The Influence of Regulatory Oversight on Environmental, Social, and Governance Ratings

DISSERTATION

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Abstract

Ratings made by third parties of a firm's performance in the specific areas of environmental stewardship, social responsibility, and overall governance, or ESG have become important criteria that investors consider in determining a firm's value. Based on stakeholder theory, the purpose of this empirical investigation is to examine the relationship between regulatory oversight and third-party ESG ratings. The methodology chosen for this research was quantitative, observational, and retrospective. Financial statistics were collected on 471 firms from four industry sectors, two heavily regulated sectors and two less regulated sectors. ESG metrics from two ESG rating services, MSCI and Sustainalytics, were collected from Fidelity.com and Yahoo Finance, respectively. The quantitative evaluation included multiple regression analysis followed by multiway frequency analysis to determine if a quantifiable relationship exists between regulatory oversight and ESG ratings. This study may provide information to help stakeholders recognize the influence of regulation on ESG ratings. The result of this study may also be beneficial in explaining to investors and company leaders why ESG ratings vary among different industry sectors. This quantitative study is limited to four specific sectors but may provide insights applicable to other sectors based on regulatory intensity.

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Curriculum Vitae

Education

2000 Darden Partnership Program, Executive Education, University of Virginia, The Darden Graduate School of Business Administration, Charlottesville, Virginia

1995 American Electric Power Management Development Program, Executive Education, College of Business, Ohio State University, Columbus, Ohio

1984 Master of Business Administration, Quantitative Analysis, St. John's University, Jamaica, New York

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1975 High School, Archbishop Molloy High School, Briarwood, New York

Professional Experience

1979-1984 Design Engineer, American Electric Power Service Corporation, New York

1985-1993 Project Controls Engineer, American Electric Power Service Corporation, Ohio

1994-2003 Manager – Generation Planning and Budgeting, American Electric Power Service Corporation, Ohio

2004-2007 Director – Corporate Budgeting, American Electric Power Service Corporation, Ohio

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Academic Experience

1987-1992 Adjunct Instructor, Construction Management Technology Department, Columbus State Community College, Columbus, Ohio

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Chapter 1 – Introduction

Identifying correlations between corporate social responsibility (CSR), corporate financial performance (CP), stakeholder engagement, and sustainability has been the subject of considerable discussion. For example, Michelon, Boesso, and Kumar (2013) found that companies that include CSR initiatives based on strategic priorities in their plans have better financial results than companies that do not link CSR initiatives to strategy. Likewise, Hariyati and Tjahjadi (2015) showed how a sustainable innovation strategy improved financial and environmental performance. Corporate performance measures now include non-financial metrics and even sustainability measures (Mackey, Mackey, & Barney, 2007). Common metrics used in CSR reporting are ratings made by third parties of a firm's performance in the specific areas of environmental stewardship, social programs, and overall governance, or ESG (Yoon, Lee, & Byun, 2018). ESG has also been described as "the 'three pillars' of sustainability: Economic, Environmental, and Social" (Panayiotou, Aravossis, & Moschou, 2009, p. 132). Socially responsible investor demands for information related to CSR performance have led to the emergence of ESG rating agencies (Escrig-Olmedo, Fernández-Izquierdo, Ferrero-Ferrero, Rivera-Lirio, & Muñoz-Torres, 2019). However, recent events call into question whether ESG ratings truly reflect a firm's commitment to performing well in the areas measured. In one example, Cherry and Sneirson (2011) point to the 2010 British Petroleum-leased Deepwater Horizon explosion and subsequent oil leak in the Gulf of Mexico as a case study in greenwashing that demonstrates the need to substantiate corporate claims of social responsibility. Greenwashing, or the appearance of the adoption of CSR measures to avoid negative sentiment or government regulations, adds a dose of cynicism and bolsters those who are critical of including CSR as a firm performance measure (Bento, Mertins, & White, 2017, p. 771).

The current study will examine the relationship between ESG ratings and regulatory oversight. Firms in heavily regulated sectors are under pressure to increase their ratings. Becher and Frye (2011) contend that the "presence of regulators may pressure firms to adopt effective corporate governance structures that promote safety and soundness" (p. 750). Rather than focus solely on the relation between ESG rankings and financial metrics, this study will seek to determine if there is a significant statistical difference in ESG ratings between firms in highly regulated sectors and less regulated sectors.

While the terms CSR and sustainability refer to actions of a company to address social, ethical, and environmental issues, third-party ESG ratings represent how the company is measured on those actions in addition to its governance policies and practices. This study will focus on the relationship between ESG ratings for two heavily regulated sectors of the economy, the utility sector and the financial sector, and two less regulated sectors, the consumer discretionary and information technology sectors. This study will also recognize the potential influence of institutional investors by treating the percent of institutional investor stock ownership as a mediating variable. Harjoto, Jo, and Kim (2017) found that institutional investors prefer firms that appear strong on CSR activities. They also state that many institutional investors are signatories to the United Nations' "Principles for Responsible Investment" (UNPRI). The study will also include firm size (market capitalization) and return on assets (over three years) as additional mediating variables as these financial measures have been identified as factors that affect corporate social performance.

This study will include all mid-size and larger companies in these four industry sectors that have an ESG rating from Morgan Stanley Capital International (MSCI) and/or Sustainalytics. MSCI is an ESG rating agency that studies the environmental, social and

governance-related business practices and is considered a prominent supplier of consulting services that rates over 5,000 firms around the world, providing over 200 ESG indicators (Escrig-Olmedo et al., 2019; Ojala, 2019). Sustainalytics, formed in 2008 with the consolidation of DSR (Netherlands), Scoris (Germany) and AIS (Spain), also rates companies on environmental, social and governance issues using industry-specific indicators. In 2017, Sustainalytics rated over 6,500 companies across 42 sectors around the world (Huber & Comstock, 2017).

Statement of the Problem

The level of regulatory oversight in a specific industry sector may bias the ESG ratings of firms in that sector. As ESG ratings serve to increase firm attractiveness to investors, outside factors that affect ESG ratings should be considered by investors when evaluating and comparing firm attractiveness. The literature reviewed in this study points to the problem that, while companies appear to recognize the benefits of having favorable ESG ratings, there may be external factors (such as regulation) that result in certain sectors receiving higher (or lower) ratings than others. As reported by Curran (2019), the weakness in the ESG rating system is evident in the bankruptcy filing by PG&E Corporation, which Curran calls "…the latest stumble by a company rated highly by environmentally focused investors, further exposing a weakness in a scoring system meant to measure risk for shareholders." Another recent failure of ESG ratings involved Volkswagen, as evidenced by the following two articles highlighting the difference between their ESG rating in 2011 and their performance in 2015. Barclay (2011) quotes an ESG rating service that reported in 2011 "Companies like Ford, Volkswagen, and Toyota are industry leaders on certain ESG issues, in ways that should inspire and guide other automakers that still have some way to go to catch up to them" (p. 1). After the Volkswagen emission scandal, Hay (2015) opined that the "Volkswagen debacle highlights the importance of investing with an eye

to environmental, social and governance factors -- but also its limitations" (p. 2). These two high profile examples of ESG rating failures are reasons to take a closer look at whether there are systemic issues with ESG ratings.

Research Question and Hypotheses

Research Question 1. What is the relationship between a firm's total ESG rating and the level of regulation in the firm's industry sector? The null and alternative hypothesis that address this question are:

$H1_0$: Firms in heavily regulated sectors will have total ESG ratings that are not statistically significantly different from firms in less regulated sectors.

H1a: There is a statistically significant difference in the total ESG ratings for firms in heavily regulated sectors than for firms in less regulated sectors.

Research Question 2: What is the relationship between a firm's component ESG rating and the level of regulation in the firm's industry sector? The null and alternative hypothesis that address this question are:

$H2_0$: The ESG component ratings (environmental, social, and governance) for firms in heavily regulated sectors are not statistically significantly different from the ESG component ratings for firms in less regulated sectors.

H2a: There is a statistically significant difference in the ESG component ratings for firms in heavily regulated sectors than for firms in less regulated sectors.

Study Relevance and Potential Outcomes

Before this study, there has been a gap in the literature regarding the correlation of ESG ratings to regulatory intensity. This study will test the premise that heavily regulated firms have ESG ratings that are statistically significantly different than less regulated firms.

This study adds to the literature by expanding the scope of studies concerning ESG ratings beyond financial performance measures to include external factors such as regulatory oversight. The results of this study may determine if ESG ratings are correlated with significant regulation and may provide company stakeholders and leaders with information regarding how much emphasis they should place on reported ESG ratings. The study results may be applied to other regulated industries that are being measured on ESG performance so that investors and stakeholders may weigh the credibility of these ratings.

Recent environmental, safety, and public relations disasters by highly rated companies such as British Petroleum, Pacific Gas and Electric, and Volkswagen have called into question the legitimacy of using ESG ratings to mitigate risk (Cherry & Sneirson, 2011; Curran, 2019; Hay, 2015). This study may provide investors with additional criteria to be considered when reviewing ESG ratings.

There are several potential outcomes for this study. First, there may be a significant statistical relationship between firm ESG ratings and regulatory oversight; or there may be a statistically significant relationship between certain components of ESG ratings and regulation. There may be a statistically significant relationship between ESG ratings by one rating agency (e.g. Sustainalytics) but not by another (e.g. MSCI). Conversely, there may be no statistically significant relationship between these variables. The outcomes may be readily explainable using, for example, stakeholder theory, or they may be the basis for recommending future studies. From a practical standpoint, company leaders and stakeholder groups may benefit from these results. For company leaders, understanding the strength and direction of the relationship between how their company's ratings are influenced by regulatory oversight may provide insight into the

corporate culture and mid-level leadership. For stakeholders, these results may serve to either validate or disprove their perception of corporate ESG rankings.

Theoretical Framework

Stakeholder theory has become a significant factor in discussing the formal relationship (in terms of structure and dimension) between business and society (Maon, Lindgreen, & Swaen, 2010). Stakeholder theory recognizes the connection between an organization's success and the value it brings to its primary stakeholders, in addition to receiving implicit approval from secondary stakeholders. This may include government and non-governmental organizations (Maon et al., 2010). Minoja (2012) sees the key assumptions of stakeholder theory as viewing firms by their relationships with key stakeholders, then recognizing that a firm's purpose is to create and distribute value to as many of these stakeholders as possible, realizing that the ability to achieve this purpose relies on cooperation from the actual stakeholders.

The three common and related forms of stakeholder theory are descriptive, normative, and instrumental. While the principle premise of instrumental stakeholder theory is that improved financial performance will come from ethically developed stakeholder relationships (Jones, Harrison, & Felps, 2018), Jones et al. question this premise and suggest that identifying moderating influences must be part of the stakeholder discussion. Including moderators recognizes the dynamics and interdependence of the business environment. Jones et al. call for examining the content and nature of the business - stakeholder relationship and not simply company policies and specific actions.

As it relates to this current study, Jones, Harrison, and Felps (2018) state that identifying moderating influences is critical to the stakeholder discussion in that in a dynamic, knowledge-intensive business environment moderator play a significant role.

Limitations of the Study

This study is limited to the utility, financial, information technology and consumer discretionary sectors and the results may not apply to other sectors. The ESG and financial data elements used in this study were collected in December 2019 from financial services websites, which may not account for anomalies in recent corporate activities such as mergers and divestitures. The ESG ratings are from third-party rating services, which use proprietary criteria. Data used in determining a company's ESG rating may also be influenced by self-reporting by the individual companies being rated. Financial statistics including market capitalization, return on assets over three years, and institutional ownership percentages were also from a financial services website and were collected in December 2019.

The analyses performed for this study require ESG ratings from MSCI or Sustainalytics. MSCI ESG ratings were required for multiway frequency analysis, and Sustainalytics ratings were required for multiple regression analysis. The study was also limited to mid, large and ultra-large capitalized firms. Smaller firms are less likely to have ESG ratings and therefore were not included. The regulated sectors were selected based on the work of Boo and Sharma (2008) who stated that companies that perform essential services and are critical to economic development, such as companies in the financial and utility sectors, are subject to closer regulatory oversight. These sectors are also subjected to state regulation in addition to federal regulation. The consumer discretionary and information technology sectors, while still subject to certain regulations pertaining to all publicly traded companies, are more influenced by market forces.

Delimitations

This study looks to determine the impact regulation may have on ESG ratings by including four sectors, two that are highly regulated and two that are not. Future studies may be expanded to include additional sectors or additional levels of regulation. This study is a cross-

sectional study, looking at ESG ratings at one point in time. Future studies may be longitudinal, including changes in ESG ratings from year to year. Indeed, future studies may drill down to industry sub-sectors, or whether state versus federal regulation has a greater impact on ESG ratings.

Threats to Validity

According to Creswell (2014), statistical conclusion validity threats come about when the researcher draws inaccurate inferences from the data due to inadequate statistical power or a violation of a statistical assumption. G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) was used to determine the minimum sample size for adequate statistical power. Inadequate definitions and variable measures lead to threats to construct validity. The objectives of this study include providing research and analytically derived evidence to company executives, investors, and regulators based on stakeholder theory, which excludes other approaches and theoretical frameworks that could yield different conclusions. Using other analytical techniques, theoretical frameworks, or examination of other sectors' ESG measures, could lead to varying conclusions. External factors, such as the potential bias of the ESG rating firms, may affect the values of the independent, mediating, and dependent variables for this study. The selection of variables used in this study followed a thorough review of the research literature, demonstrating a need to evaluate regulatory oversight, financial performance, profitability (return on assets), and ESG within the context of the stakeholder theory framework (Boo & Sharma, 2008; Michelon et al. 2013; Boesso, Favotto, & Michelon, 2015; Erhemjamts & Huang, 2019; and Miralles-Quirós, M., Miralles-Quirós, J., & Redondo Hernández, 2019). An additional validity threat involves the selection of company metrics for this study derived from financial measurements of firm size and profitability. The firm size and profitability measurements in this study are internationally accepted accounting-based standard measurements. Multiple financial metrics have been used

for similar studies, however, there has been no unanimity of the most appropriate financial measurements for this study's purposes. The measures selected, market capitalization as a proxy for firm size and return on assets as a proxy for profitability have used to measure not only firm financial strength (Michelon et al., 2013) but also the likelihood of better governance or CSR adoption. In a measure of governance, Boo and Sharma (2008) found the natural log of Total Assets correlated with measures of governance (using audit fees as a proxy) and return on assets is an appropriate measure of governance risk. Michelon et al. reference CSR research by Boesso and Kumar (2007) who determined it is appropriate to control for firm size because larger companies see more pressure from stakeholders to adopt CSR initiatives. Michelon et al. also address research by McWilliams and Siegel (2001) who purport the obvious mathematics that the cost to a company of implementing CSR initiatives is proportionately less as firms increase in size.

Definition of Terms

The following terms used in this study are briefly defined below. The terms that represent study variables are further elaborated on in the review of the literature (Chapter 2) and are operationalized in the methodology discussion (Chapter 3).

Corporate Social Responsibility (CSR) integrates social and environmental concerns into business strategies and core activities (Ingham & Havard, 2017). CSR is a stakeholder-oriented concept that goes beyond the internal workings of a company and is motivated by an ethical understanding of the company or organization's responsibility for the outcomes of its business activities, looking to gain society's acceptance of the legitimacy of the organization (Maon, Lindgreen, & Swaen, 2010).

Environmental, Social and Governance (ESG) ratings evaluate a firm's environmental, social, and corporate governance efforts and aggregate the results of these efforts (Yoon et al.,

2018). ESG rating agencies evaluate the corporate sustainability performance of many companies (Escrig-Olmedo et al., 2019). The components of the ESG ratings as measured by MSCI are included in Table 1 below.

Table 1: MSCI 2018 Key Issue Hierarchy

3 Pillars	10 Themes	37 ESG Key Issues
Environment	Climate Change	Carbon Emissions Product Carbon Footprint Financing Environmental Impact Climate Change Vulnerability
	Natural Resources	Water Stress Biodiversity & Land Use Raw Material Sourcing
	Pollution & Waste	Toxic Emissions & Waste Packaging Material & Waste Electronic Waste
	Environmental Opportunities	Opportunities in Clean Tech Opportunities in Green Building Opp's in Renewable Energy
Social	Human Capital	Labor Management Health & Safety Human Capital Development Supply Chain Labor Standards
	Product Liability	Product Safety & Quality Chemical Safety Financial Product Safety Privacy & Data Security Responsible Investment Health & Demographic Risk
	Stakeholder Opposition	Controversial Sourcing
	Social Opportunities	Access to Communications Access to Finance Access to Health Care Opp's in Nutrition & Health
Governance	Corporate Governance*	Board* Pay* Ownership* Accounting*
	Corporate Behavior	Business Ethics Anti-Competitive Practices Tax Transparency Corruption & Instability Financial System Instability

Institutional Investors represent the percent of outstanding shares held by institutions, such as pension funds. Erhemjamts and Huang (2019) found that there is an increasing volume of literature looking at how institutional ownership affects firm behavior.

Market Capitalization is the total market value of outstanding stocks of a publicly-traded company. A company's market value over time recognizes the tangible and intangible improvements associated with prudent CSR initiatives over time (Michelon et al, 2013)

Regulatory Oversight refers to the level of regulation that a firm operates under. Highly regulated (versus unregulated or less regulated) companies are companies that are subjected to added and more intensive industry-specific regulations (such as with financial institutions and utility companies) versus companies that are not bound by additional regulation (Boo & Sharma, 2008). In most countries including the United States, regulations require banks to have periodic regulatory inspections, minimum capital requirements, and stringent internal control and disclosure requirements. Utilities are subject to federal and state-specific regulations. Electric utility regulation has been prevalent in the US electric utility industry for over 100 years, where a state regulatory agency both protects the monopoly status of utility companies and authorizes the tariffs and rate structures that a utility can impose on its customers (Hausman & Neufeld, 2011).

Total Three-Year Return is a measure of firm profitability (Lee et al., 2018). Return on investment considers the present value of capital appreciation, dividends, interest, and taxes expressed on an annual basis. (Fidelity.com. 2019).

Sustainability is the generation of positive outcomes at the societal level, the consideration of complexities and pressures, and the integration of heterogeneous and competing judgments (Hahn &Figge, 2018, p. 922).

Organization of the Remainder of the Study

The organization of the remainder of the dissertation is as follows. The Chapter 2 review of the literature summarizes research concerning the history and current state of CSR/ESG reporting, stakeholder theory, and the relation between ESG and firm performance.

Chapter 3 provides a detailed overview of the research design and methods used in this study including a review of each of the variables used in this research for relevance and application to the research hypotheses.

Chapter 4 includes the data collection process and presents the results of the quantitative analysis. Chapter 5 summarizes the findings including interpreting the modeling results. Chapter 5 also includes recommendations for future research, implications for practitioners, and a brief conclusion.

Conclusion

There are multiple motivations for a company to improve its ESG and sustainability performance. Additionally, extrinsic factors such as regulatory oversight may bias ESG ratings for specific sectors. The company's investment and performance in ESG and sustainability may be ethically commendable, but shareholder and executive expectations of the impact that ESG ratings have on financial performance is a complex issue that may be addressed from a variety of management theory approaches. These expectations may range from legitimately wanting to improve society and share the company's story with all outside stakeholders, to simply providing the appearance of caring about groups of stakeholders or the environment without taking serious actions to improve performance in these areas. This study adds to the literature by expanding the scope of previous ESG studies beyond financial performance measures to include the relation to regulatory oversight.

Chapter 2 – Review of the Literature

Introduction

The literature referenced in this study was the result of an extensive search of peer-reviewed papers on the topics of stakeholder theory, corporate social responsibility and its relation to financial performance, management theory, performance reporting, industry regulation, sustainability, and ESG reporting. To identify articles, the researcher primarily relied on EBSCOhost Business Source Complete and the Electronic Journal Center databases. The literature search used the following keywords or phrases: corporate social responsibility and CSR), corporate performance, financial performance, stakeholder theory, sustainability, regulation, performance reporting, and ESG reporting. Preference was given to more recent peer-reviewed studies. In total 104 studies are cited in the reference list.

The concept of CSR has been studied for over 66 years starting with Howard Bowen offering an initial definition in 1953 (Evans et al., 2013). Davis (1960) produced an early work addressing CSR where he addresses three questions of the time:

> (1) Why do businessmen have social responsibilities, if, in fact, they do? (2) How does a businessman know the directions his social responsibilities lie? And, (3) If businessmen fail to accept social responsibilities incumbent upon them, what consequences may be expected (Davis, 1960, p. 70).

As background, this literature review will begin by looking at aspects of CSR in early management theories, followed by current management theories that relate to CSR. The influence of stakeholders is then explored, followed by literature that explores the CSR versus profit maximization argument. The literature on CSR/ESG performance reporting will be examined, describing how firms use environmental, social, and corporate governance scores

(ESG) as a measure of their CSR (and sustainability) performance. Next, the literature on how CSR/ESG messaging influences firm performance is presented. Finally, the literature review summarizes research that addresses the variables in this study. This literature review will highlight gaps in the current research regarding the drivers of ESG ratings showing that while ESG ratings and firm financial performance (and to a lesser extent, environmental performance) have been studied extensively, other firm attributes that may affect ESG ratings have not.

A brief chronological summary of a sampling of the literature associated with the relationship between CSR/ESG and firm performance is provided in Table 2. Table 3 includes a summary of the literature addressing why firms may be interested in improving CSR/ESG ratings.

