to develop, implement and manage these initiatives. Management and shareholders expect to benefit from these programs. One way that firms can benefit from their sustainability efforts is by using it as a signal to customers, regulators, non-governmental organizations, and competitors. These efforts can differentiate the firms that are going above and beyond regulatory requirements to be responsible when it comes to the environment and the community. Companies can communicate their accomplishments towards program goals through advertising, press releases, a sustainability report or even product marketing labels and promotions. In this research, we will examine companies that communicate on sustainability by using a standardized framework and characterize the relationships between predictors and outcomes of reporting activity.
2.2 Literature Review

The current literature is full of reports on the effectiveness or lack thereof of mandatory reporting, including research that focuses on hiring practices, toxic substance inventories, hazardous waste disposal, emissions and other corporate actions with economic, social and environmental impacts (Gray, 2013).

Voluntary reporting also receives extensive review in the literature. There are a number of attempts to standardize voluntary reporting, with frameworks or guidelines provided by various organizations. The Organization for Economic Co-operation and Development (OECD), United Nations Global Compact (UNGC), and Carbon Disclosure Project (CDP) all provide guidelines for firms to report on CSR. In most cases, firms have latitude in how extensively they commit to the framework with respect to actions that are included in the report.

The literature examining the reasons for firms to engage in voluntary reporting has found that there is little consistent motivation or benefit. The link between reporting and firm performance is ambiguous (Burnett et al., 2011; Clark & Allen, 2012; Ameer & Othman, 2012; Jeffers & DeGaetano, 2013; Guidry & Patten, 2010; Jooh et al., 2011; Sulkowski & White, 2010). Despite the ambiguity, more than 75% of global firms engage in CSR reporting (KPMG, 2013). The Wall Street Journal reported that more companies in the S&P 500 index are touting their efforts to curtail greenhouse-gas emissions, reduce waste and improve their performance on other nonfinancial fronts (Chasan, WSJ, 6/10/14). According to an article in Harvard Business Review, by
“treating sustainability as a goal today, early movers will develop competencies that rivals will be hard-pressed to match” (Nidumolu et al., 2009). Various research studies have focused on the results of engaging in voluntary CSR reporting, with some of the expected benefits being customer loyalty, enhanced reputation, increased sales, and competitive advantage. Even so, some firms are still hesitant to report on CSR because it may require a firm to disclose sensitive information, add costs, and divert resources from activities that increase shareholder value (Margolis & Walsh, 2003). Nidumolu et al., (2009) noted that “…..many companies are convinced that the more environment-friendly they become, the more the effort will erode their competitiveness. They believe it will add to costs and will not deliver immediate financial benefits.”

Certain business sectors appear to be aligned with a specific CSR reporting emphasis. It is likely that the type of focus a sector adopts in its reporting is a response to the external pressures it receives from its customer base. Fernandez-Feijoo et al. (2013) found in a study of 1047 companies in 11 countries and 38 industries that transparency of CSR reports is affected by the stakeholder pressure in an industry. CSR reporting serves as a signaling tool for the firm to differentiate itself from its competitors and communicate its cultural values to its external stakeholders. The business sector as a whole may informally adopt a reporting focus to address the consumers’ concerns.

Some of the business sectors that focus on environmental aspects of CSR in reporting are the manufacturing, mining and energy sectors, with corporations reporting on goals such as reduction in emissions, energy and water use, waste generation and natural materials depletion. These business sectors also have invested in improving eco-
efficiency, from embracing solar energy, to the increased use of renewable materials. Since these industries have received a significant amount of public scrutiny in the past decades regarding environmental infractions, resource depletion and pollution, they may be vulnerable to questions about their environmental impact. Environmentally sensitive industries have also been examined more in terms of their sustainability behaviors and reports (Alali and Romero, 2012; Deegan, 2002; Deegan and Gordon, 1996). Addressing environmental concerns proactively in the form of detailed CSR reports may serve as an approach to improving investor confidence, employee morale and consumer satisfaction. One should note that many regions have passed environmental legislation requiring corporations to address their environmental impact so that the additional cost of voluntary CSR reporting is minimized. A gap in environmental CSR reporting is the lack of transparency to stakeholders of which of the initiatives that a firm undertakes are required by legislation, and which are voluntary. Being able to determine the voluntary actions of a corporation would allow an investor to identify which firms are truly taking action to improve or protect the environment, versus the firms that are merely taking steps to be in compliance with regulations.

Reporting with a focus on the economic aspects of CSR is common amongst services corporations, particularly those providing business to business products. Within this business sector, the hospitality business was an early adopter of sustainability practices, such as reducing water and energy use. A challenge with economic CSR reporting is communicating the benefits from initiatives, without the appearance of hypocrisy (Laufer, 2003; Pennington and More, 2010). For example, some hotel chains
have been accused of greenwashing, since they were able to save on water and energy bills while implying that they were helping the environment by not replacing linens as frequently as previously practiced. It is also challenging to obtain CSR cost and performance information from traditional business performance reports, without excessive creativity.

CSR reporting that focuses on social and ethical concerns is the primary domain of apparel and consumer goods companies. Companies that are closer to the consumer may be under greater media pressure and therefore may report on CSR more actively. Reports often highlight labor and trade practices, community relations, social justice and philanthropic activity. Labor practice is a particularly problematic issue where many firms may avoid full disclosure. If a firm is sourcing products from a country that permits child labor, it would place that firm at a competitive disadvantage to source without the use of child labor. Some corporations may report on community involvement, such as providing literacy classes at its factories, but for some stakeholders, it’s not adequate compensation for utilizing a vulnerable labor force.

Many firms with a socially sustainable focus report on issues such as fair trade and alternative trading practices. A significant challenge associated with this type of reporting is that it can lead to the question of cost optimization for the economic health of the firm. Management is often tasked with demonstrating the link between socially sustainability initiatives and improved business performance, so that these initiatives are viewed as more than a public relations expense or a philanthropic initiative. The ability to
identify a business contribution from CSR activities would encourage support, both internally and externally, for these initiatives.

All CSR reporting seem to share the challenge of communicating to external and internal stakeholders that (1) sustainability initiatives are being implemented; and (2) it is in the long term interest of the corporation and its stakeholders to continue to engage in these activities.

Nonetheless, many firms are engaging in CSR of some form, and reporting on their activities. Commitment to CSR reporting is a long-term initiative for the most successful firms. This study will examine the organizational and the strategic characteristics that predict which firms may engage in CSR disclosure according to a standardized reporting framework, and what benefits may be obtained from reporting. As noted in Sarkar et al. (2015), increased CSR is one of the motivators for firms to engage in sustainability activities. Companies are motivated to work toward achieving both environmental and financial objectives.

2.3 Research Gaps

Most of the current research into reporting activity has been focused on whether or not a firm reported, with no differentiation on the level of reporting. There have been few approaches that attempt to discern a firm’s commitment to CSR activities, or to any of the CSR reporting guidelines. Furthermore, because there are several reporting frameworks in use, and inconsistency in the manner that the framework is applied,
scholars have identified that variations in the way that firms report on CSR activity may lead to difficulties in comparing performance (Matthews & Rusinko, 2010) and in gaining a comprehensive view of a firm’s progress towards its CSR goals. This is problematic for investors or other stakeholders, as it becomes difficult to compare a group of firms in a similar industry and to assess their liability regarding environmental risks or other governance exposures. This study will use data from one CSR reporting database to minimize the inability to compare firms’ performance on CSR metrics.

The literature reports that many studies that examined financial accounting and/or market-based performance and the relationship with CSR were inconclusive (Jooh et al., 2011; Fernandez-Feijoo et al., 2014), partly as a result of inconsistent approaches to identifying and measuring CSR. A positive relationship between reporting and performance has been reported by Burnett et al. (2011), Clark & Allen (2012), Ameer & Othman (2012), and Jeffers & DeGaetano (2013). Guidry and Patten (2010) reported a neutral relationship, and Jooh et al. (2011) reported a negative relationship. Wai Kong Cheung (2011) concluded in his study of the impact of inclusion or deletion from the Dow Jones Sustainability World Index (DJSWI) on stock return that there is little evidence that investors value sustainability. DJSWI is a global index that tracks the performance of companies that are leaders in terms of CSR. Inconsistency in reporting measures have been considered as a contributor to the conflicting results (Fernandez-Feijoo et al., 2014). Some studies have measured reporting by frequency of CSR disclosures, or by the intensity of those disclosures (how detailed the report is), or by stakeholder pressure or scrutiny.
There is a risk that voluntary reporting may be neglected or eliminated in times of austerity at corporations if there is no link between reporting and performance benefits (Montiel & Delgado-Ceballos, 2014). Demonstrating a positive relationship between reporting and performance could provide much needed support for voluntary CSR within organizations. Opposition to CSR engagement and reporting is often based on the lack of a clear relationship between performance results and sustainability.

2.4 Research Questions & Hypotheses Development

The research objectives in this study were to determine (1) the significance of the relationship between the predictors of CSR and reporting; and (2) the significance of the relationship between reporting and its consequences. It is important to delineate these relationships because a positive link between reporting and performance could bolster support for voluntary CSR engagement and disclosure.

Objective 1

The first objective was to determine the significant factors that predict the voluntary reporting activity of a firm.

In this study, we examined the relationship between organization type and voluntary reporting. Two dimensions were used to differentiate between organizations – firm characteristics and managerial strategy.


Firm characteristics and Reporting

Results from many of the studies examining the relationship between firm characteristics and reporting have been inconclusive. This may be due to inconsistent approaches to identifying and measuring reporting activity (Jooh et al., 2011; Fernandez-Feijoo et al., 2013). Galani et al. (2012) found a significant relationship between reporting and company size. However, Dragu & Tiron-Tudor (2012) found little influence on reporting by organization size. These researchers used the Deloitte Sustainability Scorecard (Deloitte, 2014) for measuring reporting practice in their study. The Deloitte Sustainability Scorecard is intended to provide guidelines on what should be included in sustainability reports published by corporations.

Two measures of firm characteristic that describe a firm in terms of its resources, complexity and influences were selected for this study.

a) Number of employees

This is a typical measure of firm size and complexity, and demonstrates resources available to the firm to engage in activities such as CSR and its reporting. Galani et al. (2012) reported a significant relationship between reporting and firm size; this is in contrast to Dragu and Tiron-Tudor’s (2012) finding that firm size had little influence on reporting.

b) Slack resources

Slack resources are a characteristic that describes the resource “surplus” for a firm. According to resourced-based and behavioral theories of the firm, financial slack can facilitate the firm’s survival and contribute to performance improvement. Slack
provides the resource that allows the firm to be insulated from shock in the marketplace, resolve internal conflicts over resources and secure funds for innovation (Lee, 2011). In this study, the current ratio, calculated as current assets divided by current liabilities, will be used as a proxy for slack resources, as described by Daniel et al. (2004). The current ratio is a financial ratio indicating a firm's market liquidity and ability to meet creditor's demands. Perez-Batres et al. (2012) investigated the relationship between slack resources and reporting activity and found that there was a positive and significant association. However, this study included only U.S. based corporations, firms that are operating in an environment with a high level of stakeholder pressure for reporting.

After considering the inconsistent results from earlier studies, the following research question and hypotheses were formulated to determine the nature of the relationship between firm characteristics and reporting:

Question 1

Is the relationship between organizational characteristics and reporting significant?

- **H1**: There is a significant relationship between number of employees and reporting level.
- **H2**: There is a significant relationship between slack resources and reporting level.

**Managerial strategy and Reporting**

This study also examined the relationship between managerial strategy and CSR reporting. Miles and Snow’s (1978) typology of firms based on their ability to innovate
and adapt to their environment were used to characterize firms. There are no published studies addressing how functional attributes according to Miles and Snow could predict voluntary reporting behavior. Miles & Snow (1978) described firms based on product mix and market domain and classified them as follows:

- **Defenders** – firms with a narrow product focus and market domain. Defenders choose to operate in stable markets, and will have improved processes that make them efficient. These firms tend to operate in a capital intensive manner, and their advantage may stem from efficient asset utilization. Investment in fixed assets will be higher than for prospectors.

- **Prospectors** – firms that are trendsetters and change leaders with respect to product mix and market approach. These organizations are always at the forefront of searching for new opportunities. The firm is not completely efficient, and there is often a high level of investment in R&D as the firm nimbly pursues technology and innovation.

- **Analyzers** – firms that are efficient and stable. These are mature firms that use their resources with competence and are not always the innovators. This type of firm will not be the one to embrace a new trend in the market, but will prefer to operate in stable markets, where it can implement structures and processes that improve its efficiency. This organization accepts following competitors, where the risk can be assessed and limited.

- **Reactors** – firms that are followers in the market with respect to product offerings and strategy. This type of firm may have the in-house expertise to perceive
opportunities but may not have the resources to respond quickly enough to be a market leader. This organization is more reactive to trends and environmental changes, following the prospector types.

Figure 2.1 maps the Miles & Snow typology for organizations.

Figure 2.1: Miles & Snow Strategic Organization Typologies

Hambrick (1983) compared and validated functional attributes for these strategic types and reported differences among several variables for firms that fitted each type. This study will use these variables to quantify strategy for firms in this study.
a) R&D expenses

This measure of a firm’s resources committed to development is higher for prospectors than for other strategic types, since prospectors are at the forefront in bringing new products and services to the market.

b) Capital intensity

Capital intensity measures how a firm puts its assets to use to generate income. In this study, capital intensity will be determined from the ratio of total assets to net sales for firms in the dataset.

c) Employee productivity

Employee productivity will be determined by the ratio of net sales to number of employees.

d) Fixed assets

This is a measure of the firm’s investment in tangible assets such as plants and equipment.

The following question and hypotheses were formulated to characterize the relationship between organization characteristics and reporting:

Question 2

Is the relationship between managerial strategy variables and reporting significant?
- **H3**: There is a significant relationship between R&D expenses and reporting level.

- **H4**: There is a significant relationship between capital intensity and reporting level.

- **H5**: There is a significant relationship between employee productivity and reporting level.

- **H6**: There is a significant relationship between fixed asset value and reporting level.

**Objective 2**

The second objective was to determine the benefits that firms were deriving from engaging in voluntary reporting activities.

There is an expectation that voluntary CSR reporting will produce benefits to the firm. It is important that these are measurable so that investors and other stakeholders can support the allocation of resources to support CSR. Two anticipated benefits that firms may derive by voluntarily reporting on CSR are improved financial performance and improved reputation. Kolk (2005) and Brown et al. (2009) reported that companies stated that the most important reasons to incorporate CSR reporting into their practices are reputation management and brand protection.
Reporting and Financial performance

Studies of the relationship between reporting and financial performance have failed to provide consistent conclusions. Sulkowski & White (2010) did not find a significant relationship between reporting and financial performance. Clarkson et al. (2011) reported a positive relationship between net sales and environmental performance reporting and between market capitalization and environmental performance reporting for the four most polluting industries in the US – pulp and paper, chemical, oil and gas, and metals and mining. Their finding was consistent with a resource-based view of the firm, since firms with adequate financial resources were better positioned to support environmental performance reporting. This supports the view that polluting industries are more engaged in reporting, however, it also limits extension of these findings since they studied only four industrial sectors.

The following research question and hypotheses were developed to assess the relationship between reporting and financial performance:

**Question 3**

Is the relationship between reporting and financial performance significant?

- **H7**: There is a significant relationship between voluntary reporting level and net sales.

- **H8**: There is a significant relationship between voluntary reporting level and market capitalization.
The expected outcome is that firms that are more engaged in voluntary reporting will perform better, as they reap the benefits of CSR disclosure.

**Reporting and Reputation**

Nikolaeva & Bicho (2011) reported a positive relationship between CSR reporting and reputation. The researchers used the adoption of Global Reporting Initiative (GRI) principles as the measure of reporting, with no differentiation for what level of GRI principles were adopted. GRI is a global non-profit founded in 1997 with the objective of standardizing CSR reporting by organizations (http://www.globalreporting.org). Reputation was measured by various indexes, including Interbrand (top global brands), Dow Jones Sustainability Index (top rated companies on sustainability practices), as well as Lexis-Nexis (for media exposure, public relations and media diffusion). In contrast, Shauki (2011) examined reputational risk and favorable rankings and their relationship with reporting, and found no significant relationships in both direct and mediating models. The findings from this study could be viewed as limited since the data used was limited to companies located in Indonesia.

The following research question and hypotheses were formulated to determine the relationship between reporting and reputation:

**Question 4**

Is the relationship between reporting and intangible reputation significant?
- $H9$: There is a significant relationship between voluntary reporting level and reputational risk.

- $H10$: There is a significant relationship between voluntary reporting level and ranking.

The conceptual framework for the relationships being examined in this study is illustrated in Figure 2.2.

**Figure 2.2**: Conceptual framework for relationships between antecedents and consequences of reporting
2.5 Data

This study was conducted using secondary data obtained from the 2012 GRI database, firms’ annual reports and websites; and the 2012 RepRisk database.

The GRI guidelines provide economic, environmental, social and governance performance metrics. Companies using the guidelines are required to declare the level at which guidelines are being adopted – and the reporting level is assigned a rating of A, B, or C, with the reporting criteria at each level corresponding to an increasing application of the framework. Companies can have their CSR reports verified by an external third party, or checked by the GRI. In the case of a verified report, a (+) is added to the level of reporting designation, i.e. A+, B+, C+.

In this analysis, firms that reported as A and A+ were combined as A, B and B+ were combined as B, and C and C+ were combined as C. GRI was chosen for the basis of the study because it is one of the dominant standards for CSR reporting, being used by more than seventy-five percent of the global firms that provide reports (KPMG, 2013).

Values for number of employees, current assets, current liabilities, R&D expenses, total assets, net sales, fixed assets and market capitalization were obtained from 2012 annual reports for the firms included in the study. The reports are available on firms’ websites. All currencies were converted to US dollars at the exchange rate on December 31, 2012 (www.xe.com).

The RepRisk database was used to provide the environmental component of the firm’s Reputational Risk Index (RRI) as a variable of intangible reputation. The RRI
quantifies reputational environmental, social and governance (ESG) risk exposure for clients by capturing ESG related criticism for companies. RepRisk is a Swiss firm that continually monitors 27 ESG issues globally. The RRI ranges from 0 to 100, and is calibrated as follows:

- 0-24: low risk exposure
- 25-49: medium risk exposure
- 50-74: high risk exposure
- 75-100: very high risk exposure

Ranking was determined from a composite measure of how a company is ranked by ESG responsibility systems. The systems that were included are the three most significant rating systems for social responsibility – the FTSE4Good Index, the Dow Jones Sustainability Index and the Ethibel Sustainability Index (Hartman et al., 2007). The FTSE4Good Index was established in 2001, with the objective of measuring the performance of companies that meet criteria requirements in five areas of globally recognized CSR standards (FTSE4Good, 2015). The five areas that are measured are work toward environmental sustainability, development of positive relationships with stakeholders, support of universal human rights, insurance of good supply chain labor standards, and counter bribery practices. DJSI is a global index that tracks the performance of companies that are leaders in terms of CSR (DJSI, 2014). It was first published in 2001. The Ethibel Sustainability Index (ESI) was created in 2002 in partnership with Standard and Poor’s (Ethibel Sustainability Index, 2015). The index was
designed to estimate the sector weights in the S&P Global 1200 (Sustainable Investment Institute, 2015). The ESI is intended to measure sustainable development and stakeholder involvement.

The dataset contained information for 750 for-profit organizations that completed CSR reports according to the GRI framework in 2012. Mean substitution was used to complete missing data.

2.6 Methods

Data was collected from the GRI and RepRisk databases, and from firms’ annual reports. The dataset was split into two segments that reflect firms with high environmental risk and firms with low environmental risk. Environmental risk was based on the environmental component of the RRI. Firms with environmental reputational risk above the median were coded as “1” and firms with risk below the median were coded as “0”.

All analyses were performed using SAS Institute’s JMP Pro 11 statistical software. Analysis of variance for the two groups was performed to determine if there was a significant difference in GRI reporting levels for firms reporting at a GRI level of A, B or C level.

Nominal logistic regression analyses were conducted to determine if there were significant relationships between firm characteristics and reporting, and between management strategy and reporting. Logistic regression takes the form:

$$\text{logit } p = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_k x_k$$
where the dependent variable \( \logit p \) represents the range of probability from zero to one that a particular value will be taken. In this study, dependent variable is the probability that a firm will choose to report at level A over C, or B over C.

