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U.S. Corporate Energy Productivity, Greenhouse Gas Productivity, and Return on Equity

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Walden University

College of Management and Technology

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Terry Tate

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Walden University
2018

Abstract

U.S. Corporate Energy Productivity, Greenhouse Gas Productivity, and Return on Equity

by

Terry Tate

MS, Jones International University, 2013

BS, Jackson State University, 2011

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

August 2018

Abstract

Corporate leaders are expected to engage in corporate social responsibility by some stakeholders, but there is no consistent evidence that corporate social performance relates to financial performance. Grounded in instrumental stakeholder theory, the purpose of this correlational study was to examine the relationship among energy productivity, greenhouse gas productivity, and return on equity. The 2016 Newsweek Green Ranking U.S. 500 was the population for this study, which consisted of the largest companies in the United States with the highest corporate social performance scores. The secondary data were collected from Newsweek.com and Morningstar.com for this study. The multiple linear regression was used in the data analysis for the study. This study's model was $F(2,104) = 1.028$, $p = .361$, Adjusted $R^2 = .001$ and represented that there was not a statistically significant relationship among energy productivity, greenhouse gas productivity, and return on equity. The implications for positive social change include the potential to provide corporate leaders with additional evidence to inform fact-based decisions related to the strategic allocation of resources to manage corporate energy productivity and greenhouse productivity. Effectively managing energy productivity and greenhouse gas productivity could contribute to reducing global warming, which would improve the quality of lives of U.S residents.

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Dedication

I dedicate this work to my family (past, present, and future). I dedicate this accomplishment to my grandparents (Elizabeth Tate, Albert Tate, Bertha Leflore, and William Leflore). I dedicate this accomplishment to my father, Johnny Tate, who is the first in our family to achieve college degrees (both associates and bachelor's) and my mother, Denise Tate, who always motivated me to pursue higher education. Both my parents sacrificed so much to send me to college after high school, and I honor them for that. I dedicate this accomplishment to my four brothers (Christopher Tate, Adron Tate, Malcolm Tate, and Albert Tate) and hope they will also follow their dreams. I dedicate this accomplishment to the mother of my child, Rachel Martin, who always believed in me and motivated me to continue pursuing my education throughout my master's and doctoral degrees. I also dedicate this accomplishment to my son, Terry Geonnie Tate, Jr. I hope Terry Jr. will pursue his doctoral degree someday and I will be there to guide him with the fundamentals of research. I love everyone whom I dedicated this accomplishment to along with other family and friends not mentioned.

Acknowledgments

I acknowledge the faculty and staff at Walden University for making this journey more comfortable. I acknowledge my classmates and professors who challenged, critiqued, and encouraged me throughout the doctoral program. I also acknowledge my first Chair, Dr. Craig Martin.

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Section 1: Foundation of the Study

Some U.S. stakeholders expect business leaders to make decisions that are profitable and environmentally responsible. U.S. corporate leaders can improve their corporate environmental impact by investing in corporate social responsibility (CSR) activities (Jones, Willness, & Heller, 2016). Bridoux, Stofberg, and Den Hartog (2015) found that some U.S. consumers do not value corporate social responsibility benefits, but business practitioners continue to implement CSR programs. Corporate leaders understand that they should manage profitable companies, but some leaders do not have experience with CSR implementation and maintenance. Some business leaders improve CSR to improve corporate reputation and to remain competitive in their industries. Some business practitioners did not intend to improve company profitability with CSR implementations (Shnayder, van Rijnsoever, & Hekkert, 2015). It has been difficult for some business leaders to find solutions for their businesses to operate profitably and sustainably. After the start of the 21st century, more business leaders provided and advertised their corporations' green products and services (Willness & Jones, 2013). Corporate leaders who engage in CSR compete to satisfy consumers and stakeholders, but the relationship between profitability and CSR activities is unclear and represents a subject worthy of examination.

Background

The business standard has been for corporations to implement voluntary environmental responsibilities that are potentially profitable (Čarnogurský, Diačiková, Ďaňková, & Ľach, 2015). A corporation that excessively emits greenhouse gases and

wastes resources could prevent profits by attracting negative media coverage and protest (Kareiva, McNally, McCormick, Miller, & Ruckelshaus, 2015). Sustainability literature is increasing, and researchers argue whether CSR is profitable or charitable. Some scientists encourage business leaders to limit environmental harm by reducing energy usage and greenhouse gas emissions (Kareiva et al., 2015). Researchers have contributed to sustainability literature by publishing articles related to energy productivity and greenhouse gas productivity, which are ratio measures with profitability and pollution factors (Ahmed & Beck, 2016). A corporate leader can generate more revenues for their company while using less energy and reducing greenhouse gas emissions demonstrates CSR (Murguia & Lence, 2015).

Brower, Kashmiri, and Mahajan (2017) performed an analysis of 250 quantitative studies to examine the relationship between corporate financial performance (CFP) and CSR, but the researchers yielded inconclusive results with significant, insignificant, positive, and negative correlations. As more business leaders embrace CSR, concerns increase regarding how those activities relate to profitability, which is a key stakeholder expectation (Hameed, Riaz, Arain, & Farooq, 2016). Business practitioners, corporate stakeholders, scholars, and members of society may benefit from research-driven actions based on conclusive evidence of the relationship among corporate energy productivity, greenhouse gas productivity, and return on equity (ROE).

Problem Statement

Business practitioners plan, record, and analyze traditionally unprofitable factors, such as energy consumption and greenhouse gas emission, related to business operations

because of the societal demand for CSR performance (Székely & vom Brocke, 2017). Seventy-five percent of S&P 500 companies have corporate leaders who are responsible for managing their companies' CSR performance (Hubbard, Christensen, & Graffin, 2017). The general business problem is that some business leaders do not know how their companies' CSR performances relate to their companies' financial returns (Kareiva et al., 2015). The specific business problem is that some S&P 500 business leaders do not understand the relationship among energy productivity, greenhouse gas productivity, and ROE (Nollet, Filis, & Mitrokostas, 2015).

Purpose Statement

The purpose of this quantitative correlational study was to examine the relationship among energy productivity, greenhouse gas productivity, and ROE. The predictor variables for this study were energy productivity and greenhouse gas productivity. The criterion variable for this study was ROE. The population for this study was the 2016 Newsweek Green Rankings U.S. 500 (NGR16), which is a ranking of the 500 largest and most sustainable publicly traded companies in the United States (Eccles et al., 2016). The implications for positive social change include the potential to improve the quality of life for U.S. residents who spend extended periods of time outdoors for occupational or recreational purposes by supporting the reduction of greenhouse gas emissions linked to rising temperatures and extreme precipitation.

Nature of the Study

I selected the quantitative method for this study. A researcher can analyze trends, measure variables, analyze numerical results, and explain predictions with the

quantitative method (Barnham, 2015). An examination of the relationship among corporate energy productivity, greenhouse gas productivity, and ROE required the quantitative method for this study. The qualitative method is appropriate for researchers who explore personal, cultural, or social experiences and phenomena involving a relatively small sample (Russell et al., 2016). A mixed-methods study is a combination of the quantitative and qualitative methods (Barnham, 2015; Guetterman, Fetters, & Creswell, 2015; Russell et al., 2016). A qualitative or mixed-method approach was not appropriate for this study because I identified known measurable variables with the intent to answer a research question that requires a statistical inferential approach.

I selected the correlational design for this study. A researcher can examine the extent of a relationship among two or more variables with a correlational design (Leedy & Ormrod, 2016). Different types of experimental or casual-comparative study designs are appropriate for researchers who explain causality or manipulate variables within their studies (Khorsan & Crawford, 2014). Experimental and casual-comparative designs are not appropriate for this study because I did not manipulate variables or establish cause-and-effect relationships. By collecting and analyzing data of the variables in this study, I examined the direction and degree of any relationship among two predictor variables (energy productivity and greenhouse gas productivity) and the criterion variable (ROE). Researchers often use the correlational design to quantify relationships among known variables (Ruiz de Maya, Lardín-Zambudio, & López-López, 2015). Therefore, the correlational design aligns with the purpose of this study and was the most appropriate quantitative design for this study.

Research Question

What is the relationship among energy productivity, greenhouse gas productivity, and ROE?

Hypotheses

($H_0$1). There is no statistically significant relationship among energy productivity, greenhouse gas productivity, and ROE.

(H_a1). There is a statistically significant relationship among energy productivity, greenhouse gas productivity, and ROE.

Theoretical Framework

The instrumental stakeholder theory was the theoretical framework for this study and was appropriate to examine the underlying CSR factors of stakeholder management that may relate to ROE. Thomas Donaldson and Lee Preston are the theorists of instrumental stakeholder theory and published the theory in 1995 (Donaldson & Preston, 1995). Bridoux and Stoelhorst (2014) explained that the key proposition of the instrumental stakeholder theory is that effective management of relationships with important stakeholders maximizes return on equity. A corporation may manage its environmentally concerned stakeholders by reducing energy use and improving energy productivity and reducing greenhouse gas emissions and improving greenhouse gas productivity (Kareiva et al., 2015). In this study, I used energy productivity and greenhouse gas productivity as the predictor variables, as some business practitioners are familiar with managing energy consumption and greenhouse gas emissions. As applied to this study, the instrumental stakeholder theory provided a framework for understanding

the relationship, if any, among corporate energy productivity, greenhouse gas productivity, and ROE because attentiveness to stakeholders may increase firm performance.

Operational Definitions

The following key terms are throughout this study and defined in the context of this study's topic:

Corporate financial performance (CFP): The measure of a company's financial performance, commonly defined by ratios such as return on sales, return on equity, and return on assets (Skudiene, McClatchey, & Kancleryte, 2013).

Corporate social responsibility (CSR): The responsibility that corporate leaders have to operate his or her company to not harm the environment or the community (Huang, Yen, Liu, & Huang, 2014).

Conventional energy: The traditional energy resources of the United States produced from the combustion of fossil fuels, coal, natural gas, and oil, which the EPA identifies as conventional power (Environmental Protection Agency, 2016).

Energy consumption: The amount of traditional energy consumed by a corporation to create goods and provide services (Eccles et al., 2016).

Energy productivity: The amount of energy consumed to generate corporate revenues and calculated by dividing corporate revenues by total energy consumption (Eccles et al., 2016).

Green: A term applied to goods, services, or processes of corporations that conserve energy and resources and reduce or eliminate toxic agents such as pollution and waste (João-Pedro & Lemke, 2013).

Greenhouse gas emissions: The release of greenhouse gases into the atmosphere from private or commercial activities; the most common greenhouse gases are CO_2, CH_4, and N_2O (Ge, Lei, Xu, & Wang, 2016).

Greenhouse gas productivity: The volume of greenhouse gases emitted by a corporation to generate revenues and calculated by dividing revenue by total greenhouse gas emissions (Eccles et al., 2016).

Sustainability: The processes of a corporation enhancing the capability to maintain or enhance the economic opportunity and social equity while protecting and restoring the natural environment (Craig & Allen, 2013).

Sustainability reporting: The process of generating a report that firms release to publish economic, social, environmental, and governance performance information (Jain, 2014).

Assumptions, Limitations, and Delimitations

Assumptions

Assumptions are untestable expectations or suppositions in a study that the researcher accepts as true and critical to the study (Richardson, Hudgens, Gilbert, & Fine, 2014). Dawson and Lavori (2015) and Chaibub-Neto (2016) stressed the process of identifying plausible underlying assumptions in research and maximizing the validity of any assumptions in inferential research studies. An assumption of this study was that the

Newsweek researchers used appropriate factors and methodologies to accurately calculate and rank each company's energy productivity and greenhouse gas productivity. Another assumption of this study was that the leaders of the 500 companies were honest and accurate when they verified their companies' publicly available data, which the Newsweek researchers used for each company's sustainability ranking. Another assumption for this study was that I collected accurate and truthful information from Newsweek and Morningstar.com.

Limitations

Limitations are potential shortcomings or influences on a study that are difficult or impossible to control (Leedy & Ormrod, 2016). A limitation to this study was that the energy productivity and greenhouse gas productivity variables that I used in this study contain economic factors.

Delimitations

Delimitations are the scope and bounds of a study that are set by the researcher (Leedy & Ormrod, 2016). In this study, I drew a sample from the NGR16. I did not include every company ranked on companies on the NGR16 and excluded companies not on the ranking due to time constraints to complete this study.

Significance of the Study

Contribution to Business Practice

ROE is a commonly used profitability measure. Understanding the factors that drive corporate ROE are critical to organizational policy formation and financial performance improvements (Turner, Broom, Elliot, & Lee, 2015). The results of this

study could potentially add value to businesses if business practitioners use the results as a reference to implement sustainability programs. If the findings of this study conclude a positively significant correlational relationship among energy productivity, greenhouse gas productivity, and ROE, corporate leaders would have more evidence to support their decision to implement sustainability programs. The results of this study may contribute to effective business practice when corporate leaders use the results as a reference to collaborate with other leaders to make their industries more sustainable.

Implications of Social Change

Corporate leaders of companies that do not operate sustainably can potentially use the results of this study to implement sustainability initiatives in their companies. Social change can occur when business leaders decide to practice CSR in industries not traditionally known for sustainability practices. Business leaders of competing companies within the same industries could make similar strategic operation changes to remain competitive. Corporate waste reduction as a social change could limit the negative effects that greenhouse gases have on the environment, such as global warming. Corporate leaders could contribute to decreasing the trapped heat on the earth's surface and beach erosion when their businesses emit fewer greenhouse gases (Environmental Protection Agency, 2016). U.S. residents who work outdoors or own coastal properties can benefit from corporate leaders limiting the greenhouse gas emissions that their corporations produce. If an increase of CSR commitment occurs, an increase in national employment could occur to maintain efficient CSR programs, which could strengthen the economy because of an increase in average household income, consumption, and savings.

A Review of the Professional and Academic Literature

This literature review includes a synthesis of published articles related to CSR, sustainability performance measurement, CFP, and instrumental stakeholder theory. I developed this literature review with literature found in peer-reviewed and non peer-reviewed journals. I used articles from Newsweek, which is not peer-reviewed, as a source to describe the energy productivity and greenhouse gas productivity data that I used in this study. I also reviewed books and germinal resources to support the theory and methodology selected for this study.