Table 2: CSR and ESG Relation to Firm Attributes in Recent Studies

CSR/ESG and Firm Performance		
Lu, Wang, and Lee	2013	Improved financial performance correlated to performance in terms of social responsibility. Socially responsible firms gain trust from customers, improve company goodwill, and can reinforce their brand image and competitiveness.
Michelon, Boesso, and Kumar	2013	Organizations that include CSR initiatives based on strategic priorities have better financial results.
Cheng, Ioannou, and Serafeim	2014	Superior CSR performance not only reduces costs and capital constraints but also leads to higher quality relationships with customers.
Attig and Cleary	2015	Management quality practices are positively and significantly correlated to a firm's CSR rating
Hariyati and Tjahjadi	2015	Firm environmental performance mediates partially the relation between sustainable innovation strategy and financial performance.
Aouadi and Marsat	2018	Controversies about questionable ESG conduct did not negatively affect firm value but were value enhancing.
Hahn and Figg	2018	Stock price increases when they exhibit behavior considered socially responsible, while stock price decreases with irresponsible behavior.
M. Miralles-Quirós, Miralles-Quirós, and Gonçalves	2018	Found discrepancies in how the market values the three ESG components.
Yoon, Lee, and Byun	2018	Investors positively value CSR practices,found that a firm's CSR practice does not have homogeneous valuation effects.
M. Miralles-Quirós, Miralles-Quirós, and Hernández	2019	There is a positive and significant relationship of banks' environmental and corporate governance performance with shareholder value creation.

Table 3: Motivation for CSR/ESG Ratings

Rating Motivation		
Author(s)	**Year**	**Study**
Cherry and Sneirson	2011	Found BP's advertising image was so vastly different from its true environmental and safety record.
Falkenberg and Brunsael	2011	There are four outcomes of CSR initiatives: strategic disadvantage, strategic necessity, temporary strategic advantage, and strategic advantage.
Mahoney	2012	Whether firms who issue CSR reports are more socially responsible or if they are merely trying to convince stakeholders that they are.
Goettsche, Steindl, and Gietl	2016	There is a gap in the literature regarding stakeholder interdependence between customers and shareholders in the area of sustainability reporting.
Lai, Melloni, and Stacchezzini	2016	A firm's legitimacy is threatened whenever there is a disconnect between its actions and the expectations of the social system for its conduct.
Bento, Mertins, and White	2017	Some companies may feel a moral duty to report CSR metrics without regard to the effect on earnings, other companies may report CSR metrics as a strategic move, expecting the interests of all stakeholders to be met.
Hansen and Schaltegger	2018	Increased concern regarding the issues of measuring corporate performance using only financial metrics has bolstered interest in performance measurement systems that include additional dimensions such as the BSC.
Lee, Palmon, and Yezegel	2018	The demand for CSR performance information has increased, putting pressure on managers to report it.
Saxton, Gomez, Ngoh, Lin, and Dietrich	2019	A key goal of firms' corporate social responsibility (CSR) efforts is to influence reputation through carefully crafted communicative practices.

The summaries show a continued interest in research correlating CSR/ESG performance to firm valuation and firm image.

History of CSR in Management Theories

Booth and Rowlinson (2006) suggest if the business school curriculums continue to emphasize ethics and corporate social responsibility, then they need to be informed by history. They contend that companies are now more likely to be held responsible for their past ethical conduct. Although research regarding social responsibility and ethics has recently expanded, as far back as the early 1900s industry leaders began looking at ways to improve the lives of their workers – in part to reduce government interference with their businesses (Evans, Pane Haden, Clayton, & Novicevic, 2013). Evans et al. (2013) opine that actions by Rockefeller and Ford showed that there was a connection between business and society. Heikkurinen and Mäkinen (2018) agree with this motivation and discussed how, through corporate self-regulation or

governance, firms and the economic elite can diffuse social and political pressures for restrictive business laws and regulations. CSR assumes that the corporation is part of its society and elements of CSR, such as individual and corporate philanthropy, were present hundreds of years ago and certainly during the period where early management theories were developed (Brooks, 2005). Managers endorsed early social responsibility theories, which espoused better treatment and well-being of employees, if such treatment would make workers more productive (Evangelopoulos, 2011; Koening & Waters, 2002; Jenks, 1960).

During the early 1900s, Lillian Gilbreth wrote about management as a social force that not only affected factory workers but also could affect society by creating social happiness (Krenn, 2011). Even Dennison, who is more well known for his contributions to labor relations, saw the economy and society (including government) as connected and part of an evolving process in constant need of institutional adjustment (Bruce, 2006). Later in this period, Kurt Lewin, a significant contributor to management thinking and a consultant in the fields of change resistance, decision-making, job design, group dynamics, and conflict, conducted a race relations training program for community leaders as the result of an invitation from the Connecticut State Inter-Racial Commission (Wolf, 1996; Rothwell, Stavros, & Sullivan, 2015). Other researchers found aspects of CSR in scientific management theories. Giannantonio and Hurley-Hanson (2011) chronicle the political, social, and ethical aspects of Taylor's work and how it sought to improve society, finding that Taylor's theory of scientific management essentially included the elimination of waste through improved worker efficiency. By using resources efficiently, companies reduce waste and pollution and thus benefit both the company and the environment (Giannantonio & Hurley-Hanson, 2011). Also, Kulesza, Weaver, and Friedman (2011) show how F. W. Taylor's principles align with the concept of CSR. Taylor's introduction to "The Principles

of Scientific Management" includes a quotation from President Theodore Roosevelt that aligns with the concept of sustainability: "The conservation of our national resources is only preliminary to the larger question of national efficiency" (p. 111).

Evangelopoulos (2011) investigated if Taylor's concept of reducing the country's inefficiency using scientific management concepts are still valid. He cited research that found that approaches compatible with Taylor's were being employed in government today and offered a different view of public sector efficiency by considering intangible costs and benefits. The history of management thinking toward business social responsibility is a component of ongoing progress, as seen in the writings of influential theorists of the time such as Fayol, Taylor, Follett, and Barnard (Evans, Pane Haden, Clayton, & Novicevic, 2013).

Systems theory concepts have been related to CSR and performance evaluation by several authors. The seminal writings of von Bertalanffy (2008) put forth the foundations of systems theory, setting the groundwork for subsequent studies using systems theory concepts that apply scientific principles of living systems to non-scientific subjects in an explainable manner. The complexities of CSR fit well with the concepts from systems theory as discussed by Chen and Roberts (2010) who found that multiple theories share similar language and characteristics found in systems theory. Their work explained similar social experiences with resource dependence theory, institutional theory, legitimacy theory, and stakeholder theory. In systems theory, Chen and Roberts contend that society is both influenced by organizations and influences organizations. For example, stakeholder theory sees that the organizations that are part of the environment must also consider relations among themselves (Chen & Roberts, 2010).

Evans et al. (2013) provide a comprehensive history of social responsibility as it relates to management thinking, examining social responsibility from a "history-of-management-

thought" perspective. Evans et al. (2013) summarized the research by Davis (1973) describing arguments for and against businesses pursuing CSR as shown in Table 4.

Table 4: Arguments for and Against CSR

Arguments For CSR	Arguments Against CSR
Long-run self-interest	Profit maximization
Public image	Costs of social involvement
Viability of business	Lack of social skills
Avoidance of government regulation	Dilution of business' primary purpose
Socio-cultural norms	Weakened international payments
Stockholder interest	Lack of accountability
Let business try	Lack of broad support
Business has the resources	Business has enough power
Problems can become profits	
Prevention is better than curing	

Source: Evans, Pane Haden, Clayton, and Novicevic (2013), pp. 15-18.

Evans et al. (2013) point out that the arguments for and against CSR are not necessarily management theories but enter the fields of political science and sociology. Over time, these authors report, CSR moved from the relationship between business and society to the development of stakeholder theory, which is now the primary concept for evaluating the world in which business operates.

CSR Theories and Categories

CSR has been the subject of numerous research papers as identified by Frynas and Yamahaki (2016), who cataloged CSR research by a theoretical perspective and found that stakeholder theory is the most widely used, followed by institutional theory and legitimacy theory. Likewise, Garriga and Melé (2004) categorized theories behind CSR into four groups: instrumental, political, integrative, and ethical approaches. The instrumental approach shows

how CSR leads to profit, whether directly or indirectly. Political theories highlight the social rights and duties that come with the social power of the organization, while the integrative approach includes theories that emphasize that organizations should integrate society's social demands as they are dependent on society for their permanency, growth, and existence. Lastly, ethical theories see the link between corporations and society as rooted in ethical values; so, it follows that organizations should take on social responsibility as an ethical obligation, above other considerations.

Maon et al. (2010) referenced Garriga and Melé (2004) in concluding that CSR studies include a wide range of methods, theories, and vocabularies that are diverse, vague and often complex. They also find that marketing and management scholars looked for linking potential business justifications for CSR and studied the effects of CSR commitment on reputation and financial performance.

In a more recent study, Ingham and Havard (2017) explained the motivation behind three CSR types: philanthropy, CSR integration (conducting existing business operations more responsibly), and CSR innovation (developing new business models for solving social and environmental problems) to examine the potential of CSR for probable financial and social benefits.

Zerbini (2017) has explored signaling theory and its relation to CSR. Zerbini points to research which indicates that the outcomes of social and environmental initiatives may act as signals where stakeholders view the outcomes of these initiatives and infer an ethical trait to the company. The example cited by the author is where a consumer might find that a vendor scores high in a sustainability rating and takes this as a signal that this company treats its clients responsibly.

Seele (2017) combines signaling theory with legitimacy theory to set up a discussion of the communication process about greenwashing accusations and the negative narrative caused by the accusation including its effect on legitimacy. According to Seele, existing definitions of greenwashing give too much weight to the strategic intention to mislead. Also, the definitions do not incorporate unjust allegations. Seele argues that greenwashing behavior is in the eye of the beholder, depending on an external accusation. He concludes that banks, the subject of his research, should use CSR reports to present corporate views in an objective manner, not as a pro-company communication document.

Brooks (2005) examines the convergence of strategy discussions with the theory of CSR and provides a broad definition of strategic management as the acquisition of sustainable competitive advantage. Brooks states that for CSR to be considered a strategic issue it should be considered an integral practice across the organization, and not limited to a specific organizational function. He then discusses the relation between CSR, strategy, and stakeholder management, pointing to chaos and complexity writings to make a point of the intertwined world in which organizations exist. An important role for business leaders is to interact and build relationships with relevant stakeholders, thereby creating a sustainable business that contributes to the common good (Maak, 2007). Maak goes on to say that leaders should perform actions that build social capital and then create networks of relationships that bring together otherwise unconnected groups. This process results in a concept called responsible leadership.

Maon et al. (2010) noted that a firm must become collaborative and encourage dialogue if it expects to generate the innovative ideas required to become a sustainable venture. As such, socially responsible values must be embedded in corporate culture and management philosophy.

The Stakeholder Perspective

Demands for CSR are coming from a larger and more diverse set of stakeholders causing companies to have regular communication and dialogue with stakeholder groups (Maon et al., 2009). This demand has resulted in an increased role for internal groups implementing and maintaining CSR programs (Maon et al., 2009).

Thirty-one years after Howard Bowen offered his definition of CSR, Klonoski (1991) presented an overview of the CSR debate and described the various methods taken in determining the responsibilities of businesses in the broader society. He grouped the ways companies address CSR and made general observations about the basics of the discussion itself. The intricacy of the CSR discussion can be better understood once the various CSR theories are classified with what Klonoski sees as a basic question, "Are corporations' social institutions" (p. 9)? Since that time Ali (2011) discussed how an organization should address or accommodate the pressures from external influences. Weber (2014) concluded that actively managing stakeholder relationships would be beneficial and that organizational culture is an important element in creating proactive stakeholder organizations. At a broad organizational level, Maak (2007) examined the organization-stakeholder relationship, including how the concept of responsible leadership contributes to the benefit of multiple stakeholders. By interacting with the world in a socially responsible manner, organizations gain society's trust, which leads to less intervention in their activities (Brooks, 2005).

The corporate-stakeholder relationship is much more complex than simply engaging with stakeholders (Greenwood, 2007). Greenwood suggests that there are multiple views of stakeholder engagement and she provides a model for optimal stakeholder engagement in the context of the moral treatment of stakeholders. Greenwood found that the motivation for engaging with stakeholders could vary across organizations and that some organizations may not

be responsibility neutral. Greenwood sets stakeholders apart from other entities that may interact with the company. Ideally, stakeholder engagement results in mutual benefits and just treatment of both parties. This view envisions the company/stakeholder relation as a moral partnership of equals. Unfortunately, this ideal relationship is not always likely as the company and the stakeholders are often not equal in status, so the more dominant party will set the structure of the relationship (Greenwood, 2007).

Greenwood (2007) uses the circumstances of the social reporting of the Royal Dutch Shell Company to provide an example of stakeholder engagement being viewed as responsibility. As Greenwood reports, citing Vidal (1999), Shell had improved its reputation from its nadir in 1995 when it was accused of being involved in the execution of an activist and his associates, to a peak in 1999 when Shell was considered to be ‘‘strong on the environment, ethical, and committed to human rights’’ (p. 317). While Greenwood contends this transformation was the result of stakeholder engagement, she also stated that stakeholder engagement is not only for socially responsible firms, and it is not the exclusive domain of socially responsible activities that occur within firms.

Stakeholder theory has been used to explain how consumer preferences may influence multiple operational performance dimensions. Chavez, Yu, Feng, and Wiengarten (2016) found that customer pressure has a positive impact on the use of customer-centric Green Supply Chain Management (GSCM). This study explored the connection between implementing customer centric GSCM with its precursor factors such as customer pressures, and subsequent performance outcomes including operational performance and customer satisfaction. The authors found operational performance improvements in the areas of flexibility, delivery, quality, and cost.

Thabrew (2009) presents a stakeholder-based life cycle assessment framework that may be applicable to other organizational constructs. His study used examples from a post-tsunami reconstruction project and in an integrated watershed management situation. He addresses many of the challenges inherent in gaining support and input from stakeholders, specifically in multi-stakeholder situations where parties have different interests or priorities.

Other studies focus on company models that may improve stakeholder relations. Gnan, Hinna, Monteduro, and Scarozza (2013) discussed the changing role of local governments and local public utilities. Their study looks at specific tools that may improve the quality of corporate governance in local utilities by extending stakeholder involvement.

Greenwood (2007) sees corporate irresponsibility occurring when the strategic management of stakeholders has a motive and is no longer a responsibility-neutral practice but becomes immoral, seeking to deceive and manipulate stakeholders. Greenwood provides a quote giving Friedman's (1970) view of this behavior.

> There is a strong temptation to rationalize actions as an exercise of 'social responsibility'... for a corporation to generate goodwill as a by-product of expenditures that are entirely justified in its own self-interest. I can express admiration for those (corporations) who disdain such tactics as approaching fraud (p. 324).

CSR and Sustainability versus Profit Maximization

Buller and McEvoy (2016) discuss the fast-growing interest in sustainability with ongoing business performance and point to the triple bottom line concept, which, in addition to economic outcomes, considers environmental and social implications. Not everyone has accepted the movement to measure performance by reporting non-financial metrics. As reported by Bento et al. (2017) in quoting the well-known and counter position put forth by Milton Friedman (2002): ''Few trends could so thoroughly undermine the very foundations of our free society as

the acceptance by corporate officials of a social responsibility other than to make as much money for their stockholders as possible'' (p. 133).

Snider, Hill, and Martin (2003) discuss Milton Friedman's contribution to CSR theory in his questioning of whether companies should even take responsibility for social issues. Friedman's critics point out that businesses exist to serve the larger community as well as their owners, therefore, CSR may be considered as a responsibility of a company to use its resources to benefit society (Snider, Hill, & Martin, 2003).

Despite Milton Friedman's objection, Clarke and Friedman (2016) acknowledge that the goal of maximizing shareholder value has been controversial for several years and have concluded that pursuing this goal yields mostly bad outcomes for not only shareholders but also the public at large. Specifically, they point out how research shows that by focusing on share price alone managers may not be meeting the needs of shareholders looking for other attributes such as better products, fair treatment of employees, consumer protections, and a contributor to social welfare. When corporations focus on measures of shareholder value, such as earnings per share, managers are incentivized to take liberties with accounting rules to overstate earnings. Corporations have reported inaccurate balance sheets that inflate assets and reduce liabilities (Clarke & Friedman, 2016). There is no question that accounting and auditing manipulations resulted in several recent major corporate bankruptcies including Lehman Brothers, Washington Mutual (WaMU), Worldcom, and Enron (Clarke & Friedman, 2016).

One of the more common performance measures in the business world is shareholder value maximization, or SVM (Bento et al., 2017). This concept, also known as maximizing shareholder value (MSV) is prevalent in business school curriculums and is manifested in the corporate world by a company's share price, and it has become a major factor in executive

compensation decisions (Clarke & Friedman, 2016). Maximizing shareholder wealth is a traditional economic objective that is accomplished by firm managers implementing projects or initiatives to increase the present value of future cash flows (Mackey et al., 2007). Many companies, though, are using additional metrics to analyze performance as evidenced by the widespread use of the balanced scorecard (BSC) which became prevalent in the 1990s and early 2000s (Cezarino, Junior, & Correa, 2012).

Hales, Matsumura, Moser, and Payne (2016) discuss a binary view of investment in CSR activities and then provide an alternate consideration. The first view suggests managers should invest in CSR activities only if those investments maximize their shareholders' wealth. The alternative view suggests managers only invest in CSR activities that forego profits to enrich society. The first view comports with Milton Friedman's philosophy and assumes that the managers are incentivized to maximize shareholders' wealth. The authors point out that in this first view the goal of a CSR investment is the same as any other investment. If there are any non-shareholder benefits from CSR investments those benefits are only coincidental. In this first view, Hales et al. (2016) say CSR investments would be analyzed in the same manner as any other investment using metrics such as cash flow, net present value, and return on investment, and firm performance would continue to be evaluated using normal corporate measures and ratios. Investments that maximize shareholders' wealth and benefit society are not true CSR investments because managers would still undertake them solely due to their wealth building attributes. Hales et al. note that in the alternative view, to consider an investment to be a CSR investment it must forego company profit to benefit society. A true CSR investment, by this definition, would not maximize shareholders' wealth because a firm forgoes profits to create a better society. As an alternate consideration, Hales et al. point out that these CSR investments

may instead maximize shareholders' utility if the shareholders assign value to the societal benefits that offset the negative financial impact of the investment on their wealth. Measuring shareholder utility provides a challenge as it relates to this alternate view (Hales et al., 2016).

Mackey et al. (2007) also reference the well-established financial mantra that firms will maximize their market value by maximizing the present value of their cash flows. The connection between market value and the present value of cash flows assumes that all company shareholders have the same objective, which is wealth maximization. This is not always the case as some shareholders may have other interests. For example, socially conscious investors may invest exclusively in firms that provide financial assistance to socially responsible activities (Mackey et al., 2007). When this is considered, Mackey et al. contend a company's market value is based on the supply of and demand for the type of investment prospects evident in the firm's strategies that may include the opportunity to invest in entities taking on different CSR strategies.

CSR in Performance Reporting

Lee, Palmon, and Yezegel (2018) discuss how even though there is no mandatory requirement to disclose CSR performance data, the demand for this information has increased, putting pressure on managers to report it. The authors report that third party services are reporting CSR metrics on several companies and suggest that this reporting has created a more transparent information environment, which improves relations with stakeholders. Cezarino, Junior, and Correa (2012) found that organizations use performance evaluation models to ensure their continued existence, but contend that, with a system thinking approach, organizations should take a holistic view and consider such things as the organization's relationship with its environment.

Bento, Mertins, and White (2017) describe the BSC as a performance assessment using four perspectives: financial, customer, internal business, and innovation and learning. Bento et al. (2017) express several concerns with many firms that are expanding their performance reporting to include CSR metrics. For example, while a BSC approach is well-suited to address the views of a variety of stakeholders, simply by including CSR metrics does not mean the company is now beholden to outside groups. The authors go on to say that, companies select performance measures consistent with their strategies based on the assumption that those measures will result in better overall performance over the long-term.

Falkenberg and Brunsæl (2011) explore the relationship between CSR and performance. The authors state that the findings of earlier research are not conclusive, demonstrating a need to consider other explanations. Based on earlier work that used the resource-based view of the firm to propose that CSR provides a firm with a competitive advantage, their paper further develops this concept, focusing on four outcomes of CSR initiatives: strategic disadvantage, strategic necessity, temporary strategic advantage, and strategic advantage.

Yoon, Lee, and Byun (2018) discuss the importance of using uniform metrics in CSR reporting. Their study of Korean firms evaluated the total ESG score and its three components—environmental, social, and corporate governance—as measures of the CSR performance of a firm. They found that investors positively value CSR practices, but a firm's CSR practice does not have consistent valuation effects. Their study found that the valuation effect of CSR is less strong for industries in the Korean financial market that are environmentally sensitive. They also found that the valuation effect of corporate governance practice is positively correlated to family-run conglomerates but found no correlation to ordinary Korean firms. The authors did not generalize the results to the global market, only to emerging markets.

Attig and Cleary (2015) provide perspective regarding management quality practices on CSR for domestic manufacturing firms. Their results show a positive and significant correlation between management quality practices and a firm's CSR rating. The authors state that this confirms that intangible assets affect corporate outcomes. This relationship introduces another variable into the relation between CSR and financial performance.

Cheng, Ioannou, and Serafeim (2014) discuss how superior CSR performance not only reduces costs and capital constraints but also leads to higher-quality relationships with customers (p. 5). Lu, Wang, and Lee (2013) also identified research on CSR that found improvements in financial performance correlated to performance in terms of social responsibility. They found that socially responsible firms gain trust from customers, improve company goodwill, and can reinforce their brand image and competitiveness. This may result in reduced costs. They also point to research that says companies should foster CSR to increase demand among consumers for their products. According to the authors, these findings show that CSR is a major marketing strategy that can increase competitiveness and performance.

