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Relationship Between Waste Prevention, Stakeholder Confidence, and Financial Performance of U.S. Public Manufacturers in the Advanced and Technology Industries

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Walden University
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Abstract

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MBA, University of Redlands, 2014

BS, University of Redlands, 2011

Doctoral Study Submitted in Partial Fulfillment

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Doctor of Business Administration

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Abstract

Some U.S. small public corporations are delisting within five years of an initial public offering, mostly because of financial failure. Domestic small capitalization firms in the advanced manufacturing and technology industries may not know which specific business practices impact financial performance. Grounded in stakeholder theory, the purpose of this quantitative study examined the relationship between waste prevention, stakeholder confidence, and financial performance. Archival data records ($N = 72$) were from public U.S. firms with a specific Standard Industrial Classification code, deemed by the U.S. Securities and Exchange Commission as stock issuers without suspended or revoked securities in 2013. Results of the multiple linear regression analyses were significant, $F(2, 69) = 20.68$, $p < .01$, $R^2 = .38$. Waste prevention ($\beta = .22$) and stakeholder confidence ($\beta = .52$) were significant contributors to financial performance. A recommendation is that U.S. small stock company leaders in both industries promote efforts to educate community youth in underserved areas on how the manufacturing and technology industries develop sustainable practices to serve society better. Implications for positive social change include the potential to reduce risk-related impacts on human health from toxic chemical releases, promote capital efficiency, and create jobs. U.S. small public company leaders in advanced manufacturing and technology industries may improve financial performance.

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Dedication

I dedicate this doctoral project to the following individuals: In memory of my parents, Reverend Walter Cooks Jr., and LaVerne Eugene Robinson Cooks, I deeply miss and love you. Reverend Walter H. F. Clare, thank you for being my father's best friend who continues to love his family like your very own. My beloved pastor, the late Reverend Morris A. L. Carter, Jr., I so very much miss you, and to his wife Donnie Carter, your prayers and love gave me the strength to keep moving forward. I salute my father-in-law, Sergeant Willie Clyde Davenport, who passed on December 20, 2020. As a Montfort Point Marine, my father-in-law modeled how to endure hardship as a good soldier. Sergeant Davenport fought under extreme conditions for our country and equitable representation in our country. Presented the Congressional Gold Medal in 2012, he inspired us to walk a little taller and prouder because of his love for God and our country. And to my husband, Clarence Edward Davenport, who deserves much credit for his support from the very beginning and tolerating the divided attention that comes with writing a doctoral project. In one way or another, Clemmie Ruth Parham; my sons, Charles Edward Alexander and Christopher Edward Davenport; my daughter-in-law, Megan; my grandchildren, Kalib, Ambreal, and Layla; and my siblings cheered me on.

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Section 1: Foundation of the Study

Financial performance is an essential part of business language and practice. The topic remains relative to the success or failure of most businesses. Business literature and corporate discussions directly or indirectly address financial performance consistently (Nollet et al., 2016). Financial performance is crucial, particularly for companies less central to economic activity. Business failure for such firms is a problem (Coombs & Holladay, 2018). While significant scholarly effort (e.g., Donaldson & Preston, 1995; Margolis et al., 2009; Orlitzky et al., 2003) has drawn attention to the importance of financial performance, primarily in response to influential studies, few researchers have explored why more of the United States' smaller public companies experience financial failure. In this quantitative correlation study, I examined the relationship between waste prevention, stakeholder confidence, and financial performance of publicly traded U.S. corporations in advanced manufacturing and technology industries.

Background of the Problem

For three decades, U.S. public companies have continued to decline sharply (Kahle & Stulz, 2017). According to Rose and Solomon (2016), newly public U.S. companies are virtually disappearing from the markets. U.S. public firms in advanced manufacturing and technology industries are among the gradually disappearing corporations. The U.S. Security and Exchange Commission indicated that 92% of job growth occurs after an initial public offering (IPO) filing (Blevins et al., 2017). Nearly 56% of all small U.S. public companies fail within 5 years of the IPO (Rose & Solomon, 2016).

A growing consensus exists among U.S. politicians and academic communities (Kahle & Stulz, 2017; Krol, 2017; Rose & Solomon, 2016), suggesting research is necessary to understand why smaller American public companies have a higher likelihood of financial failure. Rose and Solomon (2016) suggested empirical studies should focus on different business areas to understand the delisting of small public companies from U.S. public markets. De Gooyert et al. (2017) proposed that more business researchers could invoke stakeholder management to analyze financial performance. Freeman (2017) suggested that researchers use empirical evidence-based models to formulate smart public policy given how stakeholder theory informs corporate leadership. The rise of influential studies on financial performance and small newer American IPOs' inability to survive and grow warrants additional research. The possibility of poor financial performance failures for such organizations necessitates an investigation of the relationships between stakeholder interests and corporate financial performance (Freeman, 2017).

Problem Statement

Poor financial performance puts organizations at risk of failure (Jacobs et al., 2016). Since 1975, poor financial performance has been a significant contributor to U.S. smaller public firm failure, having declined an average of 26 each year, with a total of 1,053 firms delisted from the U.S. stock exchange by 2015 (Kahle & Stulz, 2017). The general business problem is that poor financial performance puts small publicly traded companies at risk of financial failure. The specific business problem is that some public firms in the manufacturing and technology industries in the United States do not know

the relationship between waste prevention, stakeholder confidence, and financial performance.

Purpose Statement

The purpose of this quantitative correlation study was to examine the relationship between waste prevention, stakeholder confidence, and financial performance of companies in the advanced manufacturing and technology industries. The predictor variables were waste prevention and stakeholder confidence. The criterion variable was financial performance. The target population consisted of archival data records of publicly held companies in the advanced manufacturing and technology industries listed in the U.S. Securities and Exchange Commission (SEC) (SEC, 2020a) online database. Study implications for positive social change include the potential for such corporations to align the economic interest of stakeholders while improving community environments, promoting capital efficiency, and job creation.

Nature of the Study

I employed a quantitative method to examine the relationship between waste prevention, stakeholder confidence, and financial performance of publicly owned U.S. corporations in the advanced manufacturing and technology industries. Quantitative studies are a standard mode of research for business topics (Zupic & Čater, 2015). Researchers use quantitative methods to (a) describe and compare variables, (b) explain relationships between and among variables, and (c) gather empirical evidence to test hypotheses (Bliese & Lang, 2016). Qualitative researchers view data as given, implying something already experienced or lived (Arino et al., 2016).

In qualitative studies, researchers seek to answer how and why questions and do not compare or examine relationships between or among variables or test hypotheses (Kegler et al., 2019). Researchers use mixed methods when quantitative or qualitative methods cannot alone inform the research problem (Arino et al., 2016). Because the goal of this study was to hypothesize relationships among variables, a quantitative method was appropriate. Further, researchers widely use a quantitative method to study financial performance (Wood, 2010). Financial performance was the criterion variable of interest in this study.

A correlation design is appropriate for examining the degree of relationships among nonmanipulable predictor variables (Green & Salkind, 2017). A growing share of management research involves nonexperimental correlation designs and is useful to understanding the purely predictive linkage among study variables (Floyd & List, 2016). With correlation designs, a researcher can use secondary data or survey data to identify links and predict relationships between variables (Bliese & Lang, 2016). A causal-comparative nonexperimental design was not appropriate, as this study did not include categorical variables (Green & Salkind, 2017). A quasi-experimental design was not suitable because a researcher cannot assign participants to treatment or control groups (Bisel & Adame, 2017). A correlation design was appropriate because I was investigating the relationship between two predictor variables and one criterion variable.

Research Question

Research Question: What is the relationship between waste prevention, stakeholder confidence, and financial performance?

Hypotheses

Null Hypothesis (H_0): There is no statistically significant relationship between waste prevention, stakeholder confidence, and financial performance.

Alternative Hypothesis (H_a): There is a statistically significant relationship between waste prevention, stakeholder confidence, and financial performance.

Theoretical Framework

Stakeholder theory (ST) was the framework used to investigate corporate financial performance relationships. In 1984, R. Edward Freeman proposed a new management theory, ST (Freeman, 1984). A central part of ST focuses on the role of environmental, social, and governance factors in understanding business financial performance. Donaldson and Preston (1995) later extended the works of Freeman (1984) and explained how organizations could use stakeholder relationships as a method to gain and maintain a financial, competitive advantage. More recently, Jones et al. (2018) noted how an instrumental approach to ST is a primary predictor of competitive advantage and financial performance.

In 1995, Jones expanded on Donaldson and Preston's (1995) study by explaining the financial consequences developed by addressing stakeholder interests. Jones (1995) identified four factors influencing corporate financial performance: (a) fairness, (b) shared values, (c) transaction cost economics, and (d) stakeholder management (environmental, social, governance). According to Hayibor (2017), ST and firm practices ascribed by Jones (1995) remain relevant with significant organizational research implications involving financial performance. As applied to the study, ST holds I should

expect a statistically significant relationship between the predictor variables and the financial performance of firms in the advanced manufacturing and technology industries.

Operational Definitions

Many terms and concepts for financial performance in the study appear in the business literature. The following do not and are relevant to the study.

Comprehensive income (CI): An all-inclusive amount related to accounting information and is a measure of all business activity gains or losses recorded during the year, realized or not, calculated by adding net income and *other comprehensive income* during a reporting period (Nishikawa et al., 2016).

Financial performance: A measure of the overall firm value with profitability generated by voluntary, consistent adaption of stakeholder information, which if realized, adequately appraised, and managed, provides a framework to measure value creation over a period (Vintilă & Păunescu, 2016).

Morgan Stanley Capital International STATS: A proprietary data set of environmental, social, and governance performance indicators used to measure the extent to which publicly held U.S. companies act (or do not act) to adapt a stakeholder view for corporate actions (Hart et al., 2015).

Russell 2000 Index: A proxy used to measure the common stock performance of small capitalization U.S. companies ranking between 1,001 and 3,000 (within Russell 2000 index), according to their total market capitalization classification typically before the final trading day in June (Boone & White, 2015).

Stakeholder(s): A legitimate individual, group of people, or organization influenced by or influencing firm behavior (Freeman, 1984).

Stakeholder confidence: A proxy used to reflect the aggregate satisfaction or dissatisfaction of legitimate stakeholders concerning a firm's willingness to consistently absorb stakeholder interests or information into business practices (Tang et al., 2012).

Stakeholder theory: A concept to predict how a firm will perform better in the present and future, with other things being equal, if business actions align with stakeholder interests (Freeman, 1984).

U.S. Environmental Protection Agency (EPA), Toxic Release Inventory (TRI) Program: A federal public database comprising annual data on toxic chemical releases and waste prevention activities reported by industrial and federal facilities (TRI, 2013).

Waste prevention: Company actions implemented to decrease toxins, consumption, and manufacturing cost through product design or processes (Bartl, 2014) with the intent to minimize company exposure to regulatory sanctions, litigation risk, and poor stock performance (Gupta, 2018).

Assumptions, Limitations, and Delimitations

All research has potential shortcomings, so setting boundaries for the study was critical (Bisel & Adame, 2017). I addressed the main expected research shortcomings and limits.

Assumptions

Assumptions are beliefs a researcher takes for granted, accepts as true or probable without proof to proceed with the research agenda (Bisel & Adame, 2017). The study

relied on secondary data sources, e.g., government databases, academic databases, and data sets. The four secondary sources comprise the SEC, the EPA TRI database, the Russell 2000 Index, and the Morgan Stanley Capital International STATS data set.

The SEC provides online access to corporate 10-K annual financial reports and other documents for third-party subscribers as the Russell family of indices (Financial Times Stock Exchange Russell, 2018) and the public. The EPA TRI (2013) database contains annual emission and pollution prevention data for industrial and federal facilities. Russell 2000 is a list of American small capitalization or *small cap* stock public companies. Russell 2000 relies on corporate information and financial data of annual filings from publicly traded companies provided to the SEC (Boone & White, 2015). Morgan Stanley Capital International STATS is an annual data set of environmental, social, and governance performance indicators of American publicly traded companies. I assumed all four secondary data sources were complete and accurate. The hypothesized public firms under study represent all public firms in the United States' advanced manufacturing and technology industries (Dunn et al., 2015).

Limitations

Limitations refer to potential study weaknesses a researcher cannot address, cannot control, or manipulate (Bisel & Adame, 2017). This study had four limitations. Campbell and Stanley (2010) noted one recurrent limitation that correlation research lacks controllability. I cannot control or manipulate the predictor variables under study (e.g., waste prevention and stakeholder confidence) nor randomly assign companies on the SEC and EPA databases, the Russell 2000 Index, the Morgan Stanley Capital

International STATS data set. A second limitation was that correlation analysis relies on random samples taken from secondary sources and may poorly represent public U.S. firms. Findings from this study would not be generalizable to all public companies in the advanced manufacturing and technology industries as alternative explanations could bias the study and impact financial performance results (Clougherty et al., 2016). The third limitation was that financial performance results do not indicate future performance or evidence to prompt public offerings (Westfall & Omer, 2018). A fourth limitation was that an organization being a corporate member in the Russell 2000 or Morgan Stanley Capital International STATS data set did not suggest excellent investment opportunities to improve financial performance.

Delimitations

Delimitations are choices a researcher makes to place boundaries on the study (Bisel & Adame, 2017). This study had three delimitations. First, I delimited the study to only publicly traded U.S. establishments in the advanced manufacturing and technology industries without SEC violations. The second delimitation was that I did not investigate why small public-owned U.S. firms in the advanced manufacturing and technology industries fail more frequently than their counterparts (Kahle & Stulz, 2017). A third delimitation was that I investigated only the impact on the financial performance of such companies that have or have not benefited under the Jumpstart Our Business Start-ups (JOBS) Act of 2012 (Westfall & Omer, 2018).

Significance of the Study

This section covers three significant implications of the study: (a) value to the business, (b) contribution to the business practice, and (c) implications for social change. Company executives, scholars, and business practitioners may consider the implications for the role of financial performance in the context of the study variables as a worthy research topic. Community leaders within the target population might perceive the study worthwhile because large manufacturing and technology firms have a highly visible operational and environmental impact, more integrated within their neighborhoods.

Value to Business

American publicly owned companies with a capitalization of more than 3.4 billion dollars in annual revenue do not qualify as the top 1,000 performing firms. The National Institute of Standards and Technology reported that 25% of all U.S. manufacturers were small capitalization businesses (generating more than 3.4 billion dollars annually) and are vital to the economic stability of the United States (Krol, 2017; National Institute of Standards and Technology, 2016). Small cap companies are innovative and invest more in equipment and people than their counterparts (Kahle & Stulz, 2017). Business conditions mainly related to poor financial performance can adversely impact new U.S. public companies and increase their likelihood to delist from public markets sooner than counterparts. Small cap manufacturers might utilize the research findings to identify new, unexpected relationships between waste prevention and or stakeholder confidence and business financial performance, which could help companies expand financially.

Contribution to Business Practice

According to Kahle and Stulz (2017), American public companies have continued to decline and have been overall less profitable. The decline results from many factors, and there is a lack of empirical studies in which researchers examine stakeholder interests (e.g., waste prevention and stakeholder confidence) and financial performance. Publicly held firms in the advanced manufacturing and technology industries may be unaware of the relationships between waste prevention, stakeholder confidence, and financial performance. A study with a provisional specification of waste prevention, stakeholder confidence, and business financial performance has contributed to the practice of corporate social responsibility and provided evidence about the nature of the relationships. A theoretical framework to better understand the link was ST. Furthermore, the data evidenced a link between ST and the theoretical knowledge of corporate social responsibility and corporate financial performance.

Implications for Social Change

Study implications for positive social change may include increased public awareness to encourage more quantitative investigations regarding waste prevention. The EPA (2015) reported, on average, that consumers are not recycling discarded electronics (e.g., computer, storage, terminal, peripheral devices). Instead, as Kochan et al. (2016) noted, consumers primarily store obsolete electronic hardware to fulfill a social responsibility: preventing environmental deterioration. The findings from this study may help to increase public awareness. More people may become aware of how waste

prevention programs are a viable way to dispose of obsolete electronic hardware, fulfill social responsibility, and protect the local environment.

A Review of the Professional and Academic Literature

An illustrative, systematic review of the literature regarding corporate financial performance enables the reader to validate new research efforts. Wood and Logsdon (2019) suggested that a credible, comparative literature review consists of scholarly content that can help orient readers to look at competing or contradictory works. In this literature review, I aimed to present a current state of financial performance knowledge and synthesize study results to show how environmental, social, and governance initiatives improve financial return. I focused this literature review on corporate financial performance research published in organizational journals and other selected publications that associate ST with superior financial performance.

In this study, I used ST as the theoretical framework to outline value creation activities to drive financial performance. A literature overview is necessary to address a research question; and is helpful to defend the theoretical constructs under examination, e.g., fairness, shared value, transaction cost economics, and stakeholder management (Ritz et al., 2016). This review provided a context to answer the research question: What is the relationship between waste prevention, stakeholder confidence, and financial performance of U.S. public corporations in the advanced manufacturing and technology industries? The tentative hypotheses addressed whether there is or is not a statistically significant relationship between these variables.

In this review of professional and academic literature of firm financial performance, I focused on four topics: (a) theoretical framework, (b) financial performance, (c) study variables, and (d) relational analysis. ST is the theoretical framework for this study. I explored how organizational scholars critiqued and extended the four social factors (Jones, 1995) by incorporating ST insights. Following is a review of study constructs and measures and ends with a relational analysis.

The literature review includes sources mainly from the global scholarly community, but informal networks and information can also provide valuable insight. The literature search included the following keywords: *American public manufacturers and technology firms, emergent growth companies (EGCs), comprehensive income, corporate fairness, environmental performance, financial performance, governance performance, shared value, social performance, stakeholder(s), stakeholder confidence, stakeholder management, stakeholder theory, transaction cost economics, U.S. toxic release data, value creation,* and *waste prevention*.

In addition to ancestry research and expert opinion, I searched for professional and academic literature in several databases: ABI/INFORM Collection, Academic Search Complete, ACM Digital Library, Business Source Complete, DeepDyve, EDGAR, Emerald Insight, Google Scholar, SAGE Journals, and ScienceDirect. The literature review included peer-reviewed articles published from 1979 through 2021; at least 80% of total peer-reviewed sources were within 5 years of anticipated graduation in 2021. I used Ulrich's Periodical Directory and journal websites to assess the quality of peer-reviewed studies. I sought to ensure that of the total sources in the literature review, a

minimum of 60 were peer-reviewed articles. The review culminated in 186 references for the study. The total peer-reviewed (including government websites and seminal works) was 173 references, comprising 93%. The total number of peer-reviewed references published within 5 years of the graduation date was 148, or 80%. A breakdown of literature review within the 5-year range and outside this range is in Table 1.

Table 1

Literature Review Sources

Sources	Published 2015 and earlier	Published 2016-2021	Total sources
Peer-reviewed journal articles	19	142	161
Non-peer-reviewed journal articles	1	1	2
Government websites	6	6	12
Nongovernment websites	2	4	6
Books	1	4	5
Total sources by year grouping	29	157	186

Stakeholder Theory

I drew on ST (Freeman, 1984) as a theoretical starting point to inform the research question and investigate corporate financial performance relationships. I discuss the theoretical framework in four parts arranged as a chronological narrative. Covered in the first part is the historical emergence of the stakeholder concept and institutional legacies. Summarized in the second part are the three main business models governing business in society relationships; the third part included the theoretical domain of ST (key contributors, core principles, research streams), complementary theories and comparisons, and strengths and limitations of ST. The fourth section focuses on firm financial performance research, introduces study variables, measures, and analyzes the review.

Intellectual Genesis

The question of when and how ST developed is intriguing. I tracked the historical emergence of ST in the context of how stakeholder and business relationships worked in the past. The discussion began with literature from the 14th century, with a selective focus on the 1700s and a contemporary overview. What followed is a brief and stylized account of how business relationships create shared value among groups. The review is not a complete survey of all management thought on corporate and society relations but highlights the most significant interactions. The narrative structure moved between past and present to understand colonial corporate relationships.

Institutional Legacies

The concept of *stakeholder* has a long and varied history and dates to the Medieval period. Eberstadt (1977) suggested that people in the 14th century considered God (i.e., the biblical creator of the universe presented in John 6:29) a corporate managerial stakeholder who yearly shared profits with the poor. A distinguishing feature of colonial business literature includes substantive relationships among groups who shared to create value. Malkiel (2020) and Eberstadt (1977) noted how the East India Company and the Virginia Company were the first global corporations but not the only ones in colonial times. Malkiel (2020) and Eberstadt (1977) noted how corporate value sharing suggested an implicit tenet was profitability in the harmony of interests, and firms acquired legitimacy based on service to the community.

East India Company Practices. East India Company organized on December 31, 1600, as a limited liability corporation with 400 English shareholders (Malkiel, 2020).

East Indian stockholders established policies that favored equality in shareholder voting rights regardless of holdings (Sainsbury, 1907). Investors voted with one individual having one vote, irrespective of total shares held. Fair treatment seemingly permeated some levels of East India business practices and extended to external and internal groups or employees. Despite an anemic financial performance, stockholders authorized yearly giving of Christmas benevolences to external stakeholders, the poor of Stepney, England (Sainsbury, 1907). Widowers of shipmen who also died in company service received bereavement pay.