This literature review includes content from sustainability journals, such as *CSR & Environmental Management, Acta Commercii, Corporate Reputation Review, Journal of Productivity and Performance Management, Sustainability, Organization and Environment, Sustainability Development, Business Strategy & the Environment,* and *CSR & Environmental Management*. I developed this literature review to also include content from economic and finance journals, such as *International Journal of Economics and Finance, Measuring Business Excellence, Corporate Finance Review, Economic Modelling, Procedia Economics and Finance, American Journal of Economics and Business Administration, Competitiveness Review, Journal of Business Economics & Management,* and *Journal of Economic Development*. Additional content in this literature review pertains to the theoretical framework and methodology. In addition to germinal book sources, I accessed *MIT Sloan Management Review, Law & Financial Markets Review, International Journal of Multiple Research Approaches, Scandinavian Journal of Educational Research*, and *Journal of Mixed Methods Research*. I developed this

literature review with additional content from ethics and management journals, such as *Strategic Management Journal, Journal of Business Management, Journal of Business Ethics,* and *Journal of Business Ethics*.

Organization of Review

This literature review consists of two major sections, which are the opening narrative and application to the applied business problem. The opening narrative has four subsections that include the critical analysis of the various journals and content, explanation of the organization of review, a statement of an achieved percentage of the required peer-reviewed citations for Walden's DBA program, and a statement of an achieved percentage of the required current citations for Walden's DBA program. The critical analysis of the various journals I used in this study leads to the application to the applied business problem with a synthesis of literature relevant to this study. I organized the literature of the application to the applied business problem section in the following sequence: theoretical framework options, instrumental stakeholder theory, stakeholders, energy and greenhouse gas productivity, managerial fiduciary duty, stakeholder theory, return on sustainability, financial performance measurements, CSR and CFP literature, CSR challenges, CSR implementation, CSR measurement and reporting, and Green rankings methodology.

Strategy for Searching for Literature

I searched for literature after obtaining access to multiple databases through Walden University's online libraries, such as Business Source Complete, ABI/INFORM, and Emerald Management Journals. I used these databases to identify peer-reviewed

quantitative and qualitative research studies. I accessed the Walden University Library in Google Scholar to search for current and peer-reviewed journal articles, dissertations, and government publications there. I adjusted the search limit criteria within the databases to search for current and peer-reviewed literature. Within the respective library databases mentioned previously, I adjusted the date criterion to within 5 years of my anticipated graduation year to find current literature. My inclusion of literature published before the five-year range of my anticipated graduation date represented germinal studies and theoretical contributions. Minimization of older literature and reliance upon a large percentage of peer-reviewed sources were requirements for the literature review of the Walden University DBA rubric. I researched Newsweek.com, an online magazine, to find literature describing the NGR16, which is a not a peer-reviewed reference.

I searched for literature that was relevant to the specific business problem that I examined in this study. To find relevant literature, I searched for known sustainability terms and then searched for new terms discovered in articles from previous searches. The majority of my searches occurred through the use of the following keywords and combinations of keywords and phrases to find the literature for this review: *American and United States corporate sustainability; CFP; corporate responsibility (CR); corporate social performance (CSP); CSR; energy, green, and greenhouse gas emissions; profitability and ROE; environmental, social, and corporate governance (ESG); consumer values, trends and preferences; instrumental stakeholders and stakeholder theory; reliable and valid research designs and methods;* and *quantitative methods and correlational designs*.

I have met the Walden DBA program requirements for the literature review by surpassing the 60 peer-reviewed sources minimum with 85% of those sources within 5 years of my anticipated completion date. I included 69 sources in this literature review with 93% of sources with publication dates between 2014 and 2018 (64 of 69) and 91% of sources that are peer reviewed (63 of 69). The purpose of this quantitative, correlational study was to examine the relationship among energy productivity, greenhouse gas productivity, and ROE. I tested the following hypotheses to be able to answer this study's research question.

($H_0$1). There is no statistically significant relationship among energy productivity, greenhouse gas productivity, and ROE.

(H_a1). There is a statistically significant relationship among energy productivity, greenhouse gas productivity, and ROE.

Instrumental Stakeholder Theory

I used the instrumental stakeholder theory as the theoretical framework of this study as I examine the relationship between CSR and financial performance. Thomas Donaldson and Lee Preston developed the instrumental stakeholder theory to explain the relationship between corporate management's treatment of stakeholders and corporate performance (Donaldson & Preston, 1995). Bridoux and Stoelhorst (2014) described a company's stakeholders are its employees, customers, suppliers, communities that the corporation and its suppliers operate in, and the environment. Business leaders should at least consider optimal business models they can use to generate profits and satisfy the most stakeholders possible.

Corporate leaders have the potential to create value for their corporations by making decisions that positively impact the maximum number of stakeholders. Bridoux and Stoelhorst (2014) explained one tenet of the instrumental stakeholder theory to be fairness to stakeholders relates to the enhancement of firm performance. The theoretical instrumental stakeholder model for this study is that when a corporate leader treats the majority of his or her company's stakeholders fairly by consuming energy efficiently and producing less greenhouse gas emissions, his or her company will also have a higher financial return, ROE. It is important to note that causality is not a factor in the model. The instrumental stakeholder theory contains underlying management effectiveness and firm performance variables. The public brings negative attention to companies that do not control pollution.

Corporate leaders are more concerned about satisfying environmentally conscious consumers today than in the 1980s. Corporate leaders include CSR in corporate operations because of the shift in business paradigm for businesses to operate sustainably. Zhu, Liu, and Lai (2016) agreed that the instrumental stakeholder theory is a framework that explains how managing stakeholder relationships maximizes profits; accordingly, they also suggested that managers build meaningful relationships with stakeholders to increase their companies' performance potentially. When business leaders do not operate their companies sustainably, the leaders risk losing profits. Previous researchers have emphasized the importance of satisfying corporate stakeholders to avoid financial losses. Marom (2017) found that when a corporate decision maker ignored stakeholders' needs, then the corporation did not improve financially.

As previously explained, the sample companies' energy productivity and greenhouse gas productivity scores in this study represent the fair treatment of the sample companies' relevant stakeholders. The sample companies' ROE represents the CFP of the companies that treated their relevant stakeholders fairly. If this study results in a significant relationship among energy productivity, green gas emissions, and ROE, it provides an example of instrumental stakeholder theory. A significant relationship among the variables of this study will represent instrumental stakeholder theory through managers treating the maximum of relevant stakeholders fairly and receiving superior financial performance.

The complexity of stakeholder theory allowed researchers to deconstruct the theoretical framework into three theories. Zhu et al. (2016) explained that the instrumental stakeholder theory, the descriptive stakeholder theory, and the normative stakeholder theory are the three broad theories included within broader stakeholder theory. Garcia-Castro, and Francoeur (2016) explained that when corporate leaders invest in stakeholders, their corporations increases the probability of added economic value than corporations that did not. Donaldson and Preston (1995) claimed researchers use descriptive stakeholder theory to identify an explanation of a specific corporate characteristic and explained that researchers use the normative stakeholder theory to interpret the function of a corporation.

Montiel and Delgado-Ceballos (2014) explored 170 articles stemming from the CSR and sustainability literature published for both researchers and practitioners from 1995 through 2013. The researchers analyzed various definitions, theories, and variables

used in the field of sustainability. Of the 170 sustainability articles they analyzed, a significant portion of researchers used stakeholder theory. The authors concluded that CSR research and theory is a growing and evolving field with more articles expected to come.

Theoretical Framework Options

There were four other theories that I considered for the theoretical framework of this study stakeholder theory, agency theory, shareholder theory, goal-framing theory, and emergence theory. Freeman (1984) explained the stakeholder theory around the idea that an organization that effectively manages stakeholders will have longer survival and better performance than organizations that do not effectively manage stakeholders. The focus of this study is not comparing the performance of differently-managed organizations, so the stakeholder theory option was not appropriate for this study. Leaders in an organization act as agents, but their stakeholders are principles because the leaders have a responsibility to satisfy their stakeholders. Lamont, Kennelly, and Weiler (2018) mentioned that stakeholder theory includes a broad range of agents, which includes shareholders, stakeholders, principals, and agents. The stakeholder theory contains a characteristic of the agency theory, which includes the relationship between principles and agents.

I considered agency theory for the theoretical framework for this study. However, traditionally researchers have used agency theory to explain that managers are agents only concerned with maximizing profits for their principles or stakeholders' interest (Clarke, 2014). Agency theory has similarities to shareholder theory because the

shareholder theory proposes that a manager's primary role is to maximize the wealth of his or her company's shareholders (Lamont et al., 2018). Agency theory was not appropriate for this study because it does not historically represent incorporating CSR practices to benefit stakeholders. Agency or shareholder theory is not more appropriate for this study than the instrumental stakeholder theory.

I considered the goal-framing theory for the theoretical framework of this study because an organization could achieve positive CSP and financial performance by setting goals. Birkinshaw, Foss, and Lindenberg (2014) described that the goal-framing theory contains organizational goals, hedonic versus pain goals, and income goals. I did not choose goal-framing theory for the theoretical framework for this study because it was not an appropriate theory to use in this study to examine the CSR-CFP relationship. Some CSR theories include innovative characteristics that introduce new ideas to sustainability practice.

I also considered the emergence theory for the theoretical framework for this study. Bender and Judith (2015) found emergence theory to be a promising framework to generate solutions and to stimulate new thinking about defining, monitoring, or acting for sustainability. Emergence theory is not the most appropriate theoretical framework for this study because in this study I examined the relationship between sustainability performance and financial performance with archived data, which does not emphasize emergence. I focused on how a corporations' CSR activity relates to CFP, which makes stakeholder, goal-framing, emergence, and agency theories inappropriate theoretical frameworks for this study.

Energy and Greenhouse Gas Productivity

The energy productivity and greenhouse gas productivity scores from the NGR16 are the predictor variables for this study. I used the energy productivity data to represent how much energy each company consumed to generate given revenues. I used the greenhouse gas productivity data to represent the revenues generated from the volume of greenhouse gases emitted by each company. The Corporate Knights analysts calculated energy productivity and greenhouse gas productivity in similar ways, using a three-step process (Newsweek, 2016). In the first step, the analysts divided each company's revenue by its total energy consumption to find energy productivity, percent-ranked each company against all the other companies within the same industry, and multiplied by .75. In the second step, the analysts calculated each company's change of energy productivity over a 2-year period. In the third step, analysts added the scores from the first two steps.

The Corporate Knights analysts calculated greenhouse gas productivity by using a similar multistep process used to calculate energy productivity (Newsweek, 2016). In the first step, the analysts divided revenue by greenhouse gas emissions then percent-ranked each company against all other companies in its industry and multiplied by .75. Second, the analysts calculated each company's change of greenhouse carbon emissions over a 2-year period. In the third step, the analysts added the scores from Steps 1 and 2, multiplying results by 0.9. In an additional step, the analysts considered if a company has disclosed Scope 3 carbon emissions in prior years and weighted scores according to each company's Scope 3 disclosure. In the final step, the analysts added the results of the previous steps.

Corporate leaders can manage energy productivity and greenhouse gas productivity to assist in protecting the environment. Adeneye and Ahmed (2015) described that more companies are embracing leaders who place priority on environmental protection. Wiernik, Dilchert, and Ones (2016) studied the growing interests of corporations in reducing the environmental footprints of their operations. The authors reported that more than 85% of the Fortune 500 companies studied reported proactive environmental sustainability efforts through activities to reduce energy use and promote pollution prevention.

Return on Equity

ROE is a measure that financial analysts use to evaluate the profitability of a company. An analyst, business practitioner, or researcher can calculate ROE by dividing a company's net income by its shareholders' equity. An analyst can identify a company's growth by verifying increases of a company's return equity from one accounting period to the next. Financial analysts also use ROE to measure a corporate leader's ability to generate returns from his or her company's equity (Turner, Broom, et al., 2015). Researchers can use ROE as the CFP variable in their quantitative research studies. Konečný and Zinecker (2017) explained that a researcher could use ROE to measure a business's profitability in a rigorous research study.

Corporate leaders must perform effectively and efficiently to maintain employment, earn a promotion, and earn a higher salary. Corporate leaders are motivated to increase ROE because it is a measure to represent their competence in managing their company's equity. Successful corporate leaders aspire to increase their companies' ROE

(Clayton, 2014). The long-term financial viability of any organization requires that leaders generate and increase positive returns on equity (Turner, Broom, et al., 2015). The authors also explained that inadequate ROE jeopardizes borrowing capacity and if poor ROE continues, corporations become targets for mergers and acquisitions.

As mentioned earlier, I used ROE as the criterion variable for this study. I did not calculate the sample companies' ROE in this study because I collected all the ROE measurements from one website. I collected the sample companies' ROE values from Morningstar.com, and this strategy will eliminate the probability of error in calculation. This study includes the sample companies' ROE as the criterion variable. I use the term criterion variable throughout this study because the similar and common term independent variable correctly applies to studies of causality rather than correlation (Lamont, Vermunt, & Van Horn, 2016). I used ROE in this study to evaluate a corporate leader's ability to generate profit for his or her company.

Some researchers have used ROE to examine the relationship between a corporation's social performance and financial performance. Researchers regularly use ROE as a proxy for financial performance in quantitative studies. Ahamed, Almsafir, and Al-Smadi (2014) have used ROE as the proxy for financial performance in multiple studies that they examined the relationship between CSP and CFP. Wafaa and Mostafa (2016) used ROE as a financial performance proxy in the researchers' correlation design to examine the CSP-CFP relationship.