Gosselt (2019) builds on attribution theory and looks to find how uncertified internal CSR claims and external third-party CSR labels can dissuade greenwashing and improve positive consumer responses. Moreover, his findings show that consumers are likely to accept an internal claim and not question its authenticity. He recommends a multilevel external rating system providing positive and negative external CSR information. He claims this type of rating system might be an effective tool for reducing greenwashing and contributing to a truly responsible climate.

Hariyati and Tjahjadi (2015) researched the impact that sustainable innovation strategy had on financial and environmental performance. Likewise, Michelon et al. (2013) determined

that organizations that include CSR initiatives based on strategic priorities have better financial results.

Hansen and Schaltegger (2018) report that increased concern regarding the issues of measuring corporate performance using only financial metrics has bolstered interest in performance measurement systems that include additional dimensions such as the BSC. Also, they see that the increasing strategic importance of performance metrics around environmental, social, and ethical aspects have brought debates about expanding and altering the BSC into what the authors call a Sustainability Balanced Scorecard (SBSC).

Aouadi and Marsat's (2018) study points out the nuances in using CSR metrics as a measure of firm performance. They recommend that companies must understand the moderating effects of variables in establishing the firm-to-CSR value relation. They explicitly state that their findings do not support a direct relationship between CSR and firm value in many cases, whereas indirect relationships were found. For example, they found that ESG controversies drove investors' focus to the CSR score for high-visibility companies, and this resulted in enhanced firm value. The authors conclude that the CSR score serves as an insurance against bad press regarding CSR news, and may provide high-visibility companies the ability to get a positive result from an ESG controversy.

Goettsche, Steindl, and Gietl (2016) recognized that there is a gap in the literature regarding stakeholder interdependence between customers and shareholders in the area of sustainability reporting. One of their findings is that, for a firm that does not value end-use consumers, sustainability reporting decreases the firm's value. They also report on differences in the strategic implications between less profitable and more profitable firms. They conclude that

managers must consider differences in customer profiles when determining their sustainability reporting strategy.

ESG/CSR Messaging Results

A study by Saxton, Gomez, Ngoh, Lin, and Dietrich (2019) looked to show that a primary reason firms embark on CSR is to influence reputation by using judiciously constructed communicative practices. They see this movement has accelerated with the rise of social media. Their study shows that the public wants CSR communications. They found high levels of effectiveness when messages that include CSR topics join ongoing CSR conversations created by other social movement figures. They conclude that this supports findings that postings from socially responsible companies are more likely to be shared by public audiences, accelerating social transmission regarding CSR topics.

Hahn and Figg (2018) refer to research suggesting that a company's stock price increases when they exhibit behavior considered socially responsible, while stock price decreases with irresponsible behavior. They found that not only did a firm need to behave responsibly but it also needed to provide external CSR reports which imply that investors and analysts are including CSR in their valuation metrics. While not a complete contradiction of Hahn and Figg's findings, Aouadi and Marsat (2018) found that controversies, defined as public news stories about questionable ESG conduct, did not negatively affect firm value but were value-enhancing. This phenomenon applied to high profile firms that are big, have superior performance and are in countries with greater press autonomy. M. Miralles-Quirós, Miralles-Quirós, and Gonçalves (2018) found discrepancies in how the market values the three ESG components. They found a positive and significant correlation in how the market values the environmental practices of companies that are not in environmentally sensitive fields, and that the market positively and

significantly values the social and corporate governance practices performed by the companies that are in environmentally sensitive industries.

Bento, Mertins, and White (2017) state that while some companies may believe they have a moral duty to report CSR metrics (which are used for ESG ratings) without regard to the effect on earnings, other companies may report CSR metrics as a strategic move, expecting the interests of all stakeholders (including shareholders) to be met. Other companies may simply be adding CSR metrics as a form of greenwashing, which Bento et al. (2017) do not necessarily see as wrong in that it forces companies to act responsibly or be called out as hypocrites.

According to legitimacy theory (LT), a firm's legitimacy is threatened if there is a disconnect between its performance and the expectations of the society for its conduct (Lai, Melloni, & Stacchezzini, 2016). This external perception may be influenced by managers by voluntarily providing evidence to select groups to show that they are meeting the requirements of public expectations. In this way, disclosure acts as a symbol to communicate changes in the corporate behavior, therefore, correcting poor legitimacy. Lai et al.'s findings indicate a relation between integrated reporting (IR) adoption and sustainability rating that is counter to the direction predicted by LT that with higher ESG scores, there is a higher likelihood to adopt an IR. They also found that firms are not implementing IR to fix specific legitimacy threats due to low ESG ratings. In finding that ESG ratings are higher when firms adopt IR versus IR non-adopters, they conclude that IR reinforces companies that already are highly transparent on ESG issues. The authors conclude that due to the significant resources and effort for IR, managers must be strongly committed to sustainability reporting to choose IR as a reporting strategy.

Cherry and Sneirson (2011) examined the discrepancy in how BP depicted itself in the public space and how it acted when its reputation was not at stake. They found BP's advertising

image was so vastly different from its true environmental and safety record. BP's social conscience was focused on endeavors that would increase profits; BP did not act in socially responsible ways unless there was a profit or public relations benefit. These authors see this as greenwashing, and what they call "faux CSR" (p. 985). "As the BP case study demonstrates, true change must coincide with some means of substantiating corporate claims of social responsibility" (Cherry & Sneirson, 2011).

Buller and McEvoy (2016) see sustainability strategies as having many positive impacts in improving a company's competitive advantage by bringing together an enhanced reputation, reduced costs and risks, and opportunities for innovation and growth. They still see a challenge, however, in translating CSR measures into a higher level of financial performance.

Organizations have varied strategies and objectives based on their culture and even their nationality, therefore performance measures are a useful tool to influence the behavior of managers so that they act in alignment with the company's strategy (Otley, 1999). Performance that increases CSR metrics has the potential to result in higher market value, even in times of uncontrolled controversies (Aouadi & Marsat, 2018). This does not imply that profit-seeking is inherently evil as profits do not prevent firms from being sustainable, rather it is an unsustainable process intended to maximize profits which causes sustainability concerns (Hansen & Schaltegger, 2018).

Variables

This portion of the review of the literature will examine the variables used in this study including a discussion of their relevance and how they were considered in other research.

Independent Variable – Regulatory Oversight

Economic regulation sets various constraints on firm actions and decisions (Cambini, et al). Regulations may incentivize investment and efficiency and/or constrain management

discretion. Public regulation is regulation created and promulgated by public authorities such as the government (Sheehy, 2015, p. 640). Sheehy sees regulation in terms of governance tasks (rulemaking, administration including compliance and enforcement, and adjudication) or activities. Boo and Sharma (2008) see companies subject to regulatory oversight as more vigilant in monitoring their internal controls and financial reporting process (representing the Governance measure of ESG) which could allow for less costly external audit monitoring (p. 56). Banks and utilities were highly regulated even before the implementation of Sarbanes-Oxley controls and as such corporate governance structures may have been more highly developed than other less regulated sectors (Coster, Dahl, & Jenson, 2014). Lee et al. (2018) found that regulatory bodies see the value offered by socially responsible firms. They point to research that found that socially responsible firms are less likely to be under SEC investigation due to GAAP violations, meaning these firms have greater transparency in their business practices than their less socially responsible peers.

Financial institutions such as banks, savings institutions, and utility companies are considered heavily regulated even though they have both experienced a level of deregulation recently (Becher & Frye, 2011, p. 740). Earlier studies see similarities in governance mechanisms for these two industries in addition to a higher level of regulatory influence (Becher & Frye, 2011). Cambini, Rondi, and De Masi (2015) describe the public utility sector as operating in noncompetitive markets strongly influenced by regulation that sets constraints on firm behavior and decisions. Regulation functions as a constraint on a firm's activities, which changes the incentives normally found in market-based mechanisms (Cambini et al., 2015).

The utility model is a monopoly model, where utilities operate in exclusive franchise territories (Starkweather, 2017) which is unlike firms in other sectors. Special interest groups that

have the resources and ability to mobilize their constituents and receive the right to intervene in the regulatory process can influence policy decisions and give themselves an advantage over other groups (Bergh & Holburn, 2006). Like energy efficiency standards (where utilities subsidize customer's purchases of energy-efficient appliances), several states have set renewable energy standards and some utilities have embraced this challenge while others reluctantly comply (Graffy & Kihm, 2014).

On the environmental regulation front, Boyd and Carlson (2016) show how the current regulatory models are achieving the goals of many environmental advocates, the reduction of carbon emissions, without a federal mandate. Likewise, Acutt and Elliott (1999) looked at the interaction between environmental and economic regulations. They examined gains to the public welfare by moving from a non-cooperative to a cooperative regulatory relationship between environmental and economic regulators. Their model studied the relationship between emissions of one pollutant and electric producer profits. Acutt and Elliott concluded that there is a potential welfare improvement under a cooperative regime in that there is a relationship between environmental and economic outcomes, and that the overall public welfare may be optimized while the individual results may be sub-optimal.

Mediating Variables

A mediating variable stands between the independent and dependent variables in a probable causal link (Creswell, 2014). One mediating variable is market capitalization, which is a measure of firm size. Larger companies tend to adopt CSR initiatives due to insistence by stakeholders, and the cost of engaging in CSR initiatives may benefit from economies of scale (Michelon, Boesso, & Kumar, 2013). Aouadi and Marsat (2018) also controlled for firm size in their measure of corporate social performance scores and ESG controversies. Lee et al. (2018)

used firm value and return on assets in their study and reported that the positive relationship between firm value and CSR is in part due to higher valued firms having lower equity capital costs.

The next mediating variable, institutional ownership, is the percent of shares held by institutional investors. Erhemjamts and Huang (2019) point to research that shows the positive and significant association between future corporate social performance and the holdings of long-term institutional owners. Their research found that executives needed to prioritize the demands of their most important stakeholders, the ones that have more power and a greater voice in the firm's strategic decisions. Duuren (2016) argues that ESG investing provides a stock selection screen and in that way is very similar to fundamental investing, even though ESG investing emphasizes non-financial dimensions of corporate performance. Arjaliès and Bansal (2018) report that equity managers (as opposed to fixed income managers) discovered methods to extract the significance of information embodied in ESG criteria. As importantly, investors' perceptions of CSR expenditures have shifted and now investors are incentivizing managers to fund and report CSR initiatives and activities. Lee et al. (2018) state that CSR has a significant influence on firm behavior due to factors that span the spectrum from external pressure to moral obligations. As importantly, investors' perceptions of CSR expenditures have shifted and now investors are incentivizing managers to fund and report CSR initiatives and activities.

Corporate profitability is another mediating variable. In her meta-analysis, Mikołajek-Gocejna (2016) summarized research that looked to establish if there is a significant relationship between CSR and company performance. The research papers included over 16,000 companies and most of the studies found a positive relationship between corporate social responsibility and company performance (71.7% of studies, 81.1% of companies). Dalal and Thaker (2019), in their

study of 65 Indian companies, found a significant positive relation between total ESG scores on return on assets, more so than other accounting measures, including Leverage or Size.

Dependent Variables – Components of ESG Ratings

The dependent variables including the environmental, social and governance (ESG) components of ESG ratings are defined by Aouadi and Marsat (2018).

- The environmental measure consists of three categories: emission reduction, product innovation, and resource reduction or energy conservation.
- The governance measure has five categories: board functions, board structure, compensation policy, shareholders policy, and vision and strategy.
- The social measure considers community, diversity, employment quality, health and safety, human rights, product responsibility, and training and development.

The final dependent variable is the total ESG score, which MSCI and Sustainalytics websites describe as an aggregation of the component scores.

Environmental Component

In the banking industry, there is a positive and significant relationship of banks' environmental performance with shareholder value creation (M. Miralles-Quirós, Miralles-Quirós, & Hernández, 2019). A study of six utilities and their approach toward 'green' stakeholders in the United Kingdom found that each company dealt with the stakeholders differently and that the companies did not have a standard approach (Harvey & Schaefer, 2001). This study found that stakeholders that were institutionally grounded, such as environmental regulators, were most influential. The next most influential group of stakeholders consisted of customers and the public, followed by economic stakeholders.

Morrison, Wilmshurst, and Shimeld (2018) looked at ways to improve reporting CSR and sustainability performance to stakeholder groups, focusing primarily on environmental information. They found that engagement between companies and stakeholders is lacking when it comes to reporting on sustainability issues. They identify the evolution of reporting over the last four decades, noting that much of the earlier reporting was driven by regulation, and they examine alternatives to improve engagement and accountability. These authors conclude that acknowledging that there is a gap between what companies report and what stakeholders want to know is a first step in reconciling differences.

Green and McCann (2011) address environmental sustainability in both the public and private sectors, noting there has been increased attention and concern toward environmental issues. The authors push an agrarian leadership philosophy and contend that leadership which emphasizes the environment and ecology should take a major role in decision-making and practices versus the profit maximization model generally used in business. In a similar vein, Caldwell and Karri (2005) present a stewardship model as ethically superior because it prioritizes societal obligations and the firm's duties toward all stakeholders.

Electric utilities will often take on socially responsible initiatives because they result in cost savings or other positive financial results, rather than for just building their image (Miras-Rodríguez, Carrasco-Gallego, & Escobar-Pérez, 2015). On the other hand, environmentally friendly behaviors in electrical companies are driven by the need to improve their image and help reverse their earlier negative impacts (Miras-Rodríguez et al., 2015).

Social Component

M. Miralles-Quirós, Miralles-Quirós, and Hernández (2019) studied the banking industry and observed that there exists a negative and significant correlation of banks' social performance

with shareholder value creation. They conclude that the relationship between ESG performance and banks' shareholder value creation is complex and needs more research.

Mahoney (2012) evaluated whether firms who report CSR activities are more socially responsible or if they are just attempting to convince stakeholders that they are. His study found a significant positive relationship in CSR ratings for firms that issue annual standalone CSR reports compared to firms that never issue these reports. His findings support the hypothesis that firms who issue standalone CSR reports do so as a signal of their greater commitment to social responsibility actions. He did not find a relationship between annual CSR reporting and profitability.

Buehler and Shetty (1976) examined four areas related to a corporation practicing socially responsible behavior. These include identifying the structural changes companies have made to integrate the social concern into the corporate operating mechanism; the nature and extent of corporate social action programs; the problems companies encounter in designing and implementing social action programs; and how size, industry, profitability, and ownership variables contribute to the difference in the way managers respond to social demands. Brooks (2005) also studied how CSR principles should be embedded across the organization, and not restricted to a specific organizational function.

Governance Component

Within the banking industry, there is a positive and significant relationship of banks' corporate governance performance with shareholder value creation (M. Miralles-Quirós, Miralles-Quirós, & Hernández, 2019). Morgan, Ryu, and Mirvis (2009) examined how companies are using their governance, structures, and systems to address corporate citizenship. Their study found that while Boards are making progress on this issue, citizenship is not yet

embedded into the operating systems or structures of many firms. Embedding a citizenship culture into an organization would add credibility to managers dealing with outside stakeholders and enforces the message that any relationship with outside parties must be governed and aligned with the overall goals of corporate leadership (Morgan et al., 2009).

Gaps in the Literature

The preponderance of the CSR/corporate performance research has been to link ESG ratings or CSR strategies to financial performance or firm financial valuation (Bento et al., 2017; Buller & McEvoy, 2016; Hahn & Figg, 2018; Hariyati & Tjahjadi, 2015; Lu et al., 2013; Michelon et al., 2013; Saxton et al., 2019). While there are studies that link ESG ratings to environmental performance (Hariyati & Tjahjadi, 2015; M. Miralles-Quirós et al., 2018), there is a lack of research linking a firm's ESG ratings to the level of regulatory oversight in the firm's sector.

The ethical lapses and apparent greenwashing strategies also call into question corporate commitment to operating in a manner consistent with their ESG ratings. As the BP disaster and Volkswagen scandal bring to light, legitimacy theory makes us question firm legitimacy when the firm does not perform in a manner expected based on its ESG ratings (Lai, Melloni, & Stacchezzini, 2016). While for many companies the intention may not be to mislead (Seele, 2017), third party evaluations are an effective way to validate a firm's claims and build consumer trust (Gosselt, 2019). The current study looks to determine if there are other structural reasons, such as heavy regulatory oversight, that also affect the ESG ratings companies receive.

Summary of Literature Review

CSR pertains, to some extent, to the expectations of the actors in the firm's social systems and as a result forces firms to acknowledge that they exist not just in a world of shareholders, but within larger networks of financial, political and social members, who each place demands on

the firm (Maon et al., 2010). Based on this stakeholder perspective, the firm is a collection of intersecting and competing interests, each with some value, and a place of facilitation where the competing interests of different stakeholders and society can interact. Firms in heavily regulated sectors are under pressure to increase their ESG ratings. Regulators may apply pressure on firms to utilize effective corporate governance structures (Becher & Frye, 2011). Rather than focus solely on the relation between ESG rankings and financial metrics, this study will seek to determine if there is a significant statistical difference in ESG ratings between firms in highly regulated sectors and firms in less regulated sectors.

Chapter 3 – Methodology

Introduction

The methodology chosen for this research will be quantitative, observational (non-experimental) and retrospective. Zyphur and Pierides (2017) see quantitative research as creating inferences that allow better descriptions of specific situations, which must actively connect research results to real-world situations. Onwuegbuzie and Leech (2005) identify objective quantitative research as falling along a continuum from exploratory to confirmatory. According to Onwuegbuzie and Leech, the objective is exploratory if the purpose of the research is to study patterns from the data that has been collected and then make statements about what the data show. For quantitative research, the objective is confirmatory if the goal is to use data to test hypotheses and make statements supporting or not supporting those hypotheses.

In the current study, the researcher will collect market capitalization financial metrics and ownership data for firms in four industry sectors from the financial service website Fidelity.com. ESG ratings will be collected from Fidelity.com and Yahoo Finance. The firms studied will include publicly traded companies that have a current ESG rating.

The author determined it would not be appropriate to use qualitative research for this study. Creswell (2014) categorizes qualitative theory as narrative research, phenomenology, grounded theory, ethnographies, and case studies, none of which apply to the current research questions. This research is using data from third party sources, not primary data, which also supports the quantitative methodology.

Two independent, quantitative assessments will be performed. First, multiple regression analyses will be conducted using the numeric (continuous) Sustainalytics ESG ratings as the dependent variables (total ESG, environmental, social, governance ratings) and regulation,

institutional ownership, total three-year return, and market capitalization as independent, or mediating variables. Next, a multiway frequency analysis (MFA) will be conducted using the categorical MSCI ESG ratings. MFA or an extension of it called log-linear analysis, is appropriate when determining the relationships among three or more discrete (categorical, qualitative) variables (Tabachnick & Fidell, 2019).

The Study Population

The study population consists of 471 publicly traded companies in four industry sectors having a market capitalization of at least $3.9 billion and having an MSCI ESG rating. A subset of these companies ($N = 313$) has ESG ratings by Sustainalytics. For the companies with Sustainalytics ratings, there are 140 highly regulated companies, 33 in the utility sector and 107 in the financial sector. There are 173 companies in the less regulated sectors, 83 the information technology sector and 90 in the consumer discretionary sector. Of the MSCI rated companies, there are 201 highly regulated companies, 64 in the utility sector and 137 in the financial sector. There are 270 companies in the less regulated sectors, 151 the information technology sector and 119 in the consumer discretionary sector. This study will compare the ESG ratings of highly regulated companies to less regulated companies. The study will compare these firms using the MSCI and Sustainalytics ratings independently.

Independent Variable and Mediating Variables

The primary independent variable in this study will be the level of regulatory oversight. Boo and Sharma (2008) found that financial institutions and utilities are subject to more regulatory oversight because of the role they play in the economy, specifically in economic development, stating that "the existence of monopoly power, externalities and informational asymmetries create a potentially constructive role for government regulation to reduce market failures and enhance social welfare" (p. 55). The financial sector includes highly regulated

depository institutions and less regulated financial intermediaries (insurance, securities brokers, and mortgage firms, for example), however, these financial intermediaries are still subject to greater regulations and restrictions than less regulated firms (Becher & Frye, 2011).

Regulatory oversight will be a binary value, "0" for firms that are not highly regulated (IT and Consumer Discretionary), and "1" for firms that are (Finance and Utilities). In the MFA these values will be depicted as either highly regulated or not highly regulated (recognizing that all publicly traded firms are subject to some level of regulation). In two studies involving corporate governance both Boo and Sharma (2008) and Coster, Dahl, and Jenson (2014) used regulated/non-regulated as an independent variable.

One mediating variable, institutional ownership, is the percent of each company's outstanding stock help by institutional firms (e.g. pension funds). Another mediating variable, market capitalization, is a measure of firm size in dollars. For the MFA, to operationalize this variable, the median value of the 471 firm's market capitalization was calculated and firms with a market capitalization greater than the median ($10 billion) are categorized as high market cap firms or large firms. Firms with $10 billion or less of market capitalization will be moderate market cap firms. The last mediating variable, total return, equals net income before taxes divided by total assets annualized over a three years.

Dependent Variables

The dependent variables will be the individual ESG component ratings (environmental, social, and governance), and the total ESG rating of each firm. To operationalize the variables, ratings from two ESG rating firms will be used, Sustainalytics and MSCI. Sustainalytics (sustainalytics.com), an independent ESG rating company based in Amsterdam, uses a numeric rating (0 to 100) for total ESG, environmental, social and governance ratings. Sustainalytics'

company-level ratings are used by Morningstar in its evaluation of the 20,000 funds they cover (Ojala, 2019).