Virginia Company Practices. Virginia Company, a joint stock company, organized in 1607, was founded in Jamestown, Virginia (Malkiel, 2020). Fiske (1899) detailed how the Virginia Company secured a competitive advantage through a trade of sugar, ginger, hides, timber, tobacco, precious metals, and human slavery. Fitzmaurice (2015) suggested the Virginia Company's practices focused on trade, social interactions, and waste prevention as formal and informal policies or practices.

Fitzmaurice (2015) described social interdependency as an obligation of a group, individual, or entity with the legitimate power to consider the interests of others. An underlying assumption business in colonial times is a notion of corporate survival being dependent on others. Such colonial corporate thinking borrowed from global philosophers. Francisco de Vitoria, a Madridian 14th-century philosopher, provided the first systematic commercialization analysis of human law principles (Bohrer, 2018). Seminal work by Vitoria created a general framework to justify business growth and expansion as a moral good and an obligation (Bohrer, 2018). Fitzmaurice (2015)

suggested Vitoria saw human law mandated that if resources were being wasted and not

efficiently used, the moral obligation was to take possession so others could benefit.

According to Vitoria, businesses have a moral responsibility to help others with the

efficient use of organizational resources.

Emergent Business Models

Joint stock corporate practices in the 1700s were distributive, meeting society's

expectations by being producers to elevate humanity by serving all social groups. The

broader implication was that such corporations pioneered a norm of shared value

expected of businesses to help society. Sainsbury (1907) noted that colonial enterprise

fostered high profits to balance risk and expenses because the firms stressed service to

communities, avoiding waste, and supporting employee welfare. The notion of how to

best serve society had broad inclusion in corporate decision making because, at least in

part, business behavior had a purpose. A century of corporate activity showed that value

creation and exchanges encouraged the development of three dominant theories on

business and society relations: (a) market focus, (b) shareholder emphasis, and

(c) stakeholder perspective. Adam Smith introduced the concept that business behavior

should have a market primacy (Newbert, 2017). In contrast, Milton Friedman proposed a

shareholder primacy (Bendickson et al., 2016), whereas R. Edward Freeman (1984)

suggested a stakeholder primacy.

Market Primacy. Adam Smith established capitalism as a relational approach to

explaining how businesses contribute to the distribution of wealth and the economic

welfare of societies (Newbert, 2017). Smith identified that an economic decision should

solely consider a normative and relational framework. Centuries later, Friedman

deconstructed Smith's business continuity model by aligning the idea of corporate social

responsibility (Bendickson et al., 2016). Friedman introduced an economic predictive

model central to the profitability dimension of corporate interest.

      Shareholder Primacy. U.S. corporate culture embodied a shareholder centrality

focus during the mid-20th century (Lah et al., 2016). The shareholder-oriented practices,

most widely associated with economist Friedman, emerged as shareholders increasingly

exerted more influence over business operations (Overall, 2016). Friedman extended

Smith's self-interest concept to explain how the nature of capitalism promotes a

shareholder primacy view for improving society (Hühn & Dierksmeier, 2016). In the

1970s, Friedman articulated the real business narrative as follows: The business of

business is business, and the ideal became known as *shareholder theory* (Bendickson et

al., 2016). Overall (2016), Bendickson et al. (2016) noted all business activities under a

shareholder model centered on financiers and increased shareholder wealth. Nonetheless,

the broader academic community has challenged tenets of the shareholder primacy role of

businesses in society.

      Stakeholder Primacy. Scholars criticized Friedman's shareholder primacy role

as a single function value assumption (Schaltegger et al., 2019). Many neoclassical

scholars opposed shareholder primacy (e.g., Hühn & Dierksmeier, 2016; Newbert, 2017;

Overall, 2016; Ritz et al., 2016). Most suggested that superior economic transactions and

sustainable societies were central to Smith's interpretation of capitalism. Schumacher

suggested people would provide contradictory demands and, over time, become

increasingly salient and persistent. Such complex demands must include a broader

context beyond a single economic response (Leonard, 2018). Furthermore, Schumacher

advocated that economic scholars should study people as if they mattered (Leonard,

2018).

Theoretical Domain

Freeman (1984) credited Igor Ansoff with introducing the term *ST* in management

literature. Freeman (2017) laid the groundwork for ST to become a theory by defining

and explaining the domain as a research and applied business framework. According to

Freeman (1984), ST is a theory of organizational management and ethics concerned with

managing a firm for stakeholders.

Freeman (1984) defined a stakeholder(s) as a legitimate individual, group of

people or organization influenced by or influencing firm behavior. Freeman (2017)

conceived a purpose of business is to create value for all. By employing Smith's ideas to

unify business and ethics, Freeman recognized internal contradictions with the

shareholder business model as lacking enough explanatory power to guide complex

business decisions (Agle et al., 2008). Freeman advocated a broader relational domain to

address a collective interest of public constituents (Ferrell et al., 2016).

Core Principles

A core principle of ST supports exchanges to create or destroy value. ST is a

central part of the conversation on why managing stakeholder interests can improve

financial performance, just as financial performance is central to ST (Freeman, 1984). ST

scholars described the concept as relational, with explanatory power to help organizations

identify value creation opportunities, balance relationships, and keep the varied stakes moving roughly toward the same direction (Agle et al., 2008; Freeman, 2017). A firm could prioritize stakeholder relationships strategically to direct a course for optimal financial performance.

Research

A course of business activities suggested by Jones (1995) is practice and investment in four social factors of ST influences financial performance (e.g., fairness, shared value, transaction cost economics (TCE), and stakeholder management—environmental, social, governance [ESG]). Management scholars study the effect social factors have on financial performance from three distinct perspectives. Scholars studied the effect from a *descriptive* stance to illustrate what organizations do or not do to engage stakeholders; a *normative* view would describe how organizations could or should act; an *instrumental* outlook reflects consequential thinking on what action an organization takes to achieve specific outcomes for others (Donaldson & Preston, 1995).

Complementary Theories

Relational behavior and frameworks have gained substantial attention in organizational literature (Barney, 2018). Resource-based theory (RBT) and transaction cost theory (TCT) are two concepts used to study corporate relational behavior and are complementary to ST (Barney, 2018; Coase, 2015). A brief overview of the complementary theories is next, followed by a conceptual comparison.

Resource-Based Theory. Barney (2018) is the architect of the RBT. Core concepts of RBT focus on financial visibility in stock turnover, analyst coverage, and

institutional ownership by investing in market-related strategies (Barney, 2018). RBT

predicts a firm will have a higher financial performance with incremental profits

redistributed back to only shareholders. Garcia-Castro and Francoeur (2016) purported

that how RBT is an extension of the shareholder primacy assumption. Barney (2018)

revealed RBT emphasizes profit appropriation and does not share a common theoretical

logic of a stakeholder perspective.

Transaction Cost Theory. Coase (2015) developed TCT in 1934; 4 decades later, Williamson extended the concept (Ketokivi & Mahoney, 2016). A notion of TCT is that firms need strategies to mitigate deception and self-interest goals associated with corporate and partnership transactions (Acquier et al., 2017). A premise of TCT infers close relationships from a commercial emphasis enables firms to predict and manage cost uncertainty (Jones et al., 2018).

Comparison. RBT and TCT share similar predictions but from a premise of different trade-offs and relationships. RBT predicts productive corporate resources and creative capabilities a firm applies to improve financial performance (Barney, 2018). RBT considers only internal stakeholders of a firm as variables to predict financial outcomes. TCT predicts improved financial performance if a firm assumes a commercial relation with stakeholders who engage in opportunistic behavior and practices (Acquier et al., 2017). According to Garcia-Castro and Francoeur (2016), ST does not depend on nor follows a simple monotonic function—no tradeoff between diverse stakeholder needs. ST affirms that more stakeholders only reward firms who balance and address their claims (Freeman, 2017).

Stakeholder Theory Strengths and Weaknesses

ST is distinct because the theory addressed moral and value topics central to managing an organization (Freeman, 2017). The theory examined managing for stakeholder's well-being as the single-valued metric to make moral choices (Bridoux & Stoelhorst, 2016; Jones et al., 2018). A primary strength of ST is the concept provided

specific ways a firm can examine the ends of all cooperative activity and means to assign value to stakeholder claims (Freeman, 2017). Since 2010, more scholars have paid attention to the role ST plays in competitive advantage (Jones et al., 2018). For instance, recently, Jones extended the original work in 1995 by integrating ST with a resource view criterion (Jones et al., 2018). In general, organizational behaviorists comport ST can also assign financial value by taking stakeholders into account (Jones, 1995; Freeman, 2017). Business leaders and scholars who appropriately adapt ST in practice and research give credence to the disciplinary nature of the theory (Berman & Johnson-Cramer, 2019).

A limitation suggested by Key (1999) and hinted at by Hargrave and Van de Ven (2017) regards ST as an incomplete theory; the theory lacks specific logic to explain relationships between stakeholders and the firm. ST, as critiqued by Key (1999), does not explain relationships between stakeholders and the firm or address tradeoffs, nor a guide on how companies can cope with or work through competing demands. Scholars also noted how ST could not convey a complete picture of financial performance nor adequate to help managers measure the diverse interest of nonshareholders (Hayibor, 2017; Lenz et al., 2017)

With known weaknesses, ST remained the preeminent management research framework within a functionalist tradition of organizational behavior. Professional and academic works increasingly support ST as a fundamental framework to better understand managing for stakeholders (Schaltegger et al., 2019). One approach of managing stakeholders evoked in ST but not examined in many strategic management theories was social themes or core social factors.

Core Social Factors

The core social factors of ST are fairness, shared values, TCE, and stakeholder management (Jones, 1995). Most ST theorists considered such factors (often unstated) an appropriate starting point for analysis and a premise to perform operational research (De Gooyert et al., 2017; Schaltegger et al., 2019). ST scholarship assumed the core social factors support an indefensible theme of stakeholder welfare. Jones et al. (2018) made a case that the specific four social factors of ST impact stakeholder's well-being. Bridoux and Stoelhorst (2016), along with Jones et al. (2018), noted many challenges to parse the idea of *stakeholder well-being*. However, if companies take the four social factors seriously, more stakeholders will be better off without making any other stakeholders worse off. A core hypothesis of an instrumental view of ST is managing stakeholder relations governed by the four social factors improved financial performance (Jones et al., 2018).

I do not suggest the four broad social factors introduced by Jones (1995) are exhaustive; however, the factors have attracted substantial research attention both in favor and in opposition. Discussion on the four core social factors proceed with fairness and shared values, followed by TCE and stakeholder management.

Fairness. Fairness is a core issue of ST (Hayibor, 2017). Fairness in business research refers to how well an organization balances the benefits and cost of corporate activity as perceived by stakeholders (Wood et al., 2021). Hayibor (2017) noted relationships between a corporation and stakeholders perceived as fair or unfair, just or unjust, influenced stakeholder behavior. Company fairness treatment can motivate

stakeholders to take counterproductive actions to promote corporate interest regardless of personal gain or sacrifice.

Corporate fairness practices aimed to build close stakeholder relationships (not estranged) are potentially a perfect instrument to foster rare and inimitable competitive opportunities (Bridoux & Stoelhorst, 2016). Fairness substantially impacted financial performance as stakeholders' perception of fair treatment destroyed or created firm value (Hayibor, 2017). Studies on corporate fairness practices often focused on human resource and administrative policies and practices, including hiring, promotions, performance evaluation, gender, ethnicity, religion, age, and transactions (Buttner & Lowe, 2017).

Brown-Liburd et al. (2018) used a 2 x 2 factorial between-subjects statistical design to examine the effect of heuristic fairness (ESG disclosure criteria) had on investors. Response from 113 investors indicated perceived fair treatment of stakeholder groups based on ESG disclosure data provided by public corporations' effect investment level and amount. Higher perceived fairness for stakeholders with a stake in business activities can position the firm for a positive future financial performance (Brown-Liburd et al., 2016). Feng et al. (2015) measured corporate fairness and inclusiveness, finding evidence for a relationship between internal stakeholder practices and financial performance.

Shared Values. Consistent with ST, the purpose of an organization is to create added shared value with society while leaving room for corporate value (Freeman, 2017). Freeman suggested people are central to creating shared value, acting either individually or collectively to create a physical manifestation of something (Van der Linden &

Freeman, 2017). Van der Linden and Freeman (2017) further suggested that a new physical manifestation or shared value is anything with the potential to be worthwhile to stakeholders. Shared value does not create value but instead promotes a collective interest of stakeholders and attraction of resources (Schneider & Sachs, 2017).

Few empirical studies explored shared value in terms of financial performance within the United States. Most recent studies investigating business shared value are works from international scholars. One study developed a proxy of shared value comprised of 26 performance indicators central to social well-being (Jones & Wright, 2016). The few studies on creating shared value held an economic focus. Sampled were 287 large Australian firms, with empirical support showing companies not financially distressed tend to practice shared value creation to drive financial performance through new capabilities and efficiencies. Jones and Wright (2016) used ESG based social rating indices and found superior financial performance led to increased shared value creation. Empirical researchers seem to agree on the role ESG social features play in studying shared value (Jones & Wright, 2016; Schneider & Sachs, 2017; Van der Linden & Freeman, 2017).

Transaction Cost Economics. TCE is the seminal work of Williamson in the 1970s as an analytic tool to assess value creation for stakeholders (Gulbrandsen et al., 2017). TCE assesses how much cost is necessary between transacting stakeholders to complete deals. Studies have used TCE to examine financial performance (Gulbrandsen et al., 2017). Organizational scholars generally perceive TCE as overly opportunistic, favoring a managerial greed perspective (Donaldson & Preston, 1995; Ketokivi &

Mahoney, 2016). Several scholars also suggested the TCE analysis is an appropriate tool to improve financial performance in the context of firm actions to create value for stakeholders (Gulbrandsen et al., 2017). Despite the academic fragility of TCE, the concept shares a relational link with ST but informed by economics (Ketokivi & Mahoney, 2016).

TCE has also been used to study cost effective manufacturing options. A study by Gulbrandsen et al. (2017) found TCE analysis can help researchers assess stakeholder value benefits in three direct ways: by reducing bargaining costs, by controlling and monitoring costs, by safeguarding against maladaptation costs. Current empirical evidence indicates an increase in smaller manufacturers who implement nontraditional ways to minimize transaction costs. For example, Dachs et al. (2019) sampled 1,705 European firms, mostly manufacturers, evidenced a slight trend in *backshoring* verse traditional offshoring activities, with a statistical procedure called logistic regression for rare events.

Backshoring (bringing manufacturing activities back home within the host country) versus offshoring is gaining more research attention. The shift in production processes is more capital and less labor intensive (Dachs et al., 2019). Management theorists suggested that a move toward backshoring triggers the development of other manufacturing cost saving practices. A potential new physical manifestation of backshoring activity might be, as Chaplinsky et al. (2017) noted, pursuing TCE to enhance the net benefit of stakeholders. Freeman might evidence backshoring is a way to pursue stakeholder research in nonmanagerial areas (e.g., law and regulation or political

economy). The growth of backshoring activity and the new emergent growth companies (EGCs) designation may suggest a physical manifestation of TCE and stakeholder research.

Emergent Growth Companies. Title I of the JOBS Act of 2012 offer private placements considering IPOs a financial advantage by lowering transaction costs of going public (Blevins et al., 2017). The JOBS Act attempts to help small IPOs be more attractive to investors (Westfall & Omer, 2018). Under the JOBS Act, burdensome accounting requirements imposed on American smaller issuers of equity by Sarbanes-Oxley (SOX) changed, creating significant cost savings for stakeholders (Chaplinsky et al., 2017).

The U.S. IPO Task Force reported (SEC, 2020b) small IPOs deemed by the SEC as a pending or EGC registrant (SEC, 2020c) will decrease the cost of going public and increase the benefit of being public. The JOBS Act allows American EGCs up to 5 years (from the date of IPO registration) to raise capital before scaling up to compliance associated with SOX and other SEC regulations (SEC, 2020b). Delayed regulatory compliance costs as accounting, legal, and underwriting fees will better position EGCs for improved financial returns (Blevins et al., 2017). IPO literature has not yet produced large scale investigations on the effects the JOB Act has had on the financial performance of smaller American IPOs (Chaplinsky et al., 2017). American public-traded corporations and new IPOs must manage transactional cost vulnerabilities and stakeholders to achieve

optimal financial performance.

       Stakeholder Management. Managing for stakeholders can help firms prioritize and invest in relationships encompassing social features central to stakeholder value creation (Montiel et al., 2018). Discussed briefly are the three social features of ST, followed by how empirical scholars conducted stakeholder management research. The three social features of ST ESG are different from the four social factors. Social features in the study refer to categories of business activity as environmental, social, governance (Wood, 2010). Social factors in the study are specific dimensions of ST (e.g., fairness, shared values, TCE, and stakeholder management) useful to financial returns if a firm consistently engages in stakeholder management (Jones, 1995). ST researchers employed the social features of ST to measure the effect of stakeholder relationships on financial performance (Wacker et al., 2016).

       Environmental. The natural environment side of stakeholder management focus on the impact organizations have on the ecosystem and crucial to firm financial performance. The natural environment is not a stakeholder but instead represents the space within which the business operates (Dixon-Fowler et al., 2017). According to Bergmann (2016), empirical environmental studies captured substantial coverage in global business publications because the space within which the business operates enhance stakeholder well-being.

       Substantial value creation for stakeholders accrues from corporate environmental issues (Lewandowski, 2017). Long-term proactive environmental practices significantly increase the financial performance of firms. A firm with a higher commitment to

environmental responsibility can prevent fines, remediation, and prevention costs having

real (positive) financial implications and superior value creation for stakeholders. The

broader business scholarship advocates for environmental sustainability translates to

lower cost, emission reduction, product innovation, or resource reduction (Gupta, 2018).

Social. All values and concerns related to stakeholders belong to the social

dimension as stakeholder management implies people. The social dimension of

stakeholder management is a metaphor for business financial performance (Freeman,

1984). Companies having close stakeholder relationships, willing to integrate stakeholder

social issues into business operations, tend to outperform competitors financially

(Schaltegger et al., 2019). Social subdimensions include fairness and shared value

creation.

Social action a company can manage included community giving and engagement

practices, labor practices, product responsibilities, and human initiatives (Freeman, 1984,

2017). Stakeholders with a stake (willing or unwilling) in company activities are part of

the business in society relationships. Lins et al. (2017) suggested business and social

relations are broadly defined concepts, hard to measure empirically, but organizations can

use social actions as a proxy for social value creation. Social actions receive substantial

attention in business studies (Carroll, 1979, 1999, 2015; Freeman, 1984, 2017; Kappou &

Oikonomou, 2016; Shabana et al., 2017; Wood, 2010). Many researchers embrace

proxies to study business social action and generally found such activities influence

financial performance (Lenz et al., 2017; Lins et al., 2017; Mattingly, 2017; Perrault &

Quinn, 2016).

Governance. Governance can be ownership from an economic stance or a stakeholder perspective (Coase, 2015; Foss & Klein, 2018). For the study, ownership was from a stakeholder stance. American public manufacturers in the advanced and technology industries could create value by managing corporate governance, so each stakeholder is better off, mainly if governance actions are in the interest of stakeholders. Governance has long existed in the management literature and continues to attract much scholarly interest. A substantial portion studied the effects governance has on financial performance (López-Quesada et al., 2018). Less investigated but relevant to the study was the effects financial deals have on financial performance.

Financial deals, particularly within the small IPO marketplace, have had little research over the last 3 decades. A few scholars, as Bartlett et al. (2017), studied the investing preference of 5,825 small U.S. IPOs, estimated the average annual investment after the 1998 economic panic declined by 96%. Evidence showed a complete collapse in demand for smaller U.S. IPOs, which was once a significant component of U.S. securities transactions. U.S. smaller IPOs who engage in governance oversight reduced managerial opportunism and investment harm to stakeholders (Canarella & Miller, 2018). Firms with a higher corporate governance level improved organizational transparency and trust also improved stakeholders confidence (López-Quesada et al., 2018).

Studies under the rubric of ST addressed in the next section focus on instrumental ends to enhance financial performance informed by stakeholders. Managing for stakeholders to improve financial performance is a positive contribution to extend ST and to help corporations who are less central to economic activity. The analysis aimed to

spotlight specific aspects of ST of which have gone relatively (or completely) unexamined or not yet to be considered crucial drivers of financial performance.

Financial Performance

Discussed in the section is a diverse range of empirical studies to assess financial performance as the presumed effect in literature. The analysis started with financial performance's conceptual structure, followed by research mode, and analyzes various studies. A review of the financial performance empirical studies focused on how some aspect of the three social features ESG of ST can be measured showed how the measures fitted instrumentally into the domain of ST research. The analysis concluded with the relevance of analyzing how waste prevention and stakeholder confidence play in financial performance and deduces the research aim.

Conceptual Structure

Financial performance was the criterion variable in the study. Financial performance is not a theory or a business model. While widespread agreement exists in the literature on the value of financial performance, little discussion emerges on the precise meaning, rarely defined by practitioners or scholars. Lebas and Euske (2002) suggested financial performance are *suitcase words*: people and scholars merge what suits their interest or research topic into the concept, while others merely let the context provide a definition. In the study, the financial performance concept evaluated business performance translated stakeholder management actions and decisions into measurable units.

Research Mode

Cross disciplinary scholars suggested an analysis or study could focus on interrelationships as an object of study (Coarse, 2015). For the study, a financial performance review was from a stakeholder-related mode of research (Freeman, 2017; Jones, 1995). Stakeholder research has four general categories: social pressures, value creation opportunities, firm strategy and performance, and instrumental outcomes (Mattingly, 2017). Scholars have increasingly become more interested in an instrumental outcome and finding measurable links between firm action and financial performance. Wood (2010) is the first to operationalize financial performance, mostly from a business research mode focusing on environmental assessments and oriented toward stakeholder management (Wood & Logsdon, 2019).