Financial Performance Measurement

Corporate leaders from every industry measure, record, and analyze their companies' financial performance because financial performance is critical for a corporation to remain open for business. A researcher has many options to use as financial performance measurements, such as ROE that I previously described, Price to Book Value (PBV), and return on assets (ROA) (Kartika & Monalisa, 2016). Each financial performance measurement represents how the decisions of a corporations' leaders impact their company's financial performance. Similar to ROE, the ROA measurement represents how well a corporate leader uses their company's assets to generate profits. Seay (2015) explained that the return on capital and risk management are value creation levers. Reiterated, corporate managers create company value when they increase return on capital and risk management. A researcher can proxy a company's financial performance with various measurements. Gherghina and Simionescu (2015) noticed the lack of statistically significant relationships between CSR and ROE in research studies they examined and recommended further research. Another reason that I used ROE as the financial performance proxy for this study is to add to the body of literature examining the CSR-CFP relationship.

The CSR-CFP Relationship

Researchers have examined the CSR and CFP relationship for over two decades now, but the results have been inconclusive. Researchers such as Brower et al. (2017) who examined studies on the relationship between CSP and CFP found mixed results. A portion of the researchers found positive or negative significant relationships and another

portion of researchers found insignificant relationships between CSR and CFP. Ping-Sheng, Cuili, and Heli (2014) reported that CSR could increase firm value in firms that are in industries that do not have high CSR demand. However, other researchers, such as Zimmermann, Gomez, Probst, and Raisch (2014), acknowledged that practitioners have traditionally categorized CSR activities as a cost, which is an alternative view to this study because of the view of sustainability spending in relation to profitability. The researchers who oppose sustainability today understand that there has not been proof that sustainability is beneficial to business financial performance. Hundreds of articles exist on the CSR-CFP relationship that researchers have examined with various variables to proxy for financial performance and social performance.

There has been sustainability literature with discussions and empirical findings of the relationship between CSR and CFP with a range of conditions and results. Wang, Dou, and Jia (2016) found that the CSR and CFP relationship was stronger for firms in mature economies than firms in undeveloped economies. As mentioned earlier, researchers have attempted various ways to construct a study to examine the relationship between CSR and CFP, but the results have not been consistent. Trumpp and Guenther (2017) found that within companies that have a low CSP, the relationship between CSR and CFP is negative. Brower et al. (2017) mentioned that the previous studies on the CSR and financial performance relationship have mixed results with linking CSR to profitability. America has not been the only country were CSR policies are common, and researchers should continue to examine the CSR-CFP relationship in other nations.

The international community has accepted CSR practices and some U.S. corporations have improved foreign communities and corporations by protecting international stakeholders. U.S. business leaders managing foreign business operations are practicing CSR because of the global demand for corporate responsibility. Hashmi, Damanhouri, and Rana (2015) found that most large U.S. corporations are involved in practicing sustainability and environmental safety in the United States and abroad. Even though this study included U.S. companies, it is important to know how the relationship, if any, between CSR-CFP, exists internationally, which can assist U.S. corporate leaders in managing the relationships with foreign stakeholders.

The CSR body of literature includes articles researching the relationship between CSP and CFP of companies across the globe. According to Bridoux et al. (2015), internationally, leveraging CSR and sustainability mechanisms in ways that lead to positive financial outcomes require that corporate managers communicate, relate to stakeholders, enhance perceptions of the firm's integrity and benevolence, and show the firm's financial viability. Foreign CSR-CFP relationship studies are valuable to multinational corporate managers because they can base their foreign CSR policies on these studies. Some researchers have examined the CSR-CFP relationship in Asia, South America, Europe, and the Middle East.

Researchers who examined the CSR-CFP relationship of foreign companies also found that the results were not conclusive. Ahamed et al. (2014) conducted a study on Malaysian companies and found a positive CFR-CSP relationship; however, the authors' small sample limited their study, and the results could not be generalized to a larger

population. Adeneye and Ahmed (2015) used a multiple regression and found that from a population of 500 U.K. companies a positive and significant relationship between CSR and CFP existed. Corporate governance is the policies and guidelines to which a company adheres applied across all or most corporate locations. Business leaders of a multinational corporation can update their company's corporate governance to implement international CSR activities.

Governments, like corporations, enhance sustainability through Corporate Responsibility (CR), CSR, and Environmental Social and Corporate Governance (ESG). Moser, Swain, and Alkhabbaz (2015) noticed that social responsibility is important to the Saudi economy because the government is trying to diversify investments to reduce dependence on the petroleum sector. Some governments have realized the value of alternative energy and mitigated the risk of depending on traditional sources of energy. Corporate leaders have foreign risks involved with practicing sustainability practices abroad. An issue with globalizing sustainability is foreign governments' willingness to participate in sustainability and reporting practices, which may include the foreign governments enacting new laws and regulations (Székely & vom Brocke, 2017). CSR practices in some countries are not legal in other countries. Some local governments in India allow children under the age of fourteen to work in factories and consider good working environments for the underaged children as good CSR practice (Varghese & Supraja, 2016). A corporate leader must examine all foreign risk associated with foreign CSR practices and to ensure the well-being of all stakeholders of his or her company.

Stakeholders

Stakeholders are groups connected directly or indirectly to a company. Cardwell, Williams, and Pyle (2017) described corporate stakeholders as individuals, groups, entities, and organizations with substantive interests, roles, powers, or rights in the affairs of companies. A corporate manager decides which stakeholders to satisfy during their business's operations. Stakeholders, such as employees, suppliers, community, vendors, customers, shareholders, and management, are important to a corporation through their influence and support of operations, trade, culture, community, and environment (Garriga, 2014). Stakeholders are important to this study because they are integral to this study's theoretical framework, instrumental stakeholder theory. Contemporary corporate managers serve a much larger stakeholder group than corporate managers in the past (Madsen & Bingham, 2014). Stakeholders are important, but are also a risk to corporations because any group of stakeholders can publish their approval or disapproval of a corporation with the potential to reach millions via social media. Stakeholders are more active, demanding, and have more power than in the past and corporate leaders need to understand who they are and what they demand.

At the basic level, two broad categories of stakeholders exist. Babar, Ghazali, Jawawi, and Zaheer (2015) categorized corporate stakeholders as internal stakeholders and external stakeholders. The authors described that every corporation has internal and external stakeholders; internal stakeholders are employees and management, whereas external stakeholders are customers, shareholders, suppliers, and community. Pandi-Perumal et al. (2015) found that company leaders considered the relationship between

their company's relationship with environmental and societal stakeholders when leading business operations.

Brunton, Eweje, and Taskin (2017) found that it is important for companies to monitor stakeholders' CSR attitudes to guarantee that CSR policy orientations meet stakeholder expectation. Researchers and practitioners understand the importance of stakeholders and their treatment because of the impact of their satisfaction or lack of satisfaction. A corporate manager has the potential to improve his or her business's performance by satisfying stakeholders. Stakeholders provide important feedback that business leaders could use to improve operations and generate profits (Garriga, 2014). Corporate leaders support some CSR decisions with stakeholder research results after performing stakeholder analysis to understand their behaviors, intentions, interrelationship interests (Mitchell, Weaver, Agle, Bailey, & Carlson, 2016). When corporate leaders take the time to understand and communicate with stakeholders, they can analyze feedback and apply their knowledge to strategic investments to increase CSR and CFP.

Managerial Fiduciary Duty

Corporate managers are responsible for protecting the wealth of their company's owners. Tu (2016) explained that corporate management must protect and maximize their company's shareholders' wealth, which describes managerial fiduciary duty. The concept of fiduciary duty relates to this study because I examined if companies acknowledged for successful CSR efforts related to the financial performance of those companies. Some researchers oppose the argument against investing in sustainability activities. Scholars

have conflicting views on fiduciary duty relating to CSR activity, but practitioners are increasingly choosing to maintain and implement CSR activities.

Stakeholders are also becoming more accepting of corporate leaders being more socially responsible. Company leaders are concerned about the relationship between their companies and stakeholders, especially the environmental and societal stakeholders (Pandi-Perumal et al., 2015). A stakeholder who is not an owner of a corporation, but connected to a corporation expect the leaders of that corporation to treat him or her fairly (Tu, 2016). Regardless of the overall inconclusive results of the CSR-CFP relationship or traditional beliefs of fiduciary responsibility to shareholders some corporate leaders include sustainable activities because they think it is beneficial.

Return on Sustainability

The metric return on sustainability (ROS) implies causality between CSR and profitability, which I do not examine in this study, but ROS is important to understand when researching the CSR-CFP relationship. Literature exists that support how CSR practices can make a financial return in the short-term. Harjoto and Jo (2015) analyzed a sample of public companies in the United States and found that CSR dedicated to internal and external stakeholders resulted in increased financial performance after one year. Some researchers such as, Von Arx, Urs, and Ziegler (2014) found that companies with CSR practices had higher financial returns than companies that did not, but other researchers found no CSR-CFP relationship. Research that concludes that a CSR-CFP relationship does not exist has found different factors why the relationship is nonexistent. Will and Hielscher (2014) found that empirical studies resulted in negative financial

returns when CSR was unrelated to value generating corporate processes. Business leaders can compare financial performance before and after implementing CSR practices to analyze the financial impact of CSR practices. Some business leaders have unsuccessfully marketed sustainability products or services, which resulted in a failed CSR program. Ng, Butt, Khong, and Ong (2014) suggested that managers should improve their company's green perceptions; skeptical consumers result in unprofitable CSR programs. American consumers trust more green products and services across all industries now than in the past, which is an indication of increased green perceptions of many U.S. companies and industries.

An initial public offering (IPO) is the first day that a privately managed company goes public or allows individuals in the public to buy its shares to own a portion of the company's equity. Jia and Zhang (2014) described perceived riskiness in their investigation of the financial performance of companies before and after IPOs and found that pre-IPO corporate performance influenced post IPO performance. The authors found that implementing an unproven sustainability program can negatively impact a company's financial performance before the IPO and perceived riskiness afterward. Fundamental finance theory suggests that the riskier a company is, the more return it has the potential to generate. IPO investments are risky, but an unproven sustainability program implemented before an IPO can cause an IPO investment to be riskier, which fundamentally should increase potential returns.

CSR Challenges

Business practitioners have several challenges when planning, implementing, and maintaining sustainability practices for their corporations to satisfy stakeholders. Some corporate leaders make immoral decisions to satisfy the demand from society for corporations to practice CSR. Schuetze and Chelleri (2016) acknowledged that CSR demand creates an unethical side of sustainability and one of the corrupt practices is greenwashing, which is attempting to make a company seem green through perception in advertising and public relations. Spyra (2017) suggested that in the environmental protection era, a company that intends to raise their customers' trust needs to invest in green resources. Corporate leaders should understand that some consumers perceive CSR marketed products as greenwashed.

Corporate leaders have difficulty achieving trust from the public that their products and business operations are sustainable. Ng et al. (2014) found that brand perceived quality and overall credibility has a significant influence on generating a greener image, perceived green value, and green brand equity. Business leaders must prove that their companies have genuine CSR practices to be trusted by consumers and it is a less difficult task for credible companies. Business practitioners often require external stakeholders to practice CSR. Corporate managers extend sustainability requirements to other companies in their supply chain to ensure sustainably sourced products. One irresponsible company in a corporation's supply chain can cause that corporation and other corporate partners to lose CSR reputations because of association. Koo, Chung, and Ryoo (2014) revealed that supply chain coordination mediates the

environmental sustainability orientation and environmental performance relationship. A corporate leader should strategically include CSR into his or her business's operations and culture (Čarnogurský et al., 2015).

Corporate leaders face a challenge when they cannot explain the timeframe to generate a financial return after implementing a sustainability program. The potential long-term financial reward for implementing sustainability is challenging to corporate leaders due to the short-term performance measurements of one fiscal quarter, three months. It is common for some shareholders to sell their shares of a company if that company's finance team announces that their company was not profitable during a fiscal quarter.

Business practitioners must decide which stakeholders to satisfy when leading corporations, but the practitioners cannot base decisions on conclusive academic evidence. The mixed results of past examinations on the relationship between CSR and financial performance are challenging for corporate leaders (Brower et al., 2017). The challenge that corporate leaders have is that some of their stakeholders expect them to be socially responsible and others expect higher profits and practitioners have no support from conclusive research.

Another challenge that a corporate manager has with CSR is that when the economy is failing the manager must decide whether he or she should focus on all stakeholders or only shareholders. Kantabutra (2014) found that perseverance and resilience are two direct predictors of a firm's ability to increase the capability to deliver strong performance in social and economic crises. The challenge of remaining green after

a crisis is that most executives' concerns are with the financial security of internal stakeholders and less interested in external stakeholders to ensure their company's survival (Bridoux et al., 2015). Some corporate leaders care about protecting the environment, but when the economy is in a recession, those leaders lose interest in protecting the environment and society to focus on generating profits.

CSR Implementation

Corporate leaders implement different types of CSR practices for various reasons, which depends on CSR implementation strategies. Gill (2015) found that some business leaders used corporate storytelling as a valuable public relation strategy to increase employee engagement in CSR implementation. Business leaders gain the skills to implement CSR initiatives through sustainability training. Baumgartner and Winter (2014) explained the importance of CSR training and developed sustainability manager, a business simulation management game, to train and educate employees.

Managers need a sufficient level of ethical awareness and the ability to empathize with all stakeholder groups to successfully execute CSR processes. Kelley and Nahser (2014) explained that some managers remain challenged to adopt CSR values after decades of access to CSR education training literature by credible publishers, such as the United Nations. Business practitioners must understand CSR in depth to encourage their employees to participate in CSR activities. Some business leaders have difficulty managing business operations without sustainability factors, and those leaders have even more difficulty operating with sustainability factors. Satanarachchi and Mino (2014) found that sustainability is a complex and constantly evolving concept. Business

practitioners plan and implement CSR programs inefficiently because of the complexity of CSR. Schneider (2015) found that a bidirectional relationship among ecological, economic, and social variables, could cause more corporate managers to implement business models including those variables. Some practitioners who implement CSR programs are willing to accept the complexity related to CSR because they believe the benefits are greater than the disadvantages.

Some business practitioners have implemented advantageous sustainability programs because the practitioners designed industry-specific CSR programs. Berinde and Andreescu (2015) acknowledged that when business practitioners aligned CSR activities with their companies' industry and community, the practitioners created advantages for all stakeholders. Robinson and Nikolic (2014) suggested that a firm should have sustainable priorities that align with global, societal, external, industry, organizational, leadership, and individual personal contexts, which describes internal and external stakeholders.