MSCI provides a score for each ESG component, environment, social, and governance, in addition to a total score. The total ESG score is an aggregate of the three component scores. The MSCI rating components were identified earlier in Table 1 and show the areas evaluated by each component. Three rating tiers – Leading, Average, and Laggard are utilized by MSCI. The MSCI tiers are not divided into equal thirds. For example, a sampling of ESG ratings of 539 large and mid-cap firms resulted in 19 percent rated as "Laggards," 68 percent rated as "Average," and 13 percent rated as "Leading." Therefore, when aggregating data for a population, the "Average" ranking will be the dominant ranking. This is not a concern if there are at least five observations for each cell in the analysis (Tabachnick & Fidell, 2019). Including the individual component ratings and the total rating provided by MSCI allows for separately testing four dependent variables.

Hypotheses

Research Question 1. What is the relationship between a firm's total ESG rating and the level of regulation in the firm's industry sector?

$H1_0$: Firms in heavily regulated sectors will have total ESG ratings that are not statistically significantly different from firms in less regulated sectors.

H1a: There is a statistically significant difference in the total ESG ratings for firms in heavily regulated sectors than for firms in less regulated sectors.

Research Question 2: What is the relationship between a firm's component ESG rating and the level of regulation in the firm's industry sector?

$H2_0$: The ESG component ratings (environmental, social, and governance) for firms in heavily regulated sectors are not statistically significantly different from the ESG component ratings for firms in less regulated sectors.

H2a: There is a statistically significant difference in the ESG component ratings for firms in heavily regulated sectors than for firms in less regulated sectors.

Statistical Tests

Multiple Regression Analysis

The first statistical test will be a multiple regression analysis. According to Tabachnick and Fidell (2019), regression analyses can be used with either continuous or dichotomous independent variables. Discrete variables can be converted to dichotomous variables by dummy variable coding with 1s and 0s. Assumptions for linear regression include:

- Linear relationship - The linearity assumption can best be tested with scatter plots.
- Multivariate normality - Normality can be checked with a goodness of fit test, e.g., the Kolmogorov-Smirnov test, and with a histogram. Skewness and kurtosis will also be evaluated.
- No or little multi-collinearity – using a Correlation matrix (Pearson's Bivariate Correlation) among all independent variables the correlation coefficients need to be smaller than 1.
- No autocorrelation - A scatterplot or Durbin-Watson test may be used to check for autocorrelations.
- Homoscedasticity - The White Test can be used to test for heteroscedasticity.

Data that violate the assumptions above may be remedied through data transformations. A concern with data transformation, though, is that the analysis must be interpreted using the

transformed variables, which may be more difficult or harder to interpret (Tabachnick & Fidell, 2019).

The regression equation will take the following form:

$$Y^i = A + B_1(REG_i) + B_2(INST_i) + B_3(TOTRET_i) + B_4(SIZE_i)$$

Where Y^i is one of the predicted Sustainalytics ESG rating components, environmental, social, or governance, or the total ESG composite rating;

REG_i = 1 for highly regulated firms and 0 for firms that are not highly regulated;

$INST_i$ = percent of shares held by institutional investors as reported by Fidelity;

$TOTRET_i$ = Annualized three-year return) as reported by Fidelity; and

$SIZE_i$ = Market capitalization (or natural log of Market Capitalization).

According to Tabachnick and Fidell (2019), the best-fitting regression coefficients produce a prediction equation for which squared differences between Y (the actual ESG value) and Y' are minimized. This solution is called a least-squares solution.

To determine if the sample size being tested provides adequate power, a power analysis, using G*Power3 Version 3.1.9 software was conducted to determine the sample size for the study to have a power value of 0.95. The results of the protocol, which is included in Appendix C1, yielded a minimum sample size of 129, and an actual power = 0.9505747.

Multiway Frequency Analysis

Multiway frequency analysis (MFA), or an extension of it called log-linear analysis, is appropriate when determining the relationships among three or more discrete (categorical, qualitative) variables (Tabachnick & Fidell, 2019). Because one of the variables may be a dependent variable (DV) and the others are independent variables (IVs), multiway frequency analysis is like a nonparametric analysis of variance with multiple levels of discrete DV as well

as discrete IVs (Tabachnick & Fidell, 2019). To analyze categorical data, log-linear models offer statistical tools and a strong framework (Sloane & Morgan, 1996). MFA is an extension of the chi-square for goodness-of-fit technique, which produces a model of expected cell frequencies that best predicts the observed frequencies, using a conservative number of variables to do so (Even & Robinson, 2013). The current study uses the SAS CATMOD procedure.

For sample size, Tabachnick, and Fidell (2019) recommend that there should be at least five times the number of cases as there are cells. For this analysis, for each MSCI category (environment, social, governance, and total) there are three rating levels (laggard, average, leader), times two market cap measures (large, moderate) times two regulatory measures (highly regulated, not highly regulated) which equals (3 x 2 x 2) 12 cells, times five or (12 x 5) 60 cases needed. The subject population consists of 471 cases; therefore, the number of cases is adequate. The log-linear analysis may fail if there are too many cells with zero values. For this study, firms with no MSCI ratings were eliminated so there are no zero values. Only firms with an MSCI rating and market capitalization data were included.

To determine if the sample size being tested provides adequate power, a power analysis, using G*Power3 Version 3.1.9 software was conducted to determine the sample size for the study to have a power value of 0.80. In a method described by Pancholi, Dunne, and Armstrong (2009) the protocol (see Appendix C2) yielded a sample size of 336 and actual power = 0.8013764:

Figure 1 is a graphic representation of how the study variables will be aggregated for MFA testing the relationship between highly regulated (HR) and not highly regulated (NR) sectors' total ESG rating for similarly sized firms.

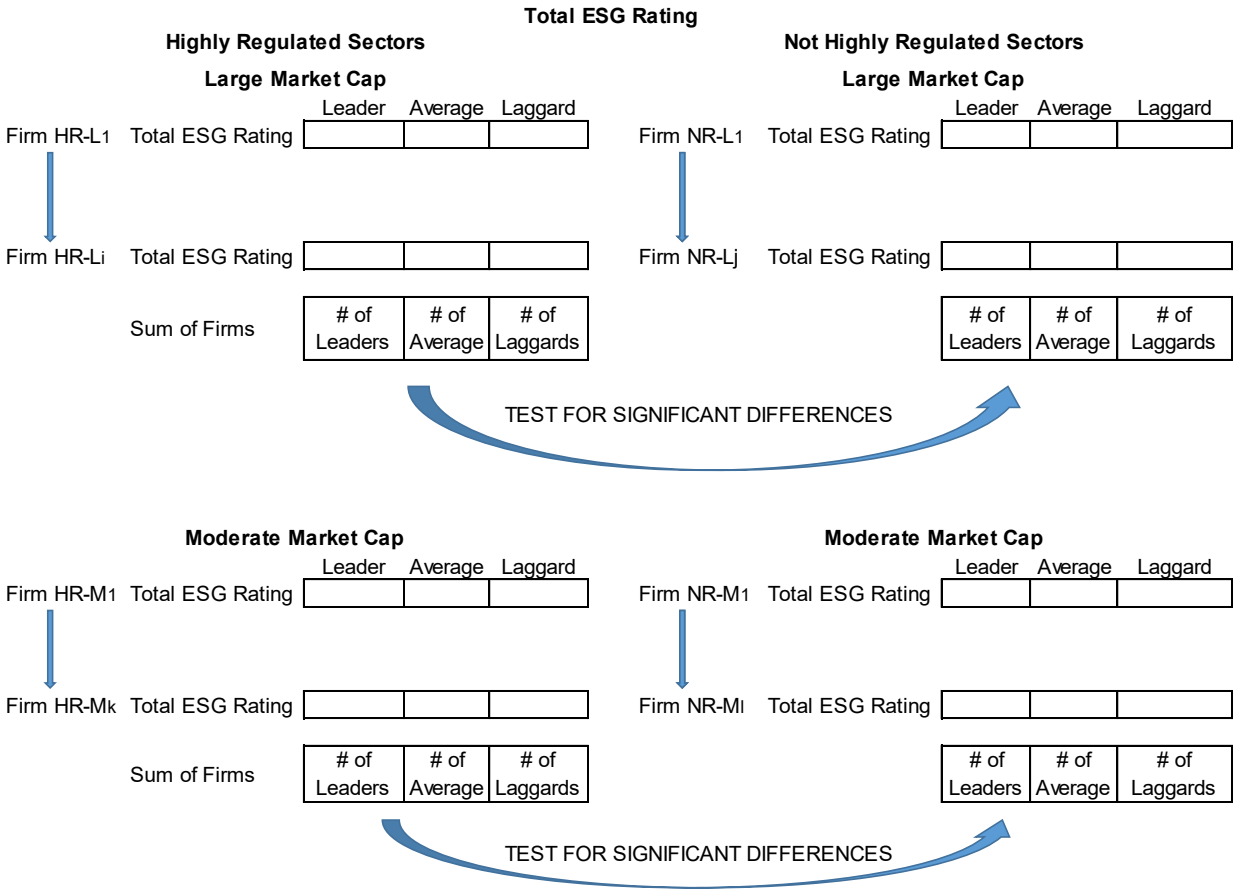

Figure 1: Relationship Among Variables to be Tested

Table 5 presents a frequency table for the multi-frequency analysis for the Total ESG rating:

Table 5: Data for Four Industry Sectors Versus Overall MSCI Rating

		Overall MSCI Rating				
Regulation	**Size**	Laggard	Average	Leader	Total	
High	Large	14	69	17	100	
	Mid	27	70	4	101	
	Total	**41**	**139**	**21**	**201**	43%
Not High	Large	19	90	26	135	
	Mid	25	95	15	135	
	Total	**44**	**185**	**41**	**270**	57%
Grand Total		**85**	**324**	**62**	**471**	
		18%	69%	13%		

Validity and Reliability Issues

This study will measure existing ratings and financial statistics for four sectors from publicly available sources. While the metrics are quantitative, and the ESG ratings are developed by well-respected third-party services, there is no method to validate the accuracy of the rating data. Descriptive statistics will be calculated for each variable and outliers will be examined in assessing the variable normality. MFA is a nonparametric statistical procedure with certain assumptions that will be considered before performing the statistical procedures. MFA assumes the independence of variables that will be tested using a correlation matrix. MFA's adequacy of sample size, which is at least five times the number of cases as cells in your design, was calculated. MFA assumes certain cell frequency conditions such as all cells having frequencies that are greater than one, and that no more than 20% are less than five. MFA assumes the absence of outliers (Even & Robinson, 2013). Tabachnick and Fidell (2019) explain that even with the best-fitting models there may be large differences between observed and expected frequencies, causing the researcher to delete or collapse the level of variables.

This analysis also uses a standard multiple linear regression analysis technique. According to Tabachnick and Fidell (2019), standard multiple regression is atheoretical, while the reasons for using other regression techniques, such as sequential regression, are theoretical or for testing explicit hypotheses. This research is empirical, therefore multiple regression is acceptable.

Because two independent statistical evaluations are being performed, one evaluation may result in rejecting the null hypothesis in one case but accepting it in the other case. Also, hypothesis $H2_0$ states that there is no significant statistical relationship between regulation and the ESG component ratings, however, a significant statistical relationship may exist for certain

ESG components but not others. If either of these results occurs, then the hypothesis will be "partially rejected."

Data Collection Process

The observational and retrospective data will be collected from Fidelity.com by specifying the sector and market capitalization criteria. Firm-level data will be aggregated by industry sector and again by regulatory oversight level. Fidelity provided the author with a letter stating that the Fidelity.com data is available to the public and there are no restrictions in using the data for this academic purpose. Sustainalytics data is also available to the public on the Yahoo Finance website.

Study Relevance and Potential Outcomes

This study adds to the literature by expanding the scope of studies concerning factors related to ESG ratings beyond financial performance measures to include regulatory oversight. The results of this study may determine if firm ESG ratings are correlated with the level of regulatory oversight in their industry sector. It may provide company stakeholders and regulators with information regarding how much emphasis they should place on reported ESG ratings. Additionally, it will attempt to determine if specific ESG measures are more aligned with regulatory oversight. The study results may be applied to other sectors that are being measured on ESG performance.

Conclusion

There are multiple motivations for a company to report its ESG and sustainability performance. The firm's investment and performance in ESG measures and sustainability may be ethically commendable, but shareholder and executive expectations ESG ratings portray is a complex issue that is being addressed from a variety of management theory approaches. These expectations may range from legitimately wanting to improve society and share the company's

story with all outside stakeholders, to just providing the appearance of caring about groups of stakeholders or the environment without taking serious actions to improve performance in these areas. This study adds to the literature by expanding the scope of previous ESG studies beyond financial performance measures to include the impact regulatory oversight may have on ESG ratings. The next chapter will address the data analysis in detail and discusses the results applying to each of the research questions previously presented.

Chapter 4 – Results

Introduction to the Analysis Results

This study uses data collected from publicly traded companies from two public sources, Fidelity.com and Yahoo Finance. This quantitative, empirical study examined the relationship between the independent variable of regulation with the dependent variables of ESG ratings, using the mediating variables of market capitalization, return on assets, and institutional ownership. The dependent variables included total ESG rating, and ratings for components of ESG, which are environmental, social, and governance. The mediating variables are consistent with those identified in the literature review, specifically in studies that examined the relationship of various financial measures to corporate social responsibility (Bento et al., 2017; Buller & McEvoy, 2016; Hahn & Figg, 2018; Hariyati & Tjahjadi, 2015; Lu et al., 2013; Michelon et al., 2013; Saxton et al., 2019). Boo and Sharma (2008) examined the link between regulation and governance. The regulated sectors, Utilities and Financials, were selected based on the research described earlier (Boo & Sharma, 2008; Coster, Dahl, & Jenson, 2014).

ESG rating data from the rating firm Sustainalytics was sourced from the Yahoo Finance website by entering in each firm's stock symbol and viewing the "Sustainability" tab. The Sustainalytics ratings are numeric (continuous) and range from 0 to 100 for each ESG measure. The MSCI ESG ratings collected from Fidelity.com consisted of categorical rankings. The nature of these dependent variables allowed for two independent analysis techniques, multiple regression and multiway frequency analysis (MFA).

A multiple regression analysis (MRA) determined the significance and nature of the independent variables on the dependent variable. The primary independent variable of interest is a categorical measure indicating whether a firm is in a heavily regulated sector or a less regulated

sector. The mediating variables were all included in the regression analysis. The dependent variables include continuous ratings of the ESG components and a total ESG rating from the rating service Sustainalytics.

The second analysis performed, MFA, used categorical ESG ratings from MSCI. The analysis examined the MSCI ratings relative to variables of market capitalization and regulation. The outcomes of both analyses informed the responses to the following two research questions:

1. *What is the relationship between a firm's total ESG ratings and the level of regulation in the firm's industry sectors?*
2. *What is the relationship between a firm's component ESG ratings and the level of regulation in the firm's industry sectors?*

Summary of Findings

This study examines the relationship between ESG ratings and regulatory oversight. The purpose of the study was to determine if firms in heavily regulated sectors have statistically significantly different ESG ratings than firms in less regulated sectors. Because two independent analyses were conducted using different analytical techniques and different sources of ESG ratings it is possible that under one analytical technique the null hypothesis is rejected, but under the alternate technique, it is not. It is also possible, for the second research question, that the null hypothesis for one component of the ESG rating is rejected, but not for other ESG rating components. Either of these outcomes will result in a partial rejection of the corresponding null hypothesis.

Findings

The study includes two research questions each with a null and alternative hypothesis addressing the research question. The null hypothesis states there is no difference in ESG ratings

between firms in heavily regulated sectors and firms in less regulated sectors. The study results are provided below with the critical values in Table 6.

Research Question 1. What is the relationship between a firm's total ESG ratings and the level of regulation in the firm's industry sectors?

- Findings: Accept $H1_0$:
  - Firms in heavily regulated sectors will have total ESG ratings that are not statistically significantly different from firms in less regulated sectors.

Research Question 2. What is the relationship between a firm's component ESG ratings and the level of regulation in the firm's industry sectors?

- Findings: Partially Reject $H2_0$:
  - The environmental and governance component ratings for firms in heavily regulated sectors are statistically significantly different from the environmental and governance component ratings for firms in less regulated sectors.
  - The social component rating for firms in heavily regulated sectors is not statistically significantly different from the social component ratings for firms in less regulated sectors for one of the tests performed.

Table 6: Null Hypothesis Summary of Results

	Reject Null Hypotheses		
	MRA	MFA	Models Agree?
Total ESG	No	No	Yes
p-value	0.155	0.2149	
Environmental	Yes	Yes	Yes
p-value	<.0001	<.0001	
Social	Yes	No	No
p-value	0.0001	0.1171	
Governance	Yes	Yes	Yes
p-value	0.0039	0.0034	

The data collection, screening, and analysis that was performed to arrive at these findings will be discussed in the following sections.

Data Description and Screening

The initial selection of firms used the Fidelity.com Stock Screener tool, which allowed for the selection of firms from specific market sectors screened for firm size. Data was collected on firms in the four industry sectors, Consumer Discretionary, Information Technology, Utilities, and Financials. In addition to total and component MSCI score data, other data retrieved from Fidelity.com included total three-year return (annualized), market capitalization, and institutional ownership. The screening criteria excluded securities that were not classified as "stock" and excluded small and micro-cap companies (firms with a market capitalization below $3.9 billion). Not all companies had an MSCI or Sustainalytics ESG ratings. Table 7 summarizes the total number of firms in each sector and the number of firms with either a Sustainalytics or MSCI rating.

Table 7: Study Population and Number of Firms by Sector with ESG Ratings

Sector	Total Firms	With MSCI	% with MSCI	With Sustainalytics	% with Sustainalytics
Consumer Discretionary	127	119	94%	83	65%
Information Technology	180	151	84%	90	50%
Utilities	69	64	93%	33	48%
Financials	154	137	89%	107	69%
Total	530	471	89%	313	59%

Table 8 displays the number of firms by subsector with Sustainalytics and MSCI ratings. Note that in the unregulated sector the largest subsectors are IT services, Software, Semiconductors, Hotels, Restaurants and Leisure, and Specialty Retail. In the regulated sector, the largest subsectors are Insurance, Banks, Capital Markets and Utilities.

Table 8: Number of Firms Rated by Sustainalytics and MSCI, by Sector and Sub-sector

UNREGULATED (*N* = 307)

Firms w/Sustainalytics* Rating: 173, w/MSCI** Rating: 270, w/o Ratings: 38

	No. of Firms Rated By: Sustainalytics	MSCI
Consumer Discretionary (*N* = 127)	**83**	**119**
Hotels, Restaurants & Leisure	18	28
Specialty Retail	16	24
Household Durables	10	12
Textiles, Apparel & Luxury Goods	10	15
Automobiles	7	5
Multiline Retail	6	7
Auto Components	6	6
Internet & Direct Marketing Retail	4	8
Leisure Products	3	5
Distributors	2	3
Diversified Consumer Services	1	6
Information Technologies (*N* = 180)	**90**	**151**
IT Services	26	37
Software	21	45
Semiconductors & Semiconductor Equip.	19	30
Electr. Equip., Instruments & Components	9	19
Tech Hardware, Storage & Peripherals	9	10
Communications Equipment	6	10

REGULATED (*N* = 223)

Firms w/Sustainalytics* Rating: 140, w/MSCI** Rating: 201, w/o Ratings: 21

	No. of Firms Rated By: Sustainalytics	MSCI
Utilities (*N* = 69)	**33**	**64**
Electric Utilities	16	25
Multi-Utilities	11	16
Gas Utilities	2	10
Ind. Power and Renewable Elec. Producers	2	7
Water Utilities	2	6
Financials (*N* = 154)	**107**	**137**
Insurance	36	45
Banks	31	48
Capital Markets	29	29
Consumer Finance	5	7
Diversified Financial Services	3	3
Thrifts & Mortgage Finance	3	5

*Sustainalytics ratings were found on Yahoo Finance

**MSCI ratings were found on Fidelity.com

For the MFA (categorical analyses), the dependent variables were the MSCI ESG ratings, as summarized in Table 9. The means and standard deviations were calculated by assigning the ESG ratings with numerical values, Laggard = 1, Average = 2, and Leader = 3. For the population, the lowest scores were for social (MSCIsoc, $M = 1.77$) and the highest scores were for governance (MSCIgov, $M = 2.26$).

Table 9: Descriptive Statistics for Multiway Frequency Analysis

MSCI Variables (n = 471)				Categorized as:		
Variable	SAS Descriptor	*Mean*	*SD*	Laggard	Average	Leader
Total ESG Rating	TotMSCI	1.95	0.56	85	324	62
Environmental Rating	MSCIenv	2.00	0.67	105	263	103
Social Rating	MSCIsoc	1.77	0.51	90	364	17
Governance Rating	MSCIgov	2.26	0.50	9	360	102

		Mean	*SD*	Non Reg	Reg
Regulation	regnoreg	0.43	0.50	270	201
				Medium	Large
Market Capitalization	Size	1.50	0.50	236	235

Testing Assumptions and Descriptive Statistics – Multiple Regression Analysis

Once the data was collected, the variables were evaluated to determine if there was any violation of the assumptions used in conducting a regression analysis. This includes assumptions of multi-collinearity, presence of outliers, normality, homoscedasticity, and independence of residuals. Distribution plots, box plots, and probability plots indicated outliers in the continuous variables and violation of normality (high skewness and kurtosis values) for institutional ownership and market capitalization. These variables were transformed as suggested by Tabachnick and Fidell (2019), using the log of market capitalization and the square root of a constant minus the percentage of institutional ownership. Outliers were then identified, and 28 records (8.9% of the total Sustainalytics rated firm population) were eliminated, including 11 regulated companies (7.9% of the regulated population), and 17 unregulated companies (9.8% of the unregulated population). The resulting descriptive statistics for the variables used in the regression analysis (N = 285) are presented in Table 10. Note that the skewness and kurtosis measures are within +/- 1, which is well within the acceptable limits.