Wood (2010) enabled researchers to examine different business activities with financial performance operationalized to improve financial performance and estimate predictions. Wood (2010) was the first to study corporate financial performance using ST related concepts like corporate social performance (CSP), with the analysis level as an approach to financial performance outcomes. Orlitzky et al. (2003) also pointed out how CSP was useful in financial performance analysis. Clarkson (1995) described CSP as a measurement that relied upon and reflected stakeholder's satisfaction or confidence involving corporate response to demands and social issues. CSP is a practical approach to study detailed characteristics of financial performance interrelationships and observable outcomes of a firm and stakeholder relations (Wood, 2010). The analysis level was

another concept many ST scholars used to measure stakeholder value related to three

ESG social features.

Organizing Plan

Levels of analysis are the organizing approach to analyze financial performance

interrelationship in empirical studies. Business studies described the analysis level as

instrumental, if any, to improve financial performance across different business

performance categories (Wood & Jones, 1995; Wood & Logsdon, 2019). I employed

Wood's (2010) seminal idea on analysis levels to identify how scholars studied statistical

relationships between different ST and financial performance measures. The analysis is a

pragmatic way to help researchers examine a variety of business performance areas.

Wood (2010) suggested the analysis levels are flexible, adaptive research tools so

scholars can choose diverse business activities to assess different firm performance areas.

Level of Analysis

Business actions, in general, have a triple distinction in the context of

performance. The triple distinction proposed to explore financial performance comprises

environmental performance, social performance, and governance performance. The three

performance levels of analysis are the same ESG social features mentioned earlier. The

analysis is a way to systematically identify, assess voluntary relationships between firm

social action with stakeholders and business performance. Wood's (2010) set of

descriptive categories of business performances focused on deliberate and unintended

externalities of business structures related to ESG. The analysis level is metric driven,

enabling firms to acquire a practical sense of ESG performances to achieve financial performance gains (Wood, 2010).

ESG Performance

Graves and Waddock (1994) described ESG performance areas as most desired by stakeholders to improve their well-being. Management scholarship mostly incorporated ESG data to address specific stakeholder groups in financial performance analysis (Mattingly, 2017; Shahzad & Sharfman, 2017). Scholars studied and identified ESG referents to include environment, communities, employees, diversity, products, and became standard research protocols for testing financial performance outcomes (Graves & Waddock, 1994). Orlitzky et al. (2003) later confirmed the role ESG practices played in superior financial performance. Growth in the number of ESG and financial performance academic studies was tremendous since the 1990s, producing over 2,000 empirical studies (Friede et al., 2015).

Recent studies exhibited a growing interest in studying operational productivity and ESG social features as both contribute to the greatest financial performance and least risk to manufacturing and technology inputs (Jacobs et al., 2016). ESG has gained increasing attention among investors in the financial markets as well. Empiric studies found evidence for ESG investing and financial performance effects (Friede et al., 2015); ESG social feature data has a substantial presence in management and financial studies and represents a factual reality for firms to achieve optimal financial performance. Over 90% of 2,200 business studies showed a statistically significant, nonnegative relationship between ESG social features and financial performance (Friede et al., 2015).

Environmental Performance. A notion underlying an environmental performance is due diligence toward safeguarding the natural environment might strengthen or weaken financial performance (Dixon-Fowler et al., 2017). The U.S. Pollution Act of 1990 noted waste prevention refers to stakeholder resources employed to reduce source contaminants into the natural environment before recycling, treatment, or disposal (Freeman et al., 1992). Corporate environmental performance (CEP) and financial performance studies used waste prevention, pollution prevention, and waste avoidance or waste reduction terms interchangeably (Bartl, 2014; Freeman et al., 1992).

Prior Corporate Environmental Performance - Financial Performance Studies. An early environmental study by King and Lenox (2002) hypothesized that the less waste generated by a firm, the better financial performance gains. Furthermore, King and Lenox (2002) found a relation remained constant over time if a firm practiced waste prevention versus other environmental approaches (e.g., recycling, recovery, treatment, end-of-pipe). King and Lenox (2002) assessed waste prevention practices and financial performance with multiple regression analysis. Recent scholarship generally studied a comprehensive construct as CEP with a variety of regression analyses. Both CEP and financial performance relationships have many subdimensions, measured by several indicators (Miroshnychenko et al., 2017). The CEP construct comprises at least *environmental management performance* and *environment operational performance* (Trumpp & Guenther, 2017). The CEP construct has been used to examine stakeholder management outcomes and is a primary indicator of organizational performance and survival.

Kudak (2014) noted, however, after the published work of Donaldson and Preston from 1995 to 2011, most business research investigated the relationship between CEP and financial performance. Scholars found a positive, negative, or nonpositive effect (Endrikat et al., 2014; Trumpp & Guenther, 2017). The studies had an apparent consensus of undecidedness on the general effect of managing the natural environmental or green practices and financial performance (Endrikat et al., 2014; Friede et al., 2015; Wood, 2010).

Recent Corporate Environmental Performance - Financial Performance Studies. Empirical evidence suggested a statistically significant positive relationship between manufacturing and technology products designed for the environment and environmental performance (Jackson et al., 2016). Environmentally friendly practices positively impact financial performance, captured as a lower cost on equity (Gupta, 2018). Hirunyawipada and Xiong (2018) also revealed a positive, bidirectional link between corporate environmental commitment and financial performance with immediate and long-term results. Conflicting empirical evidence of CEP and financial performance studies motivated more researchers to examine the link from a new perspective.

Bergmann (2016) examined the CEP-financial performance link from a qualitative approach based on 15 expert interviews. Overall, business leaders confirmed a positive relationship between CEP and financial performance, with financial gains accrue from saving resources. Endrikat et al. (2014) conducted a meta-analytical review of 149 empirical studies revealing an overall positive relationship, confirming earlier research by King and Lenox (2002). Taking Endrkat et al. (2014) findings into account,

Miroshnychenko et al. (2017) explained prior CEP and financial performance studies often empirically explored the nexus based on relatively small samples, studied in an isolated manner, and country specific. Miroshnychenko et al. (2017) provided clarity on the CEP and financial performance relation by studying 3,490 publicly traded firms from 58 countries, mainly comprising manufacturers. Unlike prior research, Miroshnychenko's et al. (2017) regression analysis examined the link by disaggregating the CEP construct into individual and combined effects of different environmental practices on financial performance outcomes. Included in the analysis was waste prevention as an environmental practice.

Social Performance. Management scholars recognized business social performance as the *de facto* law for companies (Shabana et al., 2017). Though laws do not require an organization to perform socially, the public expects such behavior as a trade-off for profit making (Carroll, 1979; Freeman, 1984). An underlying assumption of social performance considered the satisfaction of different stakeholders as instrumental for improving organizational and financial gains (Kappou & Oikonomou, 2016). Though rarely mentioned in scholarship, CSP is a social practice a firm adapts to address stakeholder concerns and values.

Prior Corporate Social Performance - Financial Performance Studies. Early management studies focused mainly on the nature of a firm's social performance and financial performance relationships. Significant studies focused on the statistical relationship from a CSP domain (Wood, 2010). Orlitzky et al. (2003) employed a statistical meta-analysis of 52 studies examining the CSP- financial performance

relationship, developed results into an effect size *r,* accounting for sampling and

measurement errors, and other measures. Empirical findings by Orlitzky et al. (2003)

found a positive relation between CSP and financial performance. Seminal empirical

work by Margolis et al. (2009) explored the same link but with a statistical meta-analysis

of 251 CSP-financial performance studies, converting results into effect size *r*. Consistent

with Orlitzky et al. (2017), Margolis et al. (2009) found a smaller, positive relation

between CSP and financial performance.

The preponderance of early empirical findings related to CSP-financial

performance linkage produced an inconsistent blend. Scholars identified a fragile

consensus resulted from stakeholder mismatching with inappropriate operational

variables (Wood & Jones, 1995) and study method differences (Orlitzky et al., 2003).

More recently, Martínez-Ferrero and Frías-Aceituno (2015) explained how measuring

financial performance is challenging; and more so, if assessing the complete CSP and

financial performance relationships. Today, CSP and financial performance studies test

the relationship with specific subdimensions of CSP, not the entire construct.

Recent Corporate Social Performance - Financial Performance Studies. Prior

financial performance studies explored mostly a statistical link to CSP with aggregate

proxies (e.g., Bergmann, 2016). Rarely have scholars investigated social subcomponents,

i.e., diversity, consumer and community relations, labor issues, stakeholder groups,

separately **(**Odriozola et al., 2017)**.** Slow but growing, more researchers are or have

focused on social practices embedded in CSP to identify key drivers of firm financial

performance. For instance, Flammer (2015) analyzed and found a financial performance

effect related to companies with improved social initiatives (employee and customer satisfaction); the relationship was concave, nonpositive. Whereas Martínez-Ferrero and Frías-Aceituno (2015) tested and noted how a bidirectional relationship occurred between CSP and financial performance, suggesting different social practices weakened or strengthened financial performance outcomes. Contribution from Shahzad and Sharfman (2017) confirmed positive evidence between CSP and financial performance, and a link was not recursive when sample selection bias was accurately corrected.

CSP scholars considered CSP a proxy for stakeholder satisfaction because direct, valid measures are costly and difficult to obtain (Orlitzky et al., 2017). Furthermore, Wood (2010) noted a search for a statistical CSP-financial performance link distorts the overall picture of social performance, and at best, misguides research. Wood (2010) called for further CSP and financial performance studies to develop general and specific approaches, with different study models, designs, and methods. Even though actual corporate social practices cannot be directly measured, a surrogate measure was CSP. Several CSP studies examined social practices and financial performance link from a multiplicity of perspectives but usually studied with social ratings as the Morgan Stanley Capital International STATS data set (Mattingly, 2017; Wood, 2010). Examples of the interest raised by business and academic communities abound in social performance and financial performance studies. For instance, Wood (2010) studied the effects of CSP on financial performance; Orlitzky et al. (2017) examined the effects of dividing CSP into different stakeholder groups. Tang et al. (2012) explored how CSP principles shaped financial performance for building stakeholder confidence. The following section covered

how researchers explored governance performance to optimize financial performance returns.

Governance Performance. Governmentality has proven helpful to improve financial performance (Clegg, 2019). An assumption of governmentality is a high level of corporate oversight enhances financial performance value (Lopez-Quesada et al., 2018). Researchers studied governmentality using governance performance (GP) to measure stakeholder relationships from the boardroom to the factory floor (Foss & Klein, 2018). Research interest in GP developed over the past decades due to corporate scandals, economic and market challenges (Balleisen, 2018). GP has emerged as the centerpiece of enterprise strategy partly related to corporate misconduct. Management (primarily American) scholarship responded to the scandals and challenges with an enterprise strategy to make stakeholders better off through *good corporate governance* and empirical research (Lopez-Quesada et al., 2018).

Scholars equated good corporate governance with GP and showed a clear intent to encourage corporations to improve stakeholder confidence (Linden & Matolcsy, 2004). Empirical researchers attempted to justify good corporate governance by uncovering a statistical link between GP and financial performance. Governance scholars viewed GP and financial performance relationships as instrumental in managing stakeholder ownership (Wacker et al., 2016). Two key features of corporate governance impacting financial performance are stakeholder ownership dispersion and transactional relationships.

Prior Governance Performance - Financial Performance Studies. Much of the earlier GP studies primarily focused on ownership dispersion. The seminal study by Fama and Jensen (1983) addressed how firms could minimize agency problems and increase financial performance gains. Scholars confirmed governance characteristics and dispersion is a relevant aspect of financial performance for corporations. Fama and Jensen (1983) found evidence of high management entrenchment potentially increased opportunistic behavior and adversely impacted financial performance. Dalton et al. (1999) confirmed a positive correlation between organizational efficiency and firms with governance structures comprising a higher proportion of outside directors. The meta-analysis of 131 studies showed a positive correlation between board size and financial performance; in contrast, Dalton and Dalton (2011) affirmed scant evidence to support the effect board size had on financial performance.

Early financial performance literature varied across industries, research topics, primarily resistant to specific financial performance prediction. A reason suggested in the literature is a statistical relationship search between GP and financial performance developed as a detour to help rebuild stakeholder confidence in American corporations post-Enron (Linden & Matolcsy, 2004). The detour emphasized the significance of fairness, equity, and appearance of propriety beg the question for relational research (Brown & Caylor, 2004).

Recent Governance Performance - Financial Performance Studies. A range of financial performance studies examined different subdimensions of GP effects on financial performance. For example, Flammer (2015) analyzed archival records from

shareholder proposals to examine the effect of a pass or fail votes on financial performance. The criterion variable was financial performance, benchmarked with Russell 3000 Index. Flammer (2015) performed a regression discontinuity analysis and showed empirical evidence, with a concave positive tie between corporate actions, enhance shared value (1.77% for shareholders), and financial performance. The theoretical framework Flammer (2015) used was corporate social responsibility (CSR), but the findings were consistent with Freeman's (1984) hypothesis: optimal financial performance depends on shared value. Young (2018) also performed a regression discontinuity analysis, with evidence showing firms operating in a stakeholder sensitive setting had improved financial performance.

The most current GP studies examined a relational side between the GP and financial performance link. Governance scholars described relational governance as the degree to which a buyer and seller used networks to create value and carry out transactions (Clegg, 2019; Lacity et al., 2016). Relational governance is unwritten, noncontractual business practices derived from social norms, e.g., communication, knowledge sharing, trust, commitment, cooperation (Lacity et al., 2016). All the examples influence financial performance and other firm outcomes. GP relied on self-surveillance and collaborative sensemaking (Clegg, 2019) to reduce the cost of business and securities transactions. For example, Wacker et al. (2016) examined a sample of 987 global manufacturing companies, reported a statistically significant relationship exists between relational governance and financial performance, showing information sharing directly increased financial performance returns. A few studies investigated knowledge

sharing and relational governance produced consistent results, with a highly positive link to financial performance and competitive advantage (Cohen et al., 2017; Lacity et al., 2016).

Newer studies explored another relational aspect of GP with different variables than ownership attributes. Since 2010, TCE researchers have significantly expanded variables of interest to identify effects on financial performance. An empirical study coded 219 variables from 78 management peer-reviewed journals between 2010-2014 (Lacity et al., 2016). Confirmed was scholarship introduced 69 new variables to study the direct effects of transactional attributes on governance outcomes (Lacity et al., 2016). Results captured 1,304 empirical examinations of the relationships between independent and dependent variables, 173 dependent, and 99 independent variables related to relational governance (Lacity et al., 2016).

Studying relational links related to ESG, on the one hand, and financial performance on the other examined variables based on theoretical constructs. The next section addressed steps taken to select the most appropriate instrument to measure the constructs. I described how constructs became study variables and overlapped with specific measures.

Study Variables and Measures

Financial performance was the hypothetical construct of interest. The other hypothetical constructs are waste prevention and stakeholder confidence, designed to capture real world business indicators giving rise to financial performance. Ford (2017) suggested formative indicators are variables if, combined create a composite variable.

The waste prevention index and stakeholder confidence index are formative measures, as both indicators give rise to financial performance. Appendix A outlines the operationalization of each construct. All three constructs are imperfect concepts of leading social and instrumental features underlying ST. The hypothetical constructs are not real *per se* but intended as a verbal surrogate to understand concepts derived from corporate and social interactions (Ritz et al., 2016).

Waste prevention and financial performance are standard variables found in management empirical studies. Stakeholder confidence is a relatively new research variable derived from the literature. I described each variable, provide theoretical and empirical grounds for positioning a variable as an assessment construct. In the study, a measure is a score generated by the procedure and was not the data collection instrument (Ritz et al., 2016). The following discussion described each variable, explain the measure derived from an instrument, appropriateness, and briefly addressed each instrument's strengths and limitations. Detailed information on each construct is in the data collection instrument section.

Waste Prevention

The waste prevention construct is a widely used sustainability reference in management literature with substantial empirical coverage (Hahn et al., 2018). Researchers incorporated waste prevention as a study variable to test financial performance outcomes of business strategies to manage stakeholder interest, social capital, and cost (Lewandowski, 2017; Lins et al., 2017). Management scholars mostly agreed ST embeds environmental management issues (Carrol, 2015), including waste

prevention practices (Endrikat et al., 2014; King & Lenox, 2002). Two instruments

employed to measure waste prevention in literature were the U.S. EPA TRI database and

the Morgan Stanley Capital International STATS data set. The reliability and validity of

the TRI data remained an open question and mostly uncontested (Powers, 2013). The

Morgan Stanley Capital International STATS data set has reliability, validity, and

substantial empirical evidence in business studies (Hart et al., 2015).

   Strengths and Limitations. A strength is several management scholars apply the

same instruments (TRI database and the Morgan Stanley Capital International STATS

data set) as proxies for different variables of interest (Diestre & Rajagopalan, 2014;

Fortun et al., 2016; Semenova & Hassel, 2015). Waste prevention has been

operationalized and tested in seminal studies (King & Lenox, 2002) and has significant

empirical coverage (Hahn et al., 2018). A specific limitation of the TRI database and the

Morgan Stanley Capital International STATS data set is the lack of measurement

consistency would explain some variations in study findings (Semenova & Hassel, 2015).

A general limitation of all research instruments in the study were proxies or data models,

which can never represent fully quantifiable nor complete information of actual practices

or reality.

Stakeholder Confidence

   Two instruments used to measure the stakeholder confidence construct comprised

the SEC 10-K filing report and the Morgan Stanley Capital International STATS data set.

The SEC 10-K filing included a checkbox for IPO registration of new entities seeking

ease from SOX restrictions; and, if checked, proxied as an EGC transactional practice for

this study. Morgan Stanley Capital International STATS data set contained data information on social and governance practices and proxied as structural and transactional practices for this study.

Stakeholder confidence is somewhat an unknown concept in organizational behavior scholarship but had a substantial presence in nuclear waste management literature. A premise for using stakeholder confidence in the study is the construct might be an intervening variable to analyze financial performance. Stakeholder theorists purport CSP and sister concepts—CSR, corporate social responsiveness (Wood, 2010)—were contingent on corporate firm ability to identify opportunities to improve stakeholder management and financial performance (Price & Sun, 2017). Carroll (1999) mentioned earlier seminal CSR models (Carroll, 1979) adapted ST features to outline multiple firm financial performance measures.

Tang et al. (2012) evidenced a positive relationship between what a firm does can enhance or erode financial performance. Tang et al. (2012) considered building stakeholder confidence as related dimension of CSR. Accordingly, Ioannou and Serafeim (2015) evinced CSR is a set of business policies focusing on ESG practices. CSR studies primarily include ESG social features in financial performance analysis. In radioactive waste management publications, stakeholder confidence is a key theme, particularly with the annual Nuclear Energy Agency Forum on Stakeholder Confidence workshopsth hosted by the Nuclear Energy Agency. In Nuclear Energy Agency literature, stakeholder confidence is a construct representing how confident (or not) the public feels,

continuously, about finding solutions for radioactive waste ESG challenges (Organization

for Economic Cooperation and Development, 2013).

Strengths and Limitations. Strength is the stakeholder confidence variable had

an indirect theoretical tie to ST through CSR (Tang et al., 2012). Carroll (2015) noted a

growing trend in management research is CSR became a complementary language of ST.

A limitation of stakeholder confidence is a new construct and not empirically tested.

Deduced relationships from a somewhat new study variable as stakeholder confidence

did not result in oversight or confirmatory bias. Oversight or confirmatory bias infer a

researcher missed or pursue fallacious results, so a test of significance supports personal

values (Garcia et al., 2020).

Financial Performance

Comprehensive income (CI) is the metric used to measure the financial

performance construct, reported in the Statement of Comprehensive Income of the annual

Financial Statement of public corporations. CI is mandatory reporting required by the

SEC for all American public firms. CI is an all-inclusive, single aggregate measure to

convey information on complex interrelationships of different income measurements and

risk in multiple stakeholder environments (Cataldo, 2015). Public companies calculate CI

by adding net income and other CI during the reporting period (Nishikawa et al., 2016).

The SEC 10-K annual report is the instrument to measure CI and contains extensive

financial metrics reported by all public firms to comply with annual securities filings

(SEC, 2020a). CI is an appropriate measure of financial performance for the study.

Nishikawa's et al. (2016) definition of CI fitted well within the ST domain. Nishikawa et al. (2016) defined CI as a measure of overall performance from a stakeholder's perspective as the calculation includes all gains or losses recorded during the year, realized or not. CI is not better than traditional financial metrics as net income, but merely a different measurement basis to help stakeholders quantify an amount, timing, and uncertainty of future value creation (Nishikawa et al., 2016). Consistent with Nishikawa et al. (2016), Firescu and Bondoc (2016) considered CI proxies as a quantitative metric, an adequate indicator of firm total value creation performance, and shared risk. Freeman (2017) suggested a core principle of ST is firm total value creation.

Strengths and Limitations. A strength recognized by Firescu (2015) is CI helped stakeholders explore firm financial performance differently. CI helped different financial statement users formulate rational decisions, and represents an all-inclusive value, so all stakeholders financially benefit (Firescu, 2015). Most recently, López-Quesada et al. (2018) employed CI as the criterion variable and evidence a significant, positive correlation between corporate governance and financial performance. A significant limitation of CI is the metric has the propensity for embedding accounting errors and financial misstatements and can compromise the reliability of 10-K filing data (Cao et al., 2016). CI does not help analyzers summarize the current financial performance of an operating company (Nishikawa et al., 2016). Many accounting studies considered CI as less value relevant than other financial metrics (Cataldo, 2015).