Some corporate stakeholders concern themselves with corporate social programs that organizations implement. A corporation that has implemented a social program represents that the corporate leaders of that company acknowledge the community as a stakeholder and seeks to satisfy that stakeholder (Székely & vom Brocke, 2017). When a company satisfies the individuals in the communities in which they operate is a common practice of sustainability, but corporate leaders also have other available CSR options.

Corporate leaders participate in CSR trends to compete with other companies within the same industries. Although various ways exist for corporate leaders to

implement CSR practices, some are more common than others. Hashmi et al. (2015) listed the following eight sustainability practices that U.S. corporations exercise, which were investing in energy efficient methods, consuming solar power electricity, consuming wind power electricity, consuming biofuels, trading carbon credits, supporting environmental organizations, consuming biomass electricity, and consuming hydropower electricity. Seay (2015) mentioned that companies implemented sustainability practices by reducing energy use, reducing waste, managing reputation, responding to regulatory constraints, reducing emissions, and reducing water use.

The federal government does not require the leaders of private companies to publish financial records, but leaders of private companies have been providing more information about CSR programs to the public. Menoni and Morgavi (2014) concluded that private firms tended to adopt three approaches to implementing environmental sustainability, which were efficient production technologies, research and development, and production technologies that produce less waste and greenhouse gas emissions. The energy efficient and carbon-reducing practices relate to this study because of the predictor variables of this study are energy productivity and greenhouse gas productivity.

Corporate leaders can also implement sustainability practice at the production level of their business operation. A company can make their production more sustainable by implementing cyclic manufacturing, which uses products that consumers return as raw material, rather than the traditional production model of open loop manufacturing (Tsiliyannis, 2015). Corporations that produce products are notorious for polluting the environment, but controlling pollution at the manufacturing stage of the business model

could significantly decrease a company's carbon footprint. Will and Hielscher (2014) noted that CSR could be functional when using it as a moral commitment factor during production. Some companies even monitor the logistics of their finished goods after production to make sure that any company involved with their product practice CSR.

It is common business practice for corporate leaders of organizations to place accountability of other corporations in their supply chain to practice CSR. Some corporate leaders have implemented sustainability programs because other companies in their supply chain requested that they implement CSR programs to continue a business relationship. Ferrara, Khademi, Salimi, and Sharifi (2017) described that integrated sustainable supply chain management that included social and environmental supply chain management positively associated with CFP. The integrated supply chain relates to this study because of the corporate awareness of the social and environmental stakeholders in their operations. To assist business practitioners in implementing CSR programs, researchers and practitioners have developed CSR business models and frameworks for the practitioners to follow. For example, Ganesh and Krishnan (2014) presented a case study on Extra Weave Pvt. Ltd. where corporate leaders successfully implemented a CSR development model, which the practitioners used to identify the issues in CSR implementation and appropriate solutions. Cassimon, Engelen and Liedekerke (2016) created a model for business leaders to understand the optimal timeframe to implement CSR practices to gain the most return on investment.

CSR Reporting

CSR Reporting is not mandatory for U.S. companies, but a corporate leader can voluntarily publish his or her company's sustainability report. It is difficult for a corporate sustainability reporter to compare CSR measurements to other companies because of differences in CSR measurement methodologies. Hahn and Lülfs (2014) mentioned that corporate leaders should publish balanced and complete sustainability reports, but warns that the voluntary sustainability reports are susceptible to greenwashing. Corporate greenwashing enhanced the need for transparency in sustainability reports.

Business practitioners publish credible CSR reports when motivated by societal pressure to be transparent in CSR reporting. The public has requested that corporations increase the quality of corporate sustainability reporting. Fernandez-Feijoo, Romero, and Ruiz (2014) found that pressure from some stakeholder groups cause business leaders to improve the transparency quality of sustainability reports. Amran, Lee, and Devi (2014) found that a company had higher sustainability reporting quality (SRQ) if its business leaders aligned the company with non-governmental organizations and included CSR principles in the company's vision and mission statements. Corporate leaders can also use transparency in sustainability reporting to increase reporting quality and investor confidence.

Fernandez-Feijoo, et al. (2014) explained that transparency is a CSR communication quality that improves the relationship between a company's managers and its investors. Transparency is an important aspect of the connection between a

corporation and its stakeholders. Ojasoo (2016) suggested that corporate leaders have ethic audits of their companies' CSR reporting to increase transparency and trust of stakeholders.

Sustainability reporting is increasing internationally because more consumers are demanding eco-friendly products and services in many countries. U.S. companies were the first in the world to publish voluntary sustainability reports. Berinde and Andreescu (2015) mentioned that sustainability reporting started in the United States, but is increasing in Europe and noted that Romanian companies following Global Reporting Initiative (GRI) standards were likely to increase because of the European Commission's Directive 2014/95/EU. All CSR reporting is voluntary because no mandatory CSR reporting standards exist. Hahn and Lülfs (2014) described the difficulty that business leaders have regarding the GRI to report the positive and negative aspects of their company's sustainability reporting by using the standardized GRI reporting guidelines. The researchers also created a GRI-compliance system. Corporate leaders present similar topics in CSR reporting although no mandatory CSR reporting standardization exists.

Székely and vom Brocke (2017) examined 9,514 sustainability reports published between 1999 and 2015 and found a trend in 42 topics of economic, environmental, and social sustainability topics. The authors revealed the most common terms among sustainability reports stemmed from organizational reporting of emissions and energy consumption and suggested further research on energy use, greenhouse gas emissions, and corporate sustainability. I examined energy productivity and greenhouse gas

emissions, which adds to the existing body of sustainability literature as the previous researchers recommended.

CSR Measurement

Corporate leaders should accurately measure their CSR because society is becoming more environmentally conscious and demand sustainability transparency. Kocmanová and Šimberová (2014) found that it was appropriate for researchers to use environmental, social, and corporate governance (ESG) performance indicators to collect data for sustainability reporting. ESG pertains to this study because the Corporate Knights analysts used ESG performance indicators to calculate the energy productivity and greenhouse gas productivity scores, which I examined in this study. CSR reporters measure sustainability and ESG using various methodologies. Wagenhals, Garner, Duckers, and Kuhn (2014) created a sustainability index with a five-step process by selecting the sustainability indicators, quantifying, normalizing, and weighing the indicators then constructing the sustainability index. The five-step process relates to the NGR16 because the panel of experts who created the NGR16 methodology included ranking companies using classifications, weights, standardization, and rankings in the methodology (Eccles et al., 2016). Wagenhals et al. (2014) found that indicator dependencies have a high influence on a sustainability index and financial performance.

Some corporations use custom sustainability measurement tools. Bartley et al. (2014) created a sustainability performance measurement tool for Bacardi Limited business leaders to manage, evaluate, and communicate CSR to Bacardi's stakeholders.

This study did not require a tool to collect primary sustainability data because I collected the sustainability data came from a secondary source.

Green Ranking Methodology

2009 Green Rankings methodology. The Newsweek staff published the Newsweek Green Rankings 2009 (NGR09), the company's first green rankings, and the panelists continued to improve the methodology each succeeding year (Newsweek, 2009). The difference in methodologies causes a researcher not to generalize research results of an examined green rankings that the researcher used in his or her study to unexamined green rankings. The Newsweek researchers partnered with research companies to complete the NGR09 (Newsweek, 2009). In 2009, analysts from Newsweek partnered with Trucost, KLD Research and Analytics, and Corporate Register (Newsweek, 2009).

The Newsweek panelists partnered with companies that specialized in providing the services of calculating corporate environmental impact and reputation. According to the journalists from Newsweek (2009), the analysts from Trucost measured over 700 variables to quantify each examined company's environmental impact. The KLD analysts calculated the green policy score by analyzing climate change and pollution policies versus performance, environmental effects of products, and environmental management and stewardship (Newsweek, 2009). The analysts from Corporate Register conducted a survey and provided analysis of the data collected from professionals and academics from various industries and environmental experts (Newsweek, 2009). The Corporate Register analysts used a general survey of executives of the individual companies to calculate

companies' reputation for environmental stewardship (Newsweek, 2009). The analysts used standardization to be able to compare the companies included in the NGR09.

The Newsweek researchers also weighted scores to account for industry differences and calculated Z-scores to measure how well each company's green score related to the average of the group (Newsweek, 2009). Analysts from Newsweek (2009) utilized the FTSE/Dow Jones Industry Classification Benchmark to categorize the 500 greenest U.S. companies into 15 sectors. The Newsweek analysts and partners calculated the overall NGR09 green scores by placing weights on the three indicators environmental impact (45%), green policies (45%), and standing among peers (10%). The analysts at Newsweek ranked the companies with green scores from highest to least. The Newsweek editors also published of each company's environmental impact and green policies scores.

2016 Green Rankings methodology. I used a random sample of companies from the NGR16 for examination. The Newsweek panelists changed the Green Ranking methodology in 2016 and utilized the services of Corporate Knights to assist with improving the accuracy of the overall green scores that the partners ranked. The Corporate Knights' staff performed several screens for the green rankings candidates, which included sustainability disclosure, F-score of profitability and operating metrics, product category, and sanctions (Newsweek, 2016). The Newsweek panelists fully disclosed the green ranking methodology of the NGR16, which made the green rankings more transparent than the undisclosed methodology used for the NGR09 (Newsweek,

2016). The Newsweek editors increased trustworthiness in their publishing when the panelists increased the transparency of the green rankings.

The possibility existed for a company's inclusion in the Newsweek Green Rankings for recurring years. The Newsweek analysts (2016) added the companies included in the green rankings published in 2015 to the list of NGR16 candidates, but only if the companies' scores were not in the lowest quartile of scores in their industries. The Corporate Knights' analysts used weighted performance indicators for each company they examined (Newsweek, 2016). The twelve key performance indicators and weights the analysts used were energy productivity (15%), carbon productivity (15%), water productivity (15%), waste productivity (15%), green revenue score (20%), sustainability pay link (10%), sustainability board committee (5%), and audited environmental metrics (5%) (Newsweek, 2016). The analysts added the twelve indicators of each company to equal each company's overall green score. The Corporate Knights' staff then ranked the companies by industry and decided how many companies from each industry to include on the NGR16. The final list for the NGR16 consisted of the highest ranked U.S. companies in their industries. I used two of the key indicators from the companies that made the NGR16. I used the energy productivity and carbon productivity, which I refer to as greenhouse gas productivity, key indicators to examine their relationship with ROE.

Transition

In Section 1 of this study, I presented the background and history of this study's business problem. I introduced the problem statement, which contained the general and specific problems that consisted of corporate leaders not knowing the relationship among

corporate energy productivity, greenhouse gas productivity, and ROE. I explained why I wanted to conduct this study in the purpose statement. I presented the research question in Section 1 also. I explained the instrumental stakeholder theory theoretical framework and the operational definitions of this study. The purpose statement, hypotheses, research question, and nature of the study aligned with the problem statement. I described the assumptions, limitations, delimitations, the significance, contribution to business practice, and the implication for social change of this study. Section 1 of this study ended with the literature review.

Section 2 begins with a restatement of the purpose statement. Section 2 includes the role of the researcher, data collection, participants, research, and design methods. I describe the role of the researcher and the research and design methods of this study. I describe the population, sampling and ethical research used in this study in Section 2. The data collection instruments, data organization technique, and data analysis appears in Section 2. The end of Section 2 has the explanation of this study's validity, transition, and summary. Section 3 of this study includes findings, applications of finding to professional practice, implications for social change, recommendation for further research, reflections, and provide a conclusion, appendices, and table of content.

Section 2: The Project

The purpose of this quantitative correlational study was to examine the relationship among energy productivity, greenhouse gas productivity, and ROE. The predictor variables for this study were energy productivity and greenhouse gas productivity. The criterion variable for this study was ROE. The population for this study was the NGR16, which is a ranking of the 500 largest and most sustainable publicly traded companies in the United States (Eccles et al., 2016). The implications for positive social change include the potential to improve the quality of life for U.S. residents who spend extended periods of time outdoors for occupational or recreational purposes by supporting the reduction of greenhouse gas emissions linked to rising temperatures and extreme precipitation.

Role of the Researcher

The researcher's role is to design his or her study ethically and to collect, organize, and analyze data with minimum bias (Chiumento, Rahman, Frith, Snider, & Tol, 2017). I do not have any direct relationships with any of the companies in the NGR16, which I analyzed in this study, by employment, prior research, or business relationships. Although no human research participants were in this study, I adhered to the responsibilities to cause no harm to companies and to remain ethical throughout this study. I followed the ethical rules described by authors such as Howell et al. (2015) and as outlined in the *Belmont Report* concerning ethical research standards, which addresses confidentiality, consent, and equality of participation (U.S. Department of Health & Human Services, 1979).

Participants

Companies ranked on the NGR16 were eligible to be participants for this study. I downloaded the NGR16 from Newsweek.com to gain access to the companies included in this study. I did not use human participants for this study and did not collect primary data from companies; therefore, there was not any need to establish working relationships with the participants of this study. The collection of secondary data involves the compilation of existing data previously collected by other researchers in prior studies made available to other researchers to further examine (Cheng & Phillips, 2014; Greaney et al., 2012; Leedy & Ormrod, 2016).

Analysts rank the most sustainable 500 companies in the United States on the NGR16 by overall scores with indicators, such as energy productivity and greenhouse gas productivity (Ahmed & Beck, 2016; Eccles et al., 2016; Murguia & Lence, 2015). The population of this study aligned with the research question concerning the correlation, if any, among corporate energy productivity, greenhouse gas productivity, and ROE. In studies with secondary data sources, the researcher must identify, appraise, and sample the population, then collect, organize, and analyze data leading to research findings of the specific research question (Cheng & Phillips, 2014; Goertzen, 2017; Turner, Dias, Ades, & Welton, 2015).