Table 10: Descriptive Statistics for Multiple Regression

Variable	SAS Descriptor	Mean	Median	SD	Kurtosis	Skewness	Min	Max
Total ESG Rating	SustTot	59.38	58.00	9.60	(0.59)	0.43	43.00	87.00
Environmental Rating	SustEnv	56.91	55.00	15.04	(0.66)	0.35	31.00	96.00
Social Rating	SustSoc	60.08	59.00	10.28	(0.38)	0.30	38.00	89.00
Governance Rating	SustGov	62.47	62.00	9.00	(0.65)	0.04	41.00	87.00
Total Annualized 3 Year Return	TotRet3yr	13.75	13.77	11.78	(0.17)	0.21	(12.22)	46.32
Institutional Ownership	InsOwnSR	4.20	4.12	1.54	(0.20)	0.27	0.32	8.02
Market Capitalization	LOGMKTCAP	1.32	1.27	0.40	(0.41)	0.48	0.60	2.40

In addition to the continuous variables, the categorical variable for regulation (M = .45), had 129 of the 285 firms coded as "1" (Regulated).

Multicollinearity. In a regression analysis, multicollinearity exists when two or more independent variables are highly correlated. This condition can be tested by constructing a correlation matrix as shown in Table 11. Al1 the correlations of the final transformed dataset variables are within an acceptable range (e.g., < .5).

Table 11: Test for Multi-Collinearity

Pearson Correlation Coefficients, N = 285 Prob > |r| under H0: Rho=0			
	LOGMKTCAP	TotRet3yr	InsOwnSR
LOGMKTCAP	1.00000	0.40531	0.29259
LOGMKTCAP		<.0001	<.0001
TotRet3yr	0.40531	1.00000	-0.02332
TotRet3yr	<.0001		0.6951
InsOwnSR	0.29259	-0.02332	1.00000
InsOwnSR	<.0001	0.6951	

Distribution plots, box plots, and probability plots indicate few outliers in each of the final dataset variables. In the probability plots found in Appendix A, Figures A1 through A3, the points tend to form a reasonably straight-line diagonal from the lower left to the top right. This feature, in addition to the histograms (Figures A5 through A8), provide the support that there was

no violation of assumptions of normality, linearity, and homoscedasticity. The absence of clear or systematic patterns in the scatter plots or the plots of the standardized residuals (Figure A4 and Figure A8, respectively) also supported the assumptions of normality, linearity, homoscedasticity, and independence of residuals.

Multiple Regression Analysis Results

The multiple regression analysis (MRA) summary tables for each of the dependent variables include the standardized regression equation coefficients for the relationships between (natural log) market capitalization, total three-year return, institutional ownership, regulation and ESG measures. The *B* coefficients, denoted as the SAS output tables as "Estimate", indicate the expected change in the dependent variable for a one-unit change in the independent variable. Keeping in mind the challenge of interpreting transformed data (Tabachnick & Fidell, 2019), the coefficient attributed to market capitalization represents a one-unit change in the Log of market capitalization, and the coefficient attributed to institutional ownership represents the square root of (100 – percent institutional ownership). Therefore, a positive coefficient for market capitalization represents changes to the dependent variable as market capitalization grows, however, the change is not linear to market capitalization. Conversely, a negative coefficient for institutional ownership represents an increase in the dependent variable as institutional ownership increases.

This analysis uses MRA with $\alpha = .05$ (two-tailed), to determine the statistical significance of the relationship between the independent variables and ESG ratings. The primary theme of the research was to determine if firms in highly regulated sectors had statistically significant ESG ratings than firms in less regulated sectors. The first research question was concerned with the total, or composite, ESG rating.

Accept or Reject Hypothesis H1

The following two hypotheses were derived from the first research question, $H1_0$ is the Null Hypothesis, $H1_a$ is the Alternative Hypothesis:

$H1_0$: Firms in heavily regulated sectors will have total ESG ratings that are not statistically significantly different from firms in less regulated sectors.

H1a: There is a statistically significant difference in the total ESG ratings for firms in heavily regulated sectors than for firms in less regulated sectors.

Total ESG Rating MRA Results. The model was adequate to significantly predict total ESG scores as shown in Table 12, F (4, 280) = 16.31, $p < .0001$, R^2 =.19. The R^2 (.19) value indicated that the linear combination of the independent/mediating variables explained approximately 19% of the variations in Total ESG ratings.

Table 12: Total ESG Model

ModelSource	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	4	4942.38095	1235.59524	16.31	<.0001
Error	280	21208.44712	75.74445		
Corrected Total	284	26150.82807			

R-Square	Coeff Var	Root MSE	SustTot Mean
0.188995	14.65779	8.703129	59.37544

The variables market capitalization (B = 9.754, t = 6.59, p<.0001), total three-year return (B = -.0987, t = -2.00, p = .0464), and institutional ownership (B = .7998, t = 2.19, p = .0290) were statistically significant to explain the variation in ESG rating. Regulation (B = 1.542, t = 1.43, p =.1550) was not statistically significant in explaining total ESG rating.

Total ESG (MRA): Fail to Reject $H1_0$. For H1, the null hypothesis $H1_0$ cannot be rejected. There is no statistically significant relationship between regulation and the total ESG ratings.

Accept or Reject Hypothesis $H2_0$

The second research question was concerned with the components of ESG ratings, environmental, social, and governance. The following two hypotheses were derived from the second research question:

$H2_0$: The ESG component ratings (environmental, social, and governance) for firms in heavily regulated sectors are not statistically significantly different from the ESG component ratings for firms in less regulated sectors.

H2a: There is a statistically significant difference in the ESG component ratings for firms in heavily regulated sectors than for firms in less regulated sectors.

The results for each ESG component will be presented separately.

Environmental MRA. The model was adequate to significantly predict the environmental component of the ESG rating, F (4, 280) = 29.40, $p < .0001$, R^2 =.296 (See Table 13). The R^2 (.296) value indicated that the linear combination of the variables explained approximately 29.6% of the variations in environmental ESG ratings, which is higher than was explained in the total ESG ratings.

Table 13: Environmental Model

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	4	19007.93167	4751.98292	29.40	<.0001
Error	280	45252.51044	161.61611		
Corrected Total	284	64260.44211			

R-Square	Coeff Var	Root MSE	SustEnv Mean
0.295795	22.34035	12.71283	56.90526

The variables market capitalization *(B* = 19.42, *t* = 8.98, *p* < .0001), total three-year return (*B* = -.2096, *t* = -2.91, *p* = .0039), and regulation *(B* = 7.201, *t* = 4.56, *p* < .0001), were statistically significant to explain the variation in the environmental component of the ESG rating. The variable institutional ownership (*B* = .8240, *t* = 1.55, *p* = .1228) was not statistically significant.

Environmental Component (MRA): Reject H2$_0$. For the environmental component of H2, based on the statistical significance of regulation, the null hypothesis may be rejected for the environmental ESG rating.

Social MRA. The model, as shown in Table 14, was adequate to significantly predict the social component of the ESG rating, *F* (4, 280) = 12.99, *p* < .0001, R^2 =.156. The R^2 (.156) value indicated that the linear combination of the independent/mediating variables explained approximately 16% of the variations in social ESG ratings.

Table 14: Social Model

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	4	4694.92135	1173.73034	12.99	<.0001
Error	280	25296.22251	90.34365		
Corrected Total	284	29991.14386			

R-Square	Coeff Var	Root MSE	SustSoc Mean
0.156544	15.82027	9.504928	60.08070

The variables market capitalization *(B* = 6.861, *t* = 4.24, *p* < .0001), and regulation *(B* = -4.602, *t* = -3.90, *p* = .0001), were statistically significant to explain the variation in the environmental component of the ESG rating. The negative coefficient for regulation indicates that regulated companies have lower environmental ratings than unregulated companies do. The variables total three-year return (*B* = -.0739, *t* = -1.42, *p* =.1573), and institutional ownership (*B* = .6905, *t* = 1.73, *p* =.0839) were not statistically significant.

Social Component (MRA): Reject H2$_0$. For the social component of H2, based on the statistical significance of Regulation, the null hypothesis may be rejected for the social ESG rating.

Governance MRA. The model, as shown in Table 15, was adequate to significantly predict the governance component of the ESG rating at α = .05, but not at α = .01, with *F* (4, 280) = 3.18, *p* =.0140, R^2 =.0435. The low R^2 (.0435) value indicated that the linear combination of the independent/mediating variables explained only 4% of the variations in governance ESG ratings. This is the lowest R^2 value of all the ESG models.

Table 15: Governance Model

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	4	1001.52505	250.38126	3.18	0.0140
Error	280	22027.52758	78.66974		
Corrected Total	284	23029.05263			

R-Square	Coeff Var	Root MSE	SustGov Mean
0.043490	14.19733	8.869596	62.47368

The variable regulation *(B* = 3.206, *t* = 2.91, *p* =.0039), was statistically significant to explain the variation in the governance component of the ESG rating. The variables market capitalization *(B* = 1.988, *t* = 1.32, *p* = .6440), total three-year return (*B* = -.0233, *t* = -.46, *p* = .6440), and institutional ownership (*B* = .5869, *t* = 1.58, *p* = .1152) were not statistically significant.

- For the governance component of H2, based on the statistical significance of regulation, the null hypothesis may be rejected for the governance ESG rating.

Governance Component (MRA): Reject $H2_0$. For H2, the null hypothesis was rejected for all the sub-components of the ESG ratings, therefore, for the multiple regression analysis, the null hypothesis $H2_0$ is rejected. There is a statistically significant relationship between regulation and the sub-components of the ESG ratings.

Multiway Frequency Analysis Results

The MFA for each of the dependent variables include the maximum likelihood analysis of variance and the analysis of maximum likelihood estimates which provide a chi-squared statistic, the *p*-value for the intercept, and the *p*-value for each of the two independent categorical

variables, market capitalization (Size) and level of regulation (regnonreg). The *p*-value determines if the null hypothesis, that a variable's regression coefficient is zero, can be rejected, assuming the rest of the variables are in the model. If the p-value is less than $\alpha = .05$, then the null hypothesis can be rejected, and the parameter estimate is statistically significant at that alpha level.

This analysis used a multi-frequency analysis (SAS CATMOD) with $\alpha = .05$ (two-tailed), to determine the statistical significance of the relationship between the independent variables and ESG ratings. In the categorical analysis, observations are assigned to categories, therefore outliers and normality issues are not a concern.

As in the regression analysis, the first research question was concerned with the total, or composite, ESG rating.

Accept or Reject Hypothesis $H1_0$

The following two hypotheses were derived from the first research question. $H1_0$ is the Null Hypothesis, $H1_a$ is the Alternative Hypothesis:

$H1_0$: Firms in heavily regulated sectors will have total ESG ratings that are not statistically significantly different from firms in less regulated sectors.

H1a: There is a statistically significant difference in the total ESG ratings for firms in heavily regulated sectors than for firms in less regulated sectors.

Total ESG Rating MFA. For total ESG ratings, the results are shown in Table 16. From this ANOVA table, there is evidence for a firm size effect ($DF = 2$, $X^2 = 13.11$, $p = .0014$), but no evidence for a regulation effect ($DF = 2$, $X^2 = 3.08$, $p = .2149$). The Likelihood Ratio indicates whether the interaction of the variables improves the model. In this case, the model fits very

well, meaning that there is no evidence of an interaction between firm size and regulation on Total ESG ratings.

Table 16: ANOVA Total ESG

Maximum Likelihood Analysis of Variance			
Source	**DF**	**Chi-Square**	**Pr > ChiSq**
regnoreg	2	3.08	0.2149
Size	2	13.11	0.0014
Likelihood Ratio	2	2.81	0.2449

Total ESG MFA: Fail to Reject $H1_0$. For H1, the null hypothesis $H1_0$ cannot be rejected. There is no statistically significant relationship between regulation and the total ESG ratings.

Accept or Reject Hypothesis $H2_0$

The second research question was concerned with the components of ESG ratings, environmental, social, and governance. The following two hypotheses were derived from the second research question:

$H2_0$: The ESG component ratings (environmental, social, and governance) for firms in heavily regulated sectors are not statistically significantly different from the ESG component ratings for firms in less regulated sectors.

H2a: There is a statistically significant difference in the ESG component ratings for firms in heavily regulated sectors than for firms in less regulated sectors.

The results for each ESG component will be presented separately. In summary, based on the results of the MFA for each component of the ESG ratings, the finding related to H2 is:

- For $H2_0$, based on the statistical insignificance of regulation related to the social component of the ESG ratings, and the statistical significance of regulation related to the environmental and governance components of the ESG ratings, the null hypothesis is partially rejected.

Environmental MFA. The results for the environmental ESG component are shown in Table 17. From this ANOVA table, there is evidence for a firm size effect (DF = 2, X^2 = 20.37, p < .0001), and a regulation effect (DF = 2, X^2 = 26.37, p < .0001). The Likelihood Ratio indicates that the interaction of the variables improves the model.

Table 17: ANOVA Environmental

Maximum Likelihood Analysis of Variance			
Source	**DF**	**Chi-Square**	**Pr > ChiSq**
regnoreg	2	26.37	<.0001
Size	2	20.37	<.0001
Likelihood Ratio	2	8.04	0.0179

Environmental Component (MFA): Reject $H2_0$. Based on the statistical significance of regulation, the null hypothesis $H2_0$ can be rejected for the environmental component of the ESG rating.

Social MFA. The results for the social ESG component are shown in Table 18. From this ANOVA table, there is no evidence for a firm size effect firm size (DF = 2, X^2 = 1.14, p = .5668), or a regulation effect (DF = 2, X^2 = 4.29, p = .1171). The Likelihood Ratio indicates that the interaction of the variables improves the model.

Table 18: ANOVA Social

Maximum Likelihood Analysis of Variance			
Source	**DF**	**Chi-Square**	**Pr > ChiSq**
regnoreg	2	4.29	0.1171
Size	2	1.14	0.5668
Likelihood Ratio	2	7.37	0.0251

Social Component (MFA): Accept $H2_0$. Based on the statistical insignificance of regulation, the null hypothesis $H2_0$ cannot be rejected for the social component of the ESG rating.

Governance MFA. The results for the governance ESG component are shown in Table 19. From this ANOVA table, there is no evidence for a firm size effect firm size (DF = 2, X^2 = 1.39, p = .4992), but there is evidence for a regulation effect (DF = 2, X^2 = 11.38, p = .0034). The Likelihood Ratio indicates that the interaction of the variables improves the model.

Table 19: ANOVA Governance

Maximum Likelihood Analysis of Variance			
Source	**DF**	**Chi-Square**	**Pr > ChiSq**
regnoreg	2	11.38	0.0034
Size	2	1.39	0.4992
Likelihood Ratio	2	7.80	0.0203

Governance Component (MFA): Reject $H2_0$. Based on the statistical significance of regulation, the null hypothesis $H2_0$ can be rejected for the governance component of the ESG rating.

For H2, the null hypothesis was rejected for two of the three sub-components of the ESG ratings, therefore, for the multi-frequency analysis, the null hypothesis is partially rejected. There is a statistically significant relationship between a firm's level of regulation and the environmental and governance sub-components of the ESG ratings.

Summary of Analysis Results

The results of these analyses, detailed below, are that $H1_0$ is accepted (cannot be rejected), and $H2_0$ is partially rejected:

- Accept $H1_0$: Firms in heavily regulated sectors will have total ESG ratings that are not statistically significantly different from firms in less regulated sectors.
- Partially reject $H2_0$: The ESG component ratings (environmental, social, and governance) for firms in heavily regulated sectors are partially statistically significantly different from the ESG component ratings for firms in less regulated sectors. Specifically:
    - $H2_0$ is rejected for environmental and governance ratings. Firms in heavily regulated sectors will have environmental and governance ratings that are statistically significantly different from firms in less regulated sectors.
    - $H2_0$ is partially rejected for social ratings,
        - firms in heavily regulated sectors will have social responsibility ratings from MSCI that are not statistically significantly different from firms in less regulated sectors,

- firms in heavily regulated sectors will have social responsibility ratings from Sustainalytics that are statistically significantly different from firms in less regulated sectors.

Table 20 provides a recap of the results of both the MRA (multiple regression analysis), and the MFA, (multiway factor analysis) for the null hypothesis $H1_0$ and $H2_0$.

Table 20: Results Summary for MRA and MFA

Reject Null Hypotheses

		MRA	MFA	Models Agree?
H1	**Total ESG**	No	No	Yes
	p-value	0.155	0.2149	
H2	**Environmental**	Yes	Yes	Yes
	p-value	<.0001	<.0001	
	Social	Yes	No	No
	p-value	0.0001	0.1171	
	Governance	Yes	Yes	Yes
	p-value	0.0039	0.0034	

Except for the social component of the ESG ratings, conclusions regarding the null hypotheses are consistent between the MRA, which is based on Sustainalytics ESG ratings, and the MFA, which uses the MSCI ratings. A review of the descriptive statistics reveals that the social rating has the second-highest mean rating using the Sustainalytics data, but has the lowest mean rating based on MSCI data. This is likely due to differences in how the independent rating services score companies or weigh the components that make up the social performance rating. As will be further discussed in Chapter 5, both highly regulated and less regulated companies are subject to similar stakeholder influence relative to social rating measures, so the presence of stricter regulation may not drive a difference in social scores. Due to the mixed results of the two analyses, the null hypothesis related to the social rating is partially rejected.

Table 21 summarizes the MRA results for each variable showing the coefficient estimates and t-values. Note that the institutional ownership variable is only significant for the total ESG rating, but not for any of the ESG component ratings. The SAS results for the MRA are included in Appendix B.

Table 21: Summary of Multiple Regression Analysis Results

	Estimate	t-Value		Estimate	t-Value
Total ESG Rating			**Social Rating**		
Intercept	43.608	20.05 **	Intercept	51.662	21.75 **
LOGMKTCAP	9.754	6.59 **	LOGMKTCAP	6.861	4.24 **
TotRet3yr	(0.099)	(2.00) *	TotRet3yr	(0.076)	-1.42
InsOwnSR	0.800	2.19 *	InsOwnSR	0.691	1.73
regnoreg 0	1.542	1.43	regnoreg 0	(4.602)	-3.9 **
Environmental Rating			**Governance Rating**		
Intercept	26.658	8.39 **	Intercept	55.941	25.24 **
LOGMKTCAP	19.419	8.98 **	LOGMKTCAP	1.988	1.32
TotRet3yr	(0.210)	-2.91 **	TotRet3yr	(0.023)	-0.46
InsOwnSR	0.824	1.55	InsOwnSR	0.587	1.58
regnoreg 0	7.201	4.56 **	regnoreg 0	3.206	2.91 **

Note: * indicates significance at .05 level, ** indicates significance at .01 level.

The MFA analysis results summarized in Table 22, show neither firm size nor regulation has an impact on the Social rating, whereas both firm size and regulation are significant for the environmental rating. Regulation is the only significant variable for the governance rating. Of the component ESG models, the explanatory power of the regression, or R^2, was highest for the environmental model (R^2 = .296), lower for the Social model (R^2 = .156), and lowest for Governance (R^2 = .044). These R^2 values are considered weak (environmental) and very weak (social and governance). The MFA corroborates the results for the environmental and governance models regarding regulation, which provides some additional credence to the relationship.

Table 22: MFA Analysis Results.

Total ESG Rating	Chi-Square
Intercept	214.73 **
regnoreg	3.08
Size	13.11 **
Likelihood Ratio	2.81

Social Rating	Chi-Square
Intercept	192.11 **
regnoreg	4.29
Size	1.14
Likelihood Ratio	7.37 *

Environmental Rating	Chi-Square
Intercept	87.1 **
regnoreg	26.37 **
Size	20.37 **
Likelihood Ratio	8.04 *

Governance Rating	Chi-Square
Intercept	152.22 **
regnoreg	11.38 **
Size	1.39
Likelihood Ratio	7.8 *

Note: * indicates significance at .05 level, ** indicates significance at .01 level.

Conclusion

This analysis is unique from other research on ESG ratings in that it uses ratings from two independent rating services – MSCI and Sustainalytics, and tests for statistical significance using two different methods – MRA and MFA.

As stated in the literature review (Chapter 2), much of the research to-date in this subject has been to link ESG ratings or CSR strategies to financial performance or firm financial valuation (Bento et al., 2017; Buller & McEvoy, 2016; Hahn & Figg, 2018; Hariyati & Tjahjadi, 2015; Lu et al., 2013; Michelon et al., 2013; Saxton et al., 2019). The literature review found there is little research linking firm ESG ratings to the regulatory oversight the firm experiences. The results of this study bolster the conclusion of Miralles-Quirós, et al., (2019), that the relationship between ESG performance and shareholder value creation is complex and needs more research. This study does partially support earlier studies that there is a relationship between profitability, or company performance, and CSR (Dalal & Thaker, 2019; Lee et al., 2018; Mikołajek-Gocejna, 2016). Implications of this data analysis will be evaluated in-depth in Chapter 5.

Chapter 5 – Summary, Implications, and Future Directions

Introduction

This chapter summarizes and concludes the dissertation. It includes a summary and discussion of the analysis performed in Chapter 4 and compares the results of that analysis to previous research, in some cases confirming and in other cases contradicting those earlier findings. This chapter also discusses the applicable theories on which the research was based and discusses implications of the study to practitioners. The limitations of the methods and analysis performed in this study are provided, followed by recommendations for future studies in this area. Finally, the chapter concludes by describing the significance of this dissertation to the academic and professional communities.

Overview of Study

This study examined the relationship between a firm's ESG ratings and the firm's level of regulatory oversight. Higher ESG ratings serve to increase firm attractiveness to investors, so investors should consider factors that affect ESG ratings when evaluating and comparing firms. Independent services provide ratings of firm ESG performance in areas of environmental stewardship, social responsibility, and corporate governance. These rating services also provide an overall total ESG rating that aggregates the scores of the three components. The link between ESG and financial performance has received much attention, but this study adds to the literature by addressing another firm attribute, regulatory oversight, consistent with the recommendations from Van Duuren et al. (2015).