Multivariate analysis of variance (MANOVA) was used to assess the relationships between reporting and performance, and between reporting and intangible reputation. Where there is an indication of a significant relationship from the MANOVA, univariate analyses of variance will be conducted to determine the significance of individual variable contributions.

Where significant relationships were indicated, interactions between independent variables were also evaluated to determine if they were significant contributors to the relationships.

2.7 Results

Table 2.1 provides the descriptive statistics for the variables used in this study of 750 publicly traded companies that reported using the GRI framework in 2012. The ranges of values for the antecedents and consequences demonstrate that firms of all sizes and with various resources have adopted the GRI framework. The number of employees ranged from 16 to 434,000, with a mean of 33,000 employees. Slack resources, determined by the ratio of current assets to current liabilities, varied from $40,000 to over $15 million. The amount that firms spent on research and development varied from zero to over $10,430 million. The mean value for capital intensity, determined by the ratio of
total assets to net sales, varied from 0.074 to 4798. Employee productivity, reported as
the ratio of net sales per employee, ranged from $500/employee to almost $450
million/employee. The range for fixed assets of firms in the dataset ranged from $41,000
to almost $205 million. Values for net sales ranged from $207,000 to about $467 million.
Market capitalization ranged from $1.4 million to over $1.5 billion. The reputational risk
index for firms included in the study ranged from 0.46 to 64. Ranking, which reported
how a firm was ranked by three ESG rating systems, varied from 0 to 1, with zero
indicating rating by none of the systems, and 1 indicating rating by all three. The most
frequently observed rank was 0.33.
<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MEAN</th>
<th>MEDIAN</th>
<th>STANDARD ERROR OF MEAN</th>
<th>MINIMUM</th>
<th>MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of employees (2012, ’000)</td>
<td>33.14</td>
<td>11.56</td>
<td>2.23</td>
<td>0.016</td>
<td>434</td>
</tr>
<tr>
<td>Slack resources (2012, $ million)</td>
<td>1.72</td>
<td>1.40</td>
<td>0.06</td>
<td>0.040</td>
<td>15.06</td>
</tr>
<tr>
<td>R&amp;D Expenses (2012, $ million)</td>
<td>890.90</td>
<td>100.48</td>
<td>117.46</td>
<td>0.00</td>
<td>10,432</td>
</tr>
<tr>
<td>Capital Intensity (2012)</td>
<td>13.979</td>
<td>1.552</td>
<td>6.835</td>
<td>0.074</td>
<td>4,798</td>
</tr>
<tr>
<td>Employee Productivity (2012, $ million/employee)</td>
<td>1.777</td>
<td>0.346</td>
<td>0.768</td>
<td>0.0005</td>
<td>449.78</td>
</tr>
<tr>
<td>Fixed Assets (Dec 2012, $ million)</td>
<td>6,867.47</td>
<td>1,657</td>
<td>683.47</td>
<td>0.041</td>
<td>204,901</td>
</tr>
<tr>
<td>Net Sales (2012, $ million)</td>
<td>14,090</td>
<td>3,922</td>
<td>1,219.25</td>
<td>0.207</td>
<td>467,153</td>
</tr>
<tr>
<td>Market Capitalization (Dec 2012, $ million)</td>
<td>71,373</td>
<td>6,576</td>
<td>41,637</td>
<td>1.431</td>
<td>1,540,000</td>
</tr>
<tr>
<td>Reputational Risk Index</td>
<td>22.55</td>
<td>22</td>
<td>0.602</td>
<td>0.46</td>
<td>64</td>
</tr>
<tr>
<td>Ranking</td>
<td>0.4808</td>
<td>0.33</td>
<td>0.2047</td>
<td>0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**Table 2.1:** Descriptive statistics for antecedents and consequences of reporting

Mahalonobis distances were calculated to determine the presence of outliers. Two firms with extreme values for some of the measures were indicated. The data for these firms was examined to ensure accuracy, and the subsequent analyses were completed with their exclusion. These outliers did not appear to impact the significance of the analyses so they remained in the dataset.
The correlation matrix for the variables used in this study are included in Table 2.2. There were no extremely strong correlations between variables to indicate multicollinearity. The strongest correlation was between net sales and fixed assets (0.743).

<table>
<thead>
<tr>
<th></th>
<th>Employees</th>
<th>Slack Res.</th>
<th>R&amp;D Expenses</th>
<th>Capital Intensity</th>
<th>Productivity</th>
<th>Fixed Asset</th>
<th>Net Sale</th>
<th>Mar Cap.</th>
<th>RRI</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slack resources</td>
<td>-0.076</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R&amp;D Expenses</td>
<td>0.460</td>
<td>0.070</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital Intensity</td>
<td>-0.023</td>
<td>-0.013</td>
<td>0.036</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee Product.</td>
<td>-0.043</td>
<td>0.008</td>
<td>-0.047</td>
<td>-0.004</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed Assets</td>
<td>0.322</td>
<td>-0.097</td>
<td>0.076</td>
<td>-0.019</td>
<td>-0.003</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Sales</td>
<td>0.540</td>
<td>-0.085</td>
<td>0.292</td>
<td>-0.021</td>
<td>-0.008</td>
<td>0.743</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Cap</td>
<td>0.600</td>
<td>-0.039</td>
<td>0.087</td>
<td>-0.060</td>
<td>-0.006</td>
<td>0.001</td>
<td>0.027</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RRI</td>
<td>0.362</td>
<td>-0.011</td>
<td>0.258</td>
<td>0.029</td>
<td>-0.099</td>
<td>0.294</td>
<td>0.385</td>
<td>0.029</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Ranking</td>
<td>-0.048</td>
<td>-0.40</td>
<td>-0.013</td>
<td>-0.003</td>
<td>-0.002</td>
<td>-0.060</td>
<td>-0.032</td>
<td>-0.013</td>
<td>-0.062</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Table 2.2: Multivariate correlations for variables in dataset
Table 2.3: Distribution of GRI Application Level for the study dataset

Table 2.3 shows the distribution of GRI application level for the firms in the dataset. A+ was the most frequently used reporting level, indicating that the firms were committing to the GRI framework at a high level, and the GRI reports were being verified by a third party or GRI. Almost half of the firms in the dataset had reports that were verified (345 out of 750).

Figure 2.3 shows the distribution of industry sectors, the largest being financial services (95 firms), followed by mining (52 firms) and energy (50 firms). There were 34 industry sectors represented in the dataset. Figures 1.4 and 1.5 show the sector distributions for the group of firms with High Environmental Risk and Low Environmental Risk, respectively.
**Figure 2.3:** Distribution of Industry Sectors
Figure 2.4: Sector Distribution for firms with High Environmental Risk
Most of the firms (556 out of 740) had a high level of environmental risk, as measured by the environmental component of the RRI. Table 2.4 shows the frequency of environmental risk.
Table 2.4: Frequency for firms with High Environmental Risk and Low Environmental Risk

<table>
<thead>
<tr>
<th>Environmental Risk</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>556</td>
</tr>
<tr>
<td>Low</td>
<td>194</td>
</tr>
</tbody>
</table>

Results for the analysis of variance for the relationship between GRI reporting level (A, B, or C) and environmental risk showed a significant difference for the way that firms with high environmental risk report on CSR compared to firms with low risk ($F(1,749) = 49.3373, p < 0.0001$).

Nominal logistic regressions for the relationships between firm characteristic and reporting, and strategy and reporting are shown in Table 2.5.
**Firm Characteristics and GRI Reporting Level**

ChiSq: 19.63167  
p>ChiSq: 0.0006

<table>
<thead>
<tr>
<th>Parameter Estimates</th>
<th>Estimate</th>
<th>Std Error</th>
<th>ChiSquare</th>
<th>Prob&gt;ChiSq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.0104157</td>
<td>0.2263618</td>
<td>0.00</td>
<td>0.9633</td>
</tr>
<tr>
<td>No. of employees</td>
<td>1.1612557</td>
<td>3.4246e-6</td>
<td>11.50</td>
<td>0.0007*</td>
</tr>
<tr>
<td>Slack resources (millions)</td>
<td>-0.0622903</td>
<td>0.1082233</td>
<td>0.33</td>
<td>0.5649</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.01244565</td>
<td>0.2053861</td>
<td>0.00</td>
<td>0.9517</td>
</tr>
<tr>
<td>No. of employees</td>
<td>1.02315613</td>
<td>3.4064e-6</td>
<td>9.02</td>
<td>0.0027*</td>
</tr>
<tr>
<td>Slack resources (millions)</td>
<td>0.07679019</td>
<td>0.0898107</td>
<td>0.73</td>
<td>0.3925</td>
</tr>
</tbody>
</table>

For log odds of A/C, B/C

**Strategy and GRI Reporting Level**

ChiSq: 41.99492  
p>ChiSq: < 0.0001

<table>
<thead>
<tr>
<th>Parameter Estimates</th>
<th>Estimate</th>
<th>Std Error</th>
<th>ChiSquare</th>
<th>Prob&gt;ChiSq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.4953897</td>
<td>0.3489391</td>
<td>2.02</td>
<td>0.1557</td>
</tr>
<tr>
<td>R&amp;D expenses (millions)</td>
<td>0.00030308</td>
<td>0.0001803</td>
<td>2.82</td>
<td>0.0928*</td>
</tr>
<tr>
<td>Capital Intensity</td>
<td>0.11507511</td>
<td>0.140058</td>
<td>0.68</td>
<td>0.4113</td>
</tr>
<tr>
<td>Employee Productivity (million/employee)</td>
<td>0.32437709</td>
<td>0.3159139</td>
<td>1.05</td>
<td>0.3045</td>
</tr>
<tr>
<td>Fixed Assets - net (million)</td>
<td>7.08384618</td>
<td>3.0765e-5</td>
<td>5.30</td>
<td>0.0213*</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.42075555</td>
<td>0.3406184</td>
<td>1.53</td>
<td>0.2167</td>
</tr>
<tr>
<td>R&amp;D expenses (millions)</td>
<td>0.00023211</td>
<td>0.0001816</td>
<td>1.63</td>
<td>0.2012</td>
</tr>
<tr>
<td>Capital Intensity</td>
<td>-0.1277693</td>
<td>0.1628137</td>
<td>0.62</td>
<td>0.4326</td>
</tr>
<tr>
<td>Employee Productivity (million/employee)</td>
<td>0.28487867</td>
<td>0.3152887</td>
<td>0.82</td>
<td>0.3662</td>
</tr>
<tr>
<td>Fixed Assets - net (million)</td>
<td>3.39517e-5</td>
<td>0.0000315</td>
<td>1.16</td>
<td>0.2812</td>
</tr>
</tbody>
</table>

For log odds of A/C, B/C

**Table 2.5: Results of Logistic Regression for Antecedents of GRI Reporting Level**
Results of multivariate analysis of variance for the relationships between reporting and performance, and reporting and intangible reputation are shown in Table 2.6.

**GRI Reporting Level and Performance**

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>Approx. F</th>
<th>NumDF</th>
<th>DenDF</th>
<th>Prob&gt;F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilks' Lambda</td>
<td>0.9546284</td>
<td>4.3688</td>
<td>4</td>
<td>744</td>
<td>0.0017*</td>
</tr>
</tbody>
</table>

**Univariate Effects – GRI Level and Net Sales**

**Analysis of Variance**

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRI Level</td>
<td>2</td>
<td>2.5378e+10</td>
<td>1.269e+10</td>
<td>11.9255</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Error</td>
<td>734</td>
<td>7.8099e+11</td>
<td>1.064e+9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Total</td>
<td>736</td>
<td>8.0636e+11</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**GRI Reporting Level and Intangible Reputation**

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>Approx. F</th>
<th>NumDF</th>
<th>DenDF</th>
<th>Prob&gt;F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilks' Lambda</td>
<td>0.8765237</td>
<td>3.5761</td>
<td>4</td>
<td>210</td>
<td>0.0076*</td>
</tr>
</tbody>
</table>

**Univariate Effects – GRI Level and RRI**

**Analysis of Variance**

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRI Level</td>
<td>2</td>
<td>1392.124</td>
<td>696.062</td>
<td>5.2477</td>
<td>0.0057*</td>
</tr>
<tr>
<td>Error</td>
<td>371</td>
<td>49210.073</td>
<td>132.642</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Total</td>
<td>373</td>
<td>50602.196</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Univariate Effects – GRI Level and Ranking**

**Analysis of Variance**

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRI Level</td>
<td>2</td>
<td>5.8815e+17</td>
<td>2.941e+17</td>
<td>4.9389</td>
<td>0.0083*</td>
</tr>
<tr>
<td>Error</td>
<td>153</td>
<td>9.1101e+18</td>
<td>5.954e+16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Total</td>
<td>155</td>
<td>9.6982e+18</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 2.6:** Results of MANOVA for GRI reporting level and its outcomes
Interaction terms were generated to determine if these had a significant effect on the relationships indicated by the results. Logistic regression analysis and multivariate analysis of variance with interaction terms did not result in any other significant relationships.

2.8 Discussion and Conclusions

The ranges of values for the antecedents and consequences of reporting that are presented in Table 2.1 illustrates that firms of all sizes and with various resources have adopted the GRI framework. KPMG in its 2013 Survey of Corporate Responsibility Reporting (KPMG, 2013) stated that CR reporting should no longer be viewed as an optional exercise to polish a corporate image, but instead should be an essential business management tool. While larger firms have been reporting on CSR for several years, smaller firms are now following suit and have become more engaged in sustainability activities and reporting. This point is discussed by Pandit & Rubenfield (2016) in their study of CSR reports of the 100 smallest companies in the S&P 500. They found that almost 50% of the firms in their sample had CSR initiatives, with about 83 of the firms focusing on their environmental impact.

Figure 2.3 shows the distribution of industry sectors, the largest being financial services (95 firms), followed by mining (52 firms) and energy (50 firms). There were 34 industry sectors represented in the dataset. This is further evidence that the GRI
framework is being adopted by all types of firms, with a broad spectrum of ESG concerns. The large proportion of the dataset being financial services may be a reflection of the governance issues in that sector, following the world financial crisis in 2008. Firms in the mining and energy sectors have a long history of stakeholder scrutiny and hence may be proactive in engaging in CSR and providing voluntary disclosures. As the data was segmented into firms with high and low environmental risks, the distributions for these segments are shown in Figures 2.4 and 2.5 respectively. Figure 2.4 shows that the top three sectors for the group of firms with high environmental risk are mining, energy and utilities. The top three sectors for the group of firms with low environmental risk, as seen in Figure 2.5, are financial services, real estate, and food and beverage companies.

The correlation matrix in Table 2.2 shows little evidence of multicollinearity between the variables included in this study. The largest correlation reported was less than 0.75 and this was between fixed assets and net sales. Since these variables were not being used together as predictors or outcomes, they remained in the dataset. Fixed assets was evaluated as a predictor for reporting and net sales was evaluated as an outcome of reporting.

The distribution of GRI Application Level for the dataset that is shown in Table 2.3 implies a commitment to a high level of adoption of the GRI framework by the firms in this study. A+ was the most frequently adopted reporting level. This is the highest GRI adoption level, and these firms went even further by having their CSR reports verified, either by GRI or an external third party. External assurance of CSR reporting can validate
the data included in the report, particularly the quantitative data such as emissions reduction, or energy conservation. External assurance also provides the firm’s stakeholders with a sense of confidence in the report and demonstrates a commitment to CSR reporting, according to the GRI (www.globalreporting.org). Almost half of the firms in the dataset had reports that were verified (345 out of 750).

The level of environmental risk identified for the firms in the dataset was determined from the environmental component of the RRI. Most of the firms (556 out of 740) had a high level of environmental risk, as presented in Table 2.4. This may be one of the factors for these firms to elect to voluntarily disclose CSR performance. These firms may be aware of their vulnerability and have taken steps to communicate with stakeholders in a structured manner. CSR reports may also improve the firm’s impression with stakeholders, presenting them as good corporate citizens.

The analysis of variance for the relationship between GRI reporting level and environmental risk showed a significant difference for the way that firms with high environmental risk report on CSR compared to firms with low risk ($F(1,749) = 49.3373$, $p < 0.0001$). This indicated that there may be differences between the firms reporting at the three GRI levels (A, B, or C).

**Antecedents and Reporting**

Results of the logistic regressions for the relationships between firm characteristic and reporting, and strategy and reporting are shown in Table 2.5.
Firm characteristics and GRI level

The model fit results for the relationship between GRI level and the firm characteristics of number of employees and slack resources was significant (ChiSq 19.6317, p<0.05). The number of employees was a significant predictor for firms reporting at level A over level C, and for firms reporting at level B over level C. Slack resources was not a significant predictor for GRI level for this sample. According to Pandit & Rubenfield (2016), past research has reported a significant association between company size and voluntary CSR reporting. Number of employees is frequently recognized as an important measure of company size. Researchers have hypothesized that the greater exposure to media and higher political visibility may motivate larger firms to disclose CSR performance. The fact that slack resources was not significant to predicting GRI level is encouraging to firms without access to large resources. A large financial cushion does not appear to be a necessary factor in adhering to the GRI framework at a high level. These results support the first hypothesis, that the relationship between number of employees and GRI reporting level is significant. The second hypothesis is not supported – the relationship between slack resources and reporting level has not been shown to be significant for this sample.

The resulting predictive functions for GRI reporting level with number of employees are:

\[
\text{logit \{A/C\}} = -0.0104 + 1.161E^{-5}\text{(No. employees)}
\]

\[
\text{logit \{B/C\}} = 0.0124 + 1.023E^{-5}\text{(No. employees)}
\]
**Strategy and GRI level**

Nominal logistic regression of GRI level on the strategy variables produced a model with significant fit (ChiSq 41.9949, p<0.05). R&D expense and fixed assets were significant predictors at a significance level of 0.1 and 0.05, respectively, for firms that reported at a level of A versus level C. The capital intensity and employee productivity were not significant in the model. There were no significant predictors for firms reporting at GRI level B over level C. These results partially support the third and sixth hypotheses, indicating that R&D expenses and fixed assets could be significant predictors to GRI level, but only for firms adopting the framework at the highest level. The fourth and fifth hypotheses are not supported by these results.

The following predictive function for reporting as a function of the significant variables can be provided:

\[
\text{logit } \{A/C\} = -0.4954 + 0.0003(R&D) + 7.084E-5(\text{FixedAssets})
\]

**Reporting and Consequences**

Results from MANOVA for the relationships between GRI reporting and performance, and between reporting and intangible reputation are shown in Table 1.6.

**GRI Reporting level and performance**

MANOVA to test the hypotheses that the three different GRI reporting levels would result in significant differences in net sales and market capitalization for the firms in this sample revealed a significant multivariate main effect for GRI level: Wilks’ Lambda = 0.954, \(F(4,744) = 4.3688, p<0.005\). Given the significance of the overall test,
the univariate main effects were examined. Significant univariate main effects for GRI level were obtained for net sales, $F(2,734) = 11.9255, p<0.001$. The effect was significant between firms reporting at level A over level B and those reporting at level A over level C. The univariate main effects for GRI level on market capitalization was not significant for this sample. Thus, the seventh hypothesis was supported – the relationship between reporting level and net sales is significant. The eighth hypothesis was not supported by these results. GRI level is not a significant predictor of market capitalization for this sample of firms. This is in stark contrast to findings by Pandit & Rubenfield (2016) that found a significant association between company size in terms of capitalization and voluntary CSR reporting.

GRI Reporting level and intangible reputation

Results from MANOVA to determine if GRI reporting levels would result in significant differences in RepRisk index or Ranking indicated a significant multivariate effect: Wilks’ Lambda = 0.877, $F(4,210) = 3.5761, p<0.05$. Given the significance of the overall test, the univariate main effects were examined. Significant univariate main effects for GRI level were obtained for RepRisk index, $F(2,371) = 5.2477, p<0.05$. The effect was significant between firms reporting at level A over level C, but the effect was not seen for firms reporting at levels B and C. The univariate main effects for GRI level on ranking was significant for this sample $F(2,153) = 4.9389, p<0.05$. This effect was indicated for firms reporting at levels A or B when compared to firms reporting at level C. These results support the ninth hypothesis and tenth hypotheses partially. GRI
reporting level has a significant effect on reputational risk and ranking. However, the effect is only significant between certain reporting levels.