Relational Analysis

Decades of different trends led to many studies of a business relationship and financial pursuit in organizational behavior. The review revealed how business professionals and researchers have increase interest in both stakeholder orientation and performance issues. Both communities preferred specific ways to analyze business relations. Most studies examining correlates between stakeholder attributes and financial performance, for instance, used financial metrics provided by SEC 10-K annual reports and Morgan Stanley Capital International research index scores. Studies from the review hewed closely to a dominant measurement approach, favoring mostly multivariate equation models where financial performance is the presumed effect (c.f., Freeman, 2017; Wood et al., 2021).

The review also provided substantial insight on value creation as a necessary component for any size business. An emergent theme identified in the review was how value creation could not develop from any business practice but instead from specific business relationships. If Freeman's (2017) observation is consistent, a link exists between the specific broad social features introduced by Jones (1995) and financial performance returns. Revealed also were weaknesses in research efforts to investigate how socially responsible behavior as waste prevention practices and or building stakeholder confidence practices had a measurable effect on corporate financial performance. A result of the review suggested more studies multiplied rather than build new knowledge. The analysis did confirm and uncover potential stakeholder reactions

and business financial performance relationships, which could lead to a higher probability for support of the research hypothesis.

Confirmed in both prior and recent studies was waste prevention and financial performance were established empirical constructs, with theoretical links to ST (Mattingly, 2017; Shahzad & Sharfman, 2017). In contrast, stakeholder confidence was a relatively new construct in organizational behavior scholarship with limited to no empirical testing. At best, the stakeholder confidence construct captured the essence of ST in terms of business responsibilities toward stakeholders. Overall, the review confirmed study variables supported a hypothetical relationship.

Enormous as the body of work is on ST and financial performance, studies have yet to fully explore value creation related to how IPOs stock issuances were a relational dimension of GP. Missing from the research stream are two considerations. Current research established GP transactions drive financial performance; surprisingly, little attention investigated the relative effects of relational governance on buyer and seller of smaller IPO securities transactions. Second, despite the centrality of a stakeholder perspective in GP analysis (Clarkson 1995), prior or current empirical studies rarely made distinctions of IPO transactions as a dimension of GP or studied the effects on financial performance.

Transition

Section 1 of the study provided a foundation to establish a need for predicting the relationships between stakeholder interests and financial performance. Section 1 introduced the research question, purpose, nature, theoretical framework, operational

definitions, assumptions made, limitations and delimitations boundaries, and significance of the study. A review of the professional and academic literature described the theoretical framework and included mostly new studies with similar predictor and criterion variables as in the study. Section 1 provided conceptual grounds for positioning waste prevention, stakeholder confidence, and financial performance as assessment constructs.

Section 2: The Project

In Section 2, I restate the purpose statement and discuss the research participants, my role as a researcher, defend the chosen research method and design, and explain the population and sampling process. Section 2 also addresses the ethical treatment planned, data collection instruments and technique, and data analysis procedures and concludes with a discussion of the study's validity.

Purpose Statement

The purpose of this quantitative correlation study was to examine the relationship between waste prevention, stakeholder confidence, and financial performance of companies in the advanced manufacturing and technology industries. The predictor variables were waste prevention and stakeholder confidence. The criterion variable was financial performance. The target population consisted of archival data records of publicly held companies in the advanced manufacturing and technology industries listed in the SEC (2020a) online database. Study implications for positive social change include the potential for corporations to better align the economic interest of stakeholders while also improving community environments and promoting capital efficiency and job creation.

Role of the Researcher

The role of the researcher is to collect the right information to inform a research question ethically. The research objective in this study was to examine the relationship between waste prevention, stakeholder confidence, and financial performance. Before collecting data, I remained cognizant of the objectivity of my duty as a quantitative

researcher. A precondition for high objectivity is researcher and participant detachment. The role of quantitative researchers is to maintain a minimal presence and to have minimal interaction with research subjects; however, any interaction or intervention between research subjects and a researcher results in computer-coded transmissions and data structuring (Schroeder, 2016). No professional or personal relationship existed between the research subjects in the study and me. A researcher must engage in fair and equitable treatment to maximize harm reduction to research subjects or stakeholders (U.S. DHS, 2012b). A researcher must comply with laws and regulations and engage in ethical management practices. A researcher has an obligation of transparency and accountability to research subjects and stakeholders on how the study and findings could result in beneficial or harmful outcomes (U.S. DHS, 2012a). I adhered to the Belmont Report (U.S. DHHS, 1979) and Menlo Report standards and implemented the principles during data collection.

Participants

In this section, I discuss how I defined and described the eligibility criteria for archival data records. The eligibility criteria cover characteristics, strategies to access the research subjects, research alignment, and working relationships. Research subjects of interest were archival data records of public-owned U.S. firms from the advanced manufacturing and technology industries. Research subjects were required to meet eligibility criteria for study inclusion. Eligibility criteria for the research subject pool were (a) U.S. public firms in the advanced manufacturing and technology industries

within the 40 Standard Industrial Classification (SIC) codes shown in Appendix B, (b) who did not have suspended or revoked securities in 2013.

My strategy to access research subjects began with the Morgan Stanley Capital International STATS data set. The Morgan Stanley Capital International STATS data set was the primary source to access research subjects (Boone & White, 2015). Cross matched were unique corporate identifiers established by the SEC's (2020a) Electronic Data Gathering, Analysis, and Retrieval system (EDGAR) database, the TRI database, and Russell 2000. Corporate unique identifiers included SIC code, ticker symbol, facility or corporate address, current and past corporate data, CI data, IPO filing date, securities registration status, and EGC registration status. The Russell 2000 Index provides a quick check for which sampled firm is a small cap issuer. Companies in the Morgan Stanley Capital International STATS data set that met eligibility criteria became part of the study pool. A study pool well-aligned with the research question also results in a more informed study. Secondary financial data provided by the EDGAR database and the Russell 2000 Index, verified by SOX certified auditors, can further enhance research validity and alignment (Schroeder, 2016).

The study was information and communication technology (ICT) research involving only data (U.S. DHS, 2012b). ICT researchers cannot have a working relationship because the research subjects are nonhuman. ICT researchers only conduct technical interactions with a computer screen, mostly research performed by computer programs (Schroeder, 2016).

Research Method and Design

Details in this section comprise the research method and design of the study. I explain the research method and how my philosophical worldview justified the method choice and research design in both sections.

Research Method

I chose to conduct quantitative research for this study. A quantitative method is more appropriate than either a qualitative or mixed method because the approach allows a researcher to (a) describe and compare variables, (b) explain variable relationships, and (c) gather empirical evidence to test hypotheses (Bliese & Lang, 2016). Cohen et al. (2003) purported a quantitative method is appropriate for researchers when investigating the total variation of the criterion variables linked with predictor variables. Quantitative methods can test and predict variable relationships (Cohen et al., 2003).

The quantitative research method aligns with my post-positivist worldview. Many post-positivists consider raw data the closest thing to a generalizable statistical reality (Babones, 2016). Post-positivists favor quantitative research over qualitative or mixed methods because the approach offers a straightforward understanding of an issue through numeric values (Babones, 2016). Core assumptions post-positivists hold are that data leads to an approximate truth through a series of deductive, logical related steps. Empirical researchers approach problems through determination, reductionism, scientific rigor, measurement, and theory verification to conduct research (Bliese & Lang, 2016).

Babones (2016) noted the quantitative method is a preferred research framework of social science. A quantitative approach invokes a sense of authority and

persuasiveness, and such studies are useful to social scientists and business researchers (Bliese & Lang, 2016). A better look at the acceptance of quantitative research is from a bibliometric analysis. Bibliometric researchers Zupic and Čater (2015) found an increased presence of quantitative research in business studies since 2001. With a study sample size of 8,514 article citations, Zupic and Čater (2015) concluded only 1 in 11 groupings of scientific research domains involved a qualitative method among the study's list of top management journals (Academy of Management Journal, Strategic Management Journal, and the Journal of Management).

Quantitative researchers want to establish how and why things vary, whereas qualitative researchers seek to explain how and why things happen. In contrast, mixed-method researchers elicit information on how and why things vary and occur. Qualitative researchers seek subjective interpretations of reality to understand some aspect of a lived experience or an experience within an organizational context (Arino et al., 2016). Such researchers approach the topic of interest using abductive practices, e.g., talk, gestures, facial expressions, ideas, field notes, and sight (Arino et al., 2016). Researchers use a mixed method if a quantitative or a qualitative approach cannot alone advance a sufficient explanation for the research problem (Bisel & Adame, 2017). Because the study involved comparing variables and hypothesized relationships, the quantitative method is most appropriate (Bliese & Lang, 2016).

Research Design

I chose a correlation nonexperimental research design to test and estimate a relationship between waste prevention, stakeholder confidence, and financial

performance for the study. Research can take either an experimental or nonexperimental

path. A researcher determines design choice based on whether predictor variables are

manipulable, coupled with if variables can be randomly assigned groups to artificial

situations and conditions (Campbell & Stanley, 2010). A researcher chooses a

nonexperimental research design if unable (or unwilling) to change or modify predictor

variable characteristics under study (Curtis et al., 2016). Research design scholars

Campbell and Stanley (2010) described nonexperimental or quasi-experimental designs

as viable alternatives when a researcher cannot manipulate study variables. Campbell and

Stanley (2010) further explained that researchers choose nonexperimental designs if

information originates from secondary data sources and or intact groups.

Population and Sampling

The target population I generalized research findings were public-traded U.S.

corporations from the advanced manufacturing and technology industries. Description of

the study population included: (a) U.S. public firms from the advanced manufacturing

and technology industries covering 40 SIC codes (shown in Appendix B) (b) who did not

have suspended or revoked securities in 2013.

I chose a *purposive nonprobabilistic* sampling approach to begin the analytical

process. Purposive sampling is most appropriate if the sample choice relies on researcher

judgment. The process helps identify which research subjects inform the research

question (Shahzad & Sharfman, 2017). Business researchers choose a nonprobabilistic

technique if the sample selection is not a random process (Cloughery et al., 2016). A

nonprobabilistic sampling technique is appropriate. The goal in the selection of samples

first considered the characteristics of the archival records. I identified and selected

sample units by cross referencing all four data sources: (a) the SEC EDGAR database, (b)

the TRI database, (c) the Russell 2000 Index, and (d) the Morgan Stanley Capital

International STATS data set. The collection of sampled firms included small, medium,

and large cap companies. The purpose of the Russell 2000 is merely to identify small cap

public companies. Firms identified as being on the Russell 2000 Index received a special

code to calculate the overall proportion of small cap firms in the final data set. Sample

units or research subjects that matched the study criteria of inclusion remained in the final

data set, but all others removed (Shahzad & Sharfman, 2017).

While the universe of U.S. public corporations is extensive, only a few firms met

study inclusion. The same firms listed on the SEC EDGAR database were cross matched

in the TRI database and the Morgan Stanley Capital International STATS data set. A

match among all three sources became the study population comprising 344 corporations.

Figure 1 is a graph of the power analysis for the study sample size (Faul et al., 2019), a

multiple linear regression analysis, a random model (nonexperimental design), with two

predictor variables, and one criterion variable. Based on G*Power software, two-tailed,

priori power analysis assuming a medium effect size of .3 ($f^2 = .15$), $\alpha = .05$, the required

sample size is 72 to achieve a power of .8 and 108 for a .95 net power (Faul et al., 2019).

A weakness of purposive nonprobabilistic sampling is that insufficient statistical power

to reject the null hypothesis could occur whether a research subject met study inclusion

criteria.

Figure 1

Power Analysis for Sample Size
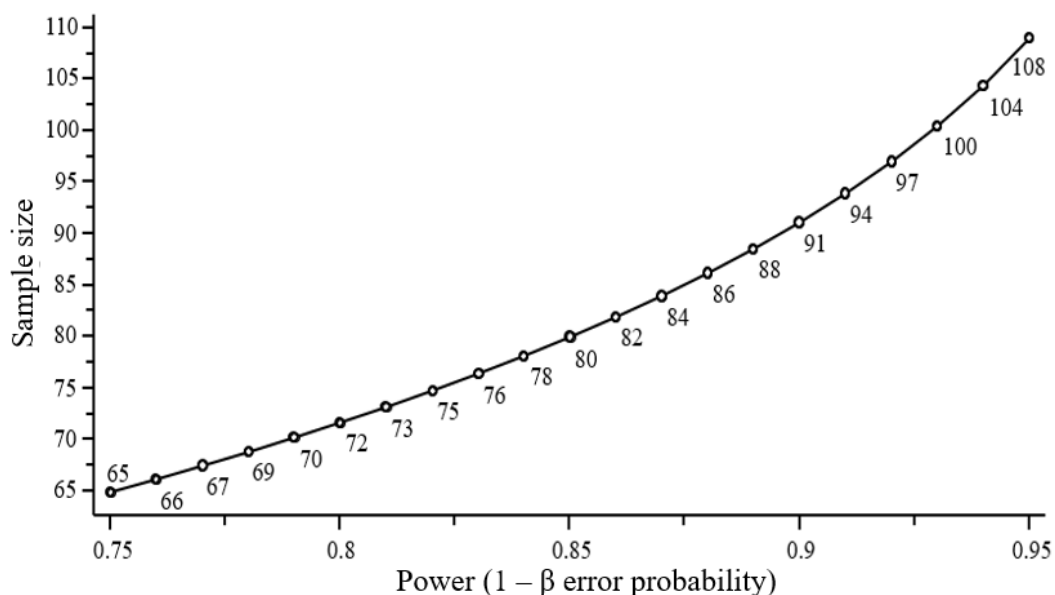
Figure 1. Power analysis for sample size.

Ethical Research

In ethical research, a researcher aims to discuss safeguards to reduce unauthorized research access. I sought and received approval from the Walden University Institutional Review Board for the study (03-26-20-0517895). Secondary data sources for the study included the SEC EDGAR database, TRI database, Russell 2000 index, and the Morgan Stanley Capital International STATS data set. The SEC EDGAR database contains mandated annual filings of publicly traded companies and provided financial and governance accountability information. The TRI database is the source of public waste management information. Russell 2000 provided some financial metrics and corporate identity information. The Morgan Stanley Capital International STATS data set served as a proxy of actual performance assessments related to corporate ESG practices.

This study relied on data from online secondary sources. Insight from the Menlo Report (U.S. DHS, 2012b) provided guidelines to establish ethical management of secondary data not addressed or required under the federal Common Rule. The final research data did not have any corporate identifier information (U.S. DHS, 2012b). Data from the research subjects were password protected on my computer with an additional copy at Carbonite computer cloud storage service for 5 years. The computer and cloud storage password protection ensure the research data set remains confidential and reduces impermissible disclosure. After 5 years from the date of final approval of this study, I will destroy the data set.

Data Collection Instruments

In this section, I present details on research instruments used to collect data for the study. I include instrument names, descriptions, measure weights, validity, and reliability. Addressed was how I mapped data from each measurement instrument to the study variables. See Appendix C for a summary of data mapping to the research instrument. Scores to measure the three study variables originated directly from the data collection instruments.

Instruments for the study were not instruments in a traditional research manner as gathering data, e.g., survey, test, questionnaire. Instead, the study instruments already had data; my role as a researcher is to ensure the secondary data informs the research question. I did not adjust or revise any instrument in the study as public instruments were available online and did not require special administration or usage permission. The secondary analysis used the following study instruments: the SEC EDGAR database, the

TRI database, the Russell 2000 index, and the Morgan Stanley Capital International

STATS data set.

Description and Weight Measure

I incorporated the Morgan Stanley Capital International (MSCI) STATS data set

to access a list of constituent corporate members from the universe of U.S. public firms

from the manufacturing and technology industries. Stakeholder confidence is the second

continuous variable in the study. MSCI (2018) STATS data set is a multidimensional

rating instrument and measured the social ESG performances of U.S. public companies.

Data needed from the MSCI (2018) STATS instrument to measure the stakeholder

confidence variable comprises corporate social and governance performance assessments

of which contributed unique information to the final score.

According to Lenz et al. (2017), in 1991, Kinder, Lydenburg, Domini (KLD)

Research & Analytics Inc. first introduced a screening instrument to identify and measure

trends in a firm's environmental and social performance. KLD researchers constructed a

reliable profile of U.S. corporate activities based on ESG performance assessments. KLD

researchers gathered performance data by conducting corporate interviews, corporate

information reviews, and media reports (Perrault & Quinn, 2016). Composite scores

derived from the KLD data set provided stakeholders with a numeric value to measures

whether corporate policies and practices were consistent (Lenz et al., 2017).

In 2010, MSCI entered the ESG rating industry, acquired KLD Research &

Analytics Inc., rebranded the products and services as MSCI ESG KLD (Lenz et al.,

2017). MSCI STATS is a broad social market index of corporate social research on over

3,000 U.S. publicly held firms (Hart et al., 2015). Stakeholders relied on MSCI

investment portfolios to assess if American public corporations have policies consistent

with actual practices.

Empirical researchers mostly agreed MSCI STATS is an appropriate instrument

to measure corporate ESG performance (Mattingly, 2017). Mattingly (2017) found 34

journals published over 100 empirical studies using the KLD data set (renamed MSCI

ESG KLD STATS or *STATS* after 2011) between 1991 and 2011. The KLD data is an

appropriate proxy for actual business ESG performance and offers scholars a

comprehensive approach to analyze corporate actions toward stakeholders (Mattingly,

2017; Perrault & Quinn, 2016). STATS (2014) is appropriate to measure both predictor

variables as the instrument with broad appeal in business research and extensive

empirical support.

Weight Measurement

STATS researchers issued corporate participants ordinal, close-ended survey

questions to collect ESG performance values assigned on a 5-point scale from -2 to +2

integer values (Hart et al., 2015). STATS analysts measured corporate social

responsiveness across seven performance attributes: community, corporate governance,

diversity, employees, environment, human rights, and products (Hart et al., 2015).

Provided in Appendix D is a complete list of composite variables and ESG performance

indicators. Each performance indicator had a binary score. Raters scored company

performance as DID or DID NOT meet performance criteria established for an ESG

indicator. Firms who DID meet the performance criteria received 1 (*if a company DID*

meet a performance criterion) or a 0 (*if a company DID NOT meet a performance criterion*) established for an ESG indicator. A notation of *NR* or NOT RESEARCHED meant a rater did not evaluate a company for a specific ESG performance criteria. Composite scores in STATS range from 0 (*indicating a firm was less responsive to stakeholder interests*) to 4 (*indicating a firm was more responsive to stakeholder interests*) (Morgan Stanley Capital International, 2018).

U.S. SEC Database

The criterion variable in the study is financial performance, a ratio variable. The SEC 10-K annual filing report is the instrument to measure firm financial performance. CI was the tool for measuring the predictive accuracy of financial performance. CI is available in the SEC filings, required for public firms, and reported in the Statement of Comprehensive Income of the annual Financial Statement (see Appendix G).

Conceptual Structure. The Financial Accounting Standard Board (FASB) (Financial Accounting Standard Board, 1997) described the conceptual structure of CI as an accounting measure for financial performance. In 1973, accounting professionals and academic leaders established the FASB and developed accounting standards to report economic activity in a company's financial statements (Kreuze & Newell, 1999). The FASB defined CI in 1985, codified in Statement of Financial Accounting Standards No. 130 (SFAS) (Financial Accounting Standard Board, 1997). Under the U.S. Generally Accepted Accounting Principles, CI included revenue, expenses, gains, and losses but excluded from net income. Kreuze and Newell (1999) suggested CI is an all-inclusive

measure accounting for all revenue, expenses, gains, and losses regardless of the transaction period.

Weight Measurement. Firescu and Bondoc (2016) provided a way to explain the weight measurement of CI. I adapted Firescu and Bondoc's (2016) approach and calculated the mean CI dollar value as a baseline, and presented the deviation of each research subject's CI value from the mean. Values below (rounded to the nearest dollar amount) the mean CI value suggested a U.S. public corporation in the study, on average, had a poor financial performance. Values on or above (rounded to the nearest dollar amount) the mean CI value indicated a U.S. public company from the manufacturing and technology industries, on average, had a superior financial performance.

U.S. EPA TRI Database

Waste prevention was the first continuous predictor variable in the study. The TRI (2013) database and STATS (2014) data set were instruments to measure the waste prevention variable. Data needed from the instruments were emission management, environmental opportunities, natural resource uses, and were all binary values.

The TRI (2013) database contained annual emission and pollution prevention data from 370,000 source reduction projects (industrial and federal facilities). The TRI program tracked and provided waste management information on toxic chemicals posing a threat to human health and the environment produced by organizations, mostly included the U.S. manufacturing industry (see Appendix G). Combined data values from TRI and STATS became a proxy for actual environmental performance, measured in the study as waste prevention. For example, Diestre and Rajagopalan (2014) relied upon TRI data to

study the relationship between waste prevention actions of public manufacturing firms and competitive advantage as a proxy for financial performance.