Research Method and Design

Research Method

I used a quantitative method for this study to examine the degree and direction of the relationship, if any, of a company's corporate energy productivity, greenhouse gas

productivity, and ROE. A quantitative method is appropriate for examining relationships among known variables (Barnham, 2015; Campbell, 2016; Maxwell, 2015). The other two research methods that I did not use because they are not appropriate for this study are qualitative and mixed methods. Qualitative research methods typically apply to the exploration of social experiences through the collection and analysis of richly in-depth data, such as narrations using words (Guetterman et al., 2015; Ragin, 2014; Russell et al., 2016). A mixed method approach involves researchers combining qualitative and quantitative methods (Alavi, 2016; Campbell, 2016; Guetterman et al., 2015). The qualitative method is appropriate for exploring the meaning of human problems, social issues, and reporting rich descriptions and mixed methods are appropriate for research which adds numerical analyses to that understanding (Barnham, 2015; Goertzen, 2017; Maxwell, 2015). The purpose of this study was not to generate rich descriptions of a phenomenon or to add numerical analyses to qualitative data, which makes the quantitative method the best option for my study and the qualitative and mixed method approach inappropriate choices.

Research Design

I used a multiple regression to address the research question and hypotheses. Multiple regression is a commonly applied approach to research questions and hypotheses involving relationships, associations, and correlations (Kondrat & Jaggers, 2016; LaMont et al., 2016; Leedy & Ormrod, 2016). I used a correlational research design because it was the most appropriate for this study to examine the relationship that between two or more variables statistically. Various applications of correlation statistics

are among the main research designs applied by researchers using the quantitative method (Girling & Hemming, 2016). Different quantitative designs include experimental, non-experimental, and quasi-experimental or causal-comparative (Leedy & Ormrod, 2016). A quantitative study that is correlational is typically a non-experimental design, requiring an examination of the relationships between known and measurable variables; conversely, an experimental design involves the examination cause-and-effect relationships typically through the comparisons of groups (J. Cohen, P. Cohen, West, & Aiken, 2013). A quasiexperimental design and causal-comparative design are similar to an experimental design without the random assignments of participants to different groups (Bor, Geldsetzer, Venkataramani, & Bärnighausen, 2015; Kelly, 2015).

I did not intend to examine cause-and-effect relationships and have no intention to assign participants to different treatment or control groups or adjust variables or treatments. Therefore, an experimental design was unnecessary and inconsistent with the goals established for my study. Instead, a thorough and extensive review of the literature revealed variables of interest in prior studies indicating the possibility of significant correlations of variables identified for this study. I intend to examine the possibility of relationships among the selected variables to answer a research question and test hypotheses that align with a correlation design. A correlation design was an appropriate choice to achieve the goal of examining relationships that may exist among corporate energy productivity, greenhouse gas productivity, and ROE for the companies represented in this study.

Population and Sampling

I used a sample from the population of this study, which were the companies listed in the NGR16. The NGR16 consists of the 500 corporations in the United States with the largest market capitalization and highest CSP scores. Defining the population for the study helps readers understand the context of the study and any unique characteristics of the larger group used for sampling in a quantitative study (Antwi & Hamza, 2015; Campbell, 2016; Goertzen, 2017). The NGR16 population, which includes energy productivity and greenhouse gas productivity scores aligned to this study's research question; therefore, I was able to use the sample to examine the potential relationship of corporate energy productivity, greenhouse gas productivity, and ROE.

I used the probabilistic random sample method because the participants in this study were randomly selected from a known list. I used a random sample for this study, which some researchers consider an optimal approach for selecting participants for a quantitative study (Bradley & Brand, 2013; Check, Wolf, Dame, & Beskow, 2014; McShane & Böckenholt, 2016). A researcher can use randomization software to reliably avoid bias in a quantitative study (Cui, Bu, Wang, & Liao, 2014; Kim & Shin, 2014; Köhler, Landis, & Cortina, 2017). I used the Stat Trek free random sampling software to select the companies that I examined in this study.

Two advantages of random sampling are simplicity and a higher chance of representing the whole population with generalization (Campbell, 2016). Other advantages of using a probabilistic random sample method include less researcher bias, minimal costs, and time efficiency (Haneuse, 2016; Lee & Yoon, 2017). Some

disadvantages of random sampling include access to the population, the ability to collect complete contact information or data, and the retention of participants (Brueton et al., 2013; Molenberghs et al., 2014; Salkind, 2016). Each company in this study's population had an equal chance of selection. An equal chance of selection is the basis of random sampling (Amro & Pauly, 2017; Bradley & Brand, 2013; Kennedy-Martin, Curtis, Faries, Robinson, & Johnston, 2015).

I used G*Power3 software to justify an appropriate effect size, alpha *p* value, and power to generalize the correlation, if found, to the population as a whole for this study. Establishing effect size and conducting a-priori power analyses are important steps in determining the appropriate sample size for a research study (Bradley & Brand, 2013; Jäntschi, Bálint, & Bolboacă, 2016; Lakens, 2013; Wiederman, Artner, & Von Eye, 2017). Statistical power analysis software is an acceptable choice for determining ideal sample sizes (Kelly, 2015; Kim, 2016; Lakens, 2013). Sample size calculation is essential to determining data collection requirements and interpreting the generalization of statistical results to the entire population (Bradley & Brand, 2013; Kim, 2016; Wiederman et al., 2017).

Ethical Research

As the researcher, I was responsible for receiving written consent forms from each human participant, if any, included in this study before the data collection phase (U.S. Department of Health & Human Services, 1979). As the researcher, I was also responsible for clearly communicating to each participant, if any, that they were able to withdraw from the study at any time without penalty. The inclusion of informed consent

forms, withdrawal procedures, and an address of incentives or penalties are steps that enhance the ethical treatment of human research participants (Howell et al., 2015). The inclusion of informed consent forms, withdrawal procedures, and an address of incentives or penalties are unnecessary for this study because I did not include human participants in this quantitative, correlational study. I had to protect the organizations that I examined in this study. Greaney et al. (2012) explained that secondary data from historical financial records are acceptable in quantitative studies. I adhered to the rules and regulatory practices required by Walden's IRB and the *Belmont Report* to assure that the protection of organizations was adequate (Hardicre, 2014). I did not need to provide a consent form in the text, appendices, and Table of Contents of this research paper because I did not use human participants.

I stored this study's collected data on a flash drive and stored it in a personal lockbox, which I only have access and where it will remain for 5 years. After 5 years, I will permanently delete the electronic files from the flash drive. I will know when to the five-year timeframe comes because I wrote the disposal date on the personal lockbox and on the flash drive. There are no hard copies, papers, or recordings to store or destroy. The Institutional Review Board (IRB) confirmed that this study met Walden's ethical study and approved data collection for this study and provided an IRB approval number, 04-02-18-0498830. A coding system allowed identity protection of this study's sample of companies; I labeled each sample company in this study with a numerical value to protect their identity. Fiske and Hauser (2014) explained that coding systems protect the identity

of companies. As the researcher, for this study, I researched in an ethical manner with no intent to harm the organizations that I included in this study.

Instrumentation

The instruments that I used for this study are the NGR16 and Morningstar.com. The editors at Newsweek, Inc. published the NGR16 and Morningstar.com staff published ROE data that I used in this study in 2015. I used the instrument developed by the Newsweek staff to collect the energy productivity and greenhouse gas productivity scores, which I used as CSP proxies. Researchers described that CSP could be proxied by corporate sustainability data (Nollet et al., 2015). The analysts from Newsweek used 2014 financial data of the companies included in the NGR16 and the Morningstar.com analysts published public companies' 2014 financial data online in 2015. With the data from Newsweek.com and Morningstar.com, I was able to examine a company's 2014 energy and greenhouse gas productivity to its 2014 ROE.

Analysts calculate energy productivity using a company's total revenue and total energy use; analysts calculate the greenhouse gas productivity variable using a company's total revenue and greenhouse gas emissions (Newsweek, 2016). Analysts calculate return on equity using a company's net income and shareholder's equity. The scales of measurement for energy productivity, greenhouse gas productivity, and ROE are ratio data. The ratio data scale of measurement has meaningful differences between values (Schollmeyer & Augustin, 2015). Interval data values also have meaningful differences, but the difference is that ratio data has a meaningful 0.0 point and interval data does not (Campbell, 2016). The energy productivity and greenhouse gas productivity

variables that I used for this study and collect from the NGR16 instrument were ratio data. The analysts calculated energy and carbon productivity scores by using division, which makes the ratios meaningful for comparison and 0.0 productivity scores accurately representing that no measurements exist (Newsweek, 2016). Opara and Hryniewicz (2016) defined interval data as the fixed numerical values within a specific range; ratio data has fixed numerical values and a meaningful 0.0 value.

The NGR16 was the appropriate instrument for gathering the secondary data, energy and greenhouse gas productivity. The methodology for calculating the productivity scores is transparent. The Newsweek analysts demonstrated cooperativeness with companies listed on the NGR16 by giving each company the option to verify their company's data collected from public sources. The Morningstar.com instrument was the appropriate instrument for gathering secondary data of ROE because the company's analysts were transparent with the calculation and gathered raw data from audited financial statements that corporate financial reports submitted to the U.S. Securities and Exchange Commissions (SEC). Investors, scholars, academics, and business professionals have used Morningstar.com to collect the financial information of publicly traded companies. Moningstar.com is a website used and accepted by prior researchers who have examined the business performance of corporations by collecting financial data, such as equity (Kreibohm, 2016; Pinto, Henry, Robinson, & Stowe, 2015).

I did not administer instruments, such as surveys and questionnaires because I used secondary data in this study. The Newsweek analysts calculated energy productivity by using three steps. In the first step, the analysts divided revenue by total energy

consumption, percent-rank each company against all the companies in its industry, and multiplied by 0.75. In the second step, the analysts calculated each company's change in energy productivity from two years before. In the third step, the analysts added the scores from steps one and two for the final energy productivity score.

The Newsweek analysts calculated greenhouse gas productivity by using similar calculation steps as energy productivity. In the first step, the analysts divided revenue by greenhouse gas emissions, percent-ranked each company against all the companies in its industry and then multiplied by 0.75. In the second step, the analysts calculated each company's change of greenhouse carbon emissions from two years prior. In the third step, the analysts added the scores from steps one and two. For the final greenhouse gas productivity score, the analysts weighted each company's scores from step 3 according to the disclosure of Scope 3 carbon emissions in the prior year. The final step of the entire process was for the analyst to rank the companies by highest scores.

The financial reporters of the companies that Morningstar collected ROE from calculated the measure by dividing their company's net income by their company's shareholders' equity. The financial reporters calculated their company's net income line on their company's income statement by subtracting the cost of sales, other expenses, and taxes of their company's during a certain period from their company's total revenue for the same period. The financial reporters also calculated their shareholders' equity line on a company's balance sheet by subtracting the total liabilities from total assets of their company. I used the ROE measures published by Morningstar.com to increase validity

and minimize the chance of error when calculating the ROE of the companies that I examined in this study.

A company that has a higher energy productivity score and greenhouse gas productivity score represent that the company's leaders manage operations that are more efficient and clean than other companies (Newsweek, 2016). Higher ROE ratios indicate higher profitability. Lee (2015) described that financial analysts measured the profitability of a company's invested shareholder capital by calculating the company's ROE. Financial analysts and investors use companies that publishes corporate financials, such as Morningstar, to make investment decisions. Academic researchers and business practitioners use ROE to investigate profitability. Researchers and practitioners use CSP measures such as energy productivity and greenhouse gas productivity, to measure and analyze a company's sustainability. No published reliability and validity or strategies for the NGR16 or Morningstar.com exists.

The analysts from Newsweek adjusted their methodology for scores since the previously published green rankings. Morningstar analysts do not make any adjustments to published ROE data. I placed the URL to the home page of Morningstar.com and Newsweek.com in the appendix of this study (Appendix B). The raw data of the energy productivity, greenhouse gas productivity, and ROE scores for each company in this study are available in the appendix section of this study (Appendix C).

Data Collection Technique

This study involved the collection of secondary data from Newsweek and Morningstar databases; there was no need for interviews, observations, surveys or

protocols for this study. I collected data by downloading the NGR16 as an Excel file. I searched for the secondary ROE data using Morningstar. Next, I added each company's ROE measure to the Excel spreadsheet. A researcher has the advantage of saving time by collecting secondary data instead of administering surveys (Cheng & Phillips, 2014; Goertzen, 2017; Greaney et al., 2012). An advantage of collecting secondary data is that third-party companies published historical financial records, and a researcher could collect all of his or her financial data from one source (Greaney et al., 2012; Ludlow & Klein, 2014; Maxwell, 2015). I collected all ROE data from Morningstar.com and all energy and greenhouse gas data from Newsweek. When a researcher collects secondary data from one source, the consistency of the data collection improves (Campbell, 2016; Goertzen, 2017; McCusker & Gunayadin, 2015). The advantages of using secondary data for this study included the convenience of saving time and money not saved using other data collection techniques and consistency if collected from one source.

Understanding the disadvantages of using secondary data should be known before conducting research with secondary data. A researcher has the disadvantage of not performing site visits by collecting secondary data for a study (Campbell, 2016; Greaney et al., 2012; Maxwell, 2015). Site visits are unnecessary in this study because I examined a research question about known variables and reported corporate measurements. A disadvantage of collecting secondary data for ratios is that the different publishers of the secondary data may have different values because he or she uses different calculation methods, such as averaging or rounding (Greaney et al., 2012; Leung, 2015; Salkind, 2016). I overcame this disadvantage by using a single source to collect data for each

variable. Another disadvantage of collecting secondary data is the inability to verify the accuracy of the original data collection, and there may be missing data (Cheng & Phillips, 2014). I overcame this disadvantage by using secondary data from Morningstar.com and Newsweek.com, which are reputable sources.

Data Analysis

I analyzed the productivity and ROE data that I used to answer the following research question: What is the direction and degree of the correlation that may exist among energy productivity, greenhouse gas productivity, and ROE? I also tested the hypotheses of this study that follows to provide a framework for this study and to be able to answer the research question mentioned previously.

Null Hypothesis (H_0). There is no positive direction and significant degree of correlation among energy productivity, greenhouse gas productivity, and ROE.