Results from this study indicate that some measures of company size and resource, such as number of employees, R&D expenses and fixed assets value, are important predictors of voluntary disclosure for all types of firms. Net sales, reputational risk and sustainability ranking are significant outcomes of voluntary reporting level. The effects of GRI reporting level on outcomes is not uniform at all reporting levels. The effect of GRI reporting level on performance on intangible reputation is larger for firms that report at the A level on the GRI framework. Future studies need to focus on the differences between firms reporting at A and C levels to determine what underlying characteristics may influence management decisions on CSR.

2.9 Implications and Recommendations

Results from this study has implications for internal and external shareholders, as well as for management. These results can provide support for voluntary reporting within a firm, where there may be conflicts regarding resource use and the benefits of disclosure. Corporate managers may have to justify to budget managers that the costs of CSR reporting are a proper use of company resources. In 2014, GRI estimated that the cost and burden of reporting using its framework can range from as little as €2,000 to over €100,000. These costs include the time to develop and gather data, implement new processes, train personnel, verify data, prepare reports, and fees for consultants
(www.globalreporting.org). This estimate does not include the foregone opportunity costs for resources that could have been employed more productively elsewhere in the business.

For external stakeholders, these results encourage the use of CSR reports as a resource for analysis. The importance of reporting as a predictor for net sales should encourage its use when evaluating investments for investors, as for supply chain managers when assessing opportunities.

### 2.10 Limitations and Future Research

One limitation of this study is that it only included corporations, primarily because performance data for these organizations is readily available. The research could be extended to include other types of organizations, such as governments and non-profit entities, however, other measures of performance would need to be used. Many facilities that are operated by municipalities, such as airports and waste treatment plants, could have significant detrimental environmental and quality of life impact on the resident community. These organizations also may report on sustainability goals using the GRI framework as a guide, however, financial performance measures such as market capitalization are not easily available.

A further limitation of this study is that GRI reporting levels was used as a proxy for reporting quality. Since the reporting levels are self-declared and not always verified, they may not actually reflect the extent of the report. Further work could investigate the
relationships that were analyzed in this work for a sample that only included verified reports. It is likely that the sample may be smaller than the one that was used in this study. Additionally, there are limitations in the dataset. For one, since it is for voluntary reporting, firms in the dataset are self-identifying their business sector, supporting data is generated internally without audit, and could be based on extrapolation or estimates.

Furthermore, other measures of firm characteristics, strategy, financial performance and intangible reputation may yield different results. Future studies could include other measures to confirm results from this study.
2.11 References


CHAPTER 3

Sector Influence on GRI Reporting Level and Financial Performance

Abstract

Corporate social responsibility (CSR) is quickly becoming a necessity for businesses today, whether it’s in response to regulation or voluntarily to address stakeholder concerns. One approach that companies are adopting to demonstrate good corporate citizenship is to provide CSR reports that disclose sustainability goals and achievements. There are, however, costs associated with completing these reports. These costs may take the form of capital improvement projects to install equipment that monitor emissions, developing environmentally sensitive products, or providing training and support for employees. There may also be a foregone opportunity cost since any funds that support these initiatives may have been put to alternate use to maximize shareholder value. Voluntary reporting may also increase the firm’s disclosure of sensitive information to competitors and regulators.

Management is sometimes challenged by investors to justify the tangible benefits that may be gained by this level of disclosure and transparency. Researchers have found inconsistent results when examining the relationship between CSR reporting and financial performance. Firms in environmentally sensitive industries have adopted voluntary reporting more than firms in less environmentally-sensitive industries, which may indicate that there may be a difference in performance benefits. Research also
indicates that all sectors do not disclose the same types of CSR information. There are
differences in report quality, with regard to content and detail. Earlier studies on the
benefits of voluntary reporting have not focused on report quality, but on whether or not
the firm furnished a report.

This study will examine the relationship between GRI reporting level and
financial performance for six industrial sectors with different levels of environmental
risk. If results can demonstrate that there is better financial performance for firms that
report at a higher level, more corporate managers may be encouraged to adopt voluntary
reporting in a meaningful way.

**Keywords:** Global Reporting Initiative (GRI), Information ratio, Sharpe ratio, Alpha,
Beta, R-squared, Sector
3.1 Introduction

With the increasing demand for disclosure on sustainability activities that is being placed on management by all stakeholders, many firms have been utilizing standardized frameworks to report on corporate social responsibility (CSR). Reporting on CSR activity places a burden on the firm, in the form of economics, employee time, disclosure risk and other resources. Managers are sometimes challenged as to whether CSR reporting is a productive use of company resources. To that end, there has been a significant amount of work investigating the link between CSR disclosure and financial performance. Adding to the requirement of demonstrating a benefit from reporting, investors have become more interested in the area of responsible investing over the past two or three decades (www.ussif.org). These investors are seeking investments in firms that demonstrate care about the environment and their impact on society.

CSR reports are being used to assess how a firm is positioning itself as a sustainable company and to report on accomplishments against sustainability goals. The Forum for Sustainable and Responsible Investment (www.ussif.org) reports on the sustainable, responsible and impact investment (SRI) sector in the United States. This non-profit organization reported a growth in SRI investments from approximately $2500 billion in 2005 to over $6000 billion in 2014 (Figure 3.1). Sulkowski and White (2010) suggest that increases in reporting may be attributed to socially responsible investment, with twelve percent of managed assets invested in stocks being screened based on ethical criteria. Investors may be motivated by a desire to reduce their risk exposure, as
companies with negative environmental and social reputations may be more susceptible to regulatory and public relation controversies.

Figure 3.1: Growth in SRI Investments

Earlier studies have failed to present conclusive evidence of the link between CSR reporting and financial performance. Industry sector appears to play a role but study results have been ambiguous and inconsistent. Additionally, the measures of performance have varied between studies and may not always have captured performance relative to
other investment opportunities, which may be of more import to investors. To that end, this study will examine the relationship between reporting and financial performance indicators relative to the markets for the top industrial sectors with high environmental risk and low environmental risk that used the Global Reporting Initiative (GRI) framework to report on CSR in 2015. GRI is a global non-profit founded in 1997 with the objective of standardizing CSR reporting by organizations (http://www.globalreporting.org).

Results of this study will support earlier work that has recommended the use of sector specific CSR frameworks that capture the reporting standards and challenges specific to certain industries. Sector specific frameworks allow firms to assess their CSR performance in a manner that is relevant to their industry and also allows users of the CSR report to compare performance differences on sustainability performance between firms.

3.2 Literature Review

With the growth of CSR in the latter part of the twentieth century, stakeholders began to hold firms accountable for the impact that their operations were having on the environment and communities. Environmental or social accounting grew as a concept and firms had to invest resources in addressing these concerns. The traditionalist view of the firm asserts that investing in CSR may not be the most productive use of company resources (Friedman, 1970).
In response to these concerns, there has been extensive research on the influence of CSR reporting on the performance of firms that adopt reporting frameworks, such as GRI. The GRI guidelines provide economic, environmental, social and governance performance metrics. However, little of the research has focused on individual sectors, or on comparing sectors. Daszynska-Sygadlo et al. (2016) have observed that evaluating CSR effects across various sectors could yield vague results, since there may be confounding of effects across sectors. There has been a tendency for several decades for firms in highly polluting industries, which are often viewed as high risk, to be proactive in corporate responsibility (CR) reporting. Patten (1991) reports that companies in the oil and gas industries were among the first to disclose on environmental impacts, from as early as the 1980s. Similarly, the energy, mining and utilities sectors have all been early adopters of CSR reporting (Alonso-Almeida et al., 2014). In this study, the authors reported that the two industrial sectors that have been the leaders in adopting the GRI framework are the financial and energy sectors. The authors proposed that motivations behind CSR reporting are different for these two sectors, with the financial sector attempting to correct the perception of lack of transparency, and the energy sector addressing its perception as a ‘dirty’ industry.

A review of the firms that reported using the GRI framework in 2015, and an assessment of the firms’ environmental risk revealed that the leading high risk sector was mining, and the leading low risk sector was financial services. There has been a number of studies addressing the relationships between reporting and performance for these two sectors, however, most of the studies are focused on whether or not a firm reported,
without differentiation between the various extents of GRI reporting. The GRI allows firms to declare the level at which guidelines are being adopted – and the reporting level is assigned a rating of A, B, or C, with the reporting criteria at each level corresponding to an increasing application of the framework. Companies have the option of having their reports verified by an external third party, or checked by the GRI. If a report is verified, a (+) is added to the level of reporting, so the levels become A+, B+, C+.

Gomes et al. (2014) reported on a study of the mining sector in Brazil where firms were surveyed on the effects of sustainable management practices on business performance. Some of the dimensions that were included in the study, such as supply chain sustainability and environmental improvements, were shown to have a positive relationship with firm performance. However, Barkemeyer et al. (2015) in reporting on the role of CSR reports in addressing land management issues in the mining sector, found that reporting did not adequately provide details and insight on best practices for sustainable land management within this business sector.

The voluntary nature of CSR reporting means that it allows the firm flexibility and latitude in the information that is included in the report. Brammer & Pavelin (2008) reported that there was a lot of variation in the quality of voluntary reports that firms provided. This inconsistency in reporting could undermine the value of the reports to stakeholders, including investors who may wish to use them when analyzing the sustainability risk of potential investments. Several reporting frameworks have been adopted in an attempt to standardize CSR reporting, including guidelines provided by The Organization for Economic Co-operation and Development (OECD), United Nations
Global Compact (UNGC), and the Carbon Disclosure Project (CDP). However, the GRI framework has emerged as the most widely adopted CSR reporting tool, with adoption by over 75% of the largest 250 global corporations (KPMG, 2013).

Heenetigala et al. (2015) investigated the mining sector in Australia to examine how ESG disclosures were being reported. They found that there was a lack of consistency in the manner in which ESG indicators were being measured by the companies in the sample, even though they were operating in the same industry. The inconsistency was more pronounced for environmental and social measures, since the governance metrics were required to comply with regulatory guidelines. This finding points to the difficulty that stakeholders encounter when attempting to evaluate CSR performance for a sector.

Chen & Tang (2015) presented results of a study to assess the effects of corporate social performance on financial performance of manufacturing companies using the GRI reports for 75 companies in various business sectors. In this study, financial performance was measured by return on equity, sales growth and cash flow to sales ratio. They reported a positive and significant association between some categories in the CSR and return on equity, but the other financial measures did not correlate significantly with CSR performance. In contrast to these results, Madorran & Garcia (2016) reported that they did not find a significant relationship between CSR and financial results from their study of Spanish companies. These studies did not differentiate for the levels of adoption of the CSR guidelines that are available to firms.
Studies have been completed that examine the relationship between risk and CSR. Jo & Na (2012) defined risk as the risk inherent in a firm’s operations as a result of external or internal factors that can affect profitability. Their study focused on controversial sectors such as alcohol, tobacco, or gambling. They concluded that management in high risk firms engage in CSR mostly to reduce risk and will report on their CSR activities.

Galani et al. (2012) suggest that companies adopting CSR frameworks, such as GRI, are voluntarily reporting a higher level of information. Schadewitz & Niskala (2010) and Berthelot et al. (2012) suggest that firms could be recognized and rewarded for this additional disclosure by receiving significant premiums in financial markets. Legendre & Coderre (2012) also posits that CSR reporting can be used to address reputational risk.

The literature review reveals that there is ambiguity in the results from studies examining CSR, reporting, and financial performance. These ambiguities have been assigned to various factors, including variations in metrics, sectors, and risk. For these reasons, this study will compare financial performance and GRI reporting level for firms with disparate levels of environmental risk. Since the firms will all be reporting using the same framework, there will be less variability in measurement. The study will focus on two groups of firms, one that has high environmental risk, and one that has low environmental risk. As noted by Sulkowski & White (2010), one of the key objectives of business scholarship related to CSR reporting is to determine how reporting is influenced by financial and environmental performance. This study will contribute to the research in
this area by differentiating the relationship between reporting and financial performance for sectors with disparate environmental characteristics.

3.3 Research Gaps

This study will examine CSR reporting and financial performance for two groups of firms that differ widely on environmental risk. A review of the firms that reported on CSR using the GRI framework in 2015 identified that the three leading high environmental risk sectors were mining, energy and utilities, and the three leading low environmental risk sectors were financial services, real estate and food and beverage companies. While there has been extensive research to determine the relationship between performance and reporting for these sectors, results have been inconclusive. Variations in reporting frameworks, performance metrics, and other factors have been identified as possible reasons for the inconsistent findings. This research study aims to reduce some of the variation. One framework for reporting, the GRI guidelines, will be applied for the entire study sample. The study will evaluate the same performance metrics for all the firms in the sample.

Whether or not a firm’s management elects to report on CSR can be an important signal to internal and external stakeholders. The firm may attract employees who are of the opinion that CSR matters, the community in which the firm operates may view the firm as a more responsible corporate citizen, and suppliers, investors and customers may consider that management believes that CSR is important. Signaling theory suggests that
CSR engagement can influence stakeholders’ perceptions about a firm’s quality and its performance prospects (Roberts & Dowling, 2002).

A study by Dewi (2015) of the relationship between financial performance and CSR for mining firms in Indonesia found that investors’ focus on short-term information led to indifference towards middle- and long-term initiatives, such as CSR. This is problematic for environmentalists and other sustainability managers, since CSR improvements require a long-term commitment from corporations, particularly for industries such as mining that could have a multigenerational environmental impact.

Ofori et al. (2014) studied the relationship between CSR and financial performance for 22 firms in the Ghanaian banking sector and reported that there was a positive but insignificant relationship. The current study will include a larger and more geographically diverse sample of firms in the financial services sector.

This study will use financial measures that evaluate performance over a few years. Four risk ratios - alpha, R-squared, beta, and the Sharpe ratio will be used. The study will also include the Information ratio as a measure of return relative to the financial markets.

Calculated values such as the Sharpe ratio (Sharpe, 1966) and the Information ratio (Gupta et al., 1999) provide risk-adjusted measures of return that investors can use to assess performance. The Sharpe ratio is a measure of return relative to a risk-free rate, and the Information ratio is a measure of return relative to a financial market benchmark. R-squared represents the percentage for the firm’s performance that can be attributed to performance in a benchmark index. Alpha is a measure of the value that a firm’s
management is adding to its financial performance. Beta is a measure of the volatility of the firm’s performance relative to that of the financial markets. This study will include calculated values of the ratios for the firms in the sample over a four-year period from 2012 to 2015.

This study will contribute to the literature on CSR and financial performance by (1) differentiating between levels of GRI reporting, (2) examining performance over a longer period, and (3) determining if financial measures may relate to GRI reporting level for sectors with different environmental risk.

3.4 Research Questions and Hypotheses

The relationship between return and risk is the guidepost for the majority of investment decisions. Research into CSR reporting has alluded to voluntary disclosure being used to address ESG risk (Legendre & Coderre, 2012; and Schadewithz & Niskala (2010)). Berthelot et al. (2012)) have suggested that firms could be recognized and rewarded for this additional disclosure by receiving significant premiums in financial markets.

There were three research questions about CSR reporting and financial performance that were examined in this study:

Question 1:
Is there a significant difference in GRI reporting level for firms in a high environmental risk sector compared to those in a low environmental risk sector?
Since the inception of GRI as a reporting framework in 1999, sectors that receive a high level of scrutiny have been the leaders in voluntary disclosure. As Alonso-Almeida et al., (2014) reported, the motivation for CSR reporting may differ for these firms. Companies in the financial services sector may be concerned about the perception of lack of transparency, particularly after the 2008 global financial crisis. Their motivation for engaging in CSR and reporting may be focused on governance issues. Firms in sectors that have traditionally been considered as environmentally harmful, such as energy or mining, may be motivated to report on CSR by environmental pressures (Patten 1991). Accordingly, after evaluating the firms that reported on CSR using the GRI framework in 2015 for their level of environmental risk, the mining, energy and utilities sectors and the financial services, real estate and food and beverage sectors emerge as the leading industries with high and low environmental risk, respectfully. Studies that have examined CSR effects across various sectors have yielded vague results (Daszynska-Sygadlo et al., 2016). There has been no studies assessing GRI reporting level for differing environmental risk.

This leads to the formulation of the following hypothesis:

\textbf{H1}: Firms with high environmental risk will adopt the GRI guidelines at a higher level than firms with low environmental risk.
Question 2:

Is there a significant relationship between GRI reporting level and the risk ratios in this study (alpha, beta, R-squared and Sharpe ratio) for firms in a high environmental risk sector compared to those in a low environmental risk sector?

Differences in the way that sectors engage in CSR disclosure may be affected by the environmental risk that the sector is exposed to. We may then expect that the financial markets would recognize the impact of risk and that firms’ risk ratios would reflect this. According to Jo & Na (2012), risk is inherent in a firm’s operations as a result of external or internal factors that can affect profitability. While Jo & Na (2012) focused on controversial sectors such as alcohol, tobacco, or gambling, we may see the same effects in the current study due to environmental risk. Research by Galani et al. (2012) proposes that firms that disclose on CSR are reporting a higher level of information. The current study will also consider that the financial markets recognize that disclosing at a higher GRI level may correspond to higher risk and the risk ratios would reflect this premium. Research has not consistently supported this proposition, as for example, Schröder (2007) reported a comparable Sharpe ratio for investments classified as responsible in terms of CSR, and those classified as conventional. However, that study did not differentiate for firms by sector nor level of reporting.

The following hypotheses have been formulated to address this research question:
H2: Firms with high environmental risk will have a stronger relationship between GRI reporting level and alpha than firms with low environmental risk.

H3: Firms with high environmental risk will have a stronger relationship between GRI reporting level and beta than firms with low environmental risk.

H4: Firms with high environmental risk will have a stronger relationship between GRI reporting level and R-squared than firms with low environmental risk.

H5: Firms with high environmental risk will have a stronger relationship between GRI reporting level and the Sharpe ratio than firms with low environmental risk.

Question 3:
Is there a significant relationship between GRI reporting level and the Information ratio for firms in a high environmental risk sector compared to those in a low environmental risk sector?

The Information ratio provides a comparison of the firm’s performance relative to a benchmark performance. The expectation is that firms with high environmental risk will perform in a manner that compensates investors for undertaking the additional risk. There is no available research that discusses how CSR disclosure may interact with the Information ratio at this time.

The following hypothesis has been formulated to examine the relationship between GRI reporting level and the Information ratio for firms in a high environmental risk sector and a low environmental risk sector.
H6: Firms with high environmental risk will have a stronger relationship between GRI reporting level and Information ratio than firms with low environmental risk.

The conceptual framework for the relationships being examined in this study is illustrated in Figure 3.2.

![Conceptual framework for relationships between GRI reporting level and financial performance for given environmental risk](image)

**Figure 3.2:** Conceptual framework for relationships between GRI reporting level and financial performance for given environmental risk

The measures of financial performance that were used in this study are very relevant to the investment analysis community who is often tasked with identifying alternate investments that will outperform those that may be viewed as minimal risk such
as treasury bonds. If these hypotheses can be supported, investors looking for environmentally sensitive opportunities will be able to include CSR reports as a research tool that can indicate how a firm may perform over time.

3.5 Data

Data for the sample of firms included in this study was obtained from a number of secondary sources, including the 2015 GRI database (www.globalreporting.org), firms’ annual reports and websites for the 2012-2015 period; and the RepRisk database (www.reprisk.com).

GRI reporting level

The GRI guidelines provide economic, environmental, social and governance performance metrics. Companies using the guidelines are required to declare the level at which guidelines are being adopted – and the reporting level is assigned a rating of A, B, or C, with the reporting criteria at each level corresponding to a higher extent of application of the framework. Companies can choose to have their reports verified by an external third party, or checked by the GRI. In the case of a verified report, a (+) is added to the level of reporting designation, e.g. A+, B+, C+. The firms in this study were the corporations that reported on CSR using the GRI framework in 2015, with three adoption levels: A, B and C.