Weight Measurement. I adapted Kanashiro and Rivera (2019) approach to confirm facility compliance with the federal Clean Air Act by recoding the data. For instance, Kanashiro and Rivera's (2019) approach confirmed compliance recoded as a binary score of 1 (*in compliance*) or 0 (*not in compliance*). Firms chosen for Kanashiro and Rivera's (2019) study received an emission management weight of 1 (*if toxins and emissions generated by a facility or corporation were at or above the computed mean Risk-Screening Environmental Indicators* (RSEI) *score*) (see Appendix J). An RSEI score of 0 (*indicated toxins and emissions generated by a facility or corporation were below the mean RSEI score*) (Risk-Screening Environmental Indicators, 2019). A lower composite score indicated the environmental practices were more responsive to stakeholder interests, and a higher score suggested company environmental emission practices were less responsive to stakeholder interests.

Russell 2000 Index

Russell 2000 is a domestic, unmanaged, capitalization-weighted small cap stock and measured the performance of the bottom 2,000 publicly traded U.S. companies in the Russell 3000 index (Boone & White, 2015). Russell 2000 serves as an essential component of the U.S. small cap stock ownership (Boone & White, 2015). In June, Russell 2000 reconstitutes to accommodate changes in membership delisting (small cap companies leaving public markets) or reclassified for a higher or lower index. Researchers increasingly relied on the Russell 2000 index to investigate small cap stock

performance, corporate financial performance, and the index is appropriate for the study (Boone & White, 2015; Flammer & Luo, 2017). The STATS data set contain different market capitalization classifications and industries, with more large cap public company constituents than counterparts. Research subjects chosen for study inclusion had matching archival records from the SEC's EDGAR database, the TRI database, and the STATS data set. Russell 2000 is neither a variable nor a construct in the study, nor necessitates scale of measurement, scoring, nor weight management defined and measured.

Validity

Validity is the extent to which data derived from an instrument reflects actual performance or behavior (Berchtold, 2016). A study instrument undergoes validity checking from a continuum of theory building and testing by researchers (Reio, 2016). For instance, the 10-K annual filing content posted in the EDGAR database, the TRI program, and the Russell 2000 index provide financial and environmental data, yet neither undergo validity checks by scholars. Among the instruments used in the study, only STATS had the most empirical evidence of validity and convergent validity (Semenova & Hassel, 2015).

Reliability

Research reliability is repeatable or replicable outcomes of a test or study instrument, as measured under the original conditions (Berchtold, 2016). Reliability is consistency in measurements. All four study instruments had reliability measurements having physical properties. Reported in the section were prior study estimates for the

reliability of the study instruments. While studies reported the reliability with Cronbach's alpha or by audit and monitoring processes, I chose Cronbach's alpha coefficient ranking from prior studies as a reliability benchmark for the study.

U.S. SEC and Russell 2000 Index

The SEC and the Russell 2000 Index relied on audit processes to disseminate reliable corporate financial and securities data. The SEC allowed public and commercial subscribers access to the SEC's EDGAR corporate annual filings (SEC, 2020a). The Russell 2000 Index is a recipient of the EDGAR dissemination stream. Publicly traded companies are subject to 10-K yearly filings. An independent auditor must verify 10-K financial data and registered with the Public Company Accounting Oversight Board before publishing SEC requisite data (Schroeder, 2016). Auditors who comply with control testing standards of attestation and publicly held companies who have a corporate official to certify financial data accuracy help increase the reliability of SEC requisite data (Schroeder, 2016). An auditing process ensures the reliability of financial information and reduces source errors.

TRI and STATS

The TRI and STATS data rely on corporate emission compliance reports and academic journals for reliability. Yearly, TRI updates reliable environmental data from American manufacturers allowing the EPA and American citizens to assess toxin emissions (Fortun et al., 2016). Firms listed on the TRI database must have a corporate official certify the quantity and type of toxins released and specify a corrective action if needed. Cormier et al. (2015) tested TRI's reliability and found Cronbach's alpha ranges

from 0.71 to 0.93 for the TRI scores. The STATS data set provided reliable yearly measurements of ESG performance for American public corporations (Mattingly, 2017). The reliability of the STATS data set had substantial empirical evidence in business studies (Hart et al., 2015). Cronbach's alpha was at least 0.60 for STATS ESG scores (Hart & Sharfman, 2012).

I chose the study instruments because scholars mostly agreed on the published reliability and validity, or suitable as reported in the literature. The study relied on highly reliable and valid instruments established in the literature to support an interpretation of data in an unbiased manner.

Data Collection Technique

The section focused on the data collection technique for the study. Covered were some advantages and drawbacks of the data collection technique.

The data collection technique chosen for the quantitative study is secondary field research or archival research (Heng et al., 2018). Sources of the secondary data are available online. A rationale for choosing secondary field research is the technique provided a better option to inform the research question. Data needed for the study came from the universe of U.S. corporate public firms and may not be collectible by a single researcher or research team (Heng et al., 2018). Data needed to study American public firms from the advanced manufacturing and technology industries already exist. According to Dunn et al. (2015), secondary data relevant to the study help a researcher test a hypothesis or conduct new research. The four secondary data sources were most

appropriate and relevant to answer the research question and examine a relationship between study variables.

The process of collecting data began by accessing the SEC EDGAR database. I identified public firms listed with specific SIC numbers, as shown in Appendix B. Appendix E illustrates the cross referencing process and how data elements connect. With a corporate ticker symbol, SIC code, I matched and collected raw data from all four secondary sources. The matching process ended when the final spreadsheet contained all the relevant data.

Secondary field research advantages were less time and resources to conduct analysis, convenient, and cost effective (Dunn et al., 2015). A drawback is a researcher relying on secondary sources might not have an opportunity to understand the methodology associated with data collection (Heng et al., 2018). Another disadvantage of secondary field research is previously collected data limit a researcher's ability to participate in the data collection process (Dunn et al., 2015).

Data Analysis

The research question and hypotheses presented in the data analysis section described and defended the statistical analysis chosen. Included are assumption violations underlying the analysis, actions to mitigate common analysis threats, data handling (e.g., data cleaning, missing data, interpretation of results, a software platform to analyze the data, and analysis appropriateness).

Research Objective

Data for the analysis came from the SEC's EDGAR database, the TRI database,

and the STATS data set. Collected data for the analysis provided insight to examine the research question and hypotheses:

Research Question: What is the relationship between waste prevention, stakeholder confidence, and financial performance?

Null Hypothesis (H_0): There is no statistically significant relationship between waste prevention, stakeholder confidence, and financial performance.

Alternative Hypothesis (H_a): There is a statistically significant relationship between waste prevention, stakeholder confidence, and financial performance.

Analysis

I tested the hypothetical predictions with standard multiple regression analysis, entering all predictor variables into a linear equation simultaneously (Green & Salkind, 2017). Appendix F illustrated the mathematical modeling of multiple linear regression. The analysis approach is suitable for describing the strength of relationships using at least two interval and or ratio variables (Ziglari, 2017). The test also checked for curvilinear and moderator effects and simultaneously tested for collinearity between predictor variables (Cohen et al., 2003). Multiple linear regression analysis is appropriate, as the study had two predictor variables (interval) and one criterion variable (ratio). All three variables were continuous scale data, providing a fuller range of values. Multiple linear regression is appropriate to analyze data for experimental and nonexperimental designs with complex interrelationship effects (Green & Salkind, 2017).

Defense

Multiple linear regression (MLR) has some advantages over other correlation

analyses. The analysis is a statistical procedure helping researchers assess the relationship between a criterion variable and multiple predictor variables (e.g., X_1, X_2) with two predictor variables. Other applied correlation analysis procedures not appropriate for the study included bivariate linear regression, mean square contingency coefficient (Phi correlation), canonical correlation, partial correlation, point-biserial correlation, eta correlation, Kendall and Spearman rank correlation coefficients (Green & Salkind, 2017).

Researchers choose bivariate linear regression studies to examine the degree that two variables vary together, while the mean square contingency coefficient (or Phi correlation) studies examine two binary variables (Green & Salkind, 2017). Partial correlation studies aim to determine spurious relationships between variables (Green & Salkind, 2017). A biserial correlation is appropriate for studies having one or two continuous variables and a binary variable where the data is naturally occurring, i.e., not intentionally forced into two segments (Green & Salkind, 2017). The biserial correlation would be a possible data analysis candidate if the waste prevention and stakeholder confidence variables were unforced into two binary values, 1 and 0. Canonical correlation is appropriate for studies analyzing a relationship between predictor variable sets (Uurtio et al., 2018). Eta correlation, also called correlation ratio, is relevant when researchers investigate curvilinear predictor variables (Norouzian & Plonsky, 2018). Spearman and Kendall rank correlation studies are relevant for paired ranking of nonnormal data (Green & Salkind, 2017).

Assumptions

Multiple linear regression statistical analysis test had four essential assumptions.

First, an assumption made is the variables comprised at least one ordinal, interval, or ratio for nonexperimental studies (Ziglari, 2017). All three variables were either interval or ratio levels of measurements. Second, the assumption is a nonexperimental study with more than one predictor variable help minimize errors or optimize the statistical explanation (Cohen et al., 2003). The study had two predictor variables. Third, the assumption considered that all study variables were multivariate normally distributed (Green & Salkind, 2017). The only statistical relationship between waste prevention data, stakeholder confidence data, and financial performance data is a linear one if met. Fourth, an assumption is the information revealed from the data distribution will not be a significant source of statistical threats. Scholars identified multicollinearity, outliers, normality, linearity, homoscedasticity, and independence of residuals pose severe threats to a valid interpretation of regression coefficients (Green & Salkind, 2017).

Multicollinearity

A multicollinearity violation occurs if at least one predictor variable had a high correlation with other predictor variables (Green & Salkind, 2017). Waste prevention and stakeholder confidence were predictor variables in the study and were formative composite variables, e.g., a variable comprising multiple ESG indicators combined into a single variable (Sarstedt et al., 2016). Interaction of such composite variables potentially can create a multicollinearity threat and influence Type I error rates to produce reasonable conclusions (Green & Salkind, 2017). I tested multicollinearity violations with the variance inflation factor (VIF) and provided tables. A conventional remedy of multicollinearity is a larger sample size (Green & Salkind, 2017).

Outliers

Data outliers can substantially threaten the precision and direction of the regression line, leading to a Type I error rate and reduced statistical power to reach conclusions (Liao et al., 2016). Severe outliers can produce inappropriate predictions of financial performance. I tested for outliers with descriptive statistics and computed leverage, distance, and influence measures (Darlington & Hayes, 2017). A remedy included removing outliers, or retention, or accommodating outliers to reduce the impact (Wang et al., 2017).

Normality

Violation of normality indicates the residuals do not have a bell-shaped distribution (Green & Salkind, 2017). Threats from a normality violation impact Type I and Type II error rates for a statistical conclusion (Courtney & Chang, 2018). The effects of a normality violation indicate the distribution of means across data samples for waste prevention, and stakeholder confidence variables have an abnormal distribution. I tested the normality assumption with the Shapiro–Wilk test. Strategies to help resolve a normality threat were power transformation techniques and mathematically making the data more normal (Nwakuya & Nwabueze, 2018).

Linearity

A threat of linearity undermines the predictable capacity of the regression line or plane. A consequence of a nonlinearity data assumption is the amount of change in a predictor variable would not change the criterion variable at a constant rate, nor somewhat straight (Green & Salkind, 2017). The effects of a linearity violation indicated

the relationship between waste prevention, stakeholder confidence, and financial performance is not a relatively straight line. I tested linearity with the SPSS curve estimation procedure. Optimal nonlinear models were another way to resolve a linearity threat and reduce Type I and II error rate conclusions (Wooldridge, 2013).

Homoscedasticity

A threat of homoscedasticity occurs if the variance is not reasonably equal across the predictor range (Nwakuya & Nwabueze, 2018). Homoscedasticity would make the statistical significance of the predictor variables invalid. I tested for homoscedasticity violations with the Koenker test (Daryanto, 2018). Solutions for dealing with a homoscedasticity threat comprised variance stabilizing transformations, generalized or weighted least squares, or robust regression (Yang & Mathew, 2018).

Independence of Residuals

An independence violation may exist if residuals are conceptually or statistically, like other residuals (Green & Salkind, 2017). Replicated information compromises statistical conclusions because the residuals are dependent and interacting and impact Type I and Type II rate errors differently (Rutz & Watson, 2019). I tested the normality of residuals with the Durbin-Watson test (Wooldridge, 2013). I controlled threats to the independence of residuals with theoretical and valid instruments and methodologies to produce relatively unbiased coefficients (Cloughery et al., 2016; Rutz & Watson, 2019).

Data Preparation

As pointed out earlier, the target population is corporate archival records from American public firms in the advanced manufacturing and technology industries.

Conditional to perform data analysis included using the SEC EDGAR database, the TRI database, the Russell 2000 index, and the STATS data set. I analyzed a chance relationship between waste prevention data, stakeholder confidence data, and financial performance data.

Data Handling

The data analysis employed four secondary sources, considered clean data (Krishnan et al., 2016). The SEC EDGAR database and Russell 2000 index contained corporate financial statements required by SEC 10-K filings. The TRI database and STATS relied on third-party auditors or raters to certify the validity of ESG performance indicators. Cleaner data as the four secondary sources help researchers overcome endogeneity problems (Boone & White, 2015). The data analysis comprised limited data cleaning. I employed a multiple imputation procedure to manage missing data from the archival records. Produced is a single data set based on imputed values to test assumption violations and conduct the MLR statistical analyses (Darlington & Hayes, 2017). Interpretation of detected individual effects for all multiple regression coefficients helped determine the statistical significance between study variables and guide hypotheses decision making (Ziglari, 2017). The software for data analysis is IBM SPSS (International Business Machines, 2017).

An MLR helped investigate the proportion of variance in financial performance (criterion variable) given the influence of waste prevention and stakeholder confidence (predictor variables). With no missing data, combined with no severe assumption violations, the MLR analysis produced a reliable, predictive estimate of the criterion

variable. Controlling for threats underlying an MLR analysis helped rule out alternative explanations for the financial performance of U.S. public firms from advanced manufacturing and technology industries. Controlling for threats improved the study validity as well.

Analysis Appropriateness

I tested the hypothetical predictions with multiple regression analysis. MLR is an appropriate statistical procedure to describe the strength of relationships using at least two interval and or ratio variables (Ziglari, 2017). The analysis is appropriate for two predictors and one dependent variable regression analysis. Multiple regression has some advantages over other correlation analyses. The statistical procedure helps a researcher assess the relationship between a criterion variable and multiple predictor variables (e.g., X_1, X_2, for two predictor variables). MLR helps analyze data from studies with experimental and nonexperimental designs (Green & Salkind, 2017); and investigate multivariate normal data distributions (Aberson, 2015). The test also checked for curvilinearity, moderator effects, and simultaneously test for collinearity between predictor variables (Cohen et al., 2003). Furthermore, the MLR analysis can also increase the risk of Type I and II errors, particularly with a combination of smaller sample size and multiple criterion variables (Taylor & Spurlock, 2018). The study had only one criterion variable, with an amble sample size (derive by a power analysis), so the MLR analysis should help mitigate or reduce the probability of statistical errors (García-Pérez, 2012).

Study Validity

The section defined study validity, identified the statistical software used for the study, outlined an action plan to reduce incorrect predictive relationships. A researcher can control statistical conclusion validity with statistical tests and generalization (García-Pérez, 2012), and checks helped identify preventable threats to statistical conclusion validity and increase the likelihood of study generalization.

Statistical Conclusion Validity

Study conclusion validity addressed whether a research project has controls to ensure the conclusions represent the sample data. Study validity in post-positive research considers how close secondary data measures the approximate real performance (Lachmann et al., 2017). I relied on secondary data sources to validate study validity. Secondary data sources used in nonexperimental studies warrant study validity checks because the research draws on mathematical modeling as a proxy for corporate decision making (Lachmann et al., 2017). The study is a nonexperimental quantitative correlation design and did not necessitate an internal validity test (Campbell & Stanley, 2010). The software used to test statistical conclusion validity threats in the study is IBM SPSS (International Business Machines, 2017).

Threats

Threats to statistical conclusion validity were (a) reliability of the instrument, (b) data assumptions, (c) and sample size. Each condition can produce incorrect conclusions for the financial performance of an American public own advanced manufacturing and technology industries. A common cause of statistical conclusion errors is a mismatch

about study variables relationships based on statistical estimates between the collected and hypothesized data (Taylor & Spurlock, 2018).

Reliability

An intent of reporting the reliability coefficient is to measure how close the reported reliability coefficient for the waste prevention and stakeholder confidence instruments were to the calculated reliability coefficient. Reported reliability coefficient comparisons with the calculated reliability coefficient enable a researcher to determine whether an instrument was reliable (Green & Salkind, 2017). Less reliable instruments in a study suggest the research project could produce faulty conclusions (Widyawati, 2020). Ways to ensure acceptable reliability are developing theoretically based instruments established in the literature (Reio, 2016). All instruments used in the study had substantial theoretical and empirical support in the literature. A refinement of the instrument focused on comparing the reported reliability coefficient and my accepted calculated value of $\geq.7$, with higher coefficients indicating higher reliability levels. I calculated the stability of measures with the IBM SPSS Analyze/Scale/Reliability Analysis procedure to compute Cronbach's alpha coefficient (Green & Salkind, 2017).

Data Assumptions

Invalid sample data assumptions can produce erroneous study validity. Bases to accept or reject a statistical claim or a null hypothesis is the sample data (Campbell & Stanley, 2010). Characteristics of the sample data combined with a decision rule can lead to an incorrect decision. A wrong decision could be a Type I error indicating variable relationships are trivial when the relationship was nontrivial. A Type II error means the

variable relationships are nontrivial; when the relationship was trivial (Haynes et al.,

2017). A Type I error rate can perpetuate rather than alleviate statistical error. Type I, α

(alpha of .05), indicates a 5% probability of rejecting the null hypothesis when the null is

true. A Type II, β (beta of .95), indicates a 95% probability of failing to reject the null

hypothesis when the null is false. A safeguard from data assumption threats to conclusion

validity relates to the research design and the statistical analysis (García-Pérez, 2012).

The research design is a correlation nonexperimental and appropriate with multiple linear

regression statistical analysis.

Sample Size

Appropriate sample sizing helped minimize threats to study conclusion validity

and impact a Type I error to achieve conclusions (Corwin et al., 2017). The target

population is American public corporations who belong to the advanced manufacturing

and technology industries. I increased the sample size to achieve a power analysis of .80

for predictor coefficients simultaneously (Aberson, 2015). A power analysis of .80 did

reasonably mitigate Type I and Type II errors (Aberson, 2015).

Generalization

American public companies were not specific to an industry and generalizable,

posing no threat to external validity. Corporate constituents on the SEC EDGAR

database, the TRI database, the Russell 2000 index, and the STATS data, set reflect

different industries (Boone & White, 2015). I excluded any company from the final data

set that did not meet study eligibility, as mentioned in the population section. A

generalization may not be tenable to other populations under the research structure, and

additional research beyond the data set could yield different results. A goal was to minimize statistical conclusion validity violations or unmet assumptions hampering accurate regression analysis. If met, the Gauss-Markov theorem guarantees the best linear unbiased estimators ensured the hypothesized relationships worked for all public corporations from the advanced manufacturing and technology industries (Wooldridge, 2013). Correct usage of statistical tests and strategies to control Type I and II error rates did yield evidence to guide practical business decisions and in different settings.

Transition and Summary

Section 2 focused on the research operation of the study variables. A goal of Section 2 ensured the operationalization of constructs developed a credible foundation for predictive estimates of corporate financial performance. Section 2 comprised three processes (a) the research structure, (b) technical instruments, and (c) crucial validities. The research structure process repeated the purpose statement, addressed participant selection, the role of the researcher, method and design, population and sampling, and ethical principles guiding the project. The technical instruments process described and assessed instruments, data collection, and techniques, defended multiple regression analysis to test a *priori* hypotheses. The crucial validities process highlighted ways to limit biases and threats in statistical conclusion validity. A summary of each process delved into techniques quantitative researchers rely on to conduct archival research. Section 3 presented research findings, provided managerial and social implications, addressed venues for future research.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this quantitative correlation study was to examine the relationship between waste prevention, stakeholder confidence, and financial performance of U.S. companies in the advanced manufacturing and technology industries. The predictor variables were waste prevention and stakeholder confidence. The criterion variable was financial performance. The multiple linear regression model was able to significantly predict financial performance, $F(2, 69) = 20.68$, $p < .01$, $R^2 = .38$. Therefore, the null hypothesis is rejected, and the alternative hypothesis is accepted.

Presentation of the Findings

In the presentation of findings, I discuss the assumption testing results, present descriptive statistics, conduct a multiple linear regression analysis based on multiple imputations, report inferential statistical analyses, including results of the internal consistency of reliability, provide a theoretical conversation on the results, and conclude with an analysis summary. I analyzed a sample of 72 archival records from 344 U.S. public manufacturing and technology firms listed on the U.S. SEC EDGAR online database. I employed bootstrapping, using 1,000 samples with replacement, to improve efficiency and valid confidence intervals. An approach used to produce a 95% bootstrap confidence interval included obtaining bootstrap samples of the original data (including missing values) and then applying multiple imputations to each bootstrapped data set. The approach had statistical support to justify bootstrap confidence intervals for data requiring multiple imputations (Schomaker & Heumann, 2018).

Test Assumptions

I tested assumption violations related to multicollinearity, outliers, normality, linearity, homoscedasticity, and independence of residuals. I evaluated assumptions with IBM SPSS procedures, and the IBM SPSS *save* subcommand, comparing leverage, distance, and influence statistics with other cases in the data set. The bootstrap procedure, using 1,000 samples with replacements, also helped reduce the influence of assumption violations (Darlington & Hayes, 2017).