Alternative Hypothesis (H_a). There is a positive direction and significant degree of correlation among energy productivity, greenhouse gas productivity, and ROE.

I used a multiple regression statistical procedure to analyze the relationship among the energy productivity, greenhouse gas productivity, and ROE variables of this study, which have a ratio scale of measurement. The multiple regression analysis was appropriate for testing the direction and strength of the relationship between two or more ratio scale of measurement variables (Jäntschi et al., 2016; Köhler et al., 2017; Martin & Hall, 2016). I used a multiple regression analyses to analyze inferential statistics of this study's data, which is a requirement for a quantitative study. A multiple regression is an acceptable technique for researchers to use for inferential statistics and is a widely

applied statistical approach involving predictor variables and a criterion variable (Köhler et al., 2017; Kondrat & Jaggers, 2016; Lamont et al., 2016).

A researcher can use the multiple linear regression to model the relationship between two or more predictor variables and a criterion variable by fitting a linear equation to observed data (Jäntschi et al., 2016; Kondrat & Jaggers, 2016; Lamont et al., 2016). I used multiple linear regression to examine if a linear relationship among energy productivity, greenhouse gas productivity, and ROE exist. The multiple linear regression model follows: $Yi = \beta0 + \beta1\ Xi1 + \beta2\ Xi2 +...\beta p\ Xip + \varepsilon i$. Yi is ROE, the criterion variable, β0 is the intercept, β1 and β2 are the multiple regression coefficients, energy productivity and greenhouse gas productivity, and εi is the random error term or residual. I analyzed the output tables that generated in the SPSS software after the multiple regression calculation to understand the direction and degree of the relationship, if any, among energy productivity, greenhouse gas productivity, and ROE.

Alternatively, a simple linear regression is a statistical analysis, which a researcher can use to analyze the relationship of one predictor variable and one criterion variable (Campbell, 2016; Jäntschi et al., 2016; Sánchez-Taltavull, Ramachandran, Lau, & Perkins, 2016). A researcher should choose a simple linear regression and test for a correlation between only two variables and should use a multiple linear regression to compare two or more predictor variables with at least one criterion variable (Campbell, 2016; Lamont et al., 2016; Leedy & Ormrod, 2016). I used energy productivity and greenhouse gas productivity for the two predictor variables in this study. I used the

sample companies' ROE as the criterion variable in this study; therefore, the multiple regression analysis technique was the best approach for this study.

I screened for data to analyze the quality of the data and to verify if the data is appropriate. The screening of data is necessary to ensure that data are appropriate for the multiple regression statistical analysis (Leedy & Ormrod, 2016; Molenberghs et al., 2014; Wiederman et al., 2017). I did not use the data of all 500 companies ranked in the NGR16; I used a random sampling method to choose which companies that I examined. There is a possibility of missing data when using secondary data in research (Cheng & Phillips, 2014). Dong and Peng (2013) and Akl et al. (2015) recommended for a researcher to have a strategy to improve their dataset if any data is missing. I analyzed if any energy productivity, greenhouse gas productivity, and ROE data are missing by using the Analyze/Descriptive Statistics/Explore function in the SPSS software. According to Mercieca-Bebber et al. (2016), missing participant data and excluding participants with incomplete data may cause bias in a study. I did not exclude any participants with missing data; I used the multiple imputation function in SPSS to replace any missing data. Acknowledging the shortcoming and excluding participants with missing data is a strategy that a researcher can use after identifying missing data (Akl et al., 2015; Dong & Peng, 2013). I also screened this study's data by testing for the assumptions of multiple linear regression (Cho, Kim, & Kim, 2017; Salkind, 2016; Smith, 2017).

The parametric assumptions for multiple regression are outliers, multicollinearity, singularity, normality, linearity, and homoscedasticity (Campbell, 2016). Outliers are data points that are the furthest away from the scatterplot's regression line (Altman &

Krzywinski, 2016; Leedy & Ormrod, 2016; Lehmann & Lösler, 2016). I tested for the outliers of this study by analyzing scatterplots using SPSS. The multicollinearity assumption is that there is a high correlation between the predictor variables of a study and the singularity assumption is that the predictor variables of a study correlate perfectly (Jäntschi et al., 2016; McCusker & Gunayadin, 2015; Tamura et al., 2017). I tested for multicollinearity assumption by analyzing the variance inflation factor (VIF) values using SPSS. The assumption is true when VIF factors are below 10. The normality assumption is an assumed normally distributed dataset (Cho et al., 2017; Lantz, Andersson, & Manfredsson, 2016). I tested for the normality by using the Predicted Probability (P-P) plot with SPSS. I analyzed to see if the plots conformed to the defined diagonal line that generates in the results of the P-P plot. A diagonal line with conforming plots represents that the data are normally distributed. This study passed the assumption of normality. The linearity assumption is that predictor variables and criterion variables have a straight-line relationship (Arai, 2016; Maity, 2017; Martin & Hall, 2016). I tested linearity by analyzing the data on a scatterplot with SPSS by viewing if there was a straight-line relationship among energy productivity, greenhouse gas productivity, and ROE. The homoscedasticity assumption is that the residuals of a study's criterion variables are equal between that study's predictor variables (Campbell, 2016; Johansson, Strålfors, & Cedersund, 2014; Rana, Aneiros, Vilar, & Vieu, 2016). I tested for homoscedasticity by using a scatterplot in SPSS and analyzed the distribution of the data. If needed, I would have used bootstrapping to address violations to assumptions of this study. A researcher can use bootstrapping to test dataset reliability, control for stability results, normalize

data, and to make statistical inferences (Köhler et al., 2017; Wiederman et al., 2017; Yuan & MacKinnon, 2014).

I examined the statistical results of this study to determine whether a possible correlation exists among the variables in this study. Researchers examine the F-statistic to understand whether a correlation exists among the predictor and criterion variables (Köhler et al., 2017; Kondrat & Jaggers, 2016; Smith, 2017). The established parameters for the current study are a medium effect size of 0.15 at the 95% confidence level and a 0.05 *p* value. Establishing a confidence level of 95% and *p* value of 0.05, implies that the researcher should reject the null hypothesis if the generated *p* value of the F-statistic is less than .05 (Jäntschi et al., 2016; Stern, 2016; Tijssen & Kolm, 2016). Therefore, I should analyze the *p* value of the F-statistics and should fail to reject the null hypothesis if the resulting *p* value is greater than 0.05. Alternatively, a *p* value less than 0.05 should result in the rejection of the null hypothesis. The *p* value of the F-statistic identifies the overall significance of a three-variable model. However, additional examination of the model might be necessary because a significant F-statistic might be indicative of the moderating influence of an independent and unrelated variable. If the *p* values of the correlation analysis between energy productivity and greenhouse gas productivity variable are less than 0.05, I should reject the null hypothesis. A *p* value less than 0.05 indicates a statistically significant relationship among the variables of this study (Jäntschi et al., 2016; Leedy & Ormrod, 2016; Martin & Hall, 2016). If there is a significant relationship among energy productivity, greenhouse gas productivity, and ROE, then the strength of the correlation among the predictor and criterion variables occurs. If there is

not a significant relationship among energy productivity, greenhouse gas productivity, and ROE, then the examination of the strength and direction of the relationship is void.

The R-square value in the model identifies whether the combination of predictor variables explain a significant portion of the total variance of the criterion variable (Kondrat & Jaggers, 2016; Lamont et al., 2016; McCusker & Gunayadin, 2015). An R-square value of 1.0 represents a 100% variance in the criterion variable and perfect predictive accuracy (Köhler et al., 2017; Martin & Hall, 2016; Wiederman et al., 2017). The R-square value of 1.0 is uncommon. Research models producing R-square value closer to 1.0 are more reliable than models producing R-square values closer to 0.0 (Molenberghs et al., 2014; Pallant, 2013; Wiederman et al., 2017). An adjustment of R-square is necessary to account for additional predictor variables contributing to the criterion variable in the multiple linear regression due to chance (Kondrat & Jaggers, 2016; Martin & Hall, 2016). I analyze the Adjusted R-square value to understand the degree of the relationship among the energy productivity, greenhouse gas productivity, and ROE and to determine the quality of this study's model. I analyze the Adjusted R-square value of this study's variables as using the same process as described in the analysis of the R-square value. I used SPSS version 24 to perform the data analysis for this study.

Study Validity

The two types of validity in research are internal validity and external validity (Christ, 2013; Leung, 2015; Yilmaz, 2013). I describe the external validity and statistical conclusion of this study in the subsections below. I did not include the internal validity of

this study because I used the threats to a statistical conclusion. The threats to statistical conclusion align with this study's correlational design and secondary data. Threats to those conclusions include the reliability of the instruments, data assumptions, and sample size (Köhler et al., 2017; McCusker & Gunayadin, 2015; Yilmaz, 2013). I used a random sample in this study. I improved this study's external validity by using a random sample (Köhler et al., 2017; McShane & Böckenholt, 2016; Yilmaz, 2013).

Threats to Internal Validity

Internal validity pertains to the causal relationships among variables (McCusker & Gunayadin, 2015; Smith, 2017; Yilmaz, 2013). I used the correlational design for this study, which is a nonexperimental design that includes the correlation statistical test that does not calculate causation. I did not investigate causality in this study because I examined the correlational relationship among corporate energy productivity, greenhouse gas productivity, and ROE. Therefore, I did not examine the threats to internal validity in this study. Alternatively, I discussed the threats to the statistical conclusion of this study.

Threats to Statistical Conclusion

The two threats to the statistical conclusion are Type I error and Type II error (Smith, 2017; Stern, 2016; Wiederman et al., 2017). A researcher commits a Type I error when mistakenly rejecting a null hypothesis and a Type II error when erroneously failing to reject a null hypothesis (Aquilonius & Brenner, 2015; Stern, 2016; Wiederman et al., 2017). The sample size is important for validity also. When a researcher uses a sample size that is too small, it decreased the validity quality of their research (McShane &

Böckenholt, 2016; Nunes, Ferriera, Ferriera, & Mexia, 2014; Tijssen & Kolm, 2016). I used G* Power software to determine the appropriate sample size for this study.

Reliability and Replicability

The two instruments that I used in this study the NGR16 and financial metrics provided by Morningstar.com. The administration at Newsweek employed a panel of experts to review the quality of the instrument and data collection methodology created and used by the analysts from Newsweek and Corporate Knights (Eccles et al., 2016). The Morningstar.com administration commits to maintaining quality data and uses the principles of LEAN and Six Sigma to assure quality data. The Morningstar.com analysts communicated with the leaders of the companies that provided data to confirm that their companies' data were correct.

Assumptions for this study include the expectation that I collected accurate and truthful data from Newsweek.com and Morningstar.com. An assumption of this study was that the Newsweek researchers used appropriate factors and methodologies to accurately rank energy productivity and greenhouse gas productivity. Another assumption of this study was that the leaders of the 500 companies were honest and accurate when they verified their companies' publicly available data with Newsweek. I assumed that the Newsweek CSP data and Morningstar.com CFP data are accurate and truthful. The administration at Morningstar.com and panel of experts on staff at Newsweek have a continuous data quality inspection process including communicating with the companies providing data, internal data audits, and applications of the principles

of LEAN and Six Sigma. Using secondary data from a database allows future researchers the opportunity to replicate the study.

De Schryver, Hughes, Rosseel, and De Houwer (2015) discussed reliability regarding replicability, noting that a study should ideally be both reliable and replicable. Future researchers will be able to replicate this study if he or she collects the exact data that I used in this study. Other researchers and I could independently collect identical 2014 ROE, energy productivity and greenhouse gas productivity data if we gathered the data of the same companies from the same databases. Future researchers will collect the same data as I did if he or she retrieves the 2014 ROE data of each company from the key statistics section of Morningstar.com. Future researchers will be able to collect the exact energy productivity and greenhouse gas productivity data if they download the NGR16 and use the same companies' energy productivity and carbon productivity that I used in this study. Differences in replicated studies may be due to the composition of the random sample. A random sample is unique and can serve as a reference in comparison to other samples that may be alike in most relevant respects (Brueton et al., 2013; Molenberghs et al., 2014; Saint-Mont, 2015).

Threats to External Validity

External validity is the ability of a researcher to apply the results of his or her study to other populations than the population that the researcher examined. Some researchers have described external validity as the inferences of relationships established by statistics and applied to different persons, settings, and times (Campbell, 2016; Khorsan & Crawford, 2014; Salkind, 2016). The threats to external validity are any factor

that limits the results of a study's generalization. The quality of a sample impacts a study's generalization; therefore, a threat to external validity. A researcher should consider how each decision in the research process impacts other steps or areas in the research process. For example, inclusion and exclusion criteria for a population's sample can minimize bias within a sample, but may also cause threats to the study's external validity (Kennedy-Martin et al., 2015; Kim & Shin, 2014; Smith, 2017). The criterion for this study's sample is a company's inclusion in the NGR16. The result from this study is not useful for the companies not included in the NGR16 because of this study's criterion. The generalization of this study's results aligns with this study's specific business problem to examine energy productivity, greenhouse productivity, and ROE.

Future researchers will be able to generalize the results of this study only to the NGR16 population and not from the rankings of different years. Newsweek's panelist created a unique methodology for the green rankings that consisted of the largest and most sustainable companies in the United States determined by revenue, market capitalization, and highest sustainability performance. Future researchers may not be able to generalize the results of this study to the green rankings from previous or future years. Researchers should reflect carefully on the external validity of published studies and cautiously extrapolate results to other populations while questioning the similarities among the sample in one study and other populations (Kennedy-Martin et al., 2015; Khorsan & Crawford, 2014; Stuart, Bradshaw, & Leaf, 2015).