This study has a basis in stakeholder theory, including identifying moderating influences, which must be part of the stakeholder discussion (Jones, Harrison, & Felps, 2018). Including moderators recognizes the dynamics and interdependence of the business environment. Jones et

al. call for examining the content and nature of the business - stakeholder relationship. Other literature reviewed in this study highlights that there may be external factors (such as regulation) that result in certain sectors receiving higher (or lower) ESG ratings than others.

The study also observed whether firm size, profitability, and institutional ownership had a statistically significant relationship with ESG ratings. The literature that informed this study includes Boo and Sharma (2008), Michelon, et al. (2013), Boesso, Favotto, and Michelon (2015), Erhemjamts and Huang (2019), and Miralles-Quirós, et al. (2019).

This study used ESG rating data from two independent sources, Sustainalytics, which was reported on the website Yahoo Finance, and MSCI, which was reported on Fidelity.com. All the data for this study was collected in December 2019. Two independent statistical analyses were then performed, multiple regression analysis (MRA) using the Sustainalytics data, and multiway frequency analysis (MFA) using the data from MSCI. This study used data from four industry sectors, two heavily regulated sectors – Financials and Utilities, and two less regulated sectors, Information Technology and Consumer Discretionary.

In both the MRA and MFA analyses, firms were categorized as either regulated or unregulated (regulation was treated as an independent variable). Market capitalization or firm size was a mediating variable in both analyses. The MRA also included profitability (total annualized return over a three years), and percent of shares held by institutional investors as other mediating variables.

ESG ratings were the dependent variables. The statistical analyses used total ESG rating as a dependent variable for Research Question 1, and then used each component of the ESG rating, environmental, social, and governance, as dependent variables for Research Question 2.

Summary of Results

The results for each research question will be explained by summarizing the conclusions of the MRA and MFA. The two different sources for ESG ratings, and two distinct statistical tests, provides additional assurance when the findings are consistent and additional questions when they are not.

Research Question 1 asked whether there is a relationship between a firm's total ESG rating and the level of regulation in the firm's industry sector. That is, do firms in heavily regulated sectors have ESG ratings that are statistically significantly different from firms in less regulated sectors? The results indicate that there is not a statistically significant relationship between the level of regulation and the total ESG rating.

Research Question 2 asked whether there is a relationship between a firm's component ESG ratings and the level of regulation in the firm's industry sector. Specifically, do firms in heavily regulated sectors have environmental, social and governance ratings that are statistically significantly different from firms in less regulated sectors? Looking at each component separately, there is a statistically significant relationship between the level of regulation and a firm's environmental rating and its governance rating. For the social responsibility rating, there was a statistically significant, but negatively correlated relationship using the Sustainalytics data, but no statistically significant relationship was present with the MSCI data.

A more detailed discussion of these results and the relationship to existing literature follows.

Discussion of Results

To reject the null hypotheses, consistent conclusions from the two distinct statistical analysis techniques needed to agree. In all but one case, the social component of the ESG ratings,

the two analyses returned consistent results. Following is a discussion of the results as they relate to each research question.

Research Question 1

The first research question looked at the relationship between a firm's total ESG rating and the level of regulation in the firm's industry sector. The study concluded that there is no difference in ESG ratings between firms in heavily regulated sectors versus less regulated sectors. Regarding the mediating variables, market capitalization/firm size had a significant and positive relationship to total ESG ratings. The mediating variables total three-year return and institutional ownership both had significant but negative relationships with total ESG ratings.

On the surface, it appears odd that regulation is statistically significant for each of the ESG component ratings in the MRA, but not for the total ESG rating, which is an aggregation of the three components. However, looking at the signs of the coefficients for regulation in the ESG component results from the MRA, two components (environmental and governance) were positive, while the coefficient for the social rating was negative. The remaining three variables, which had a significant statistical relationship with total ESG, had coefficients moving in the same direction for each of the ESG component models as they did for the total ESG rating. If we think of the total ESG rating as the sum or average of the component ratings, it is easy to see how there could be a significant relationship with the individual components but not a relationship with the aggregate rating if the nature of the component relationships flipped between positive and negative.

Research Question 2

The second research question looked at the relationship between a firm's component ESG rating, environmental, social, and governance, and the level of regulation in the firm's industry

sector. As stated earlier, except for the Social score, the MRA and MFA provided consistent results, rejecting the null hypothesis and concluding that there is a statistically significant relationship between the level of regulation and the environmental and governance components of the ESG ratings. In the MRA this relationship was positive – firms in heavily regulated sectors had higher environmental and governance ratings. The MRA found a statistically significant, but negative, relationship between regulation and the social rating, while the MFA did not find a statistically significant relationship.

Based on stakeholder theory, this result is not surprising. Recall from Table 1 that the social rating is a measure of a firm's performance in the areas of human capital, product liability, and social opportunity. It is likely that in the area of human capital, the heavily regulated utility and financial sectors are under similar pressures to improve their treatment of the workforce to attract and keep employees, as are the consumer discretionary and IT sectors. In terms of product liability, the consumer discretionary and IT sectors face a similar, if not greater, litigious public as the financial and utility sectors. Regarding social opportunity, many companies, out of philanthropy, to improve the quality of life in their communities, or for marketing purposes, contribute to local and national non-profits or community initiatives. Therefore, both highly regulated and less regulated companies are subject to similar stakeholder influence relative to social rating measures, so the presence of stricter regulation does not drive a difference in social scores.

The positive coefficient for regulation in the environmental and governance MRA models may be due to the specific attributes of firms in the regulated sectors selected, utilities and financial institutions. The utility sector has been transforming to more sustainable ways to produce energy and publicly promoting energy efficiency (in states where they are incented to do

so). From an environmental perspective, due in part to increased regulation of coal by-products coupled with tax incentives for renewable energy, over the past year several utilities have announced CO_2 reduction goals and fossil plant closures. They are also adding record volumes of renewable energy resources to their portfolios. From a governance perspective, the financial sector was largely responsible for the 2008/2009 market collapse, which resulted in additional oversight and restrictions. It is not surprising that firms in these heavily regulated sectors receive higher environmental and governance ratings as they are expected to comply with demands placed on them by stakeholders and regulators in these specific areas. While companies in all industries must comply with U.S. EPA and Sarbanes-Oxley regulations, the IT and Consumer Discretionary firms in the unregulated sectors have lower levels of regulated emissions than utilities and are less likely to cause a major disruption to the economy if they suffer financial losses. As a result, any emphasis on environmental or governance initiatives is more likely to be voluntary than mandated.

As for the other variables in the MRA, market capitalization had a significant and positive relationship for the environmental and social ratings, the total three-year return had a significant but slightly negative relationship for the environmental rating only, and institutional ownership did not have a statistically significant rating with any of the ESG components. In the MFA, firm size had a significant relationship to the environmental rating, but not to the social or governance rating. This indicates that firm size matters as it relates to environmental stewardship and social initiatives, while profitability and institutional ownership were not factors.

Relationship to Literature and Theory

Stakeholder theory sees the link between an organization's success and the value it brings to its primary stakeholders, in addition to receiving implicit approval from secondary stakeholders, including government and non-governmental organizations (Maon et al., 2010).

Freeman (2004) recognizes that organizations are unique and that a stakeholder approach enables a firm to include values and direction that are specific to that organization into its standard strategic formulations. Dahan, Doh, and Raelin (2015) recognize that, while stakeholder theory may not be the best way to categorize interactions between firms and governments, it does help to address the role of government in society.

The review of the literature found there is little research linking a firm's total ESG ratings to the regulatory oversight in the firm's industry sector. However, there is research that is relevant to the components of ESG and the level of regulation. Chapter 2 described research supporting the other study variables and their relationship to total ESG ratings, which is briefly summarized here.

The finding of this study, that firms in heavily regulated sectors had higher environmental and governance ratings, supports earlier studies in the literature. Michelon et al. (2013) recognized that each sector was subject to pressure from different stakeholder groups. Specifically, Michelon et al. identified customer groups as having the most influence on consumer product companies while utilities face significant pressure from stakeholders who are concerned with the environmental impacts of their operations. Similarly, Boesso, Favotto, and Michelon (2015) found that corporate performance improves in firms that invest in CSR initiatives that are most important to their stakeholder needs. Boesso et al. also determined that by being in an environmentally sensitive industry, firms improve the relationship between CSR and corporate performance more than firms that are not in environmentally sensitive industries.

This study supports earlier studies that there is a relationship between regulation and governance. Boo and Sharma (2008) examined the association between internal corporate governance and audit fees. Boo and Sharma found that the regulated companies paid lower audit

fees due to the partial substitution of regulatory oversight for external audit monitoring. Becher and Frye (2011) stated that "governance is affected by the presence of regulators even if they do not directly dictate monitoring levels.'' He and Yang (2014) also examined how industry regulations affect corporate governance and financial reporting, suggesting that the different requirements on boards may be imposed depending on the regulatory context of the industry.

This study only partially supports earlier studies that there is a relationship between profitability, or company performance, and CSR (Dalal & Thaker, 2019; Lee et al., 2018; Mikołajek-Gocejna, 2016).

This study found a modest statistically significant relationship between institutional ownership and total ESG, but no statistically significant relationship between institutional ownership and the components of the ESG ratings. This is consistent with Erhemjamts and Huang (2019) who studied CSR and institutional ownership time horizons (short-term versus long-term). They reported that the empirical relationship in the literature is mixed, while their study found that long-term institutional investors promoted CSR and short-term investors discourage CSR. In addition to time horizon, there are a growing number of pension funds and endowments that are emphasizing ESG as socially conscious investors may only invest in firms that fund socially responsible activities (Mackey et al., 2007, p. 821).

In this study firm size or market capitalization had a statistically significant relation to total ESG and environmental ratings. No statistically significant relationship was found between size and governance, and only the MRA found a statistically significant relationship between size and social responsibility. The literature includes many studies that identify firm size as a mediating variable when studying corporate performance and CSR ratings for reasons provided by Michelon et al. (2013). These reasons include how growing companies will receive increased

pressure from stakeholders to take on CSR initiatives, and the investment in CSR is a relatively small part of a large firm's budget. Michelon et al. also provide a counter argument that large firms suffer from inertia, so it is harder for them to implement new programs compared to smaller firms. Interestingly, Miralles-Quirós, et al. (2019) found a negative and significant correlation of banks' social performance with shareholder value creation and concluded that the relationship between ESG performance and banks' shareholder value creation is complex and needs more research.

Implications for Practitioners

This study's findings, that environmental and governance ratings for firms in heavily regulated industry sectors are statistically significantly higher than for firms in less regulated sectors, has implications to investors, company executives, other stakeholders, regulators, and the elected officials that create regulations.

Investors rely on ESG ratings for a range of reasons, from risk mitigation to determining whether a company is socially responsible. This study suggests that investors should consider moderating factors such as whether the firm is in a heavily regulated sector when weighing firm ratings based on ESG criteria. Some ESG rating services, such as Sustainalytics, report how a firm compares to its peers. This may be a more valuable metric than the absolute rating.

Company executives in heavily regulated sectors should recognize that there is an expectation that their firm must meet regulatory requirements, that compliance is expected, or they will fall behind their competitors and peers. The utility sector, which is the target of climate change activists, has been transforming to more sustainable ways to produce energy and publicly promoting energy efficiency. The financial sector has received increased scrutiny and a tarnished reputation after the sub-prime mortgage crisis pushed the nation into a recession, but is now experiencing stellar stock performance. It is not surprising that firms in these heavily regulated

sectors receive higher environmental and governance ratings as they were required to comply with demands placed on them by stakeholders and regulators in these specific areas. Firms in unregulated sectors may consider studying how firms in the regulated sectors overcame their tarnished images to emerge as better performers in these measures.

Company executives may also recognize firms in heavily regulated sectors have social ratings that are statistically significantly lower than do firms in less regulated sectors. Stakeholder theory would suggest that firms will focus on activities that reflect stakeholder priorities. In the heavily regulated sectors, this focus is on environmental and governance initiatives. All companies, regulated and unregulated, have stakeholders, such as employees, customers and the local communities they operate in, that pushes them to be socially responsible. In this regard, the heavily regulated companies are no different from the unregulated companies.

Regulations are generally enacted by federal or state legislative bodies and enforced by regulatory commissions or agencies. This study suggests that regulations make a difference in how companies perform, specifically related to environmental initiatives. For example, regulated utilities earn a return on prudently invested capital. When government regulations call for reductions in plant emissions, or an increase in renewable energy resources, state utility commissions recognize that the utility is mandated to make these investments and is then more likely to authorize cost recovery. Firms that are not required by regulation to make these environmentally friendly investments must fund them from corporate profits, which may put them at a financial disadvantage relative to their peers.

Stakeholders may find these observations informative. They should not expect regulated companies to be any more philanthropic, worker-oriented, or socially accountable than any other company, in fact, they may be less so. They should expect regulated companies to perform better

where regulation requires more of them. They should recognize that when unregulated companies exceed their peers' ESG ratings they may be doing so out of true social responsibility.

Limitations

As described in Chapter 1, there are several limitations to this study. First, data from only four industry sectors were considered, financials, utilities, IT, and consumer discretionary. Selecting data from other sectors may produce different results. Second, the study used ESG ratings at a specific point in time, December 2019. ESG ratings may change from year-to-year as companies focus on new initiatives, or as previously unknown activity comes to light. Third, there was a binary distinction on the level of regulation. While this distinction was selected based on earlier studies identified in the review of the literature, there are methods to quantify the level of regulation that industry sub-sectors face. Fourth, only companies with market capitalizations greater than $3.9 billion were included in the analysis. Including smaller companies may impact the results, however, smaller firms may not be as likely to have ratings by ESG rating services. Fifth, while ESG ratings from two independent rating services were used, there may be consistent biases in how these rating services account for ESG risk in specific sectors. Finally, the selection of the other independent or mediating variables (other than regulation) may have influenced the coefficients in the models.

Recommendations for Future Research

The findings of this study show that there are outside factors that may have a significant statistical relationship to firm ESG ratings. Given the importance investors are placing on these ratings additional research in this area is warranted. Future studies may address some of the limitations found in this study. Future studies should consider other sectors subjected to government oversight, for example, pharmaceuticals or chemicals, in addition to other less regulated sectors. Rather than parsing the population using the industry sector, future studies

could find value in looking at industry sub-sectors. Also, future studies could compare different regulated sectors to each other. Longitudinal studies have considered the change in ESG ratings over multiple years and that method would be appropriate for future studies measuring the impact of heavy regulation. There are measures of the level of intensity of federal regulations that may be an appropriate independent variable in future studies. The market capitalization cut-off in this study was arbitrary so future studies may also include smaller firms.

Significance and Conclusion

This study examined the relationship between regulation and ESG performance ratings in four industry sectors. The purpose of the study was to determine if being in a heavily regulated industry sector plays any role in the ESG ratings a firm receives. Because investors are increasingly turning to ESG ratings to assess a firm's commitment to sustainability and to reduce the perception of firm risk related to environmental, social, and governance issues, investors are interested in factors that may influence those ratings. The findings of this study indicated that regulation has a statistically significant relationship to environmental and governance ratings, but not to social ratings or total ESG ratings. The results of this study may be beneficial in explaining to investors and company leaders why ESG ratings vary among different industry sectors.

This study adds to the literature by introducing the variable of regulation, and by testing the relationship using two independent rating services and two different statistical analysis techniques. While there has been much research focused on the relationship between ESG (or CSR) ratings and firm financial performance, it is useful to see how other industry traits relate to ESG ratings.

In addition to the statistical analysis, this study's review of the literature provides a chronology of how management thinking has evolved relative to the responsibility private firms

have to society. This review of the literature includes how changes to firm performance measures have gone beyond reporting financial metrics and now often include measures of sustainable behavior. The literature also shows shareholder and executive expectations regarding ESG ratings portray a complex issue that a variety of management theories have begun to address.

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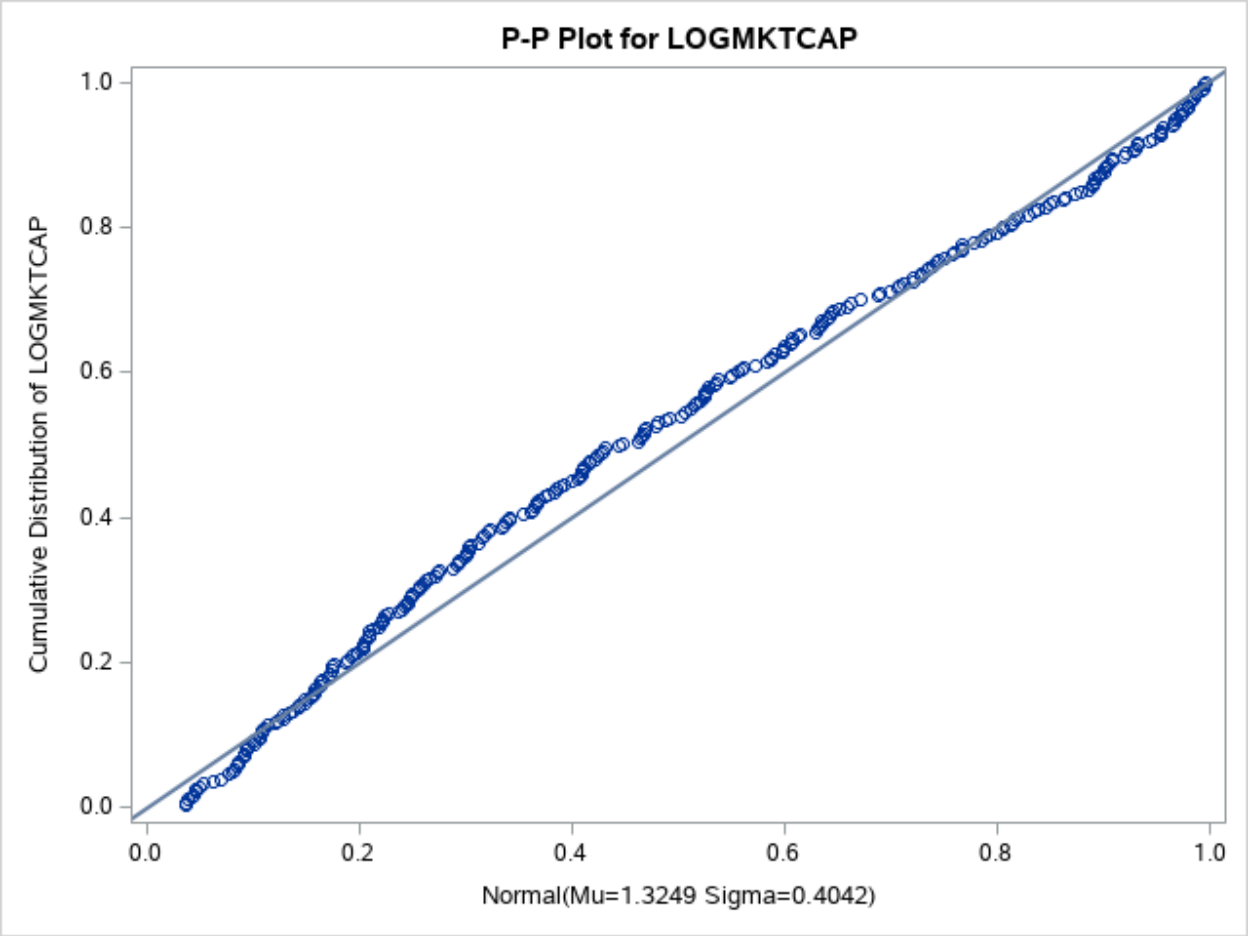
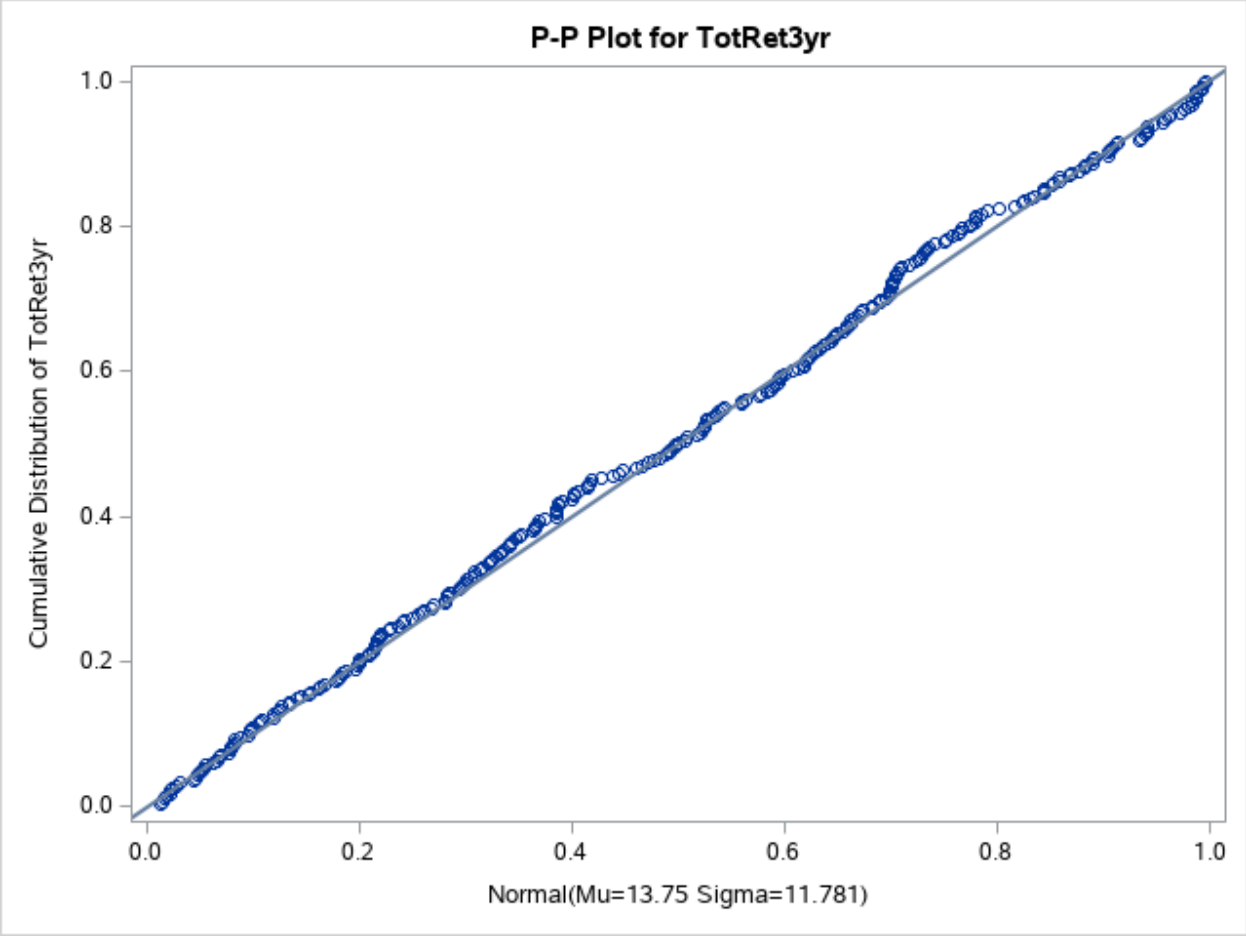
Appendix A – Variable Plots