Environmental Risk

The RepRisk database was used to provide the environmental component of the firm’s Reputational Risk Index (RRI) as a variable of intangible reputation. The RRI
quantifies reputational environmental, social and governance (ESG) risk exposure for clients by capturing ESG related criticism for companies. RepRisk is a Swiss firm that continually monitors 27 ESG issues globally. The RRI ranges from 0 to 100, and is calibrated as follows:

- 0-24: low risk exposure
- 25-49: medium risk exposure
- 50-74: high risk exposure
- 75-100: very high risk exposure

The list of firms that reported on CSR using the GRI framework in 2015 was divided into two segments that reflected firms with high environmental risk and firms with low environmental risk. Environmental risk was based on the environmental component of the RRI. Firms with environmental reputational risk above the median were coded as “1”, and firms with risk below the median were coded as “0”. Each subset of firms was sorted by sector to determine the sector with the most companies with high and low environmental risks. The mining, energy and utilities sectors were found to be the leading sectors with high environmental risk; and the financial sector, real estate and food and beverage sectors were found to be the leading sectors with low environmental risk. There were 26 firms from the mining sector, 22 firms from the energy sector, 14 firms from the utilities sector, 62 firms from the financial services sector, 28 firms from the real estate sector, and 21 firms from the food and beverage sector.
Alpha

Alpha is a calculated measure of the firm’s excess return relative to the return of a benchmark. For each firm, the return on assets was obtained from the annual report for the years 2012–2015. The excess return is the return on assets above the risk-free rate for this period, which was the return on the 3-month U.S. Treasury bill, and ranged from 0.05 to 0.07%. The benchmark was the S&P 500 Index performance for 2012–2015 (www.standardandpoors.com). The S&P 500 Index is comprised of the 500 leading companies with regard to market capitalization. This index is widely used as a gauge of market performance for the leading companies in various business sectors.

Positive values for alpha indicate that the firm is performing better than the benchmark and negative values represent poorer performance relative to the benchmark.

Beta

Beta was calculated for each firm from its annual report, as the covariance of its return on assets relative to the return of the S&P 500 index for the years 2012–2015. This is a measure of the firm’s performance in comparison to the financial market. Values for beta that are greater than one indicate that the firm has more volatility or systemic risk than the benchmark. Values for beta that are smaller than one indicate less volatility than the benchmark. A beta value of one would mean that there is perfect association between the benchmark performance and the firm’s.

R-squared

R-squared is another calculated measure of risk for the firm relative to the benchmark. Its values range from zero to one, with a value of zero meaning that none of
the changes in the firm’s performance could be attributed to changes in performance of the benchmark index, and a value of one meaning that the firm’s performance is perfectly correlated with benchmark performance. Firm performance was determined by return on assets and the benchmark was the returns of the S&P 500 index for 2012 – 2015.

**Sharpe ratio**

The Sharpe ratio (Sharpe, 1966) is the ratio of excess returns for the firm over the risk-free rate to the total risk, as measured by the total standard deviation of returns. In this proposed study, the risk-free rate was the return on the 3-month U.S. Treasury note. This ratio is used to quantify excess return per unit of risk. Returns for the firms in this study were obtained from annual reports. Negative values of the Sharpe ratio indicates that the firm is performing poorer than the risk-free standard.

**Information ratio**

The Information ratio (Gupta et al., 1999) is a measure of return relative to a financial market benchmark. The Information ratio was calculated as the ratio of excess return for the firm over a benchmark measure to the standard deviation of the excess returns. The return of the S&P 500 Index was used as the benchmark for purposes of this research. Returns for the firms were obtained from annual reports.

### 3.6 Methods

All analyses were performed using SAS Institute’s JMP Pro 11 statistical software.
Analysis of variance was completed to determine if there was a significant difference in GRI reporting level for the two sets of firms with high and low environmental risk profiles.

Multivariate analysis of variance (MANOVA) was used to assess the relationships between reporting and financial performance for the firms in each risk category. Financial performance was represented by alpha, beta, R-squared, Sharpe ratio and Information ratio for the firms in the sample.

3.7 Results

Table 3.1 presents the distribution of the five financial measures used in this study for the two risk profiles. There were outliers in each sector, based on calculated Mahalonobis distances. Two outliers were indicated in the financial services group, and one in the mining group. These firms were removed from the data for subsequent analyses.

Results for the analysis of variance for the relationship between GRI reporting level and sectors showed a significant difference in reporting level for the two risk profiles in the sample ($F(7, 166) = 3.2801, p 0.0080$). Firms in the mining sector reported at a higher level, with the most frequently declared level of A (52% of firms). Firms in the energy sector also reported at a higher level, with the most frequently declared level of A (50% of firms). Utilities firms reported most frequently at a level of A (50% of firms). Firms in the financial services sector reported with the most frequently declared level of C (30% of firms). Real estate firms mostly reported at a level of B
(86% of firms). Firms in the food and beverage sector reported most frequently at a level of B (67% of firms). The distribution of GRI reporting levels for the four sectors is shown in Table 3.2.

<table>
<thead>
<tr>
<th>Risk</th>
<th>Moment</th>
<th>Alpha</th>
<th>Beta</th>
<th>R-Squared</th>
<th>Sharpe Ratio</th>
<th>Information Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>Mean</td>
<td>0.0184</td>
<td>0.0405</td>
<td>0.4072</td>
<td>-0.9371</td>
<td>-1.4524</td>
</tr>
<tr>
<td></td>
<td>Median</td>
<td>0.0270</td>
<td>-0.0305</td>
<td>0.2946</td>
<td>-0.7900</td>
<td>-1.5012</td>
</tr>
<tr>
<td></td>
<td>Std. Error</td>
<td>0.0656</td>
<td>0.3419</td>
<td>0.2128</td>
<td>1.2188</td>
<td>0.3217</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>-0.3438</td>
<td>-1.3229</td>
<td>0.0016</td>
<td>-7.5131</td>
<td>-2.5674</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>0.5118</td>
<td>4.6512</td>
<td>0.7089</td>
<td>0.1718</td>
<td>0.2265</td>
</tr>
<tr>
<td>LOW</td>
<td>Maximum</td>
<td>0.0264</td>
<td>0.0014</td>
<td>0.3806</td>
<td>-2.4903</td>
<td>-1.7358</td>
</tr>
<tr>
<td></td>
<td>Median</td>
<td>0.0236</td>
<td>0.0009</td>
<td>0.2704</td>
<td>-2.5998</td>
<td>-1.8478</td>
</tr>
<tr>
<td></td>
<td>Std. Error</td>
<td>0.0041</td>
<td>0.0131</td>
<td>0.0486</td>
<td>0.2526</td>
<td>0.0691</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>0.1730</td>
<td>-0.5922</td>
<td>0.0050</td>
<td>-6.0570</td>
<td>-2.3677</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>0.0288</td>
<td>0.2259</td>
<td>0.9999</td>
<td>3.3752</td>
<td>0.0266</td>
</tr>
</tbody>
</table>

**Table 3.1** Distribution of financial measures for firms with high (mining, energy, utilities sectors) and low environmental risk (financial, real estate sectors, food & beverage)

<table>
<thead>
<tr>
<th>GRI Application Level</th>
<th>Mining</th>
<th>Energy</th>
<th>Utilities</th>
<th>Financial services</th>
<th>Real Estate</th>
<th>Food &amp; Beverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2</td>
<td>11</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>A+</td>
<td>13</td>
<td>3</td>
<td>4</td>
<td>9</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>B+</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>11</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>18</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>C+</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

**Table 3.2** Distribution of GRI reporting level for firms with high (mining, energy, utilities sectors) and low environmental risk (financial, real estate sectors, food & beverage) sectors
Results from MANOVA for the relationships between GRI reporting and financial performance are shown in Tables 3.3 and 3.4 for the high and low environmental risk sectors, respectively.

### GRI Reporting Level and Financial Performance

#### High Environmental Risk sectors

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>Approx. F</th>
<th>NumDF</th>
<th>DenDF</th>
<th>Prob&gt;F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilks’ Lambda</td>
<td>0.6815</td>
<td>1.6061</td>
<td>10</td>
<td>76</td>
<td>0.1210</td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>0.3352</td>
<td>1.5706</td>
<td>10</td>
<td>78</td>
<td>0.1312</td>
</tr>
<tr>
<td>Hotelling-Lawley</td>
<td>0.4428</td>
<td>1.6548</td>
<td>10</td>
<td>54.32</td>
<td>0.1159</td>
</tr>
<tr>
<td>Roy's Max Root</td>
<td>0.3777</td>
<td>2.9463</td>
<td>5</td>
<td>39</td>
<td>0.0238</td>
</tr>
</tbody>
</table>

#### Univariate Effects

#### GRI Level and Sharpe Ratio

**Analysis of Variance**

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRI Level</td>
<td>2</td>
<td>8.2943</td>
<td>4.1471</td>
<td>3.8754</td>
<td>0.0285</td>
</tr>
<tr>
<td>Error</td>
<td>58</td>
<td>50.0092</td>
<td>2.2731</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Total</td>
<td>60</td>
<td>58.3034</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### GRI Level and Information Ratio

**Analysis of Variance**

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRI Level</td>
<td>2</td>
<td>1.7477</td>
<td>0.8739</td>
<td>0.8147</td>
<td>0.4497</td>
</tr>
<tr>
<td>Error</td>
<td>58</td>
<td>20.8623</td>
<td>0.9483</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Total</td>
<td>60</td>
<td>22.6101</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### GRI Level and alpha

**Analysis of Variance**

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRI Level</td>
<td>2</td>
<td>1.5962</td>
<td>0.7981</td>
<td>2.6511</td>
<td>0.0824</td>
</tr>
<tr>
<td>Error</td>
<td>58</td>
<td>6.7437</td>
<td>0.3065</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Total</td>
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</table>

#### GRI Level and beta

**Analysis of Variance**

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRI Level</td>
<td>2</td>
<td>124.0983</td>
<td>62.0491</td>
<td>3.2708</td>
<td>0.0478</td>
</tr>
<tr>
<td>Error</td>
<td>58</td>
<td>455.2952</td>
<td>20.695</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Total</td>
<td>60</td>
<td>579.3935</td>
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#### GRI Level and R-squared

**Analysis of Variance**

<table>
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<tr>
<th>Source</th>
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<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRI Level</td>
<td>2</td>
<td>0.4941</td>
<td>0.2470</td>
<td>1.7869</td>
<td>0.0611</td>
</tr>
<tr>
<td>Error</td>
<td>58</td>
<td>2.7365</td>
<td>0.1244</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Total</td>
<td>60</td>
<td>3.2306</td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

**Table 3.3:** Results of MANOVA for GRI reporting level and financial performance for firms with high environmental risk
GRI Reporting Level and Financial Performance
Low Environmental Risk sectors

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>Approx. F</th>
<th>NumDF</th>
<th>DenDF</th>
<th>Prob&gt;F</th>
</tr>
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<tbody>
<tr>
<td>Wilks' Lambda</td>
<td>0.9273</td>
<td>1.3963</td>
<td>10</td>
<td>162</td>
<td>0.3042</td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>0.0743</td>
<td>1.3848</td>
<td>10</td>
<td>164</td>
<td>0.2975</td>
</tr>
<tr>
<td>Hotelling-Lawley</td>
<td>0.0789</td>
<td>1.3787</td>
<td>10</td>
<td>118.78</td>
<td>0.1067</td>
</tr>
<tr>
<td>Roy's Max Root</td>
<td>0.0447</td>
<td>2.2110</td>
<td>5</td>
<td>82</td>
<td>0.0823</td>
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Univariate Effects
GRI Level and Sharpe Ratio
Analysis of Variance

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<th>F Ratio</th>
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<tbody>
<tr>
<td>GRI Level</td>
<td>2</td>
<td>4.7021</td>
<td>2.3511</td>
<td>0.5863</td>
<td>0.5586</td>
</tr>
<tr>
<td>Error</td>
<td>107</td>
<td>222.0506</td>
<td>3.8285</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Total</td>
<td>109</td>
<td>226.7527</td>
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GRI Level and Information Ratio
Analysis of Variance

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<th>Mean Square</th>
<th>F Ratio</th>
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</thead>
<tbody>
<tr>
<td>GRI Level</td>
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<td>1.4714</td>
<td>0.7357</td>
<td>1.1589</td>
<td>0.3187</td>
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<tr>
<td>Error</td>
<td>107</td>
<td>21.4284</td>
<td>0.3694</td>
<td></td>
<td></td>
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<tr>
<td>C. Total</td>
<td>109</td>
<td>22.8998</td>
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GRI Level and alpha
Analysis of Variance

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<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob &gt; F</th>
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</thead>
<tbody>
<tr>
<td>GRI Level</td>
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<td>0.003512</td>
<td>0.001756</td>
<td>1.6486</td>
<td>0.0206</td>
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<tr>
<td>Error</td>
<td>107</td>
<td>0.06185</td>
<td>0.001066</td>
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<td></td>
</tr>
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<td>C. Total</td>
<td>109</td>
<td>0.06536</td>
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GRI Level and beta
Analysis of Variance

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob &gt; F</th>
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<tbody>
<tr>
<td>GRI Level</td>
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<td>0.06527</td>
<td>0.03263</td>
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<td>0.0815</td>
</tr>
<tr>
<td>Error</td>
<td>107</td>
<td>0.6425</td>
<td>0.01108</td>
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<tr>
<td>C. Total</td>
<td>109</td>
<td>0.7078</td>
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</table>

GRI Level and R-squared
Analysis of Variance

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
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<th>Prob &gt; F</th>
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<tbody>
<tr>
<td>GRI Level</td>
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<td>0.2811</td>
<td>0.1406</td>
<td>0.4078</td>
<td>0.6664</td>
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<td>C. Total</td>
<td>109</td>
<td>8.0724</td>
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</table>

Table 3.4: Results of MANOVA for GRI reporting level and financial performance for firms with low environmental risk
3.8 Discussion

**GRI reporting level and environmental risk**

From the results in Table 3.2, one can see that firms with both high and low environmental risk were leaders in engaging in CSR and voluntarily disclosing their activities, however, the mining sector was committed to applying the GRI framework at a higher level, with more than half of the firms in this sector reporting at a level of A+. This is the highest level, and these firms also elected to have their reports verified by either a third party or GRI. In contrast, almost one-third of the firms in the financial sector, while reporting according to the GRI guidelines, elected to apply the framework at the lowest level and did not have the reports verified. This contrast may be indicative of the urgency with which CSR is viewed by two different sectors. For the mining industry, scrutiny from environmentalists for land use issues, resource depletion, and pollution have all been prominent topics in CSR. The financial sector has not received this level of attention for environmental issues, so this sector may be more focused on managing perceptions regarding governance. Table 3.2 shows that firms in sectors with high environmental risk are adopting the GRI framework at a higher level than the firms with low environmental risk.

This distribution, as well as the results of the analysis of variance, support the first hypothesis. Firms with high environmental risk will adopt the GRI guidelines at a higher level than firms with low environmental risk.
**GRI reporting level and financial performance**

Financial performance data in Table 3.1 indicate that both high and low environmental risk sectors on average performed slightly better than the S&P 500 benchmark, as shown by the mostly small positive values for alpha. However, when returns above the benchmark are considered relative to the standard deviations, firms in both risk categories have delivered poorer returns than the S&P 500, as seen by the mostly negative values for the average Information ratios. In comparing sector performance against the risk-free rate, firms in both risk categories have also performed poorly on average. This is shown by the negative values for the Sharpe ratio. The median values for Sharpe ratios and Information ratios for either sector does not improve the performance relative to the benchmarks.

Firms in both risk categories had financial performance that was slightly more volatile than the benchmark index, as indicated by the small beta values.

The distribution of financial performance measures in Table 3.1 show that for firms in both risk categories, less than half of the mean performance could be explained by changes in the performance of the benchmark index, as seen by the average R-squared values of 0.0.4072 and 0.3806. This indicates that there are factors that contribute to firm and sector performance, independent of market movements.

As seen in Tables 3.3 and 3.4, MANOVA to test the hypotheses that firms reporting at GRI levels of A, B, or C would result in significant differences in the risk ratios revealed a significant multivariate main effect for firms in both risk categories, however, the effect was more significant for the high environmental risk category: Roy’s
Max Root (high) = 0.3777, \( F(7, 51) = 2.9463, p < 0.05 \); Roy’s Max Root (low) = 0.0477, \( F(7, 105) = 2.221, p < 0.10 \). The Roy’s Max Root multivariate tests provided the lowest level of power for the sample relative to the other multivariate tests. A larger sample of firms may provide multivariate test results with higher power.

Given the significance of the overall MANOVA, the univariate main effects were examined. For the firms with high environmental risk, results in Table 3.3 indicate that significant main effects for GRI level were obtained for alpha, \( F(2, 58) = 2.6511, p < 0.10 \); for beta, \( F(2, 58) = 3.2708, p < 0.05 \); for Sharpe Ratio, \( F(2, 58) = 3.8754, p < 0.05 \); and for R-squared, \( F(2, 58) = 1.7869, p < 0.10 \). For the firms with low environmental risk, results in Table 3.4 indicate that significant main effects for GRI level were obtained for alpha, \( F(2, 107) = 1.6486, p < 0.05 \); and for beta, \( F(2, 107) = 1.2298, p < 0.10 \). The second, third, fourth and fifth hypotheses are supported by these results. Our results did not provide evidence to support the sixth hypothesis.

While the results did not support all hypotheses, the results indicate that differences in environmental risks between industrial sectors may encourage adopting the GRI framework at different levels, with firms with more risk adopting at a higher level than firms in low risk sectors. The results also seem to indicate that the relationship between indicators of financial performance and GRI reporting level is more significant for firms in high risk sectors. Published work has suggested that the extent of disclosure is a function of exposure to public pressure in the social and political environments (Hackston & Milne, 1996). Galani et al. (2012) have reported that firms from environmentally sensitive industries disclose more environmental information than
companies from non-environmentally sensitive industries, likely due to the perception that environmentally sensitive companies are more environmentally damaging.

Supporting for these results could be found in the literature, with firms in polluting industries being identified as early adopters of CR reporting as stated by Sulkowski and White (2010).

3.9 Conclusions

This study examined the relationships between GRI reporting level and financial performance measures for firms with different environmental risk over the period from 2012 to 2015. Results indicate that sectors with high environmental risk are adopting the GRI framework at higher levels, and electing to have their CSR reports verified. Firms from sectors with lower environmental risk are adopting the GRI framework at lower levels and skipping report verification. Results also support the hypotheses that there are stronger relationships between GRI reporting level and some financial performance measures, namely alpha, beta, Sharpe Ratio and R-squared for firms in high risk sectors. The results did not provide evidence to indicate a significant relationship between GRI reporting level and the Information Ratio for the firms in this sample.

3.10 Implications and Recommendations

Research that provide insight into the relationship between voluntary CSR actions and rewards for corporations is of practical interest to internal and external stakeholders. This study examined how firms with differing environmental risk adopt the GRI
framework as a CSR reporting tool and found that firms with high environmental risk may be reporting at a higher level. This is encouraging for stakeholders who are concerned about the impact that high risk firms may have on the natural environment and the communities where they operate. The lower reporting level for firms in low risk sectors mean that there is a great opportunity for these sectors to set sustainability goals, develop and execute plans, and work towards becoming better corporate citizens. Firms in low risk sectors can examine and replicate some of the best practices in CSR that firms in the high risk sectors are using.

Positive relationships between CSR reporting level and financial performance measures could encourage more firms to engage in CSR activities and report on those activities. We saw a significant relationship between GRI reporting level and alpha, beta, Sharpe Ratio and R-squared for the sectors with high environmental risk but the only significant relationships for the low risk sectors were between GRI level and beta and between GRI level and alpha. This suggests that the firm’s GRI reporting level could provide some indication of its volatility relative to the financial markets.

The significant difference in reporting between sectors with different levels of environmental risk should support the development of sector specific CSR frameworks. There may be other elements of reporting that are relevant for industries such as banking that are not given the same priority as environmental concerns. Sector specific frameworks would allow firms in the same industry to be compared more directly, versus attempting to apply a broad framework to disparate sectors. GRI offers sector specific frameworks but they are not as broadly adopted as the general framework. CSR managers
should consider the use of sector specific metrics in order to reap increased benefits from the reporting tools. Materiality of CSR reports to address stakeholders concerns can be improved with the adoption of sector specific frameworks.

3.11 Limitations and Future Research

This study examined the relationships between GRI reporting level and five financial performance measures for six sectors over the period from 2012 to 2015. The performance measures that were used were alpha, beta, Sharpe Ratio, Information Ratio and R-squared. Studies that examine other measures of financial performance, such as the quick ratio or the debt ratio may produce different results. Studies of other sectors may also result other significant relationships. Future studies may be expanded to include other performance parameters that may be affected by CSR commitment as well as other sectors.