I used Morningstar.com to collect the 2014 ROE measures and the NGR16 to collect the 2014 energy productivity and greenhouse gas productivity of the same amount

of randomly selected companies for this study. Future researchers may not be able to generalize the results of this study to any population of the global green rankings from any year, because generalization may be inappropriate to other time frames (Campbell, 2016; Kennedy-Martin et al., 2015; Khorsan & Crawford, 2014). The results of a research study using the Newsweek CSP criterion may not generalize to other companies described with different sustainability rankings or indexes. Future researchers will be able to duplicate this study if they use SPSS to perform a multiple regression of the randomly selected companies' data from the NGR16. Future researchers should not use 2014 ROE from any other financial data provider other than Morningstar.com to duplicate the results of this study. A researcher can use the multiple regression analysis to test the relationship among the 2014 energy productivity and greenhouse gas productivity of companies listed in the NGR16 and the same companies' 2014 ROE from Morningstar.com.

Transition and Summary

In Section 2, I restated the Purpose Statement, which I introduced in Section 1. In the Role of Researcher subsection, I explained what I should do as the researcher of this study regarding ethics and design. In the Participants subsection, I explained that no human participants are in this study and that I examined corporations within this study. In the Research Method and Design subsection, I explained that I chose to use a quantitative method and a correlational design. In the Population and Sampling subsection, I explained that the population of this study are the companies included in the NGR16 and I drew a sample from that population. In the Ethical Research subsection, I explained that I would adhere to ethical principles from Walden University and the *Belmont Report*. In

the Data Collection Instruments subsection, I described that I would use the NGR16 and Morningstar.com to collect data. In the Data Collection Technique subsection, I gave a thorough description of how I collected data. In the Data Analysis subsection, I explained how I would provide analysis on the statistical data of this study. In the Study Validity subsection, I described that I would provide the external validity and threats of statistical conclusion in this study. I have provided a detailed description of Section 2 and provided a prerequisite for Section 3. In Section 3 Application to Professional Practice and Implications for Change, I introduce the Presentation of Findings, Application to Professional Practice, Implications for Social Change, Recommendations for Action, Recommendations for Further Research, Reflections, and Conclusion subsections.

Section 3: Application for Professional and Implications for Social Change

Introduction

The purpose of this quantitative correlational study was to examine the relationship among energy productivity, greenhouse gas productivity, and ROE. I tested the multivariate normality assumptions of this study's variables before using the multiple linear regression. The variables of this study satisfied the multivariate normality assumptions of normality, homoscedasticity, outliers, multicollinearity, singularity, and independence of residuals. I did not have to take any additional steps, such as bootstrapping before using the multiple regression test because the variables did not violate the multivariate normality assumptions. The results of the multiple regression indicated that there were no significant relationships among the variables in this study. The significance level for this study was .05 and any *p* value greater than or equal to this significance level would be insignificant. The *p* value for the relationship among energy productivity, greenhouse gas productivity, and ROE was greater than .05. After analyzing the results of the multiple regression, I concluded that there was no significant relationship among energy productivity, greenhouse gas productivity, and ROE. I accepted this study's null hypothesis and rejected this study's alternative hypothesis. Energy productivity and greenhouse gas productivity did not significantly predict ROE.

Presentations of Findings

I used a multiple regression to in this study to examine the relationship among this study's predictor and criterion variables. The multiple regression test allows researchers to examine the relationship among two or more variables. The predictor variables for this

study were energy productivity and greenhouse gas productivity. The criterion variable for this study was ROE. I used the multiple regression to examine the direction and degree of relationship among energy productivity, greenhouse gas productivity, and ROE. The multiple regression allowed me to answer this study's hypotheses, which follow:

($H_0$1). There is no statistically significant relationship among energy productivity, greenhouse gas productivity, and ROE

(H_a1). There is a statistically significant relationship among energy productivity, greenhouse gas productivity, and ROE

Descriptive Statistics

The descriptive statistics of this study, as shown in Table 1, which describes the ROE, energy productivity, and greenhouse gas productivity data of the 107 companies that I examined for this study. The table includes the mean and standard deviation of each sample company's energy productivity, greenhouse gas productivity and ROE.

Table 1:

Descriptive Statistics of Variables (N = 107)

Variables	*M*	*SD*
ROE	17.38%	9.75%
Energy Productivity	6.22%	4.05%
Greenhouse gas Productivity	6.99%	3.51%

Tests of Assumptions

I tested and analyzed each assumption of multivariate normality to ensure that each respective assumption met the requirement of multivariate normality. The results of the multiple linear regression analysis are reliable when the variables used a study satisfy the assumptions of multivariate normality (Korkmaz, Goksuluk, & Zararsiz, 2014). I tested the multivariate normality assumptions of normality, homoscedasticity, outliers, multicollinearity, singularity, and independence of residuals. The results and discussion of the multivariate normality assumptions testing follow.

Multicollinearity. The multiple regression test in SPSS generated the Coefficients output table. As shown in Table 2, the VIF of 1.360 for energy productivity and carbon productivity. The correlational analysis of predictor variables is necessary to identify the possible strength and association of the relationship between the variables (Field, 2018). VIF values between 1 and 10 and tolerance scores above 0.2 represent that multicollinearity does not exist between two variables. The energy productivity and greenhouse gas productivity variables of this study did not violate the assumption of multicollinearity.

Table 2:

Predictor Variables Collinearity Statistics (N = 107)

Variable	*Tolerance*	*VIF*
Energy Productivity	.735	1.360
Carbon Productivity	.735	1.360

Singularity. The assumption of singularity was not violated in this study because the correlation matrix, as shown in Table 3, did not show a perfect correlation between this study's predictor variables, which are energy productivity and greenhouse gas productivity. The bivariate correlations were small to medium, which reinforced that multicollinearity did not exist and that singularity did not exist.

Table 3:

Correlation Coefficients Among Variables (N = 107)

	ROE	Energy Productivity	Greenhouse gas Productivity
1. ROE	1.00	.122	.005
2. Energy Productivity	.122	1.00	.514
3. Greenhouse gas Productivity	.005	.514	1.00

Outliers, normality, linearity, homoscedasticity, and independence of residuals. I examined the normal probability plot (P-P) of the regression standardized residual (Figure 1) and the scatterplot of the standardized residuals (Figure 2) to identify outliers, linearity, homoscedasticity, and independence of residuals and a histogram with a normal curve (Figure 3) to test for normality by examining skewness and kurtosis. I determined from the examinations that there were no major violations of the multivariate normality assumptions. In Figure 1, no points were plotted extremely from the diagonal line, which represented the absence of outliers. So, the assumption of outliers was not violated. The tendency of the points reasonably lies in a straight line, diagonal from the

bottom left to the top right, which represents that the assumption linearity was not violated. As shown in Figure 2, the absence of bowing represented that the assumption of homoscedasticity was not violated. Also, the lack of a systematic pattern within the scatterplot of the standardized residuals represented that the assumption of independence of residuals was not violated. As shown in Figure 3, the histogram displayed a normal distribution of residuals, which represented that the assumption of normality was not violated.

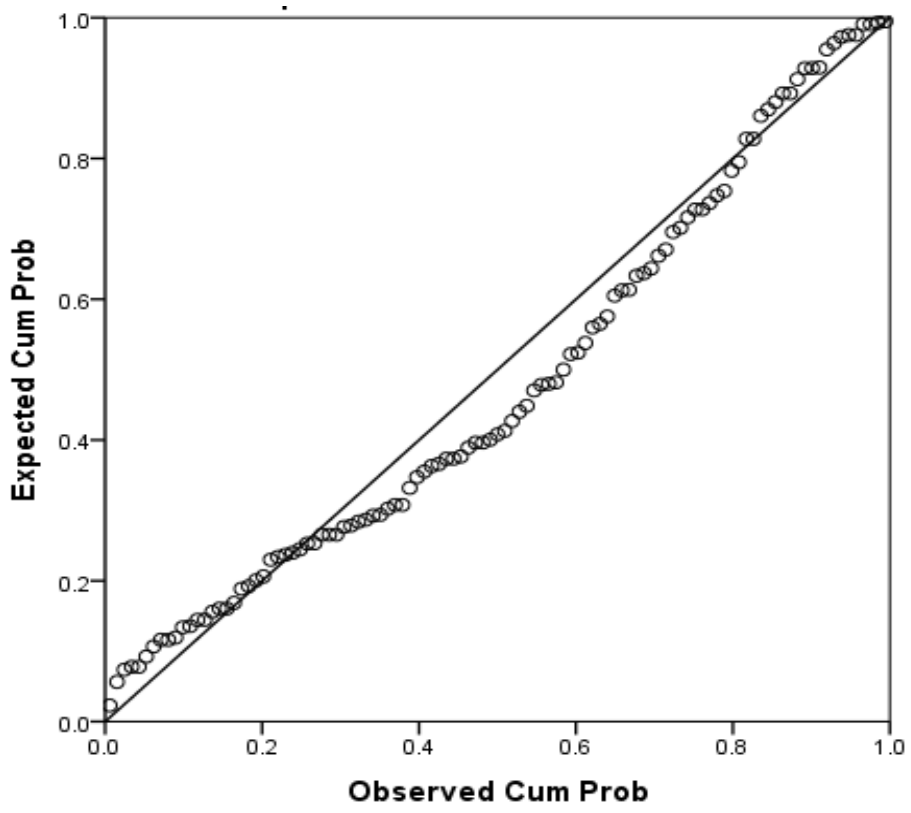

Figure 1. Normal probability plot (P-P) of regression standardized residual.

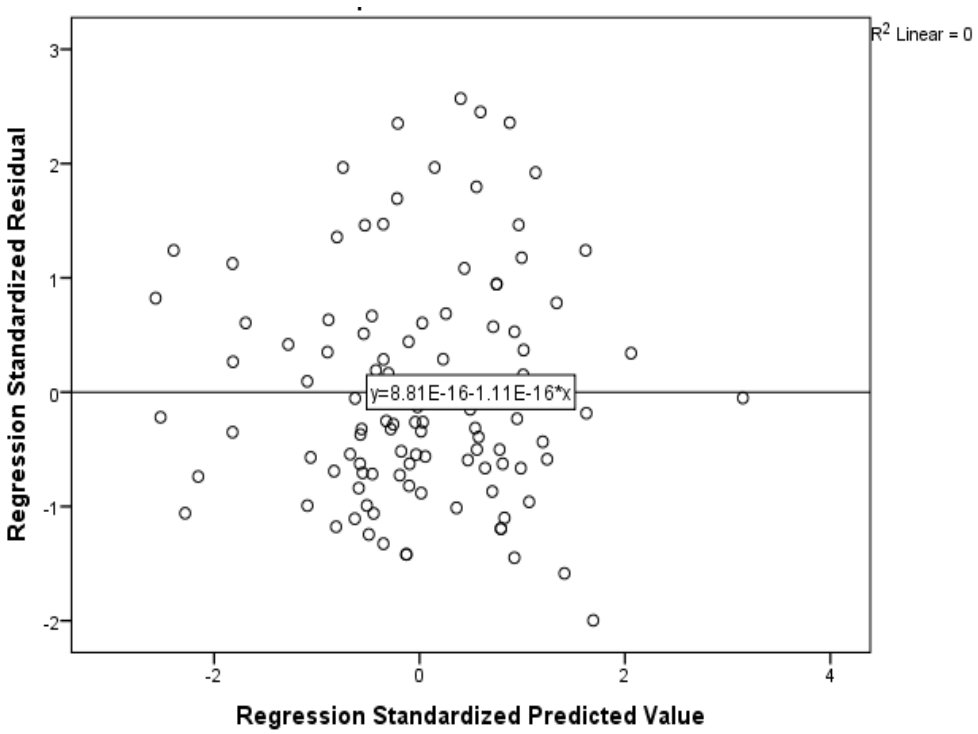

Figure 2. Scatterplot of residual value versus predicted value.

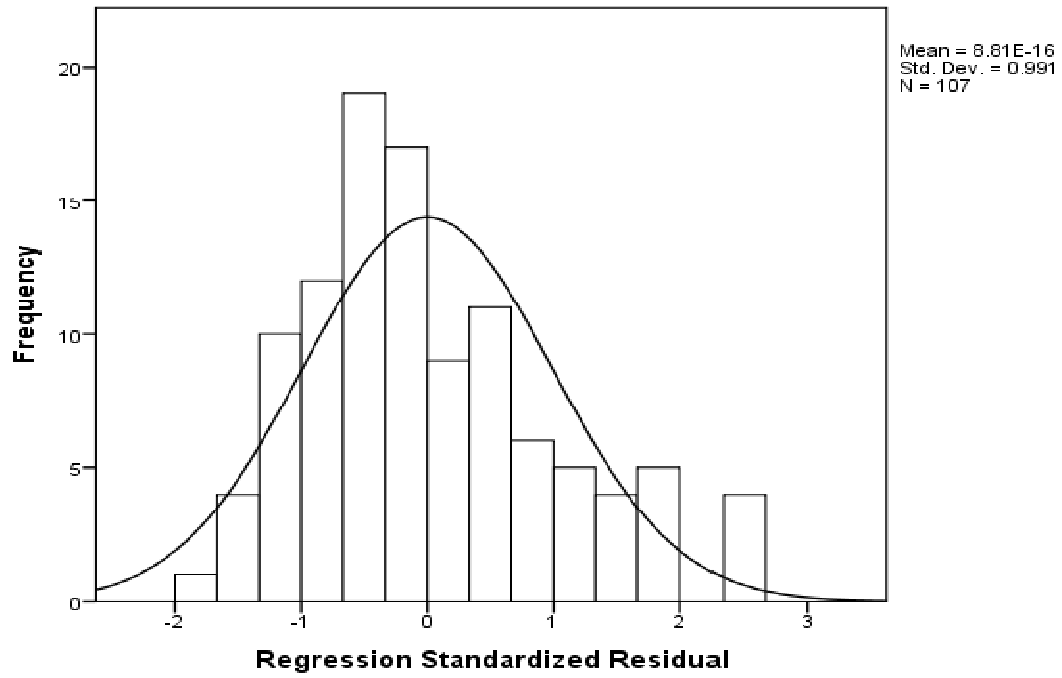

Figure 3. Histogram of standardized residual.

I tested for outliers, normality, homoscedasticity, multicollinearity, and linearity in the analysis above. Each multivariate normality assumption was met and since none of the assumptions were not violated, it was appropriate to conduct a multiple linear regression. The results of this multiple linear regression analysis are reliable. When the assumptions of multivariate normality have met the results of a multiple regression are reliable (Korkmaz et al., 2014).