Figure A1: P-P Plot for Natural Log Market Cap



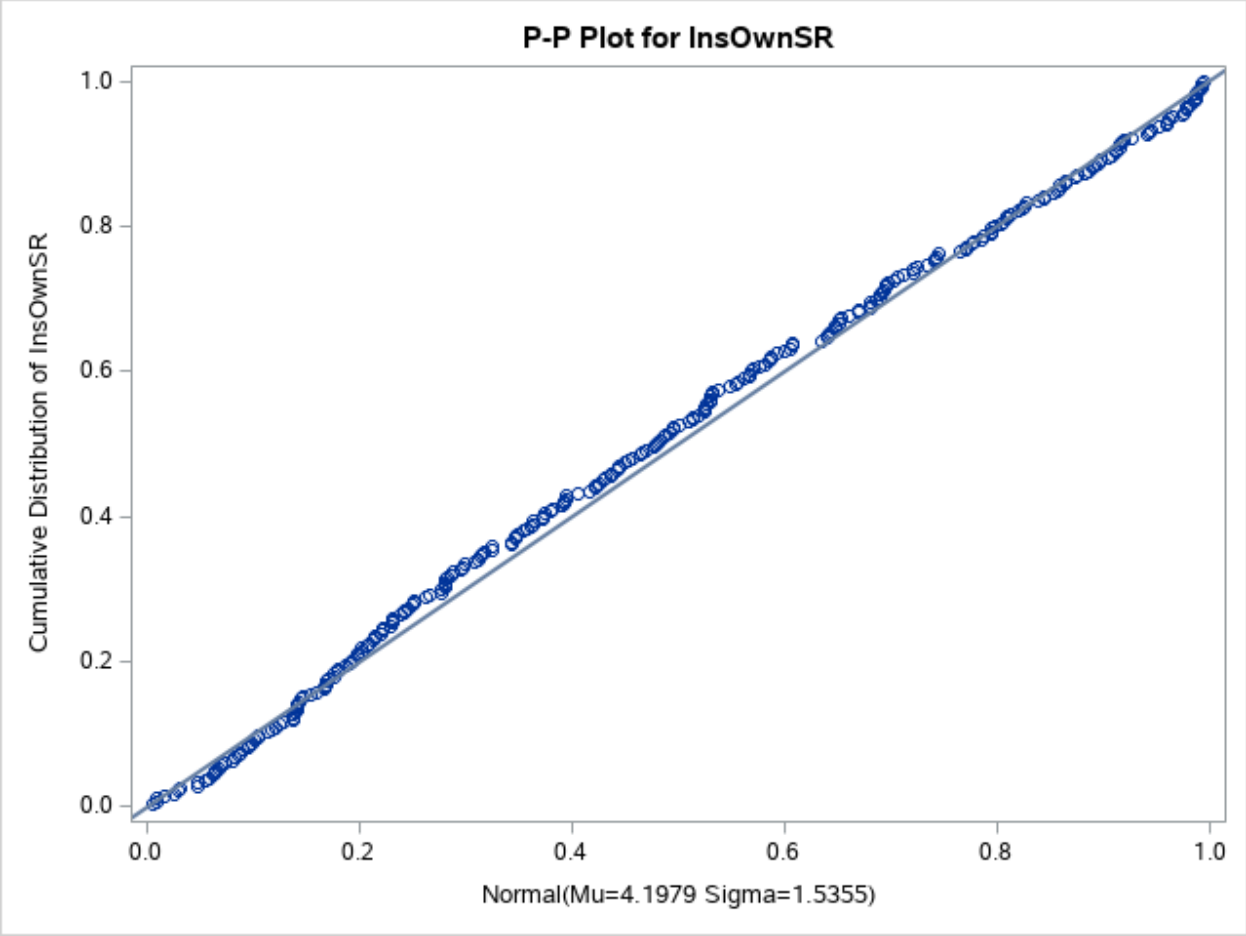
Natural Log Market Cap

Figure A2: P-P Plot for Total Three-Year Return



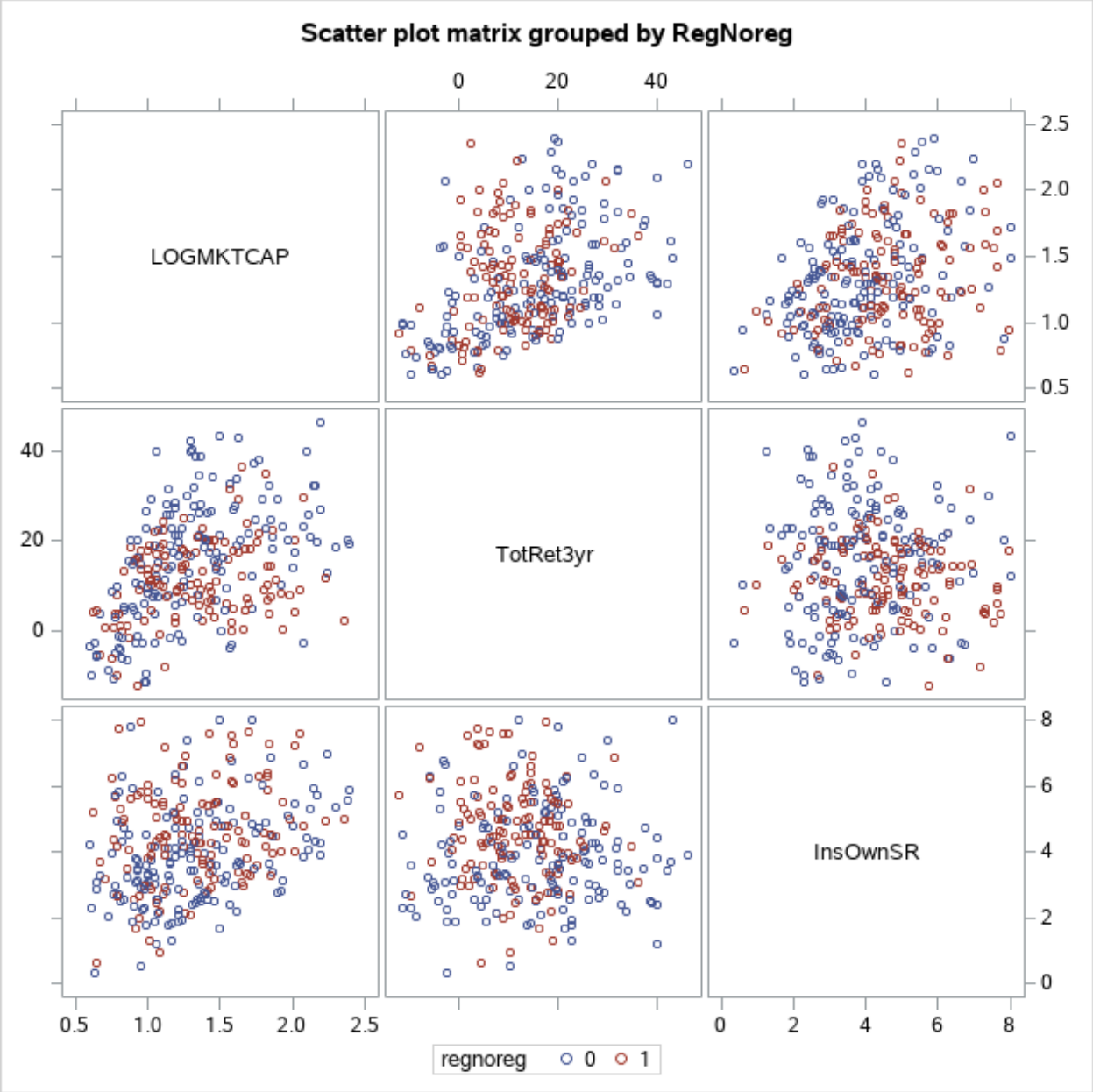
Total Three-Year Return (Annualized)

Figure A3: P-P Plot for Institutional Ownership



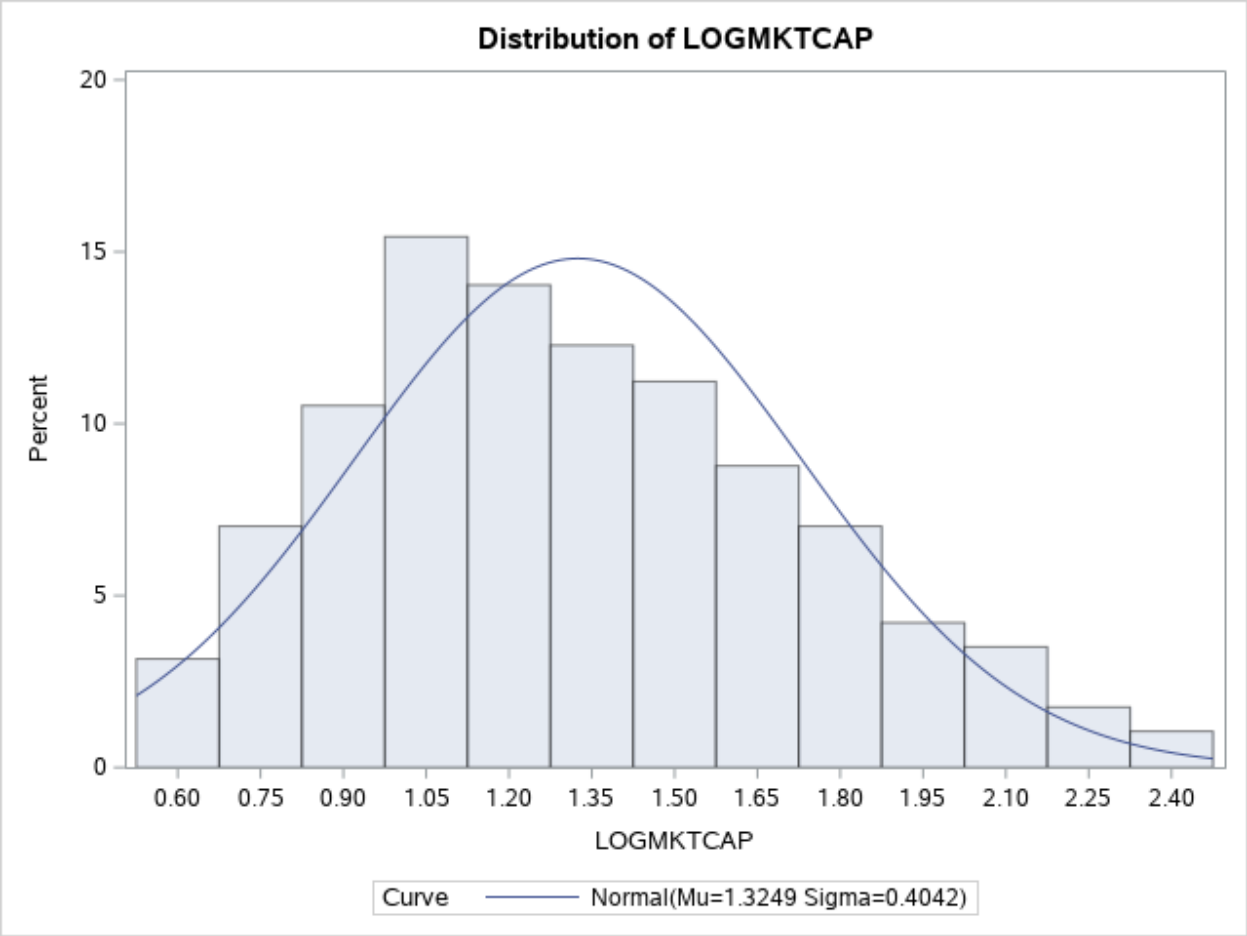
Institutional Ownership (SQRT (100 – Percent of Institutional Ownership)

Figure A4: Scatterplot for Continuous Variables



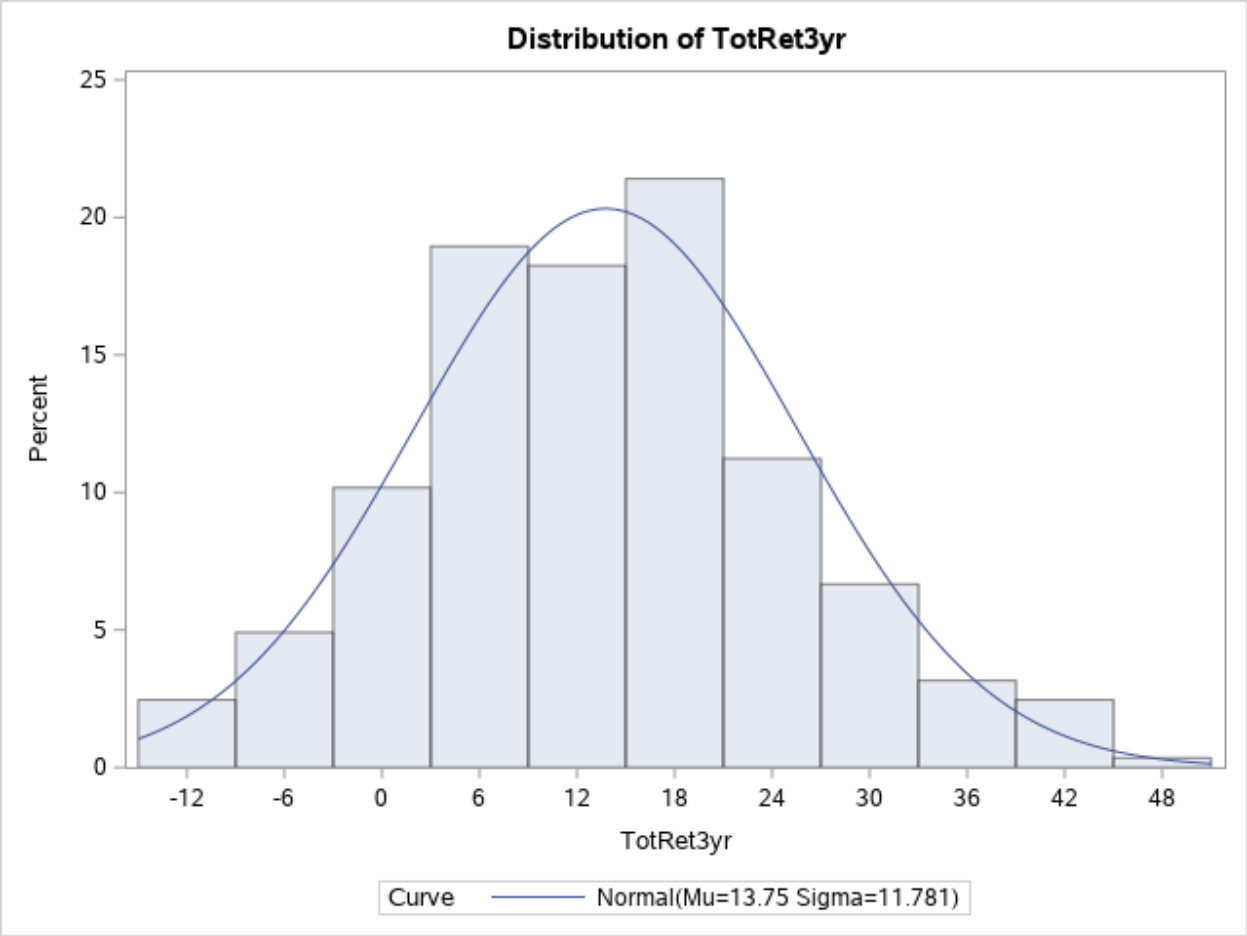
Scatterplot of continuous variables

Figure A5: Market Capitalization (Log10) Distribution



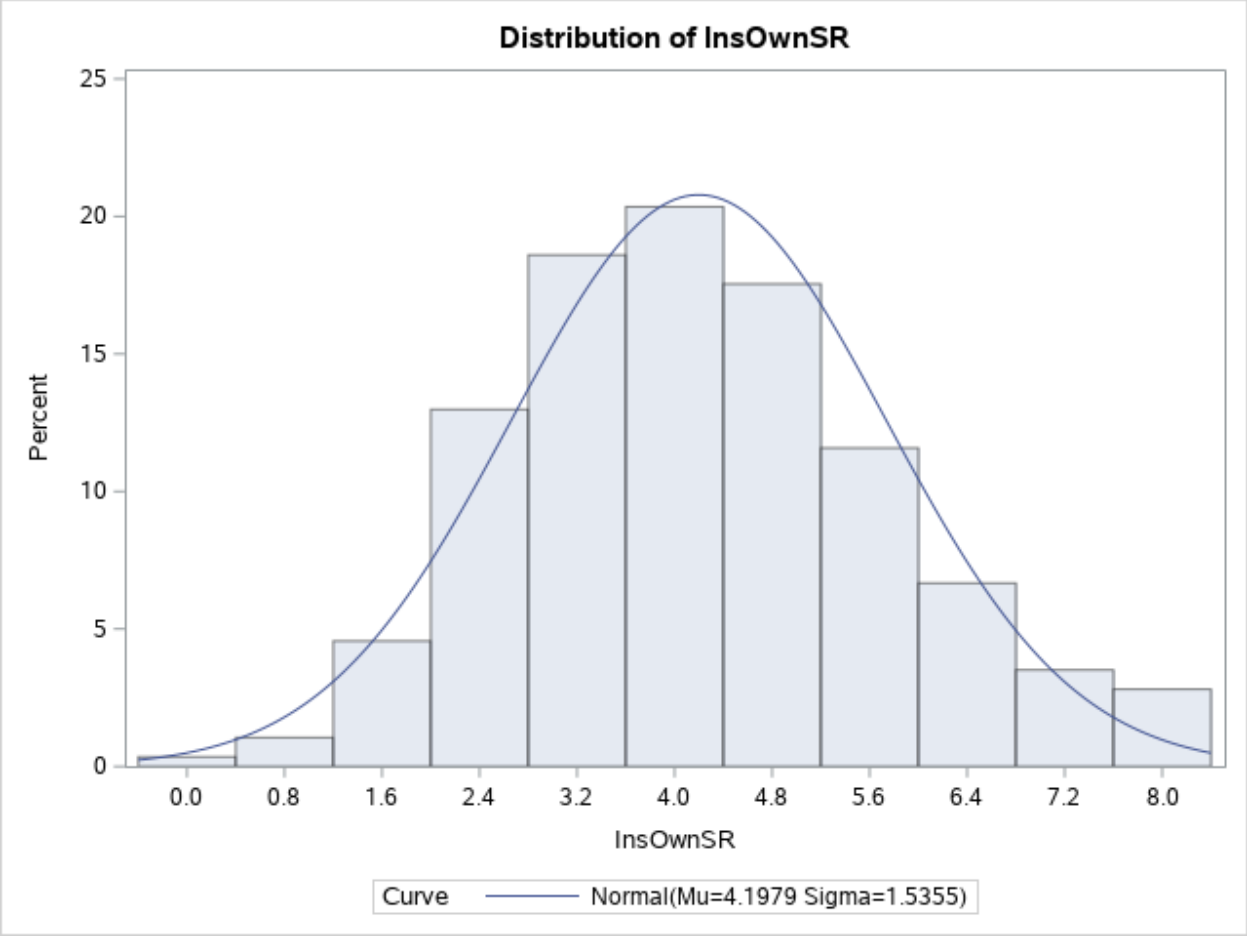
Market Capitalization (Log10 transformation)