Furthermore, these results should not be extrapolated to other sectors without careful consideration. The results offer a very general description of the relationships between GRI reporting level and financial performance measures for the six industrial sectors. Future research may focus on other sectors to determine how well those results may align with the ones in this study. This study also included only the firms that used the GRI framework to report on CSR. While the GRI framework is the most widely adopted responsibility reporting tool, there are other frameworks in use, and there may be firms that have chosen to report independently without adopting a standardized
framework. These firms may experience financial performance benefits that are not captured in this study.

Results from this study could be improved by analyzing a larger sample. The power of the multivariate tests would be improved. A longitudinal approach to this analysis may also provide more significant and reliable results.
3.12 References


Gomes, C. M., Kneipp, J. M., Kruglanskas, I., da Rosa, L. B., & Bichueti, R. S. (2014). Management for sustainability in companies of the mining sector: an analysis of the main factors related with the business performance. Journal of Cleaner Production, 84 (Special Volume: The sustainability agenda of the minerals and energy supply and demand network: an integrative analysis of ecological, ethical,
economic, and technological dimensions), 84-93.
doi:10.1016/j.jclepro.2013.08.030


CHAPTER 4

The Role of Environmental Orientation on the Relationship between Environmental Strategy and Performance

Abstract

In response to consumer and stakeholder demand, many corporations have included environmental and sustainability objectives in their business plans. Environmental strategies have been created to address the concerns of customers, employees and the community. However, strategy may not be consistently and effectively communicated and implemented throughout an organization. In order for the strategy to be effectively executed, the organization has to be oriented towards an environmental awareness. This awareness is central to the orientation of the firm to environmental issues. Orientation is recognition by management, and communication of the recognition throughout the organization, of the importance of environmental issues. Investors, management, and employees expect to realize a performance benefit from the environmental strategy. Management and shareholders will be more supportive of environmental strategy if there is a demonstrated performance benefit. This would justify the use of corporate resources to develop, communicate and implement the strategy. The expected performance benefit should include operational, social and financial dimensions. This study is designed to examine the relationship between environmental strategy and performance on these three dimensions, in the presence of environmental orientation. Data for the study will be collected from employees in a variety of industrial sectors via a survey fielded through
professional networks. Confirmatory factor analysis and structural equation modeling will be applied to the data to demonstrate the mediating effect of orientation on the relationship between strategy and performance. If results can demonstrate a mediating and supporting effect of orientation on this relationship, firms will be encouraged to develop a culture of environmentalism that can support their strategy.

**Keywords:** Corporate social responsibility (CSR), Managerial strategy, Performance, Environmental strategy, Environmental orientation
4.1 Introduction

Amongst the challenges facing corporate environmental managers, internal resistance to resource use for sustainability efforts could be significant. While executive levels of management may be embracing sustainability, these messages may not be infiltrating to all layers in an organization, particularly one that is large, complex or multinational. Banerjee et al. (2003) proposes that corporate environmentalism is comprised of two components: strategy and orientation. Strategy is concerned with how the firm’s management incorporates environmental issues into strategic plans for the firm’s businesses. This may include implementation into objectives for the firm. Orientation is recognition by management, and communication of the recognition throughout the organization, of the importance of environmental issues. In order for the strategic plans to be supported by management and investors, the firm will need to show that there is some benefit to engaging in environmental activities. The benefits may have financial, social or environmental dimensions. Entine (1995) warns that orientation without strategy may lead to the appearance of ‘greenwashing’. Conversely, strategy without orientation is unlikely to receive the support, consciousness, and dedicated resources from the organization.

This study examines the relationships between environmental strategy and corporate performance on the social, financial and environmental dimensions, and determines if orientation is mediating the relationships. Data on corporate environmentalism and performance gathered from respondents at 151 firms will be analyzed to characterize the relationships. Results of this study will provide guidance to
management on strategic factors that are critical to performance on corporate social responsibility (CSR) issues. If mediation by orientation can be demonstrated, more effort may be placed by management in developing an environmental orientation within the organization. Management may be more supportive of CSR improvements if a link to performance can be demonstrated.

4.2 Literature Review and Research Gaps

This research examined how firms’ environmental strategy aligns with performance based on data gathered from a survey of companies. Studies have shown that executive levels of management may provide direction on a firm’s environmental behavior, however, implementation and communication can be lacking. Banerjee et al. (2003) reported that there are many facets of environmentalism within a firm, including an internal orientation as well as an external orientation. The internal environmental orientation is a reflection of the firm’s values, ethical standards and commitment to protecting the environment. The external orientation reflects the firm’s interactions with external agents, such as investors, the community, or regulators. Corporations establish this external orientation through communications in the form of CSR reports, advertising, and other vehicles. The internal environmental orientation is not easily apparent to parties external to the firm, thus it is challenging to determine how firms establish this orientation. In today’s business environment, sustainability and environmental considerations are central to success in the marketplace (KPMG, 2013). A challenge to management is to ensure that the environmental strategies that are developed at executive
organizational levels are being accepted and internalized by employees to become their environmental orientation.

Within the organization, orientation has to be executed at varying levels and functional areas. Schendel & Hofer (1979) proposed the four key levels of strategy as enterprise, corporate, business and functional strategies. Enterprise strategy demonstrates the basic mission of the firm, and its purpose in society. According to Banerjee et al., (2003), few for-profit firms will integrate environmental concerns at this strategic level. Corporate strategy dictates the type of business a firm will participate in to meet its business goals. There is room for environmentalism to be incorporated at this level. The business level strategy directs the types of products or markets that a firm may target. This is the level where most firms are able to integrate environmental orientation through product differentiation or niche marketing. The last strategy level, the functional level, is where firms can change operations such as manufacturing or advertising to make environmental improvements. Maxwell et al. (1997) reported that tailoring strategy to existing practices could ease implementation but could also be a source of conflict. Oftentimes, particularly as a firm was embarking on an environmental strategy, new internal structures were required to support strategy or communication and conflicts about goals and resources could occur in an organization. Resource availability could also be problematic. For all these reasons, it is not unusual for there to be a misalignment or miscommunication between the strategic intent of corporate environmental strategy and a genuine acceptance of environmentalism throughout an organization.
Research in the area of the benefits to corporations from developed environmental strategies have yielded results that sometimes support a positive relationship with environmental, social and financial performance. However, some of the results from studies have suggested that the relationship between environmental strategy and performance is inconsistent, and may be subject to closer scrutiny (Burnett et al., 2011; Clark & Allen, 2012; Ameer & Othman, 2012; Jeffers & DeGaetano, 2013; Guidry & Patten, 2010; Jooh et al., 2011; Sulkowski & White, 2010).

Research on the relationship between environmental strategy and orientation has provided evidence of a positive association. Kitazawa and Sarkis (2000) reported a positive relationship between environmental strategy and orientation. Daily and Huang (2001) characterized environmental orientation as the presence of mechanisms that empower employees with decision making authority, communicate information throughout the firm, provide training on environmental issues and recognizes and rewards environmental improvements. Chen et al. (2015) also found evidence to support a positive relationship between environmental strategy and orientation.

While the research supports a positive relationship between strategy and orientation, and under some conditions a positive relationship between strategy and performance, this project suggests that orientation may be a mediator to the strategy-performance relationship. If this could be demonstrated, the result could influence management to support a shared vision with employees to implement initiatives that enhance environmental protection and manage impacts, beyond regulatory requirements.
4.3 Research Questions

Given the state of research into the relationships between environmental strategy and environmental, social, and financial performance, the current research issue becomes relevant: is environmental orientation a mediating factor in the relationship between environmental strategy and performance? The objective of this study is to determine the magnitude and statistical significance of environmental orientation on the relationships between environmental strategy and performance. Four research questions have been formulated to address this objective.

4.3.1 Environmental Strategy and Performance

Question 1: Is the relationship between environmental strategy and performance significant for the sample in this study?

The expectation is that firms with a clearer environmental strategy will have better performance. This will be a result of the benefit of an overall better management strategy that is communicated clearly, as well as the benefits such as reduced water and energy consumption that firms with good environmental strategies can achieve. Research supports the expectation that corporate environmental strategy will have an effect on financial performance, as reported by Qi et al. (2014). Their study of Chinese industrial firms showed that improving environmental protection strategies was positively associated with better financial performance. The study was limited in that the sample consisted of firms in a highly environmentally challenging region and sector. Jackson and Singh (2015) reported a similar finding for their analysis of firms in the US food and
beverage supply chain. These results may be limiting since the analysis focused in one region and sector. This project will examine the relationship between environmental strategy and performance for multiple sectors.

4.3.2 Environmental Strategy and Environmental Orientation

Question 2: Is the relationship between environmental strategy and environmental orientation significant for the sample in this study?

Based on the definitions of environmental orientation by Daily and Huang (2001), Kitazawa and Sarkis (2000) reported a positive relationship between environmental strategy and orientation. Chen et al. (2015) also found evidence to support a positive relationship between environmental strategy and orientation. Fraj et al. (2011) reported that firms with green marketing strategies improved their profitability, and operational performance. These results were accomplished through cost reductions and increased market share as environmental practices were adopted. We expect that the data collected in this study will support these results, showing that the relationship between environmental strategy and orientation is significant.

4.3.3 Environmental Orientation and Performance

Question 3: Is the relationship between environmental orientation and performance significant for the sample in this study?

Chan et al. (2012) have reported that environmental orientation significantly enhances corporate performance, particularly in the context of environmental
performance metrics. Fraj-Andres et al. (2009) also reported a positive relationship between orientation and financial performance.

4.3.4 Environmental orientation mediation between environmental strategy and performance

Question 4: Is environmental orientation a significant mediator on the relationship between environmental strategy and performance?

Environmental orientation, which measures how successfully a firm can transfer ownership of a strategy to an important group of stakeholders, the employees, may be a significant predictor of performance and may mediate the relationship between environmental strategy and performance. In many organizations, there is a misalignment between management decrees and implementation. Firms that are more capable of seeing a strategy through to implementation will be more successful.

The significance of the mediating relationship will be determined following the methods used by Iacobucci et al. (2007) and Sobel (1982):

Mediation may only occur if the paths between the independent variable and the mediator and between the mediator and the dependent variable are statistically significant. Sobel (1986) tests for mediation will be applied to statistical data to determine if mediation is partial or complete.
4.4 Empirical Model

Figure 4.1 illustrates the conceptual model that will be used to evaluate the relationships between environmental strategy, orientation, and performance. The proposed model hypothesizes that environmental orientation (EO) has a mediating effect on the relationship between environmental strategy (ES) and performance (Perf). Performance is described by three components: operational performance (OP), social performance (SP), and financial performance (FP).

Figure 4.1: Conceptual model for relationship between Environmental Strategy, Orientation and Performance
4.5 Methodology

4.5.1 Survey Design and Data Collection

An exploratory and descriptive study was conducted to test the model presented in Figure 4.1. A survey was created that included questions from previous fielded studies conducted in earlier research (Banerjee et al., (2003); Trumpp et al., (2015); Agarwal et al., (2015)). Additional questions were added to address the research questions pertaining to this study. Data collection was conducted in July and August, 2016. Prior to fielding the survey, it was pre-tested through interviews with ten professionals to ensure that questions were clear and answer choices were adequate. As a result of pre-test, two questions that were redundant were combined into one, and one question was re-worded to improve clarity.

Data collection was accomplished through a survey consisting of 48 questions, and five blocks. The first block, addressing corporate environmental strategy, contained 18 questions. The second block contained 15 questions designed to address corporate environmental orientation. The third block contained five questions addressing environmental performance. The fourth block, consisting of three questions, was intended to collect data on social performance. The fifth block addressed financial performance with seven questions. Respondents were asked to indicate their agreement with a statement on a scale ranging from 1 to 7, where 1 = Entirely Disagree and 7 = Entirely Agree.
Other components of the survey included an introduction to the research topic, a consent form, and the primary industrial sector for the corporate entity that employed the respondent.

The survey was sent via e-mail to 826 members of a professional network, 179 responded, and 155 agreed to complete the survey. The survey and study description had been submitted to the office of Montclair State University’s Institutional Review Board and approved under IRB number FY-15-16-266 on June 29, 2016. The IRB approval letter is amended as Appendix 1 and the survey is amended as Appendix 2. Retained survey items are presented in Appendix 3.

4.5.2 Methods and Results

All analyses were conducted using performed using SAS Institute’s JMP Pro 11 and LISREL 9.2 (for students) statistical software.

SAMPLE DEMOGRAPHICS

The survey was completed by 155 respondents, representing almost 19% response rate. Some respondents identified their firms’ primary industrial sector in the survey. There were 19 distinct sectors. The largest number of respondents who provided a response were from the Healthcare and Retail sectors (16 and 9%, respectively). Most responses for the survey were in the 3 – 5 range, representing the response categories of Somewhat Disagree (3), Neither Agree nor Disagree (4), and Somewhat Agree (5).
The responses were evaluated for survey wave bias by comparing responses that were obtained in the early part of the study, during July and August, 2016, with responses that were received in the later part, during October and November, 2016. There were no significant differences in mean responses for these two periods, so analysis continued without concern for survey wave bias.

4.5.2.1 DATA

Survey responses were analyzed to assess for outliers, normality and multicollinearity for each block of responses. Responses were also examined for missing data which could decrease the power of the results and introduce bias in the standard error terms (Allison, 2003). There were four incomplete surveys and they were eliminated from further analysis. A few (fewer than 10) surveys had missing items and these were replaced by median substitution.

Using SAS Institute’s JMP Pro 11, z-scores were calculated for each variable to determine if there were univariate outliers. Variables with z-scores exceeding +/-3.29 (p<0.001, two-tailed test) would have been identified as univariate outliers, according to the methods described by Tabachnick & Fidell (2007). No extreme outliers were identified for the survey responses using this test.

The data distribution was also examined to confirm that the conditions for Normality were satisfied. Since structural equation modeling (SEM) was going to be used to assess the fit to the model put forth in Figure 1, it was important that the data
distribution was Normal with the absence of skewness and kurtosis. JMP Pro 11 was used to calculate kurtosis and skewness statistics for each response. Results were examined to determine if any item had a skewness statistic that was greater than 3 or a kurtosis statistic greater than 8. These two conditions would have indicated lack of Normality, according to Hair Jr. et al. (2009). None of the survey responses were outside of the acceptable limits for skewness or kurtosis, so the data was accepted as confirming to Normal distribution.

4.5.2.2 EXPLORATORY FACTOR ANALYSIS

The collected data was subjected to exploratory factor analysis, using the principal components method with oblique rotation (Quartimin). Analysis followed the recommendation of Hair Jr. et al. (2009) and retained items where the factor loading was greater than 0.7. One-dimensionality of the constructs was evaluated by the Cronbach’s alpha for the factors, with a lower limit of 0.7 for acceptance. The following measures were constructed from the collected data:

1) Environmental Strategy

The survey included 18 items that addressed corporate environmental strategy. Principal components factor analysis with oblique rotation extracted two factors with eigenvalues greater than one that accounted for 79.7% of the variance in response. The first dimension (ES F1), consisted of nine items, with an eigenvalue of 13.3, and explained about 74% of the variance. This factor had a Cronbach’s alpha of 0.9721. The
second factor (ES F2) included seven items and accounted for 5.9% of response variance. Cronbach’s alpha for the second factor was 0.9693. Two items were dropped from the construct to improve dimensionality.

2) Environmental Orientation

There were 15 items in the survey that addressed corporate environmental orientation. Principal components factor analysis with oblique rotation extracted two factors with eigenvalues greater than one that accounted for 75.6% of the variance in response. The first dimension (EO F1), consisted of ten items, with an eigenvalue of 9.43, and explained about 63% of the variance. This factor had a Cronbach’s alpha of 0.9736. The second factor (EO F2) included two items and accounted for 12.70% of response variance. Cronbach’s alpha for the second factor was 0.8779. Three items were dropped from the construct to improve dimensionality.

3) Performance

a) Operational Performance

There were five items in the survey that addressed corporate operational performance. Principal components factor analysis with oblique rotation resulted in one factor with an eigenvalue greater than one that accounted for 80.6% of the variance in response. All five questions had factor loadings that exceeded 0.80, however, Cronbach’s alpha was optimized with the first three questions being included in the factor, and so two items were dropped. The resulting construct was named OP.
b) Social Performance

There were three items in the survey that addressed corporate social performance. Principal components factor analysis with oblique rotation resulted in one factor (SP) with an eigenvalue greater than one that accounted for 70.2% of the variance in response. Two items had factor loadings that exceeded 0.90, and Cronbach’s alpha for the factor was 0.8008.

c) Financial Performance

There were seven items in the survey that addressed corporate financial performance. Principal components factor analysis with oblique rotation resulted in two factors with eigenvalues greater than one that accounted for 80.5% of the variance in response.

The first factor (FP F1), consisted of three items, with an eigenvalue of 4.44, and explained about 63.4% of the variance. This factor had a Cronbach’s alpha of 0.9257. The second factor (FP F2) had an eigenvalue of 1.20 and accounted for 17.1% of response variance. Cronbach’s alpha for the second factor was 0.8692.

The financial, operational and social performance factors were combined to represent Performance in the analyses.

Descriptive statistics and factor loadings for retained items are presented in Appendix 1.
Skewness and Kurtosis statistics were determined for the constructs. All statistics were between -1 and 1, which is accepted as reasonably close to Normal (Gujarati, 2002), hence we used the multivariate techniques for Normal distributions with little concern. The Shapiro-Wilk statistic for testing Normality was significant for the Environmental Orientation measure, however, transformations did not decrease significance.

Table 4.1 presents the construct statistics and correlations.

<table>
<thead>
<tr>
<th>CONSTRUCT</th>
<th>SK</th>
<th>KU</th>
<th>AVG</th>
<th>S.D.</th>
<th>ES</th>
<th>EO</th>
<th>Perf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Strategy (ES)</td>
<td>-0.1040</td>
<td>1.0269</td>
<td>-0.1107</td>
<td>2.2561</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Orientation (EO)</td>
<td>-0.0393</td>
<td>0.9872</td>
<td>0.0525</td>
<td>0.1108</td>
<td>0.6106</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>-0.8962</td>
<td>1.0025</td>
<td>0.4456</td>
<td>3.8112</td>
<td>0.5692</td>
<td>0.5014</td>
<td>1.0000</td>
</tr>
<tr>
<td>Initial no. of items</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Items after factor analysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>% of variance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>79.7%</td>
<td>75.6%</td>
<td>76.6%</td>
</tr>
</tbody>
</table>

Table 4.1: Construct statistics and correlations

Since some of the factors accounted for a large amount of the variance, the data was also examined for the presence of common method variance (CMV). It is not surprising that this bias would be present in this data, since the respondents were providing answers for both the criterion and the predictor variables. According to the recommendation of Podsakoff et al. (2003), CMB may be present when a single factor
accounts for more than 50% of the variance, and is also likely when there is a single rater. Since it was not possible to adapt the survey procedure to gather data from more than one respondent at each company, or to field different parts of the data at different times, a single common method factor approach was used to assess the extent of CMB. A common latent factor was added to the confirmatory factor analysis models in the next phase of data analysis. Regression weights with and without the latent factor were compared to determine if the CMB is significant, and if the common latent factor should be included in the model analysis.

4.5.2.3 HYPOThESes TESTING

Structural equation modeling (SEM) was used to test the model presented in Figure 4.1. SEM was used because this method allows for the estimation of multiple and interrelated dependence relationships (Hair Jr. et al., 2009), allowing more complex models than the general linear model. A two-stage analysis was adopted in this study, with the first stage estimating the measurement model and the second stage estimating the structural model.

Measurement Model

Confirmatory factor analysis (CFA) was conducted using LISREL to estimate the measurement models for the variables in the model presented in Figure 4.1. Guidelines for assessing measurement model fit followed those described in Hair Jr. et al., (2009) and Kline (2005). Goodness-of-fit Index (GFI) ranges in value from 0 to 1 and higher
values indicate better fit. Incremental fit index (IFI) and comparative fit index (CFI) are other fit measures that indicate how well the estimated model compares to a null model. For both these indices, values range from 0 to 1 and larger values indicate higher levels of fit. The chi-squared to degrees of freedom ratio is a measure of acceptable fit when values are below 3 (Kline, 2005). The root mean square error of approximation (RMSEA) indicates acceptable fit when values range from 0.05 to 0.08.