Multicollinearity

Multicollinearity was detected by reviewing collinearity statistics, i.e., tolerance, VIF, for each composite predictor variable. The waste prevention index (WPI) and the stakeholder confidence index (SCI) are the composite predictor variables. The test provided no evidence of perfect collinearity among predictor variables (WPI, tolerance = .92, VIF = 1.08; stakeholder confidence index, tolerance = .92, VIF = 1.08).

Outliers

Outliers were detected and evaluated with the IBM SPSS *save* subcommand. Table 2 presents mean, minimum, and maximum values to identify potential outliers. Case 28 and case 60 were unusual (in absolute values) relative to other cases in the data set. Case 28 had an unusual large *t*-residual value and Cook's distance value. Case 60 was highest in Mahalanobis distance (*MD*) and high (*h*) leverage point values (Appendix I). Case 28's *t*-residual value and Cook's distance were large: 6.71, 0.55, respectively. Case 28 had a Cook's distance of 0.55 but not relatively larger than Cook's value of 0.37 for case 60.

Next, I evaluated whether both cases would influence the regression analysis. I assessed the influence of regression constants and regression coefficients with the *dfβ* statistic. In absolute value, case 28 and case 60 had relatively similar *dfβ* regression constant and regression coefficients for the predictor variables (Appendix I). Case 28's *dfβ* statistics for the regression constant, waste prevention regression coefficient and stakeholder confidence regression coefficient were 0.00, 0.24, –0.20, and case 60 values were –0.08, 0.12, –0.22, respectively. Whether case 28 and case 60 were included or excluded would not influence a statistically significant claim of effect between the criterion and predictor variables. Neither case 28 nor case 60 were outliers. The diagnostic provided no evidence of severe outlier violations.

Table 2

Summary of Leverage, Distance, and Influences Measures

Measure[a]	M	Minimum	Maximum
Tr	.03	-2.00	6.71
MD	1.97	.02	15.43
H	.04	.01	.23
Cook	.02	.00	.55
Leverage	.03	.00	.32
dfβ(constant)	.00	-.08	.07
dfβ(WPI)	.00	-.11	.24
dfβ(SCI)	.00	-.20	.22

Note. N = 72. a = Symbols reflect different diagnostic measures, tr = deleted t-residuals or studentized deleted residuals, *MD* = Mahalanobis distance, *h* = high leverage point, Cook = Cook's distance, and Leverage = centered leverage values, and dfβ = regression constant or regression coefficient.

Normality, Linearity, Homoscedasticity, Independence of Residuals

Conducted was the Shapiro-Wilk procedure to test normality assumption based on standardized residuals of the criterion variable. I checked normality with the *F*-test for testing significance. Distribution of standardized residuals were nonnormal, at .05 alpha level, $F(71) = .77$, $p < .01$. Economic data, as the criterion variable, rarely have normally distributed errors (Wooldridge, 2013). I revisited the normality threat after evaluation of the other assumptions. The curve estimate procedure tested for linearity between the criterion variable and each predictor. The *F*-test evidenced waste prevention, and stakeholder confidence had a linear relationship with financial performance, $F(1, 70)$, $p < .01$, $F(1, 70)$, $p < .01$, respectively. Linear assumption met if the *p* value was less than .05. A linear assumption violation was not evident for the criterion variable.

Homoscedasticity was assessed with the Breusch-Pagan and Koenker test statistics, using the Lagrange multiplier method (Daryanto, 2018). The Lagrange multiplier was 2.13, $p = .33$, evidencing no homoscedasticity violation because the *p* value exceeded the .05 significance level. Independence of residuals assumption was analyzed using the Durbin-Watson (DW) test. The DW test statistic was 1.82, $N = 72$, $k = 2$ (two predictors excluding constant term), $\alpha = .05$, and produced DW critical values of [1.55, 1.67] (Durbin-Watson significance tables, n.d.). The data met the assumption of independent errors as the Durbin-Watson test statistic of 1.82 was greater than 1.67.

Regarding the normality assumption violation issue addressed earlier, Wooldridge (2013) suggested residuals can be approximately normal under the first four Gauss-Markov assumptions, if the sample size is greater than 30, with few predictors in the

model and no other assumption violations. Under the first four Gauss-Markov

assumptions, I concluded no severe normality threats were evident.

Descriptive Statistics

The criterion variable was a financial metric (e.g., scale data). All data were from

2013, with financial values in U.S. dollars in billions. The predictor variables were WPI

and SCI. Samples came from archival records from 72 U.S. public firms. Table 3 displays

the descriptive statistics for the study variables. The baseline value for poor financial

performance was a CI value less than the lower limit of the bootstrapped confidence

interval mean estimate. Poor financial performance in the study is a CI value less than

$0.14, as reported in Table 3 under the bootstrapped 95% CI (*M*) column.

Table 3

Descriptive Statistics for Quantitative Study Variables and Bootstrapped

Variable	*M(SD)*	Bootstrapped 95% CI(*M*)[a]
Financial performance	$0.27($0.56)	[$0.14, $0.40]
Waste prevention index	0.33(0.24)	[0.27, 0.39]
Stakeholder confidence index	0.24(0.18)	[0.20, 0.28]

Note. N = 72

[a] Bootstrapped confidence intervals reflected data requiring multiple imputations.

Internal Consistency of Reliability

Internal consistency estimates of reliability were conducted for each predictor. I

chose Cronbach's alpha coefficient to estimate the reliability of summed items to yield an

overall composite scale score (Green & Salkind, 2017). The sample value of Cronbach's

alpha coefficient contained two composites, three items for the waste prevention

composite and five items for the stakeholder confidence composite. The calculated

Cronbach's alphas for WPI and SCI items were .23 and .28, respectively. Study scales

had unacceptable (i.e., α < .5) reliability, not meeting my expectation of the calculated

value of at least 0.70. According to Widyawat (2020), statistical evidence indicated

MSCI ESG's data measurement quality was questionable. In Widyawat's (2020) study,

reliability estimates of MSCI ESG data in 2013 were poor for all ESG performance

indicators: .235, .340, .275, respectively. Results of the calculated Cronbach's alphas

were consistent with Widyawat's (2020) reliability estimates for the data set.

Inferential Results

A multiple linear regression analysis, α = .05 (two-tailed), assessed whether waste

prevention and stakeholder confidence practices had predictive power to estimate

financial performance. The predictor variables were WPI and SCI. The criterion variable

was financial performance. The null hypothesis was that no statistically significant

relationship existed between waste prevention, stakeholder confidence, and financial

performance. The alternative hypothesis was that a statistically significant relationship

existed between waste prevention, stakeholder confidence, and financial performance.

Test assumption for multicollinearity, outliers, normality, linearity, homoscedasticity and

independence of residuals did not reveal serious assumption violations.

The model was able to significantly predict financial performance, $F(2, 69) =$

20.68, $p < .01$, $R^2 = .38$. The R^2 value indicated approximately 38% of variance in

financial performance was accounted for by the linear combination of waste prevent and

stakeholder confidence. Waste prevention and stakeholder confidence were significant

contributors to the model, but stakeholder confidence (β = .52) provided the largest

contribution. WPI uniquely predicting a 4% change in financial performance variance

when SCI was held constant, $sr^2 = .04$. SCI alone uniquely explained 25% of variance in

financial performance when accounting for WPI, $sr^2 = .25$. SCI had the largest effect on

financial performance. Table 4 depicts the regression summary. The final regression or

predictor equation was:

Predicted Financial Performance = .22(WPI) + .52(SCI) - 0.29.

Table 4

Regression Summary

Variable	B	*SE B*	β	*t*	*P*	Bootstrapped 95% CI(B)
WPI	0.51	0.23	.22	2.18	.03	[.04, .97]
SCI	1.63	0.31	.52	5.22	.01	[1.01, 2.25]
Constant	-0.30	0.11		-2.73	.01	[-.50, -.08]

Note. $N = 72$.

Waste Prevention Index

The positive slope for WPI (.22) indicated a .22 increase in CI for each additional

dollar invested in decreasing toxins and consumption. Investment in such waste

prevention practices will increase, and CI. The squared semipartial coefficient (sr^2)

indicated waste prevention practices uniquely contribute 4% to CI variance with

stakeholder confidence held constant.

Stakeholder Confidence Index

The positive slope for SCI (.52) suggested a .52 increase in CI for each additional

dollar invested in improving stakeholder confidence of a legitimate individual, group of

people, or organization influenced by or influencing firm behavior. The squared

semipartial coefficient (sr^2) indicated that ways a firm builds close stakeholder

relationships uniquely contribute 25% of variance in CI when eliminating influence from waste prevention. Table 4 summarized the regression model.

Analysis Summary

The purpose of this study was to examine whether waste prevention and stakeholder confidence could predict the financial performance of U.S. public firms in the advanced manufacturing and technology industries. Test assumptions common to multiple regression were assessed and posed no serious violations. I conducted a multiple linear regression analysis to evaluate how well the strength measures (waste prevention index and stakeholder confidence index) predicted financial performance. The linear combination of strength measures was significantly related to financial performance, $F(2, 69) = 20.68$, $p < .01$, $R^2 = .38$. Both waste prevention index ($\beta = .22$) and stakeholder confidence index ($\beta = .52$) provided useful predictive information about financial performance. The conclusion from the analysis was that the waste prevention composite and the stakeholder confidence composite were significantly associated with financial performance, even when one composite was held constant.

Theoretical Conversation

This study extended the knowledge of ST by providing predictor variables to anchor financial performance to the theory. A main theoretical contribution was the hypothetical constructs may be intervening variables. The predictors proved to be a good approximation of real business waste prevention practices, social and governance practices. Empirical findings from the study supported waste prevention, and stakeholder

confidence captured the interrelational aspect of financial performance.

Empirical findings from the study evidenced waste prevention had a positive effect on financial performance and consistent with finding by King and Lenox (2002), Endrikat et al. (2014). Empiric studies, along with this study, confirmed the four core social factors of ST are a factual reality on how corporations can improve financial performance (Bridoux & Stoelhorst, 2016). This study also confirmed findings of other scholars on social performance as a key driver for financial and organizational gains (Flammer, 2015; Kappou & Oikonomou, 2016; Martínez-Ferrero & Frías-Aceituno, 2015; Odriozola et al., 2018; Orlitzky et al., 2017; Shahzad & Sharfman, 2017; Wood, 2010). The stakeholder confidence variable was a better construct of social and governance practices because, in real business activity, such practices are not perfectly independent. Similarly, in research, such practices should be investigated as interdependent. Results from the study confirmed ST is a pathway to enhance business in society relations and corporate financial performance.

Applications to Professional Practice

The study is useful for BCM professionals. BCM professionals bear the responsibility to determine continuity requirements for long-term corporate survival. BCM professionals could expand the business impact analysis (BIA) by identifying a firm's capability to resist risk in the context of stakeholder confidence. The BIA would explore stakeholder confidence as a risk to organizational resilience, capturing processes aligned with ST's four core social factors. BIA would identify specific processes (four social factors - e.g., fairness, shared values, transaction cost economics, and stakeholder

management) lowering organizational resilience or stakeholder confidence. Sawalha (2020) suggested BCM should not be limited to risk management practices only but also strive for optimal organizational resilience by improving financial performance. The study provided empirical evidence on the relationship between stakeholder confidence and financial performance. The study could be considered a step toward developing an understanding of the effect of BCM on financial performance.

Implications for Social Change

The study provided information on socially responsible practices of companies in the advanced manufacturing and technology industries. The U.S. EPA mostly scored the sampled firms as having a *low* potential risk-related impact on chronic human health from TRI chemical releases. The study could increase awareness that U.S. public companies in both industries, on average, managed harmful TRI chemical pollutants produced during business operations. The data may spark more interest to create public safe places to collaborate on advancing sustainable manufacturing. For instance, the federal Manufacturing USA initiative sponsored by the Department of Defense (DOD), the Department of Energy (DOE), and the National Institute of Standards and Technology at the Department of Commerce are responsible for facilitating information and knowledge sharing on sustainable manufacturing and technology operations (Revitalizing American Leadership in Advanced Manufacturing, 2019). Community leaders could join the collaborative forum to learn of and bring the FlexFactor® program to schools in improvised neighborhoods (Revitalizing American Leadership in Advanced Manufacturing, 2019). A goal of the FlexFactor® program is to promote the

Manufacturing USA efforts to educate community youth in underserved areas on ways the manufacturing and technology industries develop sustainable practices to serve society better. Finally, the study could be a way to encourage exploring further empirical works on sustainable waste prevention practices.

Recommendations for Action

I recommend U.S. small stock companies in the advanced manufacturing and technology industries upscale their business model by reducing toxins and consumption and build stronger stakeholder relationships. The study results showed 80% of the poor financial performance group were small cap companies. Data from the study evidenced small cap companies could improve financial performance by a factor of .22 through waste prevention practices and .52 by building stakeholder confidence. Our nation leads the world in inventions, science, and technology research, with 70% of innovation created by the private sector alone (Revitalizing American Leadership in Advanced Manufacturing, 2019). American small public firms in the advanced manufacturing and technology industries are crucial to job creation and national security.

Recommendations for Further Research

Further research could (a) conduct a formal test of significance to determine whether the predictors have an intervening variable effect, (b) investigate ways to operationalize ST into measured variables, (c) or conduct a nonexperimental study on EGCs in the United States. As mentioned earlier in the study, a growing consensus among U.S. politicians and academic communities (Kahle & Stulz, 2017; Krol, 2017; Rose & Solomon, 2016) suggested research was necessary to understand why smaller

American public companies have a higher likelihood of financial failure. This study

began as a preliminary way to gather information about the topic. Data from the study

offered one explanation of the failure by investigating whether firm behavior (e.g., what a

firm does) intervened between ESG practices and financial performance. Preliminary

information indicated moderate to large evidence support firm behavior causes waste

prevention and stakeholder confidence practices, which causes financial performance. In

business research, intervening variable effect tests are critical to clarify how waste

prevention and stakeholder confidence work.

Researchers can investigate ways to operationalize ST into measured variables.

ST lacks an operationalized model informed by a dimensionality analysis of ESG ratings.

A novel model to operationalize ST could be called stakeholder confidence, informed by

and informative to ST. A stakeholder confidence model needs to look more like ST and

less like a trade-off frontier, more like real ESG relational business practices, and less

like obligations and power of influence. A stakeholder confidence model constructed in

such a manner ensures the ESG ratings align with the core principles of ST. ESG rating

information for business practice and academic research is essential to understand

financial relationships (Widyawati, 2020).

No sampled public firm took advantage of the JOBS Act to lower transaction

costs of going public. Failure of private placements to file new IPOs in 2013 may not

indicate a lack of corporate interest but rather a matter of timing. Eight years have passed

since the JOB Act became law. Researchers could access historical data from the SEC to

investigate the impact EGCs had on corporate financial performance. IPO literature has

not yet produced large scale investigations on the effects the JOB Act had on the

financial performance of smaller American IPOs (Chaplinsky et al., 2017).

Reflections

Our scholarly heritage is changing. No longer is evidence-driven research central

to produce new knowledge. Earlier in the doctorate program, I was convinced

quantitative analysis has it right: the path of random assignment and hypothesis testing

produces unbiased truth. Post-positive researchers like me tend to sculpt life with

numbers, sometimes biased toward high quality work with less practical solutions. The

simple and most plausible way to explain real world business problems is not always with

statistical control and random assignments.

A key takeaway from my doctoral experience is the business research framework

does not matter, but rather whether a framework produces credible, clear answers

informed by and informative to businesses. At best, statistical techniques and random

assignments produce more precise estimates but fall short of the research *gold standard*:

cause and effect claims. Qualitative research offers a better approach to verify such

causal relationships and uncover effective strategies. While empirical methods are a

crucial feature of business studies, quantitative researchers must be more alert to

opportunities the human face and their experiences with and within organizations bring to

scholarship.

Conclusion

The results confirmed the hypothesis. The presentation of findings evidenced

waste prevention, and stakeholder confidence practices had significant positive, moderate

to large effects on financial performance. In this regard, the findings evidenced the hypothetical constructs were a better measure of waste prevention and stakeholder confidence practices. Empirical findings from the study solved a piece of the puzzle on why American small public companies delist within 5 years of the IPO. Many delist because of poor financial performance. U.S. companies in the advanced manufacturing and technology industries could use the data from the study to boost financial performance by focusing on waste prevention and stakeholder confidence practices.

The study provided predictive information on financial performance; however, we also need a more nuanced view of how firms absorb stakeholder interests or information into corporate practices and thinking about financial performance. U.S. public companies from the studied industries could consider financial performance as a process of value creation. Corporate financial performance could be thought of as a relational exchange to create value; as we learned earlier in the institutional legacies section: profitability is the harmony of interests, and firms acquired legitimacy based on service to stakeholders. The study is one way to continue the conversation on how to create as much value as possible for stakeholders influenced by or influencing business behavior. Freeman (2017) admonished, and I agree: "There is much work to be done" (p. 18). More studies could examine how companies in the advanced manufacturing and technology industries create value for stakeholders. My hope is the empirical data helps U.S. small public companies in the advanced manufacturing and technology industries better financially perform and move toward a business narrative central to stakeholders.

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Appendix A: Description of Operationalizing Hypothetical Constructs

Described is a summary of how constructs were measured, the theoretical alignment, related subdimensions to the construct if appliable, and embedded relationship to the theory. Refer to Table A1 for detailed description for each operationalizing hypothetical constructs.

Table A1

Description of Operationalizing Hypothetical Constructs

Construct, and theory[a]	Measure and alignment[b]	Dimension, and subdimensions[c]	Embedded relationship[d]
Financial performance, ST (Freeman, 1984).	CI is an all-inclusive, single aggregate measure which conveys information on complex interrelationships of value creations for stakeholders (Cataldo, 2015).	CI is a calculation of which includes all gains or losses recorded during the year, realized or not (Nishikawa et al., 2016).	ST is way to examine and assign financial value to stakeholder claims (Freeman, 2017).
WPI, ST (Freeman, 1984).	WPI is a composite of which best predicts financial performance as a function of corporate environmental policies (Dixon-Fowler et al., 2017).	Environmental waste management, policies, and practice to safeguard the nature environment, and adapts renewable power generation.	ST is a way to manage waste and nonhazardous operational consequences, and renewable energy (Schaltegger et al., 2019).
		Environmental performance measurable processes to manage and protect biodiversity with corporate initiatives resulting in lower regulatory sanctions.	ST is a way to manage conservation, and pro-environmental practices (Jackson et al, 2019; Schaltegger et al., 2019).

Construct, and theory[a]	Measure and alignment[b]	Dimension, and subdimensions[c]	Embedded relationship[d]
WPI continued	WPI is a composite of which best predicts financial performance as a function of corporate environmental policies (Dixon-Fowler et al., 2017).	Environmental risk, manage stakeholder pressures related to business practices e.g., operations, emission, consequences.	ST is a way to manage counterproductive stakeholder actions aimed to destroy firm value due to inadequate corporate commitment to environmental responsibility (Gupta, 2018; Schaltegger et al., 2019).
		Environmental innovation, related to product and service design, and clean technology practices.	ST is a way to manage manufacturing cost through product design or processes (Bartl, 2014).
		Environmental RSEI management, risk related impact on chronic human health from TRI chemical releases.	ST is a way to manage potential risk-related impact on chronic human health from TRI chemical releases (Gupta, 2018).
SCI, ST (Freeman, 1984).		Fairness manages, administrative policies and practices, compensation, hiring, promotion and performance evaluation, workforce diversity.	ST is a way to build close stakeholder relationships (Bridoux & Stoelhorst, 2016; Buttner & Lowe, 2017; Hayibor, 2017).
		Shared value, manages new capabilities and efficiencies, sustainable social practices, human	ST is a way to increase shared value creation for society and the

Construct, and theory[a]	Measure and alignment[b]	Dimension, and subdimensions[c]	Embedded relationship[d]
		initiatives, and product responsibility.	corporation (Jones & Wright, 2016)
SCI continued		Governance structure, manage ownership, structure, compensations transparency, operations, and liability.	ST is a way to manage cost of business and competitive advantage from the boardroom to the factory floor (Foss & Klein, 2018).
		Governance transaction, manages transactional relationship related to EGC, supply chain and financial stability practices, e.g., technological, labor, product, capital, (Blevins et al., 2017).	ST is a way to predict and manage cost uncertainty through transactional relationships (Gulbrandsen, et al., 2017).

Note. The table provided details on how I formed the hypothetical constructs. Outcome of the heuristic method was to ensure study predictions resemble the theoretical predictions underlying ST (Regenwetter & Robinson, 2017).

a. Identified was the hypothetical constructs and the theory.

b. Listed was the name of each measure, the symbol, and the conceptual alignment to ST.

c. Described was each formative indicator and specific characteristics (dimensions and subdimensions) giving rise to financial performance (Ford, 2107).

d. Presented also was how constructs replicate the core principles ST.

Appendix B: SIC Code and Title for 40 Sampled Industries

Table B1 comprised the specific sampled industries comprising the advanced

manufacturing and technology under study by SIC Code and title.