Figure A6: Total Annualized Three-Year Return Distribution



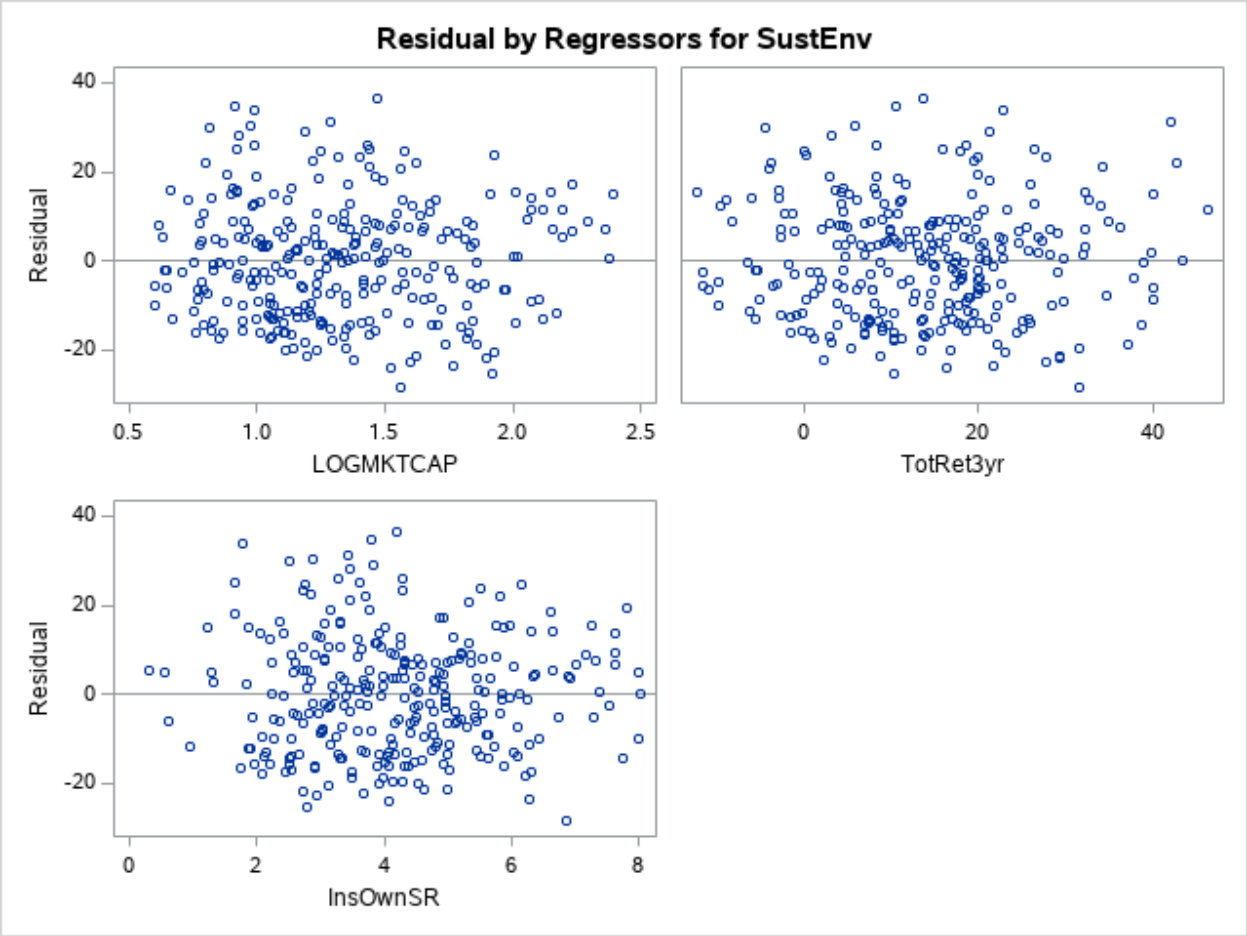
Total Annualized Three-Year Return

Figure A7: Institutional Ownership Distribution



Institutional Ownership (SQRT Transformation) SQRT (100 – Institutional Ownership Percent)

Figure A8: Residuals by Regressors For Sustainalytics Environmental Rating



Residuals by Regressors

Appendix B – SAS Result Tables

Appendix B1: SAS Output for Multiple Regression

Dependent Variable:

SustTot SustTot

Source	DF	Type III SS	Mean Square	F Value	Pr > F
LOGMKTCAP	1	3285.714330	3285.714330	43.38	<.0001
TotRet3yr	1	303.261338	303.261338	4.00	0.0464
InsOwnSR	1	364.761315	364.761315	4.82	0.0290
regnoreg	1	154.012681	154.012681	2.03	0.1550

Parameter	Estimate		Standard Error	t Value	Pr > |t|
Intercept	43.60773473	B	2.17466241	20.05	<.0001
LOGMKTCAP	9.75430195		1.48100565	6.59	<.0001
TotRet3yr	-0.09870829		0.04933107	-2.00	0.0464
InsOwnSR	0.79976325		0.36444541	2.19	0.0290
regnoreg 0	1.54204524	B	1.08141974	1.43	0.1550
regnoreg 1	0.00000000	B	.	.	.

Note: The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.

Dependent Variable:

SustEnv SustEnv

Source	DF	Type III SS	Mean Square	F Value	Pr > F
LOGMKTCAP	1	13022.03641	13022.03641	80.57	<.0001
TotRet3yr	1	1367.32993	1367.32993	8.46	0.0039
InsOwnSR	1	387.20483	387.20483	2.40	0.1228
regnoreg	1	3358.66451	3358.66451	20.78	<.0001

Parameter	Estimate		Standard Error	t Value	Pr > |t|
Intercept	26.65845812	B	3.17657235	8.39	<.0001
LOGMKTCAP	19.41872659		2.16333421	8.98	<.0001
TotRet3yr	-0.20959541		0.07205887	-2.91	0.0039
InsOwnSR	0.82400044		0.53235260	1.55	0.1228
regnoreg 0	7.20115547	B	1.57965118	4.56	<.0001
regnoreg 1	0.00000000	B	.	.	.

Note: The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.

Dependent Variable: SustSoc SustSoc					
Source	**DF**	**Type III SS**	**Mean Square**	**F Value**	**Pr > F**
LOGMKTCAP	1	1625.391067	1625.391067	17.99	<.0001
TotRet3yr	1	181.653629	181.653629	2.01	0.1573
InsOwnSR	1	271.932020	271.932020	3.01	0.0839
regnoreg	1	1371.545504	1371.545504	15.18	0.0001

Parameter	**Estimate**		**Standard Error**	**t Value**	**Pr > |t|**
Intercept	51.66155974	B	2.37500894	21.75	<.0001
LOGMKTCAP	6.86057046		1.61744721	4.24	<.0001
TotRet3yr	-0.07639539		0.05387582	-1.42	0.1573
InsOwnSR	0.69053745		0.39802090	1.73	0.0839
regnoreg 0	-4.60176021	B	1.18104840	-3.90	0.0001
regnoreg 1	0.00000000	B	.	.	.

Note: The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.

Dependent Variable:

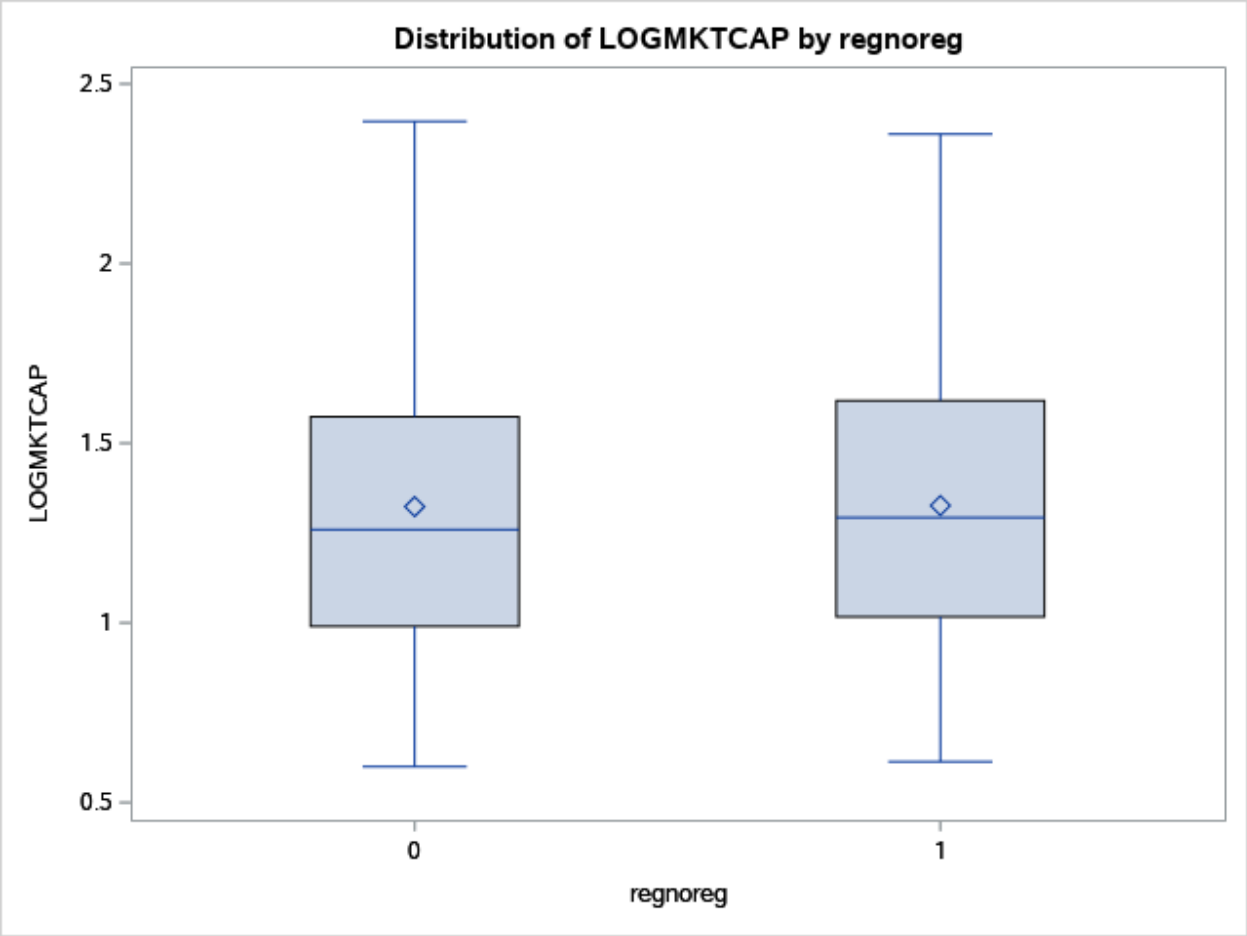
SustGov SustGov

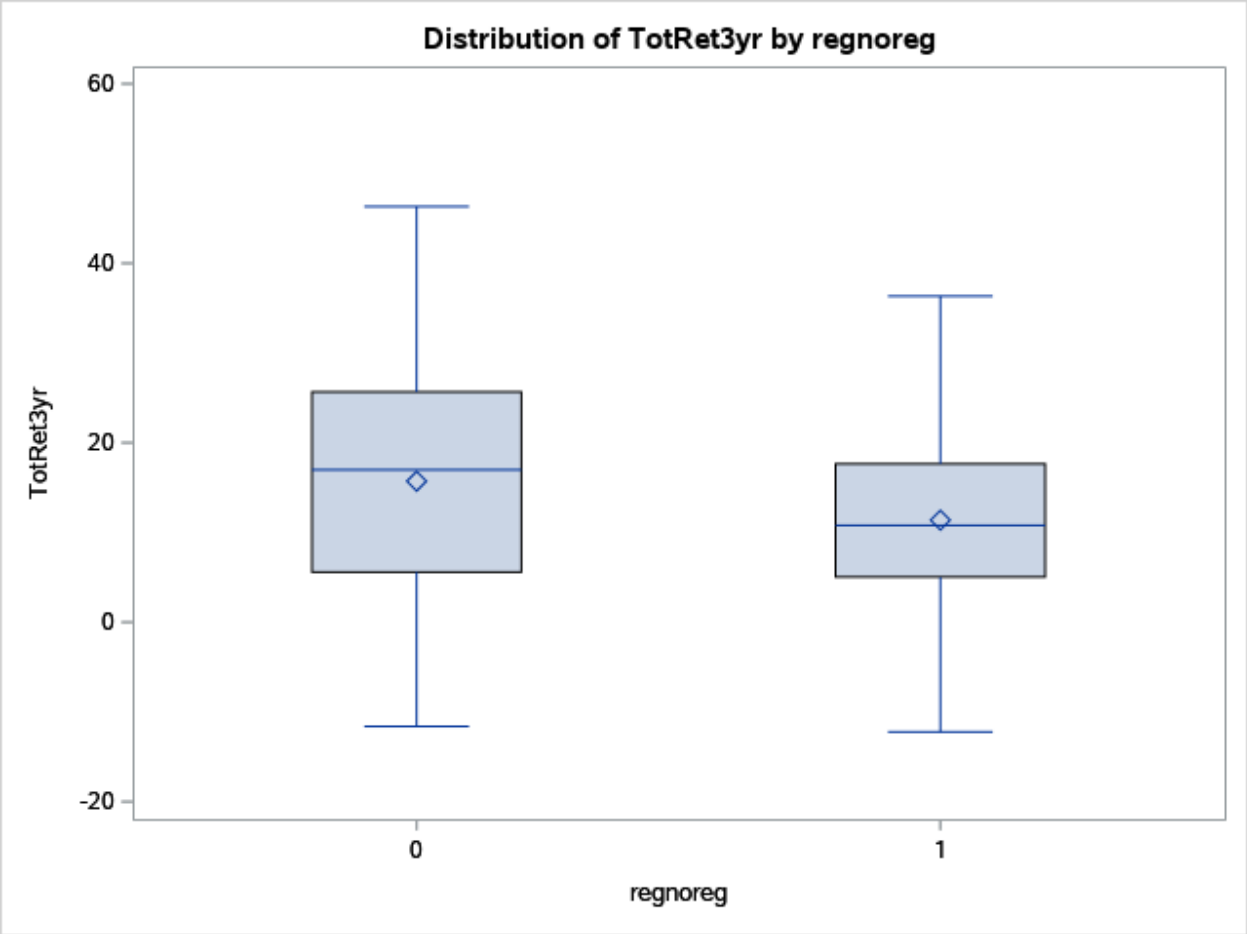
Source	DF	Type III SS	Mean Square	F Value	Pr > F
LOGMKTCAP	1	136.5445203	136.5445203	1.74	0.1888
TotRet3yr	1	16.8332370	16.8332370	0.21	0.6440
InsOwnSR	1	196.4134848	196.4134848	2.50	0.1152
regnoreg	1	665.6204338	665.6204338	8.46	0.0039

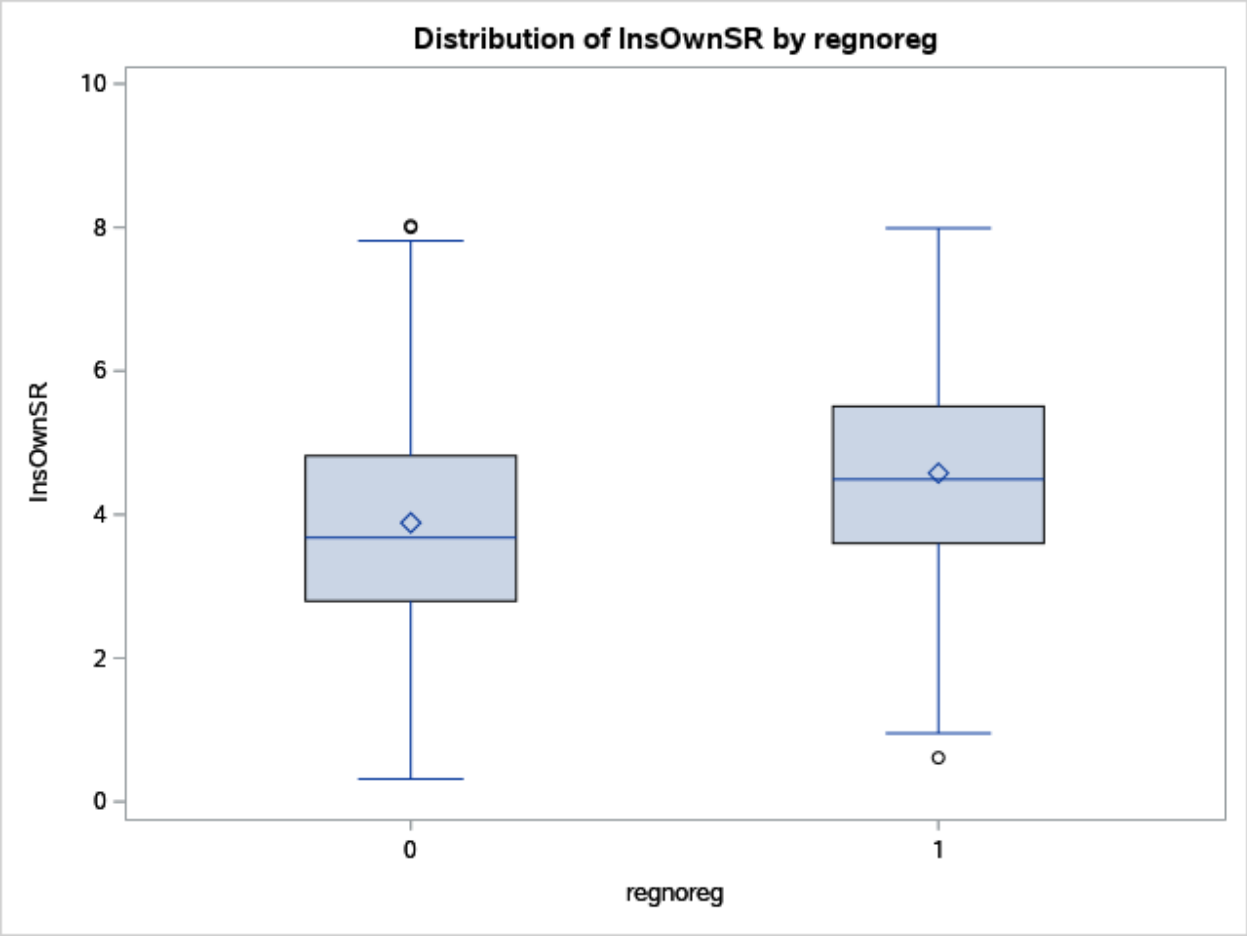
Parameter	Estimate		Standard Error	t Value	Pr > |t|
Intercept	55.94053078	B	2.21625787	25.24	<.0001
LOGMKTCAP	1.98846720		1.50933331	1.32	0.1888
TotRet3yr	-0.02325567		0.05027464	-0.46	0.6440
InsOwnSR	0.58687108		0.37141627	1.58	0.1152
regnoreg 0	3.20576879	B	1.10210440	2.91	0.0039
regnoreg 1	0.00000000	B	.	.	.

Note: The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.

Appendix B2: Boxplots for continuous variables




Distribution of TotRet3yr by regnoreg
60
40
20
0
-20
TotRet3yr
0
1
regnoreg


Distribution of InsOwnSR by regnoreg
InsOwnSR
10
8
6
4
2
0
0
1
regnoreg

Appendix B3: Test for Serial Correlation

Ordinary Least Squares Estimates			
SSE	48611.1749	**DFE**	281
MSE	172.99351	**Root MSE**	13.15270
SBC	2296.05399	**AIC**	2281.44403
MAE	10.7054775	**AICC**	2281.58689
MAPE	20.3534322	**HQC**	2287.3008
Durbin-Watson	2.1121	**Total R-Square**	0.2435

Durbin-Watson Statistics			
Order	**DW**	**Pr < DW**	**Pr > DW**
1	2.1121	0.8095	0.1905

NOTE: Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

Appendix C – Power Tests Protocols

Appendix C1: Power Test protocol for multiple regression

F tests - Linear multiple regression:

Fixed model, R^2 deviation from zero

Analysis: A priori: Compute required sample size

Input: Effect size f^2=0.15

α err prob = 0.05

Power (1-β err prob) = 0.95

Number of predictors = 4

Output:Noncentrality parameter λ=19.3500000

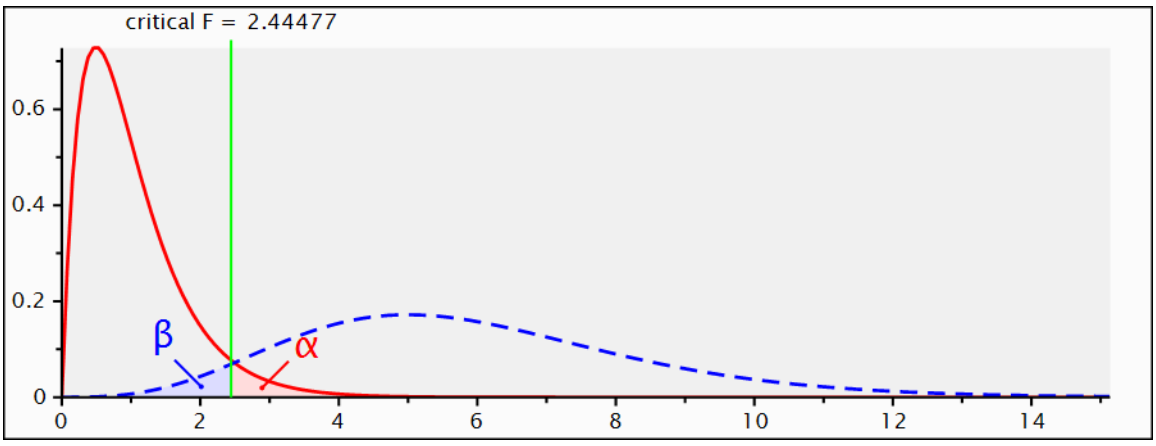
Critical F=2.4447662

Numerator df=4

Denominator df=124

Total sample size=129

Actual power=0.9505747



Appendix C2: Power Test protocol for Chi Squared (MFA)

χ^2 tests - Goodness-of-fit tests: Contingency tables

Analysis: A priori: Compute required sample size

Input: Effect size w = 0.2016637

α err prob = 0.05

Power (1-β err prob) = 0.80

Df = 6

Output: Noncentrality parameter λ = 13.6645313

Critical χ^2 = 12.5915872

Total sample size = 336

Actual power = 0.8013764