**Environmental Strategy (ES)**

The environmental strategy construct that resulted from exploratory factor analysis consisted of two dimensions, ES F1 and ES F2, which included 16 items. CFA was initiated with these items to determine a measurement model for environmental strategy (ES). Initial CFA results indicated that the measurement model could be improved. Initial CFA results were:

\[
\text{GFI} = 0.849; \text{IFI} = 0.971; \text{CFI} = 0.869; \text{Chi-sq} = 294.31; p = 0.00; df = 103;
\]

\[
\frac{\text{Chi-sq}}{df} = 2.86; \text{RMSEA} = 0.111
\]

LISREL results indicated that the measurement model for ES could be improved by adding covariances among some error terms. Five covariances were added and the CFA was repeated. The model was improved and satisfied the requirements of fit, as described in Hair Jr. et al., (2009). Goodness-of-fit statistics for the final ES measurement model are as follows:
GFI = 0.885; IFI = 0.986; CFI = 0.935; Chi-sq = 191.55; \( p = 0.00; \ df = 96; \)

\[ \text{Chi-sq/df} = 1.99; \text{RMSEA} = 0.41 \]

A common latent factor was added to the measurement model to determine if there was significant CMB. The regression weights did not increase more than 0.200 for any of the items so the analysis proceeded without the latent factor.

The final measurement model for ES is shown in Appendix 4, with both factors, ES F1 and ES F2, loading significantly. ES1 contained items that addressed strategy that focused on products, while ES2 contained items that were focused on the planning aspects of strategy.

**Environmental Orientation (EO)**

The environmental orientation construct that resulted from exploratory factor analysis consisted of two dimensions, EO F1 and EO F2, which included 12 items. CFA was initiated with these items to determine a measurement model for environmental orientation (EO). Initial CFA results indicated that the measurement model could be improved. Initial CFA results were:

GFI = 0.899; IFI = 0.960; CFI = 0.969; Chi-sq = 59.31; \( p = 0.042; \ df = 42; \)

\[ \text{Chi-sq/df} = 1.41; \text{RMSEA} = 0.072 \]

LISREL results indicated that the measurement model for EO could be improved by removing two items and adding covariances between two error terms. These
adjustments were made and the CFA was repeated. The model was improved and satisfied the requirements of fit, as described in Hair Jr. et al., (2009). Goodness-of-fit statistics for the final EO measurement model are as follows:

GFI = 0.944; IFI = 0.978; CFI = 0.978; Chi-sq = 49.88; p = 0.049; df = 35;

Chi-sq/df = 1.42; RMSEA = 0.053

The resulting construct for EO was comprised of two factors. The first factor involved three items that focused on employees’ environmental orientation within the organization. This factor was designated EO1. The second factor included items that focused on operational aspects of various functions, such as production and purchasing. This factor was designated EO2.

A common latent factor was added to the measurement model to determine if there was significant CMB. The regression weight for two of the items increased by more than 0.200 (0.21 and 0.22), however, the differences were not large enough to necessitate the addition of the common latent factor to the measurement model.

The final measurement model for EO is shown in Appendix 5.

Performance (Perf)

The performance construct that resulted from exploratory factor analysis consisted of four dimensions, which included 12 items. CFA was initiated with these
items to determine a measurement model for performance (Perf). Initial CFA results indicated that the measurement model could be improved. Initial CFA results were:

\[
\begin{align*}
GFI &= 0.962; 
IFI &= 0.870; 
CFI &= 0.987; 
\text{Chi}^2 &= 36.75; \quad p = 0.046; \quad df = 48; \\
\text{Chi}^2/df &= 0.77; 
\text{RMSEA} &= 0.066
\end{align*}
\]

LISREL results indicated that the measurement model for Perf could be improved by adding a relationship and adding two covariances between error terms. These adjustments were made and the CFA was repeated. The model was improved and satisfied the requirements of fit, as described in Hair Jr. et al., (2009). Goodness-of-fit statistics for the final Perf measurement model are as follows:

\[
\begin{align*}
GFI &= 0.971; 
IFI &= 0.892; 
CFI &= 0.992; 
\text{Chi}^2 &= 25.64; \quad p = 0.62; \quad df = 47; \\
\text{Chi}^2/df &= 0.54; 
\text{RMSEA} &= 0.047
\end{align*}
\]

A common latent factor was added to the measurement model to determine if there was significant CMB. The regression weight for three of the items increased slightly more than 0.200, (0.21, 0.22 and 0.22), however, the differences were not large enough to necessitate the addition of the common latent factor to the measurement model.

The final measurement model for Perf is shown in Appendix 6. Perf was specified by one factor for operations performance (OP); one factor for social performance (SP); and two factors for financial performance (FP 1 and FP 2). FP 1 included items that focused on the firm’s financial policies and FP 2 included items focused on profitability.
Construct reliability (CR) and variance extracted were determined for each of the measurements that would be used in the SEM analysis. These measures are presented in Table 4.2. CR for the four constructs were in the range from 0.762 to 0.946, all satisfying the commonly used threshold for acceptable reliability of 0.70 (Hair Jr. et al., 2009). Variance extracted is a measure of the overall amount of variance that is being accounted for by the construct. A commonly accepted threshold is 0.50. The construct for EO1, EO2, and Perf are slightly lower at 0.499, 0.461 and 0.496, respectfully. All other constructs were higher than the commonly accepted threshold of 0.50.

<table>
<thead>
<tr>
<th>CONSTRUCT</th>
<th>No. of items</th>
<th>Construct Reliability</th>
<th>Variance Extracted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Strategy - Product (ES1)</td>
<td>9</td>
<td>0.946</td>
<td>0.510</td>
</tr>
<tr>
<td>Environmental Strategy – Planning (ES2)</td>
<td>7</td>
<td>0.882</td>
<td>0.560</td>
</tr>
<tr>
<td>Environmental Orientation – Personnel (EO 1)</td>
<td>8</td>
<td>0.885</td>
<td>0.499</td>
</tr>
<tr>
<td>Environmental Orientation – Operations (EO 2)</td>
<td>2</td>
<td>0.875</td>
<td>0.461</td>
</tr>
<tr>
<td>Operational performance (OP)</td>
<td>3</td>
<td>0.762</td>
<td>0.496</td>
</tr>
<tr>
<td>Social performance (SP)</td>
<td>3</td>
<td>0.783</td>
<td>0.661</td>
</tr>
<tr>
<td>Financial performance – policy (FP1)</td>
<td>3</td>
<td>0.780</td>
<td>0.568</td>
</tr>
<tr>
<td>Financial performance – profitability (FP2)</td>
<td>4</td>
<td>0.856</td>
<td>0.663</td>
</tr>
</tbody>
</table>

Table 4.2: Reliability and variance extracted for constructs in measurement model
Upon satisfying the requirements for fit for the measurement model, the second stage of the analysis, structural equation modeling, was initiated.

**Structural Model**

Based on the results of CFA, structural equation modeling (SEM) using LISREL was conducted to assess the fit between the data and the model presented in Figure 4.2, and to determine if the hypotheses were supported by the survey results. SEM was used to test the following twenty hypotheses as shown in Table 4.3 and Figure 4.2:
<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Parameter est.</th>
<th>Std. error</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: ES1 → OP</td>
<td>0.0406</td>
<td>0.0278</td>
<td>Not supported</td>
</tr>
<tr>
<td>H2: ES1 → SP</td>
<td>0.1687</td>
<td>0.0169***</td>
<td>Supported</td>
</tr>
<tr>
<td>H3: ES1 → FP1</td>
<td>0.1300</td>
<td>0.0272***</td>
<td>Supported</td>
</tr>
<tr>
<td>H4: ES1 → FP2</td>
<td>0.2361</td>
<td>0.0206***</td>
<td>Supported</td>
</tr>
<tr>
<td>H5: ES2 → OP</td>
<td>0.0685</td>
<td>0.0344**</td>
<td>Supported</td>
</tr>
<tr>
<td>H6: ES2 → SP</td>
<td>0.2109</td>
<td>0.0209***</td>
<td>Supported</td>
</tr>
<tr>
<td>H7: ES2 → FP1</td>
<td>0.1794</td>
<td>0.0331***</td>
<td>Supported</td>
</tr>
<tr>
<td>H8: ES2 → FP2</td>
<td>0.3352</td>
<td>0.0249***</td>
<td>Supported</td>
</tr>
<tr>
<td>H9: ES1 → EO1</td>
<td>0.9848</td>
<td>0.0456***</td>
<td>Supported</td>
</tr>
<tr>
<td>H10: ES1 → EO2</td>
<td>0.0416</td>
<td>0.0199**</td>
<td>Supported</td>
</tr>
<tr>
<td>H11: ES2 → EO1</td>
<td>1.2818</td>
<td>0.0472***</td>
<td>Supported</td>
</tr>
<tr>
<td>H12: ES2 → EO2</td>
<td>0.0643</td>
<td>0.0245**</td>
<td>Supported</td>
</tr>
<tr>
<td>H13: EO1 → OP</td>
<td>0.0374</td>
<td>0.0245</td>
<td>Not supported</td>
</tr>
<tr>
<td>H14: EO1 → SP</td>
<td>0.1488</td>
<td>0.0149***</td>
<td>Supported</td>
</tr>
<tr>
<td>H15: EO1 → FP1</td>
<td>0.1220</td>
<td>0.0238***</td>
<td>Supported</td>
</tr>
<tr>
<td>H16: EO1 → FP2</td>
<td>0.2443</td>
<td>0.0172***</td>
<td>Supported</td>
</tr>
<tr>
<td>H17: EO2 → OP</td>
<td>0.5864</td>
<td>0.1031***</td>
<td>Supported</td>
</tr>
<tr>
<td>H18: EO2 → SP</td>
<td>0.1935</td>
<td>0.0871**</td>
<td>Supported</td>
</tr>
<tr>
<td>H19: EO2 → FP1</td>
<td>0.4614</td>
<td>0.1122***</td>
<td>Supported</td>
</tr>
<tr>
<td>H20: EO2 → FP2</td>
<td>0.1574</td>
<td>0.1203</td>
<td>Not supported</td>
</tr>
</tbody>
</table>

Table 4.3: Summary of hypotheses testing for proposed model

*** $p$-value < 0.0001

** $p$-value < 0.05

Following the methods recommended by Hair Jr. et al. (2009), individual parameter estimates were assessed to validate the proposed model. Three of the twenty proposed hypotheses were rejected.

Figure 4.2: Model for relationship between Environmental Strategy, Orientation and Performance
Environmental Strategy and Performance

The coefficients for the relationships between the environmental strategy factors and the performance factors were mostly significant (hypotheses 1 to 8). Strategy factors focused on product and planning were significant indicators for all of the factors of performance, except for operational performance (hypothesis 1). Results by Qi et al. (2014) that reported a positive association between environmental strategy and financial performance support this outcome. There is further support from Jackson and Singh’s (2015) study of the food and beverage supply chain. The coefficient of determination for the fit between the strategy factors and the performance factors, without a mediating variable was 0.3206, indicating an acceptable fit between the data and the strategy and performance relationship.

Environmental Strategy and Environmental Orientation

The coefficients for the relationships between environmental strategy factors and orientation factors were all significant (Hypotheses 9 to 12). However, relationships between both of the strategy factors and the personnel-focused orientation factor were more significant than the relationships with the operations-focused orientation factor. This result is supported by the results in recent literature (Daily and Huang (2001), Kitazawa and Sarkis (2000), Chen et al. (2015)), who reported positive relationships between strategy and orientation, indicating that strategy and the personnel-related aspect of orientation is aligned. Banerjee et al. (2003) pointed out that the relationship between
environmental strategy and orientation is complex and that may explain the weaker relationship for operations-focused orientation.

**Environmental Orientation and Performance**

The coefficients for the relationships between environmental orientation factors and performance factors were all positive, directionally supporting hypotheses 13 to 20. However, there were a couple of coefficients that were not statistically significant. The data did not indicate a significant relationship between personnel-focused orientation and operational performance, and between operations-focused orientation and the profitability focused factor of financial performance.

**Mediation by Environmental Orientation on the relationship between Strategy and Performance**

The relationships between strategy and orientation and between orientation and performance are required to be significant in order for mediation by orientation to occur. Some of the results met these requirements so the analysis proceeded to test the models with and without mediation to determine if there was a statistical difference in the coefficients for the relationship between strategy and performance factors.

The coefficient of determination for the model with mediation was 0.3836 and for the direct path was 0.3206. These results indicate that the model was a good fit for the
data collected. The significance of the mediation by the orientation factors was tested using the approaches of Baron and Kenny (1986) and Iacobucci et al. (2007). In order for mediation to occur, the difference in coefficients for the relationship between strategy factors and performance factors for the direct path (c) with mediation and the indirect path (c’) must be statistically significant. Figure 4.3 presents a graphical representation of the relationships that will be tested.
In order for mediation to occur, $a$ and $b$ must be statistically significant.

The Sobel $z$ statistic will determine if mediation is partial or complete:

- $z$ significant and $c$ is not: complete mediation by EO
- $z$ not significant but $c$ is significant: partial mediation
- Neither $z$ nor $c$ are significant: partial mediation

Sobel $z$ statistic:

$$ z = \frac{ab}{\sqrt{(b^2SE_a^2) + (a^2SE_b^2)}} $$

where $a$, $b$, $c$ and $c'$ are structural coefficients; and $SE_a$ and $SE_b$ are standard errors for $a$ and $b$

**Figure 4.3:** Sobel test representation

*Source: Adapted from MacKinnon (2008)*
Using the Sobel z statistic formula with the coefficients in Table 4.3, the test statistics were calculated. These are shown in Table 4.4, where IV is the independent variable, in this case the strategy factors, MED is the mediating factor, which is orientation factors for this study, and DV is the dependent variable, or the performance factors. It is suggested by MacKinnon (2008) that the product (ab) in the Sobel test statistic formula represents the difference in the coefficients (c-c’) for the models with and without mediation. The role of orientation that is focused on personnel as a mediator between strategy factors and performance factors is confirmed by these results. Mediation by orientation, however, was partial, since the operations focused orientation factors did not have a mediating effect on the relationships between strategy and performance factors.
<table>
<thead>
<tr>
<th>Relationship (IV→Med→DV)</th>
<th>Sobel z-statistic</th>
<th>Std. error</th>
<th>p-value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES 1 – EO 1 – SP</td>
<td>9.0644</td>
<td>0.0162</td>
<td>0.0022</td>
<td>Supported</td>
</tr>
<tr>
<td>ES 1 – EO 1 – FP 1</td>
<td>4.9875</td>
<td>0.0241</td>
<td>0.0141</td>
<td>Supported</td>
</tr>
<tr>
<td>ES 1 – EO 1 – FP 2</td>
<td>11.867</td>
<td>0.0203</td>
<td>0.0004</td>
<td>Supported</td>
</tr>
<tr>
<td>ES 1 – EO 2 - OP</td>
<td>1.9621</td>
<td>0.0124</td>
<td>0.0597</td>
<td>Not supported</td>
</tr>
<tr>
<td>ES 1 – EO 2 – SP</td>
<td>1.5224</td>
<td>0.0053</td>
<td>0.1279</td>
<td>Not supported</td>
</tr>
<tr>
<td>ES 1 – EO 2 – FP 1</td>
<td>1.8635</td>
<td>0.0103</td>
<td>0.0624</td>
<td>Not supported</td>
</tr>
<tr>
<td>ES 2 – EO 1 - SP</td>
<td>9.3729</td>
<td>0.0203</td>
<td>0.0051</td>
<td>Supported</td>
</tr>
<tr>
<td>ES 2 – EO 1 – FP 1</td>
<td>5.0370</td>
<td>0.0310</td>
<td>0.0269</td>
<td>Supported</td>
</tr>
<tr>
<td>ES 2 – EO 1 – FP 2</td>
<td>12.5860</td>
<td>0.0249</td>
<td>0.0172</td>
<td>Supported</td>
</tr>
<tr>
<td>ES 2 – EO 2 - OP</td>
<td>2.3830</td>
<td>0.0158</td>
<td>0.0672</td>
<td>Not supported</td>
</tr>
<tr>
<td>ES 2 – EO 2 – SP</td>
<td>1.6957</td>
<td>0.0073</td>
<td>0.0890</td>
<td>Not supported</td>
</tr>
<tr>
<td>ES 2 – EO 2 – FP 1</td>
<td>2.2123</td>
<td>0.0134</td>
<td>0.0569</td>
<td>Not supported</td>
</tr>
</tbody>
</table>

Table 4.4: Results for mediation testing


Goodness-of-fit for the mediation model was calculated:

\[ GFI = 0.886; \quad IFI = 0.635; \quad CFI = 0.766; \quad \text{Chi-sq} = 2.26; \quad p = 0.62; \quad df = 1; \]

\[ \text{Chi-sq}/df = 2.46; \quad \text{RMSEA} = 0.077 \]

These results suggest that the survey results fit the proposed model. According to Hair Jr. et al., (2009), values of GFI, IFI, and CFI that are closer to one indicate acceptable fit. Chi-squared to degrees of freedom ratios that are smaller than 3 are an
indicator of reasonable fit (Kline, 2005). RMSEA values that are below 0.08 indicate acceptable model fit (Hair Jr. et al., 2009).

Figure 4.4 presents the structural equation model that was generated by LISREL.

Figure 4.4: Resulting structural equation model with standardized coefficients and $t$-statistics. Mediated path: →
Notes: * denotes paths significant at p<0.05
4.6 Discussion

Corporations are under increasing pressure from consumers, regulators and other stakeholders to address the impact that operations have on the natural environment. In response, many organizations have developed strategies to frame their response to environmental pressures. However, strategy development and implementation have not always been aligned (Maxwell, 1997). Some of the reasons for this has been that firms may attempt to tailor environmental strategy to existing processes, define goals inconsistently throughout the organization, fail to resolve internal conflict over resources, and fail to view environmental pressures as a competitive opportunity.

Research on the performance benefits from environmental strategy has largely focused on specific business operations or performance dimensions. For example, De Souza et al. (2016) investigated the role of green marketing in the relationship between green supply chain management and organizational performance. Fraj et al. (2011) researched the relationship between environmental marketing and operational performance, focusing on cost reductions and efficiency improvements as the indicators of performance. The current study intended to address the research gaps by examining sustainability performance from the operational, social and financial perspectives.

Strategy and Performance

Results from the data collected in this study indicate that environmental strategy supports performance. This is an expected outcome as the firms that have developed strategies are likely to realize performance benefits, particularly from cost reductions...
from energy and material consumption. Performance improvements may also come from employee retention, and market share gain, as a result of a positive public image. Canning and Hanmer-Lloyd (2007) have reported that environmentally-friendly strategies can generate a positive attitude among customers. This result is also consistent with findings that suggest that a sustainable public image can improve reputation among other stakeholders, including employees (Miles & Covin, 2000).

Strategy and orientation

The results in this study indicate a complex relationship between environmental strategy and orientation, as noted in earlier studies by Banerjee et al. (2003). Environmental strategy had two factors, one focused on products and one on planning. Environmental orientation as measured in this study consisted of two factors, one that focused on the respondents’ view of employees’ orientation (EO1), and one on their view of operational orientation (EO2). Analysis of the data indicates that the relationship between both strategy factors and EO1 were positive and significant for the data set. Literature largely supports a positive relationship between environmental strategy and orientation (Kitazawa and Sarkis (2000); Chen et al. (2015)) but there were no distinctions in the characteristics of orientation that may have contributed to the relationship. Positive association between employee orientation and strategy is indicated by Nair and Ndubisi (2015) who reported that a strong environmental commitment at the managerial level supports a culture of environmentalism within an organization. Behavioral organization theories support the expectation that management will influence the accepted norms in the firm.
The relationships between strategy factors and the operational component of orientation were also significant. It is noted in literature that the goal setting, prioritization and planning that is involved in developing an environmental orientation could be viewed as a distraction from tasks with more immediate and tangible results, such as production or accounting (Blackburn, 2007; Farver, 2013). Nonetheless, the results suggest that strategy is important to operational orientation. Literature strongly supports the fundamental benefits of having a strategy in order to create an organization that can accomplish goals holistically (Porter (1996); Lubber, (2010)).

**Orientation and Performance**

The relationship between the employee-focused factor of environmental orientation and performance factors were mostly significant, with the exception of the relationship with operational performance. While there is evidence supporting a positive relationship between orientation and performance in the literature (Chan et al. (2012), Fraj-Andres et al. (2009)), there is also conflicting research. Chan et al. (2012) have reported that environmental orientation significantly enhances corporate performance, particularly in the context of environmental performance metrics, in their study of firms operating in China. Fraj-Andres et al. (2009) also reported a positive relationship between orientation and financial performance in their study of Spanish manufacturing firms. Linder et al. (2014) reported a negative relationship between environmental orientation and economic performance in a study of small Swedish firms. The ambiguity of results may be due to differences in defining performance, and sample characteristics due to
region or organization size. These studies did not include discriminant aspects of orientation.