Table B1

SIC Code and Title for 40 Sampled Industries

2080 – Beverages
2430 - Millwood, Veneer, Plywood, & Structural Wood Members
2451 - Mobile Homes
2621 - Paper Mills
2800 - Chemicals & Allied Products
2834 - Pharmaceutical Preparation
3310 - Steel Works, Blast Furnaces & Rolling & Finishing Mill
3312 - Steel Works, Blast Furnaces & Rolling Mills (Coke Ovens)
3317 - Steel Pipe & Tubes
3350 - Rolling Drawing & Extruding of Nonferrous Metals
3357 - Drawing & Insulating of Nonferrous Wire
3440 - Fabricated Structural Metal Products
3443 - Fabricated Plate Work (Boiler Shops)
3510 - Engines & Turbines
3531 - Construction Machinery & Equip
3550 - Special Industry Machinery (No Metalworking Machinery)
3559 - Special Industry Machinery, NEC
3560 - General Industrial Machinery & Equipment
3561 - Pumps & Pumping Equipment
3570 - Computer & Office Equipment
3571 - Electronic Computers
3572 - Computer Storage Devices
3576 - Computer Communication Equipment
3577 - Computer Peripheral Equipment, NEC
3578 - Calculating & Accounting Machines (No Electronic Computers)
3600 - Electronic & Other Electrical Equipment (No Computer Equip
3620 - Electrical Industrial Apparatus
3621 - Motors & Generators
3651 - Household Audio & Video Equipment
3661 - Telephone & Telegraph Apparatus
3669 - Communications Equipment, NEC
3670 - Electronic Components & Accessories
3672 - Printed Circuit Boards
3674 - Semiconductors & Related Devices
3678 - Electronic Connectors
3679 - Electronic Components, NEC
3714 - Motor Vehicle Parts & Accessories
3716 - Motor Homes
3743 - Railroad Equipment
3824 - Totalizing Fluid Meters & Counting Devices

Appendix C: Mapping Study Constructs

Mapped is a conceptual pathway to connect a variable or attribute to a research

instrument. Under the variable and attribute column are the hypothetical constructs and

symbols. The link ties each variable or attribute to a specific element (symbol) in the

linear multiple regression equation and the research instrument (see Appendix F). The

analyzable data column describes data contained in the instrument needed to measure a

variable or attribute. Exemplary literature in the last column contained peer-reviewed

studies using the same instrument, the same variable or attribute, or similar constructs.

Refer to Table C1 for detailed description of alignment of mapped constructs.

Table C1

Mapping Study Constructs

Variable/Attributes, Symbol	Analyzable Data	Instrument(s)	Exemplary Literature
Financial performance, the symbol is CI.	Financial metrics reported by public firms with the U.S. SEC 10-K Annual Report.	U.S. SEC	Boone and White (2015); Firescu and Bondoc (2016)
Waste prevention, the symbol is WPI	Firm action taken to help manage environmental interaction.	STATS data set, and TRI database	Diestre and Rajagopalan (2014); Mattingly (2017)
Environment waste management, the symbol is EWMtvc.	Data on whether a public firm engaged in conservation, waste prevention.	TRI database	Kanashiro and Rivera (2019)
Environmental Performance, the symbol is EPtvc.	Data on whether a public firm had pro-environmental practices, initiatives.	STATS data set	Jackson et al. (2016)

Variable/Attributes	Analyzable Data	Instrument(s)	Exemplary Literature
Environmental risk the symbol is ERtvc.	Data on whether a public firm manage risk related to poor environmental performance.	STATS data set	Semenova and Hassel (2015)
Environmental innovation, the symbol is Einnvtvc.	Data on whether a public firm invested in product and services to address resource conservation and clean technology.	STATS data set	Endrikat et al. (2014)
Environmental emission releases the symbol is EEReltvc.	Data on whether a public firm managed potential risk related impact on chronic human health from TRI chemical releases.	TRI database	Kanashiro and Rivera (2019); (Risk-Screening Environmental Indicators (2019)
Stakeholder confidence, the symbol is SCI.	Firm action taken to absorb stakeholder interests in policies and practices.	STATS data set	Tang et al. (2012)
Values/concerns, the symbol is Svalcontvc.	Data indicators on a public firm managing social and political controversies, community giving and engagement, human initiatives.	STATS data set	Lins et al. (2017); Orlitzky et al. (2017)
Fairness, the symbol is SFtvc.	Data indicators on whether a public firm has administrative policies and practices, promotion, employee development, performance evaluation, and workforce diversity.	STATS data set	Lins et al. (2017); Schaltegger et al. (2019)

Variable/Attributes	Analyzable Data	Instrument(s)	Exemplary Literature
Shared value, the symbol is Shrdvaltvc.	Data indicators on whether a public firm created worth for stakeholders, or new capabilities and efficiencies.	STATS data set	Jones and Wright (2016); Van der Linden and Freeman (2017).
Structural, the symbol is Govstrutvc.	Data indicators on organizational transparency, ownership and governance structure, financial stability, product chemical safety, manages unpredicted cost (e.g., technological, labor, product, capital).	STATS data set	Canarella and Miller (2018); Dalton et al. (1999); Fama and Jensen (1983); Kahle and Stulz (2017)
Transactional EGC, the symbol is GovtrnsEGCtvc.	Data indicators on whether a public firm is a pending or registrant with the U.S. SEC as an EGC.	U.S. SEC 10-K Annual Report	Westfall and Omer (2018)

Appendix D: Composite Variables and ESG Performance Indicators

Composites in the study were waste prevention index and stakeholder confidence

index. Twenty formative indicators were initially chosen for the study but 12 failed

linearity assumption. The EGC formative indicator was one of the 12. The EGC was a

governance transactional indicator and had no variations, ($M =.00$, $SD = .00$, Var = .00).

Surprisingly, none of the sampled corporations were a registrant or pending registrant

EGC with the U.S. SEC. Listed were the composites and eight formative indicators used

in the study by title and code name.

Table D1

Composite Variables and ESG Performance Indicators

Composite Variables	Predictor Variables	Code Name
Waste prevention index		WPI
	Clean technologies	ENVA
	Environmental management system in place	ENVG
	RSEI toxic emission	ENVRSEI
Stakeholder confidence index		SCI
	Charitable giving	SOCCB
	Employment of underrepresented groups	SOCDH
	Employee professional development	SOCEmK
	Human capital development	SOCEmL
	Product chemical safety	GOVPG

Appendix E: Data Sources Cross Referencing Process

Illustrated in Figure E1 is how data elements were cross-referenced with each instrument.

Figure E1

Diagrammed Cross Referencing Process
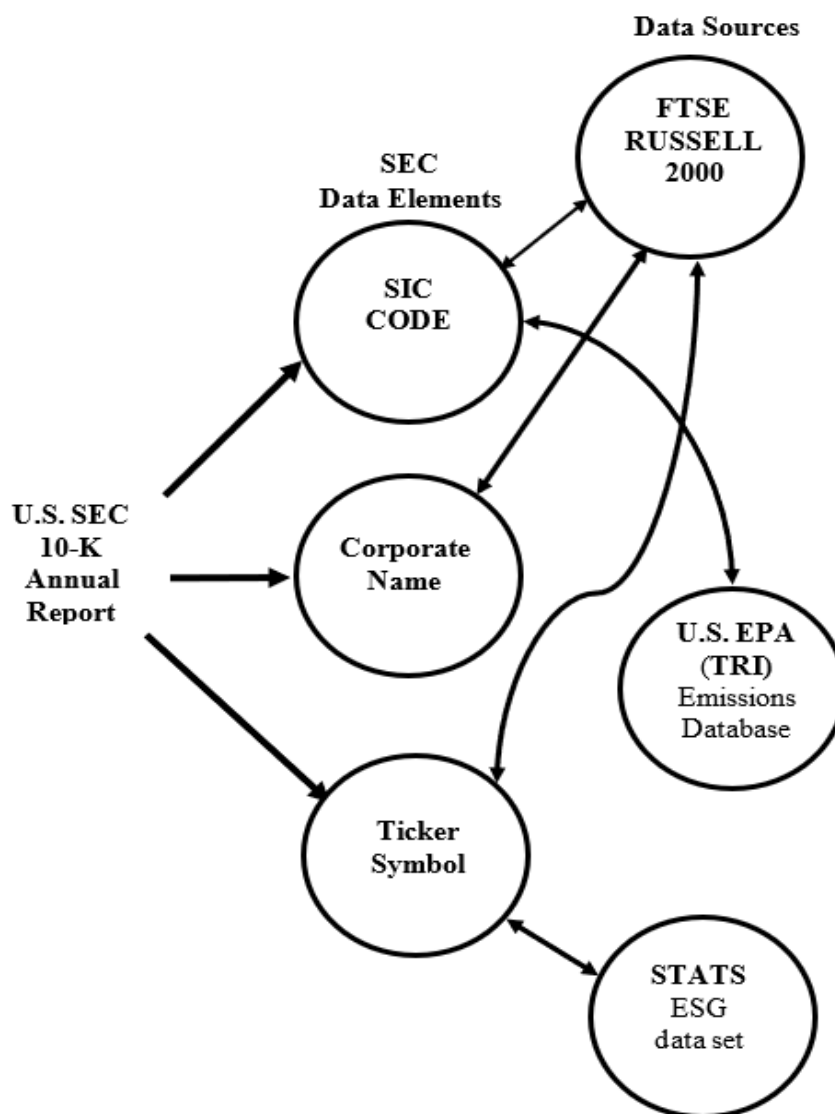
Appendix F: Multiple Linear Regression Model

I tested the hypothetical predictions with a multiple regression equation. Adapted from Freeman's (2017) suggestion for management scholars to consider including relational exchanges with stakeholders as a function of normal accounting and financial data in terms of total value created. The MLR equation as shown in (1) is a model of (r) to determine linearity and strength of the chance relationship between waste prevention, stakeholder confidence, and financial performance (Green & Salkind, 2017).

(1)

$$r = \frac{\sum XY - \frac{(\sum X)(\sum Y)}{n}}{\sqrt{\left(\sum X^2 - \frac{(\sum X)^2}{n}\right)\left(\sum Y^2 - \frac{(\sum Y)^2}{n}\right)}}$$

r = Pearson r correlation coefficient

n = Number of values in each data set

ΣXY = Sum of products of paired scores

ΣX = Sum of X scores

ΣY = Sum of Y scores

X^2 = Sum of squared X scores

Y^2 = Sum of squared Y scores

Following are the hypotheses testing equation in (2) defines prediction estimate of financial performance.

H_o: $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = \alpha_7 = \alpha_8 = \alpha_9 = \alpha_{10} = \alpha_{11} = 0$

H_a: *None of the α_i ($i = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10$, and 11) are zero.*

$$\text{CI}it = \alpha_0 + \alpha_1\text{EWMptvc} + \alpha_2\text{EPtvc} + \alpha_3\text{ERtvc} + \alpha_4\text{Einnvtvc} + \alpha_5\text{EEReltvc} + \alpha_6\text{Svalcontvc}$$

$$+ \alpha_7\text{SFtvc} + \alpha_8\text{Shrdvaltvc} + \alpha_9\text{Govstrutvc} + \alpha_{10}\text{GovtrnsEGCtvc}$$

$$+\alpha_{11}\text{GovtrnsTCEtvc} + \varepsilon it; \qquad\qquad (2)$$

where

CI = Comprehensive income of public company i at time t

1. EWMtvc = Environmental Waste Management Total Value Created Score
2. EPtvc = Environmental Performance Total Value Created Score
3. ERtvc = Environmental Risk Total Value Created Score
4. Einnvtvc = Environmental Innovation Total Value Created Score
5. EEReltvc = Environmental Emission Releases Total Value Created Score
6. Svalcontvc = Social Values/Concerns Total Value Created Score
7. SFtvc = Social Fairness Total Value Created Score
8. Shrdvaltvc = Social Shared Value Total Value Created Score
9. Govstrutvc = Governance Structural Total Value Created Score
10. GovtrnsEGCtvc = Governance Transactional EGC Total Value Created Score
11. GovtrnsTCEtvc = Governance Transactional TCE Total Value Created Score

εit = the error term, public company *i* at time *t*

Appendix G: Research Data Hyperlinks and Facility ID Numbers

Hyperlinks to locate research data obtained from the U.S. SEC and U.S. EPA

Facility ID numbers are found on pages 135-147. All U.S. SEC hyperlinks take you to the

view filing data page to access comprehensive income (2013) data or links to U.S EPA

EasyRSEI Dashboard for each sampled firm. Should you need a guide to access the U.S.

SEC research data, please review pages 134-140 (see Table G1) or access the U.S. EPA

RSEI research data, review pages 141-147 (see Table G2).

Table G1

Hyperlink to U.S. SEC Financial Statement

Corporate Name	Hyperlink to U.S. SEC Financial Statement
Advanced Energy Industries, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=927003&accession_number=0000927003-14-000012&xbrl_type=v#
Aeroflex Holding Corp.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1487990&accession_number=0001144204-13-048507&xbrl_type=v#
Allegheny Technologies, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1018963&accession_number=0001445305-14-000663&xbrl_type=v#
American Axle & Manufacturing Holdings, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1062231&accession_number=0001062231-14-000011&xbrl_type=v
American Railcar Industries, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1344596&accession_number=0001344596-14-000021&xbrl_type=v#
American Woodmark Corp.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=794619&accession_number=0000794619-14-000016&xbrl_type=v
Analog Devices, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=6281&accession_number=0000006281-14-000039&xbrl_type=v#

Corporate Name	Hyperlink to U.S. SEC Financial Statement
Applied Materials, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=6951&accession_number=0000006951-14-000037&xbrl_type=v#
Avx Corp.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=859163&accession_number=0000859163-14-000067&xbrl_type=v#
Badger Meter, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=9092&accession_number=0000009092-13-000004&xbrl_type=v
Balchem Corp.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=9326&accession_number=0001140361-14-009932&xbrl_type=v#
Benchmark Electronics, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=863436&accession_number=0000863436-14-000006&xbrl_type=v#
Briggs & Stratton Corp.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=14195&accession_number=0000014195-14-000032&xbrl_type=v#
Brooks Automation, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=933974&accession_number=0000933974-14-000042&xbrl_type=v
Cabot Microelectronics Corp.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1102934&accession_number=0001102934-14-000027&xbrl_type=v
Cambrex Corporation	https://www.sec.gov/cgi-bin/viewer?action=view&cik=820081&accession_number=0001140361-14-005709&xbrl_type=v#
Carpenter Technology Corp.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=17843&accession_number=0001104659-14-063147&xbrl_type=v
Cavco Industries, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=278166&accession_number=0000278166-14-000019&xbrl_type=v#
Chart Industries, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=892553&accession_number=0000892553-14-000010&xbrl_type=v

Corporate Name	Hyperlink to U.S. SEC Financial Statement
Cirrus Logic, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=772406&accession_number=0001193125-14-215076&xbrl_type=v#
Columbus Mckinnon Corp.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1005229&accession_number=0001005229-14-000034&xbrl_type=v#
Constellation Brands, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=16918&accession_number=0000016918-14-000011&xbrl_type=v
Cray Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=949158&accession_number=0000949158-13-000011&xbrl_type=v
Cree, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=895419&accession_number=0000895419-13-000044&xbrl_type=v
Diebold Nixdorf, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=28823&accession_number=0000028823-14-000032&xbrl_type=v#
Diodes Incorporated	https://www.sec.gov/cgi-bin/viewer?action=view&cik=29002&accession_number=0001193125-14-073365&xbrl_type=v#
Electronics For Imaging, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=867374&accession_number=0001193125-13-069775&xbrl_type=v
Emerson Electronic	https://www.sec.gov/cgi-bin/viewer?action=view&cik=32604&accession_number=0000032604-14-000048&xbrl_type=v
Exelis Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1524471&accession_number=0001524471-14-000004&xbrl_type=v
Fairchild Semiconductor International, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1036960&accession_number=0001193125-14-072955&xbrl_type=v#
Formfactor, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1039399&accession_number=0001445305-13-000585&xbrl_type=v

Corporate Name	Hyperlink to U.S. SEC Financial Statement
Generac Holdings Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1474735&accession_number=0001474735-14-000005&xbrl_type=v#
General Cable Corp	https://www.sec.gov/cgi-bin/viewer?action=view&cik=886035&accession_number=0000886035-14-000021&xbrl_type=v#
Harman International Industries, Incorporated	https://www.sec.gov/cgi-bin/viewer?action=view&cik=800459&accession_number=0001193125-14-300900&xbrl_type=v#
Infinera Corp.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1138639&accession_number=0001445305-14-000553&xbrl_type=v#
International Rectifier Corporation	https://www.sec.gov/cgi-bin/viewer?action=view&cik=316793&accession_number=0000316793-13-000024&xbrl_type=v
John Bean Technologies Corp.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1433660&accession_number=0001437749-14-003618&xbrl_type=v
Lear Corp	https://www.sec.gov/cgi-bin/viewer?action=view&cik=842162&accession_number=0001193125-14-043696&xbrl_type=v#
M/A-Com Technology Solutions Holdings, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1493594&accession_number=0001193125-13-462528&xbrl_type=v
Maxim Integrated Products, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=743316&accession_number=0000743316-13-000039&xbrl_type=v
Methode Electronics, Inc.	https://www.sec.gov/cgi-bi3678 Electronic Connectorsn/viewer?action=view&cik=65270&accession_number=0000065270-14-000023&xbrl_type=v#
Micrel, Incorporated	https://www.sec.gov/cgi-bin/viewer?action=view&cik=932111&accession_number=0000932111-13-000011&xbrl_type=v

Corporate Name	Hyperlink to U.S. SEC Financial Statement
Microchip Technology Incorporated	https://www.sec.gov/cgi-bin/viewer?action=view&cik=827054&accession_number=0000827054-13-000171&xbrl_type=v
Micron Technology, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=723125&accession_number=0000723125-13-000228&xbrl_type=v
Microsemi Conductors	https://www.sec.gov/cgi-bin/viewer?action=view&cik=310568&accession_number=0000310568-14-000242&xbrl_type=v
Neenah, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1296435&accession_number=0001047469-14-001764&xbrl_type=v#
On Semiconductor Corporation	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1097864&accession_number=0001193125-13-076823&xbrl_type=v
Osi Systems, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1039065&accession_number=0001047469-13-008515&xbrl_type=v
Plexus Corp.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=785786&accession_number=0000785786-13-000043&xbrl_type=v
Quanex Building Products Corp.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1423221&accession_number=0001423221-14-000013&xbrl_type=v#
Rexnord Corp.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1439288&accession_number=0001439288-14-000043&xbrl_type=v
Sanmina Corp.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=897723&accession_number=0000897723-14-000022&xbrl_type=v#
Schweitzer-Mauduit International, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1000623&accession_number=0001000623-14-000035&xbrl_type=v
Seagate	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1137789&accession_number=0001047469-14-006770&xbrl_type=v

Corporate Name	Hyperlink to U.S. SEC Financial Statement
Skyworks Solutions, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=4127&accession_number=0000004127-13-000056&xbrl_type=v
Sunedison, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1061027&accession_number=0001193125-13-105232&xbrl_type=v
Sunpower Corporation	https://www.sec.gov/cgi-bin/viewer?action=view&cik=867773&accession_number=0000867773-14-000011&xbrl_type=v#
Tenneco Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1024725&accession_number=0001024725-14-000006&xbrl_type=v#
Texas Instruments Incorporated	https://www.sec.gov/cgi-bin/viewer?action=view&cik=97476&accession_number=0000097476-13-000009&xbrl_type=v
TTM Technologies, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1116942&accession_number=0001193125-13-087442&xbrl_type=v
Twin Disc, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=100378&accession_number=0000100378-14-000055&xbrl_type=v
Universal Electronics Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=101984&accession_number=0000101984-14-000014&xbrl_type=v#
Vicor Corp.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=751978&accession_number=0001193125-14-099821&xbrl_type=v
Western Digital Corporation	https://www.sec.gov/cgi-bin/viewer?action=view&cik=106040&accession_number=0001193125-13-338607&xbrl_type=v
Westinghouse Air Brake Technologies Corp	https://www.sec.gov/cgi-bin/viewer?action=view&cik=943452&accession_number=0001564590-14-000306&xbrl_type=v#

Corporate Name	Hyperlink to U.S. SEC Financial Statement
Winnebago Industries, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=107687&accession_number=0000107687-14-000048&xbrl_type=v#
Woodward, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=108312&accession_number=0000108312-14-000037&xbrl_type=v#
Worthington Industries, Inc.	https://www.sec.gov/cgi-bin/viewer?action=view&cik=108516&accession_number=0001193125-14-287164&xbrl_type=v#
Xerox Corporation	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1770450&accession_number=0001770450-20-000012&xbrl_type=v
Xylem Inc	https://www.sec.gov/cgi-bin/viewer?action=view&cik=1524472&accession_number=0001524472-14-000004&xbrl_type=v#