Inferential Statistics

I used a standard multiple linear regression with an $\alpha = .05$ (two-tailed) to examine if a significant relationship existed among energy productivity, greenhouse gas productivity predicted ROE. The predictor variables were energy productivity and greenhouse gas productivity. The dependent variable was ROE. The null hypothesis for this study was that there was no statistically significant relationship among energy productivity, greenhouse gas productivity, and ROE. The alternative hypothesis for this study was that there was a statistically significant relationship among energy productivity, greenhouse gas productivity, and ROE. I used preliminary analyses and determined that there were no serious violations of multicollinearity, singularity, outliers, normality, linearity, homoscedasticity, and independence of residuals (*see Tests of Assumptions).* This study's model, which consists of data from Tables 4 and 5, was not able to significantly predict ROE, $F(2,104) = 1.028$, $p = .361$, Adjusted $R^2 = .001$. This study's significance was $p > 0.5$, as shown in Table 5, for the relationship addressed in this study's research question. Also, this study's predictor variables had $p > .05$ significance levels, as shown in Table 6. Therefore, the regression analysis produced

results that were not significantly significant for the relationship among energy productivity, greenhouse gas productivity, and ROE and disconfirmed instrumental stakeholder theory. Donaldson and Preston (1995) explained that instrumental stakeholder theory was that when corporate leaders effectively manage stakeholders that their corporations will receive an increase in financial performance. For more than twenty years there has been a debate about the profitability of corporate responsibility. Various terms and proxies were introduced since the instrumental stakeholder theory, but the relationship between corporate responsibility and its ability to generate profit has been argued and researched by scholars for decades. I used the proxies, energy productivity and energy productivity, for CSP and, ROE, for the CFP proxy in this study. Researchers either view sustainability issues as a corporate asset or liability. The debate over the CSP and CFP relationship continues because the results of the relationship remain inconsistent. Brower et al. (2017) examined previous studies published over the past forty years on the relationship between CSP and CFP found mixed results with significant and insignificant findings. Ping-Sheng, Cuili, and Heli (2014) found that CSP-CFP relationship was significant if firms were in an industry that did not have CSR demand and insignificant if firms were in an industry with CSR demand. Trumpp and Guenther (2017) found that the CSP-CFP relationship was insignificant for companies with low CSP and significant for companies with high CSP. Bhardwaj (2018) and Pin-Chao Liao (2018) found that the CSP-CFP relationship was not significant. Busch (2018) found that the CSP-CFP relationship was significant and noted that it is beneficial for corporations to manage CSP. The CSP-CFP relationship body of literature is mixed because some

studies resulted in significant relationships and others resulted in insignificant relationships. The findings of this study added to the body of literature on CSP and CFP relationship with insignificant findings. The results of this study are relative to effective business practice because an effective business leader leverages his or her CSR decisions with other benefits than ROE, such as attracting the best millennial employees and improving corporate image. Ohlrich (2015) suggested that business leaders practice sustainability to attract the best employees and to be competitive. This study's findings did not align to instrumental stakeholder theory because satisfying stakeholders by having positive corporate social performance did not result in superior financial performance.

Table 4:

ANOVA Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	195.444	2	97.722	1.028	.361[b]
	Residual	9886.728	104	95.065		
	Total	10082.172	106			

a. Dependent Variable: ROE

b. Predictors: (Constant), Carbon Productivity, Energy Productivity

Table: 5

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.139[a]	.019	.001	9.75011%	.019	1.028	2	104	.361

a. Predictors: (Constant), Carbon Productivity, Energy Productivity

b. Dependent Variable: ROE

Table 6:

Coefficients Table of Study Variables

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	16.475	2.182		7.550	.000
	Energy Productivity	.390	.272	.162	1.433	.155
	Greenhouse gas Productivity	-.216	.314	-.078	-.689	.493

a. Dependent Variable: ROE

Application to Professional Practice

This study's findings contributed to the CSP-CFP literature relating to energy productivity, greenhouse gas productivity, and ROE. Many researchers have investigated the CSP-CFP relationship, but not many have used Newsweek's categorial variables energy productivity and carbon productivity as independent variables. Most researchers used Newsweek's green score or the combined score of all the Newsweek's sustainability variables. The variables that the Newsweek analysts used to calculate the green score were energy productivity, carbon productivity, water productivity, waste productivity, green revenue, sustainability pay link, sustainability themed committee, and audit score. Even though the results of the study were insignificant regarding the relationship among energy productivity, greenhouse gas productivity, and ROE, business leaders can use the results to make optimal business decisions regarding sustainability. Business leaders can use the results of this study to mitigate the risk of equity loss from energy productivity and greenhouse gas productivity spending. Business leaders should not plan to increase ROE by improving energy productivity and greenhouse gas productivity. Business leaders should focus on other benefits of being sustainable, such as reputation, competitiveness, and gain prestigious millennial employees (Ohlrich, 2015). Business leaders have invested in sustainable initiatives with minimal knowledge of how the investment relates to financial performance. Business leaders can use the results of this study to spend less on energy productivity and greenhouse gas productivity because he or she understands that this strategy will not add to the company's shareholders equity. If business leaders invest in energy productivity and greenhouse gas productivity they could

potentially improve business practice by gaining millennial employees, can compete against other companies that practice sustainability within the same industries, and have competitive advantages against those companies that do not practice sustainability.

Implications for Social Change

The findings of this study have implications to promote social change for organizations, individuals, and the U.S. society. Corporations that excessively consume energy and emits greenhouse gas contributes to global warming (Environmental Protection Agency, 2016). Corporate leaders can use the results of this study to strategically manage operations to prevent excessive energy productivity and greenhouse gas emissions to benefit individuals, the environment, and society. The corporate leaders should explain to stakeholders that investing in energy productivity and greenhouse gas productivity will attract millennial employees, protect the environment, and protect individuals' health. The less energy that a company uses will decrease greenhouse gas emissions, which will reduce greenhouse gasses trapped on the earth's surface, which will reduce temperatures, extreme precipitation, and erosion. The reduction in temperature will benefit U.S. citizens who spend extended periods of time outdoors working or for recreational purposes. If corporate leaders maintain their employees who manage energy productivity and greenhouse productivity, such as sustainability analysts, this will benefit society because of the companies' contribution to a higher employment rate. The governments involved with these companies will have increased income taxes, the employees will have increased household income, disposable income, spending, and savings, which all will improve the economy.

Recommendations for Action

Business leaders who are responsible for business strategy, corporate social responsibility, operations, human resources, and public relations should pay attention to the results of this study. The business leaders should understand that energy productivity, greenhouse gas productivity, and ROE do not relate and should make business decisions to consider this relationship as in relates to their responsibilities. Chief Executive Officers (CEOs) and Chief Financial Officers (CFOs) should understand the optimal energy consumption and greenhouse gas emission levels for their companies that are profitable and socially responsible. Chief Operation Officers (COOs) and Chief Sustainable Officers (CSOs) should understand how energy productivity and greenhouses gas productivity relate to financial performance and environmental impact and should not overspend on CSR initiatives, but limit environmental harm. Human Resource Directors and Human Resource Managers (HR) need to understand how sustainability initiatives, such as managing energy productivity and greenhouse productivity attract millennial employees and they can use these initiatives in recruiting millennial employees (Ohlrich, 2015). Public Relation Managers (PR) should understand the risks involved with energy productivity and greenhouse gas productivity to calculate risk and reward for the sustainability initiatives to mitigate risk and to have a plan if a crisis ever occurs. I can disseminate the results of this study during presentations at sustainability and business conferences. I can also disseminate the results of this study in business and sustainability journals.

Recommendations for Further Research

A limitation to this study was that the energy productivity and greenhouse gas productivity variables that I used in this study contained economic factors. I recommend for future researchers to use other energy productivity variables that do not use revenue or other economic factors in CSP calculations. Adding to the aforementioned recommendation future researchers could use an productivity input and output calculation for energy productivity and green productivity scores. Productivity input and output scores are calculated by dividing units produced or customers serviced in 1 month divided by kilowatt hours or greenhouse gases emitted.

Reflections

When I started the DBA Doctoral Study process, I had minimal knowledge of the research process, CSR, or CSP. The extent of my CSR knowledge was that some companies advertised green operations, products, and services and I thought that green companies were respectable and would gain more customers and profits than companies that were not green. My thoughts about green companies aligned with the instrumental stakeholder theory. I expected that the results of this study would explain that the sustainability variables green productivity and energy productivity would relate to ROE because the companies from my sample included the 500 most sustainable companies with the highest market capitalization. I was shocked that this was a personal bias that I did not expect that the energy productivity, greenhouse gas productivity, and ROE variables did not relate. My personal bias did not impact the data collection or analysis of this study because my feelings or personal bias did not change the numerical data

collected or the statistical results. I have learned that as a researcher that I should not expect what the outcome of a study will or will not be, but to perform thorough research and then analyze the results.

Conclusion

Statistically, the results of this study supported a nonsignificant relationship among energy productivity, greenhouse gas productivity, and ROE. Business leaders in CEO, CFO, COO, HR, and PR roles can use the results of this study to make the best business decisions regarding job responsibilities that relate to energy productivity and energy productivity. The findings of this study support the thought of other factors than energy productivity and greenhouse gas productivity relate to ROE.

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Appendix A: URLs of Websites used to collect Secondary Data

URL for Newsweek's homepage: http://www.newsweek.com/green-2016/top-green-companies-us-2016

URL for Morningstar's homepage: http://www.morningstar.com/

Appendix B: Energy Productivity, Greenhouse Productivity, and ROE raw data

Identifier	Energy Productivity	Carbon Productivity	ROE
1	12.60%	10.70%	13.35%
2	2.40%	1.70%	14.30%
3	0.70%	2.60%	22.36%
4	6.70%	5.60%	8.01%
5	10.00%	9.10%	27.63%
6	4.70%	3.90%	11.98%
7	5.00%	5.60%	3.37%
8	0.00%	10.10%	3.96%
9	1.40%	3.40%	4.80%
10	7.10%	5.10%	35.66%
11	5.60%	11.10%	9.52%
12	2.20%	1.50%	13.86%
13	9.00%	8.50%	13.25%
14	3.00%	3.40%	31.24%
15	5.50%	7.90%	3.98%
16	12.10%	11.80%	4.52%
17	0.00%	3.80%	19.72%
18	9.90%	15.00%	33.61%
19	5.80%	6.90%	21.55%
20	7.80%	7.10%	28.54%
21	8.70%	12.10%	9.26%
22	4.70%	2.00%	17.43%
23	5.00%	5.60%	3.37%
24	11.00%	10.10%	41.57%
25	3.20%	8.20%	10.38%
26	5.80%	8.90%	18.67%
27	7.10%	9.70%	12.10%
28	9.90%	6.10%	14.78%
29	2.10%	3.10%	13.48%
30	7.20%	12.40%	10.49%
31	2.50%	3.50%	7.02%
32	3.20%	8.40%	6.23%
33	8.30%	6.30%	9.88%
34	13.30%	0.00%	21.17%
35	6.00%	9.40%	6.44%
36	11.80%	14.10%	12.24%
37	5.40%	3.00%	42.98%
38	4.00%	6.40%	21.64%
39	11.30%	7.30%	3.84%

40	0.00%	6.40%	21.00%
41	0.00%	7.20%	11.50%
42	5.00%	7.70%	23.26%
43	9.80%	3.30%	31.68%
44	3.50%	2.30%	12.02%
45	11.60%	6.50%	17.80%
46	9.60%	6.00%	37.65%
47	8.60%	6.20%	12.38%
48	1.80%	3.70%	35.55%
49	12.50%	7.70%	0.21%
50	15.00%	9.90%	23.51%
51	7.90%	9.10%	36.76%
52	5.40%	3.90%	24.43%
53	8.90%	8.10%	42.10%
54	3.50%	5.70%	12.99%
55	4.60%	5.40%	40.03%
56	13.30%	13.80%	16.41%
57	8.00%	10.10%	8.80%
58	5.50%	5.60%	14.07%
59	0.50%	2.30%	19.59%
60	5.50%	0.80%	13.55%
61	13.40%	13.70%	30.21%
62	5.50%	6.30%	11.15%
63	9.00%	8.00%	11.78%
64	6.10%	6.90%	17.90%
65	2.10%	2.90%	30.91%
66	11.20%	11.00%	6.82%
67	0.00%	10.80%	26.23%
68	9.70%	13.10%	23.32%
69	2.80%	4.30%	9.75%
70	0.00%	11.90%	21.92%
71	0.00%	7.20%	25.89%
72	5.00%	6.00%	10.05%
73	13.30%	13.40%	22.36%
74	0.00%	9.30%	7.26%
75	10.00%	10.20%	14.34%
76	7.80%	8.40%	20.51%
77	10.10%	10.60%	17.40%
78	12.20%	9.40%	26.82%
79	1.10%	1.70%	16.01%
80	0.60%	1.90%	29.53%
81	5.50%	2.60%	16.59%

82	10.10%	8.80%	7.78%
83	8.00%	5.70%	23.94%
84	10.00%	9.10%	27.63%
85	3.90%	5.20%	16.87%
86	1.30%	1.00%	9.78%
87	3.50%	5.80%	8.40%
88	12.10%	10.90%	9.48%
89	1.40%	9.70%	17.52%
90	8.50%	5.30%	23.80%
91	10.60%	8.70%	12.24%
92	3.90%	2.60%	14.87%
93	0.00%	11.60%	11.82%
94	2.60%	2.50%	14.49%
95	6.50%	9.40%	18.57%
96	6.50%	9.70%	19.70%
97	6.10%	6.90%	16.10%
98	7.50%	5.90%	15.06%
99	2.20%	3.70%	5.73%
100	1.20%	4.80%	16.83%
101	1.90%	2.30%	4.58%
102	1.60%	2.90%	11.18%
103	11.40%	10.00%	20.23%
104	11.20%	11.00%	6.82%
105	7.90%	4.10%	19.26%
106	5.30%	5.60%	14.77%
107	12.80%	12.80%	32.97%