The relationship between operational orientation and performance factors were significant except for the relationship when performance was measured only by profitability. This may be due to employees’ perceptions that performance from a CSR viewpoint is much more than profits.

**Mediation by Orientation**

Results of this study support the view that an environmental strategy will contribute to better performance, on the operational, social and financial dimensions.

However, the competitive benefits derived from an environmental strategy will be enhanced when the organization has a strong environmental orientation, particularly with regards to its workforce. This may be due to the fact that firms that are engaging employees in its sustainability planning and strategy may benefit from a better alignment between management strategy and execution throughout the organization.

### 4.7 Conclusions

This study collected data from a professional network of respondents from 189 firms to determine the relationships between environmental strategy, orientation and performance. Study results indicate that most responses were in the categories of Somewhat Disagree (3), Neither Agree nor Disagree (4), and Somewhat Agree (5). This
suggests a vague familiarity or indifference with activities supporting environmental
issues at the firm. This presents an opportunity for better integration and communication
of environmental strategy throughout the firm.

After factor analysis, structural equation modeling of the collected data indicate
that environmental strategy is a significant predictor of corporate performance, when
performance is defined by operational, social and financial items. Analysis of the data
suggested that respondents are of the opinion that environmental orientation consisted of
two components – one that focused on personnel and one that was operation-focused.
Study results indicated that environmental strategy is a positive and significant predictor
of environmental orientation focused on personnel as well as operations. Orientation
focused on personnel was a significant predictor of performance. However, operation-
focused orientation while being a positive and significant indicator for performance, did
not have a mediating effect on the relationship between strategy and performance. Tests
for mediation indicate that personnel-focused orientation is partially mediating the
relationship between strategy and performance. The competitive benefits derived from an
environmental strategy will be enhanced when the organization has a strong
environmental orientation that is supported by the employees.

4.8 Implications

Results from the survey and the statistical analyses have implications for
management. A positive relationship between environmental strategy and performance
can have a profound effect on elevating the urgency and importance of proactive environmental strategies within an organization. This could lead to a more collaborative approach with regulatory agencies and community stakeholders. The positive relationship between strategy and both factors of orientation implies that management should continue to create a culture of environmentalism to enhance adoption of sustainable business strategies.

The role of environmental orientation as mediator to the strategy-performance relationship could influence management to support a shared vision with employees to implement initiatives that enhance environmental protection beyond the regulatory requirements. Absence of a significant relationship between orientation focused on operations and performance presents an opportunity for management to improve on how environmentalism is developed within teams in the organization. An important implication for human resources (HR) management from these results is that managers who can support environmental strategy may contribute more to performance. Nair and Ndubisi (2015) suggest that environmental orientation could be enhanced by selecting and training managers that reflect the organization’s environmental commitment. According to Delaney and Huselid (1996), HR practices can contribute to perceptual measures of organizational performance.

Policy implications from the results of this study may include stronger commitment to environmental protection strategies by corporations, easing the burden and resource drain of monitoring and enforcement that is currently borne by regulatory agencies.
4.9 Limitations and Future Research

One limitation of this study is the survey respondents represented a non-random sample. The survey was fielded to organizations that the researcher could access, whose membership may be concentrated in certain industrial sectors or regions. Additionally, survey respondents only included firms where an employee chose to participate. There may have been firms where the survey recipient did not feel comfortable responding to the survey questions. This may have introduced a level of systemic bias into the data. A study with a larger sample or a study that included surveys in multiple regions may reduce bias, improve power, and support extrapolation of findings to other regions. Access to more participants may be accomplished by making the survey available at various trade shows for a broad cross-section of industrial sectors. The results of this study could be improved with a larger and a random sample of firms.

The study could be further limited by the presence of self-reporting social normative bias, where respondents may feel the need to respond to survey questions in a socially acceptable manner. This bias could misrepresent the true answers to the questions, and mask the actual relationships that were being researched (Ganster et al., 1983. Greenwashing, or the desire to improve the perception of environmental sensitivity of a firm, on the part of the respondents could have also introduced bias to the survey data.

This research could also be improved by expansion to a longitudinal approach. The survey captured respondents’ opinions at one point in time. Respondents’ answers
could be influenced by any number of external events, including geopolitical concerns or economic conditions. Data collection over various periods may be more objective since it would smooth out biases that may occur at a particular time. This would also allow researchers to identify trends in corporate environmental strategy and orientation.

Furthermore, access to multiple respondents at the participating firms may also provide more objective insight into a firm’s environmental strategy, orientation and performance, without being limited to one participant’s responses. The single rater nature of the survey may have introduced common method bias. As part of a larger study, data collection could be expanded to a broader geographic area so that regional trends could also be observed.

Measurement models could have been improved for this study by the addition of a common latent factor. Some of the factors accounted for large amounts of the variance, however, testing for differences in regression weights with and without a common latent factor did not show differences much greater than the recommended 0.200 (Podsakoff, 2003).

While these results suggest that employee engagement is significant for the strategy and performance relationship, further support is provided by Whelan and Fink (2016) who reported that including all stakeholders, including employees, can enhance the benefits that firms derive from CSR activities. These benefits may include increased levels of innovation, improved risk management, stronger culture to support sustainability, reduced employee turnover, and improved financial performance. Whelan
and Fink (2016) examined a number of industrial sectors in their study, including mining, food and beverage, chemicals and apparel.
4.10 REFERENCES


Jooh, L., Pati, N., & Roh, J. J. (2011). Relationship between Corporate Sustainability Performance and Tangible Business Performance: Evidence from Oil and Gas...


5.1 Conclusion

The current threat posed by climate change, resource depletion, and population growth on the future of the Earth has been the focus of environmentalists, non-governmental organizations (NGOs) and scientists for several decades. In response to these concerns, consumers have been pressuring firms to address their operations and the impact on the environment and society. As Hawken (1993) noted, corporations are the Earth’s dominant institutions, and as such, have access and control of the resources and should have the responsibility to manage them conscientiously. Corporations have addressed these concerns by engaging in corporate social responsibility (CSR) programs to reduce and minimize the impact of their business on society and the environment. In the context of the analyses conducted for this dissertation, CSR encompassed the actions that corporations engage in that address economic, social and environmental impacts of their operations. However, opponents of CSR by companies often remind us that the ultimate purpose of a firm’s existence is to increase its profits, according to shareholder theory (Friedman, 1970). However, Friedman’s dictum also states that the interests of all stakeholders must be balanced in the firm’s quest to increase profits. The community in which the firm operates is thus included as stakeholders. Corporate management has been challenged to demonstrate to investors that there is a benefit to deploying resources in
support of CSR programs. Despite these challenges, most large companies have undertaken CSR initiatives and have incorporated sustainability reporting into their investment reports voluntarily. KPMG reported in 2013 that more than 75% of global firms engage in CSR reporting (KPMG, 2013).

But consumers and shareholders are not the only groups that have weighed in on CSR. The United Nations has made a recommendation that all large companies should be required to provide sustainability reports by 2030 that include actions being taken to address environmental and social impacts from business (United Nations, 2013). This recommendation has been made in response to scientists, activists, NGOs and other interested groups raising concerns about issues that impact climate change, deforestation, indigenous groups, pollution and ocean acidification (Kump, et al., 2010).

Research on the benefits of CSR, and attempts to characterize the types of firms that successfully engage in CSR has yielded inconsistent results. Empirical studies of the relationship between CSR and corporate financial performance have yielded mixed results, with some studies finding a positive relationship (Bragdon & Marlin, 1972; Moskowitz, 1972, Sturdivant & Ginter, 1977); some studies finding a negative relationship (Vance, 1975; Spicer, 1978); and some studies showing no significant relationship (Alexander & Buchholz, 1978; Lu & Taylor, 2016). Some of the reasons that have been cited for this ambiguity include variability in measurement, small and non-random samples, and study design.

The main objective of this dissertation was to determine which characteristics may identify firms that engage in CSR and reporting, and what the benefits of reporting
may be to the firm, then to determine if a firm can drive its performance benefits derived from reporting by focusing on internal environmental orientation. Three studies were designed to address this objective, employing various methodologies. In “Business Strategy for Sustainable Development: Leadership and Accountability for the 90s,” (Deloitte & Touche, et al., 1992) the authors outline the seven phases that a firm should complete when creating a sustainable business. These steps are presented in Figure 5.1.

This research started out focusing on the activities in the sixth phase, which focus on reporting. However, the firm’s decision to engage in CSR and to set the groundwork to reap the benefits of CSR must start in earlier phases. The research progressed into an examination of the third and fourth steps in the process, where a firm may be developing environmental strategy, and orientation, in order to develop a culture that could support its CSR initiatives. This follows Farver’s (2013) recommendation that as a firm is thinking about being responsible, it needs to not only look outward at its impacts on the environment and society, but also look internally and try to improve the factors within its control.
The first study focused on identifying the antecedents and consequences of CSR reporting, using firms that adopted the Global Reporting Initiative (GRI) (www.globalreporting.org) as a reporting framework. The GRI was chosen because firms can adopt the framework at various levels, allowing for some distinction in the extent to which firms were reporting on CSR. This study employed analysis of variance and nominal logistic regression to determine if there were significant relationships between firm characteristics and reporting, and between management strategy and reporting. Results from this study indicated that some measures of company size and resource, such as number of employees, R&D expenses and fixed assets, are important predictors of voluntary CSR reporting for corporations. Net sales, reputational risk and sustainability
ranking were shown to be significant outcomes of voluntary reporting. However, the results suggest that the outcomes from reporting that a firm experienced was different for various levels of reporting. The effect of GRI reporting level on performance on intangible reputation was larger for firms that adopted the GRI framework at higher levels.

The second study examined the relationship between GRI reporting level and financial performance for firms with high and low environmental risk profiles. Multivariate analysis of variance was used to assess the relationships between reporting and financial performance for the firms in each risk category. Results suggest that sectors with high environmental risk are adopting the GRI framework at higher levels, and electing to have their CSR reports verified. Firms from sectors with lower environmental risk are adopting the GRI framework at a minimal level and skipping report verification. CSR reporting is likely to become even more essential for firms as more investors are using ESG information to screen potential investments. Amel-Zadeh and Serafeim (2017) surveyed senior investment professionals and report that ESG information is being used to assess risk about a company. What makes this finding even more compelling is that the survey was fielded to mainstream investment professionals, not just those that were accessing information for SRI investments. This study also noted that the lack of comparability of reporting standards was an impediment to the use of ESG information for investment screening. This lends further support for the use of standardized framework by firms for CSR reporting.
The third study examined the relationship between environmental strategy and performance, in the presence of environmental orientation to determine if orientation mediated the relationship. Data for the study was collected from employees in a variety of industrial sectors via a survey fielded through professional networks. Structural equation modeling and test for mediation were applied to the data. After factor analysis, structural equation modeling of the collected data indicated that environmental strategy was a significant predictor of corporate performance, when performance is defined by operational, social and financial items. The data suggested that respondents’ perceptions of environmental orientation consisted of two components – one that focused on personnel and one that was operations-focused. Study results indicated that environmental strategy was a positive and significant predictor of environmental orientation focused on personnel as well as operations. Orientation focused on personnel was a significant predictor of performance.

Tests for mediation indicate that personnel-focused orientation is partially mediating the relationship between strategy and performance. The competitive benefits derived from an environmental strategy will be enhanced when the organization has a strong environmental orientation that engages the workforce.

5.2 Environmental Management Implications

While CSR reporting has been widely adopted by many firms, and we have seen an accelerated diffusion of the use of reporting tools in corporate practice (Alonso-Almeida et al., 2014), CSR is still viewed as extraneous to the firm by some stakeholders,
with the less informed viewing it as a means to satisfy regulatory minimums (Farver, 2013). Furthermore, results of previous studies on the relationship between CSR and performance benefits have provided inconsistent results. Some of the reasons that have been named for the inconsistencies include the adoption of various metrics, small samples, and variability by region or industry. Among the challenges facing environmentalists and corporate environmental managers is gaining support for the use of resources for environmental improvements and CSR activities outside of those required by compliance regulations. According to Blackburn (2007), the Holy Grail of environmental activism is the ability to demonstrate a strong business case in support of CSR issues.

Results in this study that show a strong relationship between CSR reporting level and financial performance measures can support the commitment of resources to CSR efforts within an organization and this can have some important implications for the role of environmental managers. For example, results that indicate a significant influence of reporting on an important outcome such as net sales could highlight the importance of proactive CSR strategies within an organization in a very tangible manner. These results highlight the contribution of an environmental strategy that is shared by internal stakeholders to firm performance. The role of the environmental manager within the firm is critical to the successful integration of strategy into the corporate orientation. This can be accomplished through activities that build awareness, trust, and open communication. Communication is an important element because the survey results indicated that most respondents may not have been highly aware of the firm’s performance on environmental
issues. Most responses for the survey were in the 3 – 5 range, representing the response categories of Somewhat Disagree (3), Neither Agree nor Disagree (4), and Somewhat Agree (5). This suggests a vague familiarity or indifference with activities supporting environmental issues at the firm. Yet, according to KPMG (2013), more than 75% of global firms are engaging in CSR activities and reporting. The corporate environmental manager’s role could be expanded to interact with other functions such as human resources or communication to ensure that employees are familiar with the environmental strategy. The environmental manager could be called upon to provide awareness training to increase employees’ familiarity with the importance of environmental protection to the corporate strategy and performance.

As it is today, the corporate environmental manager is more often focused on regulatory compliance and certifications, impact assessment, waste management, remediation of contaminated areas, damage control and monitoring emission or pollution sources. The functional role of this position could be revised and expanded to include strategic planning. Greenwood et al. (2012) report that while responses from a survey of environmental managers indicate that they would like to contribute in a broader way to their organizations’ environmental efforts, professionals in other functions indicated that they saw environmental managers as being more focused on issues such as pollution prevention and waste management. Firms may be missing out on professional input on important sustainability and environmental issues that could improve various operations.

One definition of corporate environmental management is ‘efforts to minimize the negative environmental impact of the firm’s products throughout their life cycle’
(Klassen & McLaughlin, 1996). However, these studies indicate that an expanded role for the environmental manager could benefit the organization. Barrow (2006) describes three approaches that environmental managers could use to engage with individuals and organizations to encourage responsible behavior. These are (1) advisory approaches, through education, media or advice; (2) economic or fiscal approaches, including taxation, grants, loans, subsidies or quotas; and (3) regulatory approaches through standards, laws, licensing, zoning, restrictions and monitoring. The second and third approaches fall mainly in the domain of policymakers and legislators. The corporate environmental manager would be more effective taking the first approach.

The mediating role of orientation in the relationship between environmental strategy and performance suggests that firms could enhance the implementation and execution of strategy by improving the internal focus towards environmentalism. The environmental manager could contribute to these efforts by participating in internal communication campaigns that delineate goals and strategy. Lack of significance in the relationship between employee-focused orientation and performance may be an indication that respondents are not perceiving a clear benefit between team contributions on environmental issues. Haugh & Talwar (2010) have studied how organizations embed sustainability and raise CSR awareness. They recommend that information should be shared throughout the organization and not restricted to functional groups that are tasked with implementing specific aspects of a strategy, for example, allocating the responsibility for lowering emissions entirely to the production function. This is because when information is not disseminated companywide, the associated actions are limited to
operational issues, and there is less likelihood that the collective focus of the firm will change. The role of the environmental manager could also be expanded to include responsibility for training. As a firm progresses towards becoming more engaged in CSR, employees may need to acquire knowledge or change their approach in areas such as supply chain management, manufacturing and marketing. Effective training can accelerate the learning curve and encourage employees to embrace an environmentally-sensitive orientation.

All industries can work towards reducing their environmental impact. While firms in low risk sectors, such as financial services, have not been traditionally viewed as environmentally damaging compared to firms in sectors such as mining, the low risk sector is also consuming energy and other resources, generating waste, and impacting their host communities. These firms can commit resources to improve on CSR, with goals such as increasing the use of renewable energy, recycling, community investment, and other voluntary programs with a positive social impact.

Integrating environmentalism throughout the firm could support other broader goals and enhance performance. Positive association between employee orientation and strategy is indicated by Nair and Ndubisi (2015) who reported that a strong environmental commitment at the managerial level supports a culture of environmentalism within an organization. A stronger link between orientation and performance would be beneficial to many stakeholders, including employees, management, investors and the community.
As firms develop sustainability goals, management should consider input from multifunctional teams, to ensure that the approach is holistic and effectively capture a broad scope of concerns. This would be in keeping with the United Nations Sustainable Development Goals, which were adopted in 2015. The objective of these goals is to end poverty, protect the planet, and ensure prosperity for all (United Nations, 2015) by addressing a wide range of environmental, economic and social issues.

5.3 Limitations and Future Research

There are limitations associated with the research on this dissertation. The first and second studies were based on the GRI reporting level as a proxy for reporting quality. Since reports are not always externally verified, the quality of the report could not be ascertained. The GRI reporting level reflects the extent to which the firm indicated that the framework would be adopted. The data that was used for these studies also included only corporate entities. If the studies were expanded to include the other organizations that have adopted the GRI framework, the results may be different. Future work could be expanded to other organizations to provide a more complete picture of how the reporting level may be related to drivers and outcomes.

These studies included firms that used the GRI framework only. Inclusion of firms that provide CSR reports based on other frameworks, such as those provided by the Economic Co-operation and Development (OECD), United Nations Global Compact (UNGC), or Carbon Disclosure Project (CDP) may yield different results.
There are also limitations associated with the results of the second study which examined the relationships between GRI reporting level and financial performance measures for firms with high and low environmental risk for 2012 to 2015. A limitation with this study is that it focused on six industrial sectors, with the intent of demonstrating the relationships between reporting and financial performance for businesses with vastly different environmental risk profiles. Even though results showed differences for these sectors, they should not be extrapolated to other industries. Future work may provide more robust results if the study was expanded to include multiple sectors with different environmental risks.

The third study, which examined the role of environmental orientation on the relationship between environmental strategy and performance for corporations, also presented a few limitations. This study used results of a survey of respondents at corporations. The survey was fielded to participants that the researcher had access to through a professional network. Non-probability samples, such as this, while being accessible, are known to be unlikely to represent an intended population well (Coughlan et al., 2009). Generalization of study results are further limited by the fact that there was one respondent from each organization, and the responses only captured a point in time. Results may be improved by expanding sampling to include multiple respondents at each firm, and also by designing a longitudinal study. The data collection method in the third study could be improved for future research to include open-ended questions or even interviews. Both of these approaches may afford respondents the opportunity to provide more valuable information and thus provide a better measurement for strategy and
orientation. According to Fowler (1995), asking open-ended questions can be one of the best ways to gather information from survey respondents.

Overall, the results from this project could be improved by increasing sample sizes, examining data from different periods, and including more types of organizations. However, some of the hypotheses were supported by study results and these may serve as a starting point for future research. The relationships examined all deserve further investigation to develop a better picture of how CSR engagement can impact firm performance. As Amel-Zadeh and Serafeim (2017) reported from their survey of investment professionals, ESG reports are being used to screen companies for potential investments, and lack of comparability due to non-standardized reporting is an impediment to expanded use of ESG screening. It is expected that firms will respond by adopting standards so that shareholders can easily access information about progress towards ESG goals.

Future research examining the benefits of reporting are warranted by recent trends on the way that firms are using nonfinancial information. Eccles et al. (2011) reported that CSR reports are being used by stakeholders as a proxy for the quality of company management, as well as an indication of the level of transparency of the firm. Furthermore, this study also considered the quality of the CSR report, and not just the availability of the report. As more stakeholders evaluate CSR reports, whether its potential employees, investors, or regulators, the quality of the report will become more critical for firms to reap benefits from their CSR disclosures. Adopting standardized frameworks, such as GRI (www.reporting.org), as well as sector specific reporting
indicators, would enable stakeholders to compare companies and garner more useful information from the reports.

While investment in CSR activities have been viewed skeptically in the past, the tide may be changing as management has received stakeholder pressure to become more accountable and transparent. Management has slowly accepted that while the benefits derived from CSR may not be immediate or short-term, there are significant long-term advantages. Barton et al. (2017) reported that firms enjoy superior results when management takes the long view, versus reacting to pressures to deliver quarterly results. Barton et al. (2017) measured financial fundamentals as well as performance over a fourteen year period for 615 companies.

Recent studies strongly suggest that the long-term benefits from CSR activities outweigh the relatively short-term costs. As stated in the Brundtland Report (1987), ‘Sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs’. This statement serves as one of the most widely accepted views of sustainability and it includes the concept of a longer term view in terms of responsibility. Firms need to consider an expanded timeframe as they develop CSR initiatives and consider how CSR can contribute to performance.
5.4 References


doi:10.1002/csr.1318


As sustainability has become more embedded in the social consciousness of consumers, many corporations have responded by engaging in corporate social responsibility (CSR) initiatives. However, management continues to be challenged to demonstrate that these activities are beneficial to all stakeholders and fulfills the fiduciary duty to investors. Firms have communicated their CSR activities by public disclosure in the form of integrated reports, or sustainability reports.

This research project strived to determine the nature of the relationships between CSR activities and reporting and performance benefits for firms that use the Global Reporting Initiative (GRI) framework for sustainability reporting, and to determine if environmental orientation within an organization can drive the relationship between strategy and the performance benefits from CSR initiatives.

Three studies were completed to address the research objective. The first study examined the organizational and management characteristics that influence a firm’s decision to report on CSR using the GRI framework, and the relationship between reporting and financial performance and reputation. Results from this study indicated that some measures of company size and resource, such as number of employees, R&D expenses and fixed assets value, are important predictors of voluntary disclosure for all types of firms. Results also suggest that there are tangible, as well as intangible benefits from reporting, with net sales, reputational risk and sustainability ranking as significant outcomes of voluntary reporting.
In order to assess the role of industrial sector on the extent to which firms engage in CSR reporting using the GRI framework, and to determine if sector membership had an effect on the financial benefits of reporting, the second study examined six sectors, three sectors with high environmental risk, and three sectors with low environmental risk. Results from this study suggest that firms in high risk sectors are more engaged in CSR reporting. These firms also appear to have a stronger relationship between CSR activities and reporting and some measures of financial performance, including alpha, beta, Sharpe Ratio and R-squared.

A third study was designed to determine how internal stakeholder engagement could impact the relationship between environmental strategy and firm performance. This study was intended to provide an insight into the internal environmentalism or orientation within a firm. CSR reports and other sustainability reporting are widely used by external stakeholders but management needs to have commitment from employees for CSR policy to be implemented successfully. Data for this study was collected via a survey of 189 firms. Results of the study suggest that environmental orientation can be characterized by two dimensions, one that is focused on personnel and one focused on operations. Environmental strategy and performance were positively related for the sample, however, the relationship was stronger when orientation focused on personnel was a mediator. The competitive benefits derived from an environmental strategy will be enhanced when the organization has a strong environmental orientation that is supported by the employees.

As the world becomes more industrialized and further pressure is placed on corporations to be responsible due to environmental and social threats, such as climate
change and population growth, proactive management will need to engage in CSR. Results that demonstrate tangible and intangible benefits of CSR engagement will support the business case for responsible initiatives so that management can allocate adequate resources to CSR activities.
APPENDIX 1: Institutional Review Board approval letter

Jun 29, 2016 4:56 PM EDT

Dr. Yawei Wang and Ms. Rosita Nunez
Montclair State University
Department of Marketing
1 Normal Ave.
Montclair, NJ 07043

Re: IRB Number: IRB-FY15-16-266
Project Title: SS Antecedents and consequences of corporate social responsibility reporting by corporations: The role of management strategy and organizational characteristics

Dear Dr. Yawei Wang and Ms. Rosita Nunez:

After an expedited review:

- Category 7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Montclair State University's Institutional Review Board (IRB) approved this protocol on Jun 29, 2016. The study is valid for one year and will expire on Jun 28, 2017.

Should you wish to make changes to the IRB-approved procedures, prior to the expiration of your approval, submit your requests via a Study Modification in Cayuse IRB.

For Renewal, it is advised that you complete your renewal submission 30 - 60 days before the expiration date. If you have not received IRB approval by the study expiration date, ALL research activities must STOP, including data analysis. If your research continues without IRB approval, you will be in violation of Federal and other regulations.

Please note, as the principal investigator, you are required to maintain a file of approved human subjects research documents, for each IRB application, to comply with federal and institutional policies on record retention.

After your study is completed, submit your Project Closure submission.

If you have any questions regarding the IRB requirements, please contact me at 973-655-5189, cayuseIRB@mail.montclair.edu, or the Institutional Review Board.

Sincerely yours,

Dr. Katrina Bulkley
IRB Chair
cc: Ms. Deborah Reynoso, Graduate School, Academic Services Coordinator
APPENDIX 2: Survey

Dear ________

You are invited to participate in a study of corporate environmentalism and performance outcomes.

I hope to learn how corporate strategy and orientation towards the environment is related to perceptions on financial, social and environmental performance. You were selected to participate in this study because you are part of a group with an awareness of sustainability and environmental concerns.

If you decide to participate, please complete the following set of questions. The survey is designed to capture personal perceptions and not company views on environmentalism. It will take about 30 minutes to complete the survey. You will be asked to answer questions about environmental strategy and orientation; and financial, social and environmental performance. You may not directly benefit from this research. However, we hope this research will result in more firms implementing environmental strategies.

Any discomfort or inconvenience to you may include the loss of your time that will be required to complete the survey. Data will be collected using the Internet. There are no guarantees on the security of data sent on the Internet. Confidentiality will be kept to the degree permitted by the technology used.

If you decide to participate, you are free to stop at any time. You may skip questions you do not want to answer.

Please feel free to ask questions regarding this study. You may contact me at nunezr4@montclair.edu (973-220-7488) or my Faculty Advisor, Dr. Yawei Wang at wangya@mail.montclair.edu (973-655-4254) if you have additional questions.

Any questions about your rights may be directed to Dr. Katrina Bulkley, Chair of the Institutional Review Board at Montclair State University at reviewboard@mail.montclair.edu or 973-655-5189.
Thank you for your time.

Sincerely,

Rosita Nunez – Doctoral candidate
College of Science and Mathematics
Environmental Management Program

By clicking the link below, I confirm that I have read this form and will participate in the project described. Its general purposes, the particulars of involvement, and possible risks and inconveniences have been explained to my satisfaction. I understand that I can discontinue participation at any time. My consent also indicates that I am 18 years of age.

[Please feel free to print a copy of this consent.]

☐ I agree to participate (link to survey) ☐ I decline (link to close webpage)

The study has been approved by the Montclair State University Institutional Review Board.
RESEARCH ON ENVIRONMENTAL STRATEGY, ORIENTATION AND CORPORATE PERFORMANCE

The survey is aimed at capturing personal perceptions and not company views on environmentalism. It should take less than 30 minutes to complete the survey.

All data will be aggregated for analysis. No identifiers will be reported and individual information will not be disclosed in the finished report.
Items measuring environmental strategy

Please indicate your response on a scale of 1 (entirely disagree) to 7 (entirely agree) for the following at your firm.

1) Our firm has integrated environmental issues into our strategic planning process.

☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

2) In our firm, “quality” includes reducing our environmental impact.

☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

3) At our firm, we link environmental objectives with our other corporate goals.

☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

4) Our firm is engaged in developing products and processes that minimize environmental impact.

☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

5) Environmental issues are always considered when we develop new products.

☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

6) We emphasize the environmental aspects of our products and services in our ads.

☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

7) Our marketing strategies for our products and services have been influenced by environmental concerns.

☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

8) In our firm, product-market decisions are always influenced by environmental concerns.

☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

9) Environmental issues have been integrated into all functional areas of our business.

☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree
10) Our firm must be accountable for the way its actions affect the natural environment.
☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

11) Environmental issues are always considered when we discuss our strategic plans.
☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

12) All employees in our firm are responsible for developing environmental initiatives.
☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

13) Our firm has established environmental standards as a performance criterion for all our products and services.
☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

14) All functional managers in our firm have clear instructions for implementing company environmental goals.
☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

15) Our firm’s environmental efforts mainly revolve around compliance with current environmental regulation.
☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

16) Environmental protection is the driving force behind our firm’s strategies.
☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

17) In our firm, technology decisions are always influenced by environmental concerns.
☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

18) Our firm is engaged in exploring markets for environmental goods and services.
☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree
Items measuring environmental orientation

Please indicate your response on a scale of 1 (entirely disagree) to 7 (entirely agree) for the following at your firm.

1) At our firm, we make a concerted effort to make every employee understand the importance of environmental preservation.
   □ Entirely Disagree  □ Mostly Disagree  □ Somewhat Disagree  □ Neither Agree nor Disagree  □ Somewhat Agree  □ Mostly Agree  □ Entirely Agree

2) Our firm has a clear policy statement urging environmental awareness in every area.
   □ Entirely Disagree  □ Mostly Disagree  □ Somewhat Disagree  □ Neither Agree nor Disagree  □ Somewhat Agree  □ Mostly Agree  □ Entirely Agree

3) Environmental preservation is a high-priority activity in our firm.
   □ Entirely Disagree  □ Mostly Disagree  □ Somewhat Disagree  □ Neither Agree nor Disagree  □ Somewhat Agree  □ Mostly Agree  □ Entirely Agree

4) The financial well-being of our firm does not depend on the state of the natural environment.
   □ Entirely Disagree  □ Mostly Disagree  □ Somewhat Disagree  □ Neither Agree nor Disagree  □ Somewhat Agree  □ Mostly Agree  □ Entirely Agree

5) Our firm has a responsibility to preserve the environment.
   □ Entirely Disagree  □ Mostly Disagree  □ Somewhat Disagree  □ Neither Agree nor Disagree  □ Somewhat Agree  □ Mostly Agree  □ Entirely Agree

6) Environmental preservation is vital to our firm’s survival.
   □ Entirely Disagree  □ Mostly Disagree  □ Somewhat Disagree  □ Neither Agree nor Disagree  □ Somewhat Agree  □ Mostly Agree  □ Entirely Agree

7) The natural environment does not currently affect our firm’s business activity.
   □ Entirely Disagree  □ Mostly Disagree  □ Somewhat Disagree  □ Neither Agree nor Disagree  □ Somewhat Agree  □ Mostly Agree  □ Entirely Agree

8) It is difficult for our firm to be successful and preserve the environment at the same time.
   □ Entirely Disagree  □ Mostly Disagree  □ Somewhat Disagree  □ Neither Agree nor Disagree  □ Somewhat Agree  □ Mostly Agree  □ Entirely Agree

9) It is our firm’s mission to be a leader in environmental protection in our industry.
   □ Entirely Disagree  □ Mostly Disagree  □ Somewhat Disagree  □ Neither Agree nor Disagree  □ Somewhat Agree  □ Mostly Agree  □ Entirely Agree

10) Our firm provides training for employees on environmental issues.
    □ Entirely Disagree  □ Mostly Disagree  □ Somewhat Disagree  □ Neither Agree nor Disagree  □ Somewhat Agree  □ Mostly Agree  □ Entirely Agree
11) Our firm has an environmental management team.

☐ Entirely Disagree  ☐ Mostly Disagree  ☐ Somewhat Disagree  ☐ Neither Agree nor Disagree  ☐ Somewhat Agree  ☐ Mostly Agree  ☐ Entirely Agree

12) Our firm sets targets or objectives to be achieved on energy efficiency.

☐ Entirely Disagree  ☐ Mostly Disagree  ☐ Somewhat Disagree  ☐ Neither Agree nor Disagree  ☐ Somewhat Agree  ☐ Mostly Agree  ☐ Entirely Agree

13) Our firm sets targets or objectives to be achieved on water efficiency.

☐ Entirely Disagree  ☐ Mostly Disagree  ☐ Somewhat Disagree  ☐ Neither Agree nor Disagree  ☐ Somewhat Agree  ☐ Mostly Agree  ☐ Entirely Agree

14) Our firm uses environmental criteria to source or eliminate materials and practices.

☐ Entirely Disagree  ☐ Mostly Disagree  ☐ Somewhat Disagree  ☐ Neither Agree nor Disagree  ☐ Somewhat Agree  ☐ Mostly Agree  ☐ Entirely Agree

15) Our firm uses environmental criteria in the selection process of its suppliers or sourcing partners.

☐ Entirely Disagree  ☐ Mostly Disagree  ☐ Somewhat Disagree  ☐ Neither Agree nor Disagree  ☐ Somewhat Agree  ☐ Mostly Agree  ☐ Entirely Agree
Items measuring corporate performance

**Environmental operational performance**

1) Our firm’s direct and indirect energy consumption is changing as follows:
   - Increasing
   - Unchanged
   - Decreasing
   - Don’t know

2) Our firm’s total water consumption is changing as follows:
   - Increasing
   - Unchanged
   - Decreasing
   - Don’t know

3) Our firm’s total carbon emissions are changing as follows:
   - Increasing
   - Unchanged
   - Decreasing
   - Don’t know

4) Our firm’s total waste generation is changing as follows:
   - Increasing
   - Unchanged
   - Decreasing
   - Don’t know

5) Our firm’s hazardous waste produced is changing as follows:
   - Increasing
   - Unchanged
   - Decreasing
   - Don’t know

**Social performance**

6) Our firm supports good causes that benefit society.

   - Entirely Disagree
   - Mostly Disagree
   - Somewhat Disagree
   - Neither Agree nor Disagree
   - Somewhat Agree
   - Mostly Agree
   - Entirely Agree

7) Our firm is an environmentally responsible company.

   - Entirely Disagree
   - Mostly Disagree
   - Somewhat Disagree
   - Neither Agree nor Disagree
   - Somewhat Agree
   - Mostly Agree
   - Entirely Agree

8) Our firm maintains high standards in the way it treats people.

   - Entirely Disagree
   - Mostly Disagree
   - Somewhat Disagree
   - Neither Agree nor Disagree
   - Somewhat Agree
   - Mostly Agree
   - Entirely Agree
Financial performance

9) Our firm has a strong record of profitability.
   ☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

10) Our firm looks like a low risk investment.
    ☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

11) Our firm tends to outperform its competitors.
    ☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

12) Our firm looks like a company with strong prospects for future growth.
    ☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

13) Our firm believes that having good environmental policies and performance can add to the bottom line profitability of the company.
    ☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

14) Our firm believes that having good environmental policies and performance can reduce financial risks to the company.
    ☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree

15) Our firm believes that having good environmental policies and performance can positively protect the reputation of our company among customers, investors and local communities.
    ☐ Entirely Disagree ☐ Mostly Disagree ☐ Somewhat Disagree ☐ Neither Agree nor Disagree ☐ Somewhat Agree ☐ Mostly Agree ☐ Entirely Agree
**Company Information:** Please circle the industry sector below that best describes your firm’s primary business:

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<th>Sector</th>
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<td>☐ Household/Personal Products</td>
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<td>☐ Healthcare products</td>
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<td>☐ Metals Products</td>
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<td>☐ Retailers</td>
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<td>☐ Tourism/Leisure</td>
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### APPENDIX 3

**Survey Items with Loadings**

**Environmental Strategy (ES)**

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<td>ES1</td>
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<td>ES7</td>
<td>4.01</td>
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<td>ES8</td>
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<td>ES9</td>
<td>3.72</td>
<td>1.32</td>
<td>0.8415</td>
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<td>ES11</td>
<td>3.86</td>
<td>1.34</td>
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## Environmental Strategy (ES) - continued

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<td>ES12</td>
<td>All employees in our firm are responsible for developing environmental initiatives.</td>
<td>3.55</td>
<td>1.37</td>
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<td>ES13</td>
<td>Our firm has established environmental standards as a performance criterion for all our products and services.</td>
<td>3.84</td>
<td>1.38</td>
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<tr>
<td>ES14</td>
<td>All functional managers in our firm have clear instructions for implementing company environmental goals.</td>
<td>3.70</td>
<td>1.38</td>
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<tr>
<td>ES16</td>
<td>Environmental protection is the driving force behind our firm’s strategies.</td>
<td>3.45</td>
<td>1.37</td>
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<tr>
<td>ES17</td>
<td>In our firm, technology decisions are always influenced by environmental concerns.</td>
<td>3.76</td>
<td>1.25</td>
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<tr>
<td>ES18</td>
<td>Our firm is engaged in exploring markets for environmental goods and services.</td>
<td>3.76</td>
<td>1.36</td>
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## Environmental Orientation (EO)

<table>
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<tr>
<td>EO1</td>
<td>At our firm, we make a concerted effort to make every employee understand the importance of environmental preservation.</td>
<td>4.09</td>
<td>1.36</td>
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<tr>
<td>EO2</td>
<td>Our firm has a clear policy statement urging environmental awareness in every area.</td>
<td>3.79</td>
<td>1.43</td>
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<tr>
<td>EO3</td>
<td>Environmental preservation is a high-priority activity in our firm.</td>
<td>3.94</td>
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<tr>
<td>EO4</td>
<td>The financial well-being of our firm does not depend on the state of the natural environment. (Reversed item)</td>
<td>3.99</td>
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<tr>
<td>EO7</td>
<td>The natural environment does not currently affect our firm’s business activity. (Reversed item)</td>
<td>4.00</td>
<td>1.31</td>
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<tr>
<td>EO9</td>
<td>It is our firm’s mission to be a leader in environmental protection in our industry.</td>
<td>3.89</td>
<td>1.45</td>
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<tr>
<td>EO10</td>
<td>Our firm provides training for employees on environmental issues.</td>
<td>3.81</td>
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<td>EO11</td>
<td>Our firm has an environmental management team.</td>
<td>3.70</td>
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<tr>
<td>EO12</td>
<td>Our firm sets targets or objectives to be achieved on energy efficiency.</td>
<td>4.03</td>
<td>1.32</td>
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<tr>
<td>EO13</td>
<td>Our firm sets targets or objectives to be achieved on water efficiency.</td>
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<td>EO14</td>
<td>Our firm uses environmental criteria to source or eliminate materials and practices.</td>
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<td>EO15</td>
<td>Our firm uses environmental criteria in the selection process of its suppliers or sourcing partners.</td>
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### Environmental Operational Performance (OP)

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<td>OP1: Our firm’s direct and indirect energy consumption is increasing.</td>
<td>4.87</td>
<td>1.48</td>
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<td>OP2: Our firm’s total water consumption is increasing.</td>
<td>4.99</td>
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<td>OP3: Our firm’s total carbon emissions are increasing.</td>
<td>5.11</td>
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### Social Performance (SP)

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<td>SP1: Our firm supports good causes that benefit society.</td>
<td>5.20</td>
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<td>SP3: Our firm maintains high standards in the way it treats people.</td>
<td>5.12</td>
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### Financial Performance (FP)

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<td>FP1: Our firm has a strong record of profitability.</td>
<td>4.63</td>
<td>1.03</td>
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<td>FP2: Our firm looks like a low risk investment.</td>
<td>4.46</td>
<td>0.92</td>
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<td>FP3: Our firm tends to outperform its competitors.</td>
<td>4.68</td>
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### Financial Performance (FP) - continued

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<tr>
<td>FP4</td>
<td>Our firm looks like a company with strong prospects for future growth.</td>
<td>4.77</td>
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<td>FP5</td>
<td>Our firm believes that having good environmental policies and performance can add to the bottom line profitability of the company.</td>
<td>4.14</td>
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<td>FP6</td>
<td>Our firm believes that having good environmental policies and performance can reduce financial risks to the company.</td>
<td>4.31</td>
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<td>1.006</td>
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<td>FP7</td>
<td>Our firm believes that having good environmental policies and performance can positively protect the reputation of our company among customers, investors and local communities.</td>
<td>4.46</td>
<td>1.12</td>
<td>0.8754</td>
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</tbody>
</table>
**APPENDIX 4**

Measurement model for Environmental Strategy (ES) with significant factor loadings and error covariances

\[ GFI = 0.885; \chi^2 = 191.55; p = 0.00 \]

**ES F1**: Product focused

**ES F2**: Planning focused
**APPENDIX 5**

Measurement model for Environmental Orientation (EO) with significant factor loadings and error covariances

GFI = 0.944; $\chi^2 = 49.88$; p = 0.049

**EO F1**: Personnel focused

**EO F2**: Operations focused
APPENDIX 6
Measurement model for Performance (Perf) with significant factor loadings and error covariances

GFI = 0.971; $\chi^2 = 25.64$; $p = 0.62$

**OP**: Operational performance

**SP**: Social performance

**FP F1**: Financial performance - Policy focused

**FP F2**: Financial performance - Profitability focused
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