Table G2

Company	U.S. EPA RSEI FACILITY ID
Advanced Energy Industries, Inc.	8052WDVNCD2424M
Aeroflex Holding Corp.	11803RFLXL35SSE
Allegheny Technologies, Inc.	47371TLDYNELAFA
American Axle & Manufacturing Holdings, Inc.	49093GNRLM1HYDR
American Railcar Industries, Inc.	63301MRCNR65NMA
American Woodmark Corp.	46933MRCNW5300E
Analog Devices, Inc.	95035LNRTC1630M
Applied Materials, Inc.	4320WVSCLM987BU
AVX Corp.	29577VXCRP171HA
Badger Meter, Inc.	53223BDGRM4545W
Balchem Corp.	10973BLCHMROUTE
Benchmark Electronics, Inc.	85023SNTRN2501W
Briggs & Stratton Corp.	63901BRGGSHWY14
Brooks Automation, Inc.	01824BRKST15ELI
Cabot Microelectronics Corp.	74362TCHMN6THHU
Cambrex Corporation	50616SLSBR1900R
Carpenter Technology Corp.	3567WCRPNT226TH
Cavco Industries, Inc.	78156CVCND2301N
Chart Industries, Inc.	30114MVNCXI575A
Cirrus Logic, Inc.	5581WCRRSD495MI
Columbus Mckinnon Corp.	24236CLMBTE1B
Constellation Brands, Inc.	93639HBLNN12667
Cray Inc.	97330HWLTT1000N
Cree, Inc.	27703CRRSR4600S
Diebold Nixdorf, Inc.	2740WDBLDN115PL
Diodes Incorporated	64063TTTCH777NB
Electronics For Imaging, Inc.	48197LCTRN126JA
EMC Corporation	60525GMCLC9301W

Company	U.S. EPA RSEI FACILITY ID
Emerson Electronic	42276MRSNL150EM
Exelis Inc.	01364HRRSM100PR
Fairchild Semiconductor International, Inc.	04106NTNLS333WE
Formfactor, Inc.	94551FRMFC51LAW
Generac Holdings Inc.	53218GNRCC545W2
General Cable Corp	75688CNDCTHWY80
Harman International Industries, Incorporated	78754SMSNG12100
Infinera Corp.	94089NFNRC1322B
International Rectifier Corporation	01453MNRLL205CR
John Bean Technologies Corp.	93639FMCCR2300I
Lear Corp	44145MRCNM1000C
M/A-Com Technology Solutions Holdings, Inc.	01851MCMNC100CH
Maxim Integrated Products, Inc.	75244DLLSS4350B
Methode Electronics, Inc.	62321MTHDL111WB
Micrel, Incorporated	95131SQTCH1849F
Microchip Technology Incorporated	97030FJTSM21015
Micron Technology, Inc.	83706MCRNT2805E
Microsemi Corporation	90638BBCCK14930
Neenah, Inc.	30331DYNTR3700A
On Semiconductor Corporation	83201MRCNM2300B
OSI Systems, Inc.	90250DTSNS12525
Plexus Corp.	60089PLXSC2400M
Quanex Building Products Corp.	60921NCHLSRT24E
Rexnord Corp.	24477PTCMPRTS34
Sanmina Corp.	95134SNMNS60EPL
Schweitzer-Mauduit International, Inc.	1250WSCHWT2424R
Seagate	55435MGNTC7801C
Skyworks Solutions, Inc.	91320RCKWL2427W
Spansion Inc.	78741DVNCD5204E

Company	U.S. EPA RSEI FACILITY ID
Sunedison, Inc.	63376MNSNT501PE
Sunpower Corporation	97124KMTSS25300
Tenneco Inc.	46516TNNCT4825H
Texas Instruments Incorporated	7508WTXSNS3WEST
TTM Technologies, Inc.	92111RGRSC7447C
Twin Disc, Inc.	53405TWNDS46002
Universal Electronics Inc.	60622NVRSL1523W
Vicor Corp.	01810VCRCR400FE
Western Digital Corporation	94539RDRTC44100
Westinghouse Air Brake Technologies Corp	20876WBTCR21200
Winnebago Industries, Inc.	50436WNNBGCRYST
Woodward, Inc.	80525WDWRD1000E
Worthington Industries, Inc.	43107WSTRM245NB
Xerox Corporation	14580XRXCR800PH
Xylem Inc	14227TTSTN175ST

Guide to Access Research Data

U.S. SEC Data

Click the hyperlink associated with company you want to research found on pages 135-141. In full screen mode, glance at the bottom left side of the screen. There will be an IRS No, followed by State of Incorporation, and the Fiscal Year End information. (Noted: the IRS No shown is fictious and used only for training purposes.) Find out the fiscal end date as dates vary. Do not assume all sampled firms have a same fiscal year, i.e., starting January 1st and ending December 31st. Notice for the Fiscal Year End is 0630, meaning the financial report period ended June 30th.

IRS No: **68711861201** | State of Incorp.: **DE** | Fiscal Year End:

Print Document View Excel Document

Cover

Document And Entity Information

Financial Statements

Notes to Financial Statements

Accounting Policies

Notes Tables

Notes Details

≡   All Reports

On the left sidebar, Click *Financial Statements*.

A dropdown list appears. Click *consolidated comprehensive income*, but keep in mind corporations are not mandated by the SEC to use these exact words.

Financial Statements
    Consolidated Balance Sheets

Consolidated Balance Sheets [Parenthetical]

Consolidated Balance Sheets

Consolidated Statements of Operations

Consolidated Statements of Comprehensive In (Loss)

Consolidated Statements of Stockholder's Equity

Consolidated Statements of Cash Flow

Right of the dropdown list is financial data by years. Notice the header contains how the financial data in measured in U.S. dollars. For example, the fictious public firms reports *In Thousands* of dollars. Another firm might report differently. Next make sure you obtain **comprehensive income** data from under the right column, 2013.

Consolidated Statement of Comprehensive Income (Loss) (USD$) In Thousands, unless otherwise specified	**12 Months Ended**		
	Jun. 30, 2013	**Jun. 30, 2012**	**Jun. 30, 2011**

Guide to Access Research Data

U.S. EPA RSEI Data

Risk-Screening Environmental Indicators (RSEI) is pronounced REE-SEE. Research data for RSEI involve several steps. Follow the nine steps and to acquire the same research data used in the study.

1. Copy and paste this link in the your web browser.
   https://edap.epa.gov/public/extensions/EasyRSEI/EasyRSEI.html

2. On the left sidebar, click *Analysis* button.

   Analysis

3. Look above the *Analysis* image and slightly right, please find the following links. Click the extreme right link, *Custom Export Table*.

Analysis Overview	Chemical Analysis	Facility Analysis	Media Analysis	**Custom Export Table**

4. On left sidebar, check these boxes *Submission Year*, *TRI Facility Name*, *TRI Facility ID, State*, cursor down to *Table Metric Options* and *RSEI Score*.
5.

6. Right of the checked boxes you find this image. Click on the search icon inside the *TRI Facility ID* field.

   Table Dimension Options

   ☑ Submission Year

   ☑ TRI Facility Name

   ☑ TRI Facility ID

   ☑ State

   Table Metric Options

   ☑ RSEI Score

Submission Year	🔍	TRI Facility ID	🔍
Totals			

7. This popup window opens. Copy the Facility ID from page 142 or 143 and paste inside the *TRI Facility ID*, *Search in listbox* and the click the green check mark to complete search.

●●●   ❌✅

🔍 *Search in listbox*
0061WMPRTRSTATE

0062WPRTRCCARRE

0065WMSTRPPR127

0065WSPHLTCARRE

0071WPNCCN619AV

0072WBLLBNRICAN

8. Should several years appear thereafter, click the search icon next to the *Submission Year*, look for *2013*and click. Once year is highlighted in green then click the check mark.

●●●   ❌✅

🔍 *Search in listbox*
2011

2012

2013

9. The RSEI score corresponding to the copied Facility ID will appear. Note the fictious TRI Facility ID shown is for training purpose only.

Submission Year	🔍	TRI Facility ID	🔍	RSEI Score ▼
Totals				0
	2013	1959BL2SA1960		0

Appendix H: Comprehensive Income Raw Score Frequency Table

Detailed are the frequency distribution table for comprehensive income raw scores ($N = 72$). Observations show low and high values and clustering in one area or spread. Refer to Table H1 for frequency distribution.

Table H1

Comprehensive Income Raw Score Frequency Distribution (USD$ in Billions)

Comprehensive Income	Frequency	%	Valid %	Cumulative %
-$0.61	1	1.4	1.4	1.4
-$0.15	1	1.4	1.4	2.8
-$0.11	1	1.4	1.4	4.2
-$0.09	1	1.4	1.4	5.6
-$0.08	1	1.4	1.4	6.9
-$0.06	1	1.4	1.4	8.3
-$0.03	1	1.4	1.4	9.7
-$0.03	1	1.4	1.4	11.1
-$0.02	1	1.4	1.4	12.5
-$0.01	1	1.4	1.4	13.9
$0.00	1	1.4	1.4	15.3
$0.00	1	1.4	1.4	16.7
$0.00	1	1.4	1.4	18.1
$0.01	1	1.4	1.4	19.4
$0.01	1	1.4	1.4	20.8
$0.01	1	1.4	1.4	22.2
$0.02	4	5.6	5.6	27.8
$0.02	1	1.4	1.4	29.2
$0.02	1	1.4	1.4	30.6
$0.03	3	4.2	4.2	34.7
$0.04	1	1.4	1.4	36.1
$0.04	1	1.4	1.4	37.5
$0.04	5	6.9	6.9	44.4
$0.05	2	2.8	2.8	47.2
$0.06	1	1.4	1.4	48.6
$0.07	1	1.4	1.4	50.0
$0.08	2	2.8	2.8	52.8
$0.09	1	1.4	1.4	54.2
$0.09	1	1.4	1.4	55.6
$0.09	1	1.4	1.4	61.1
$0.10	2	2.8	2.8	63.9

Comprehensive Income	Frequency	%	Valid %	Cumulative %
$0.09	3	4.2	4.2	59.7
$0.09	1	1.4	1.4	61.1
$0.10	2	2.8	2.8	63.9
$0.11	2	2.8	2.8	66.7
$0.13	1	1.4	1.4	68.1
$0.13	1	1.4	1.4	69.4
$0.14	2	2.8	2.8	72.2
$0.14	1	1.4	1.4	73.6
$0.17	1	1.4	1.4	75.0
$0.17	1	1.4	1.4	76.4
$0.19	1	1.4	1.4	77.8
$0.22	1	1.4	1.4	79.2
$0.28	1	1.4	1.4	80.6
$0.28	2	2.8	2.8	83.3
$0.31	1	1.4	1.4	84.7
$0.35	1	1.4	1.4	86.1
$0.45	1	1.4	1.4	87.5
$0.57	1	1.4	1.4	88.9
$0.66	1	1.4	1.4	90.3
$0.68	1	1.4	1.4	91.7
$0.96	1	1.4	1.4	93.1
$1.18	1	1.4	1.4	94.4
$1.61	1	1.4	1.4	95.8
$1.83	1	1.4	1.4	97.2
$2.33	1	1.4	1.4	98.6
$2.55	1	1.4	1.4	100.0

Appendix I: Computed Measures for Leverage, Distance, Influence

Detailed computations generated IBM SPSS *save* subcommand. Computed also was high leverage point based on Darlington's and Hayes (2017) formula, $h = 1/N +$ centered leverage (p. 494). Table I1 displayed computed measures for leverage, distance, and influence.

Table I1

Computed Measures for Leverage, Distance, Influence

Case[a]	y	$\hat{y}$	e	d^e	Str	tr	MD	h
1	$0.03	-$0.29	-.26	-.12	-.26	-.26	.68	.02
2	-$0.11	-$0.16	-.27	-.12	-.27	-.27	.69	.02
3	$0.09	-$0.13	-.04	-.02	-.04	-.04	.38	.02
4	$0.01	-$0.19	-.18	-.08	-.18	-.18	.46	.02
5	$0.66	-$0.75	-.09	-.04	-.09	-.09	2.32	.05
6	$0.03	-$0.20	-.17	-.08	-.17	-.17	1.09	.03
7	$0.05	-$0.02	.03	.01	.03	.03	.74	.02
8	-$0.15	$0.27	.12	.06	.13	.13	2.14	.04
9	$0.28	-$2.13	-1.85	-.92	-1.95	-1.99	6.02	.10
10	$0.09	-$0.13	-.04	-.02	-.04	-.04	.37	.02
11	$0.11	-$0.02	.09	.04	.10	.10	1.16	.03
12	$0.00	-$0.91	-.91	-.41	-.92	-.92	.17	.02
13	$0.10	$0.05	.15	.07	.15	.15	1.08	.03
14	$0.06	-$0.13	-.07	-.03	-.07	-.07	.48	.02
15	$0.00	-$0.27	-.27	-.12	-.28	-.27	.82	.03
16	$0.04	$0.07	.11	.05	.11	.11	1.05	.03
17	$0.04	$0.03	.07	.03	.07	.07	.60	.02
18	$0.22	-$0.82	-.60	-.27	-.61	-.61	.43	.02
19	$0.01	-$0.08	-.07	-.03	-.07	-.07	.50	.02
20	$0.14	-$0.62	-.48	-.23	-.50	-.49	2.32	.05

Note. N = 72.
[a]Symbols reflect leverage, distance, influence measures, y = observed value, $\hat{y}$ = predicted values, e = residual or error in estimate, d^e = deleted residual, Str = studentized residual, tr = studentized deleted residual or deleted *t*-residuals, MD = Mahalanobis distance (*MD*), h = high leverage point, *Cook* = Cook's distance, *Leverage* = centered leverage, and *dfβ* = regression constant or regression coefficient.
[b]WPI is symbol for waste prevention index.
[c]SCI is symbol for stakeholder confidence index.

Case[a]	y	$\hat{y}$	e	d_e	Str	tr	MD	h
21	$0.35	$0.18	.53	.24	.53	.53	1.54	.04
22	$0.08	-$0.25	-.17	-.08	-.17	-.17	.86	.03
23	$0.03	$0.06	.09	.04	.10	.09	.97	.03
24	$0.08	-$0.90	-.82	-.38	-.84	-.84	2.18	.04
25	$0.10	-$0.53	-.44	-.20	-.45	-.44	1.70	.04
26	$0.02	-$0.56	-.54	-.25	-.55	-.55	.77	.02
27	$0.11	$0.17	.28	.13	.29	.28	1.05	.03
28	$2.55	$2.54	5.09	2.40	5.24	6.71	3.00	.06
29	$0.68	-$0.38	.30	.15	.32	.31	4.67	.08
30	$0.00	$0.16	.16	.07	.16	.16	2.56	.05
31	-$0.06	-$0.44	-.50	-.23	-.51	-.50	.13	.02
32	$0.19	-$0.28	-.09	-.04	-.09	-.09	.03	.01
33	-$0.03	-$1.30	-1.33	-.62	-1.35	-1.36	2.04	.04
34	$0.14	$0.05	.18	.09	.19	.19	2.49	.05
35	-$0.03	-$0.34	-.37	-.17	-.38	-.37	.73	.02
36	-$0.09	-$0.08	-.17	-.08	-.17	-.17	.84	.03
37	$0.05	-$0.28	-.23	-.11	-.24	-.23	.70	.02
38	$0.57	$0.56	1.13	.52	1.15	1.16	1.70	.04
39	$0.02	-$0.09	-.07	-.03	-.07	-.07	.50	.02
40	$0.45	-$0.80	-.35	-.17	-.37	-.36	3.92	.07
41	$0.04	$0.09	.13	.06	.13	.13	.77	.02
42	$0.02	-$0.36	-.34	-.15	-.34	-.34	.94	.03
43	$0.13	-$0.87	-.74	-.35	-.76	-.76	2.14	.04
44	$1.18	$0.63	1.81	.85	1.85	1.89	2.45	.05
45	$0.04	-$0.10	-.06	-.03	-.06	-.06	.74	.02
46	$0.07	-$0.59	-.52	-.25	-.55	-.54	5.35	.09
47	$0.14	$0.08	.22	.10	.22	.22	.99	.03
48	$0.04	-$0.73	-.69	-.32	-.70	-.70	1.21	.03
49	$0.09	-$0.72	-.63	-.29	-.64	-.64	1.09	.03
50	-$0.01	$0.18	.17	.08	.17	.17	2.02	.04
51	$0.02	-$0.50	-.48	-.22	-.48	-.48	.02	.01
52	$0.10	-$0.86	-.76	-.35	-.77	-.77	.25	.02
53	$1.83	-$0.64	1.19	.67	1.34	1.35	13.82	.21
54	$0.28	-$1.00	-.72	-.33	-.73	-.73	.94	.03
55	-$0.08	-$0.49	-.57	-.26	-.58	-.58	.46	.02
56	$0.09	-$0.42	-.33	-.15	-.33	-.33	.48	.02
57	-$0.61	-$0.84	-1.45	-.67	-1.48	-1.49	1.57	.04
58	$0.09	-$1.25	-1.16	-.53	-1.18	-1.18	1.00	.03
59	$0.04	-$0.80	-.76	-.35	-.77	-.77	1.15	.03
60	$2.33	-$0.65	1.68	.97	1.92	1.96	15.43	.23
61	$0.02	-$0.62	-.60	-.28	-.61	-.61	1.12	.03
62	$0.01	$0.06	.07	.03	.07	.07	1.95	.04
64	$0.17	-$0.21	-.04	-.02	-.04	-.04	.63	.02

Case[a]	y	$\hat{y}$	e	d^e	Str	tr	MD	h
65	-$0.02	-$0.18	-.20	-.09	-.20	-.20	2.01	.04
66	$0.96	$0.11	1.07	.50	1.10	1.10	2.10	.04
67	$0.31	$1.90	3.21	1.49	3.28	3.55	2.11	.04
68	$0.04	-$0.13	-.09	-.04	-.09	-.09	.71	.02
69	$0.17	-$0.60	.57	.28	.59	.59	4.61	.08
70	$0.15	$0.84	1.99	.92	2.02	2.07	1.40	.03
71	$1.61	-$0.89	.72	.40	.80	.80	13.63	.21
72	$0.28	-$1.04	-.76	-.35	-.77	-.77	2.09	.04

Case[a]	Cook	Leverage	$df\beta(b_{Constant})$	$df\beta(b_{WPI})$	$df\beta(b_{SCI})$
1	.00	.01	.00	.01	.00
2	.00	.01	.00	.00	.00
3	.00	.01	.00	.00	.00
4	.00	.01	.00	.00	.00
5	.00	.03	.00	.00	.00
6	.00	.02	.00	.00	.01
7	.00	.01	.00	.00	.00
8	.00	.03	.00	.00	.00
9	.14	.08	.04	-.05	-.15
10	.00	.01	.00	.00	.00
11	.00	.02	.00	.00	.00
12	.00	.00	.00	-.01	-.01
13	.00	.02	.00	.00	.00
14	.00	.01	.00	.00	.00
15	.00	.01	.00	.00	.01
16	.00	.01	.00	.00	.00
17	.00	.01	.00	.00	.00
18	.00	.01	.00	.00	-.01
19	.00	.01	.00	.00	.00
20	.00	.03	.00	.02	-.02
21	.00	.02	.00	.01	-.02
22	.00	.01	.00	.00	.00
23	.00	.01	.00	.00	.00
24	.01	.03	.00	-.04	.01
25	.00	.02	.00	.02	-.01
26	.00	.01	.00	-.01	.01
27	.00	.01	.00	-.01	.00
28	.55	.04	.00	.24	-.20
29	.00	.07	.00	-.01	.02
30	.00	.04	.00	.00	-.01
31	.00	.00	-.01	.00	.00
32	.00	.00	.00	.00	.00
33	.03	.03	.01	-.05	.00
34	.00	.04	.00	.01	-.01
35	.00	.01	.00	-.01	.01
36	.00	.01	.00	.00	.00
37	.00	.01	.00	.01	.00
38	.02	.02	.02	-.04	.01
39	.00	.01	.00	.00	.00
40	.00	.06	.00	-.02	.00
41	.00	.01	.00	.00	.00
42	.00	.01	.00	.01	.00
43	.01	.03	.00	-.03	.01

Case[a]	Cook	Leverage	$df\beta(b_{Constant})$	$df\beta(b_{WPI})$	$df\beta(b_{SCI})$
44	.06	.03	.00	.08	-.05
45	.00	.01	.00	.00	.00
46	.01	.08	.00	-.03	.03
47	.00	.01	.00	.00	-.01
48	.01	.02	-.01	.02	-.02
49	.00	.02	.00	.02	-.02
50	.00	.03	.00	-.01	.00
51	.00	.00	.00	.00	.00
52	.00	.00	.00	.00	-.01
53	.16	.19	-.03	-.04	.21
54	.00	.01	.00	-.01	-.02
55	.00	.01	.00	-.01	.01
56	.00	.01	.00	-.01	.01
57	.03	.02	-.01	-.03	.07
58	.01	.01	.00	-.01	-.04
59	.01	.02	-.01	.02	-.02
60	.37	.22	-.08	.12	.22
61	.00	.02	-.01	.02	-.02
62	.00	.03	.00	.00	.00
63	.00	.01	.00	.00	.00
64	.00	.01	.00	.00	.00
65	.00	.03	.00	.01	.00
66	.02	.03	-.01	.04	-.01
67	.16	.03	.07	-.11	-.05
68	.00	.01	.00	.00	.00
69	.01	.06	-.01	.03	.02
70	.05	.02	.02	-.06	.05
71	.06	.19	-.02	-.02	.12
72	.01	.03	.01	-.03	-.01

Appendix J: Risk Screening Environmental Indicators Scoring

RSEI is continuous data scored as a unitless measure (Risk Screening

Environmental Indicators, 2019). Shown in Table J1 are descriptive statistics on RSEI

raw and recoded scores. The raw RSEI score, $M = 56.3$, is the cutoff for which cases

receive a 0 or 1 score. A RSEI raw score of 56.3 or less received a 0 (*meaning there was*

a low potential risk related impact on chronic human health from TRI chemical releases

from business activity). A RSEI raw score greater than 56.3 were scored a 1 (*indicating*

there was a potential risk related impact on chronic human health from TRI chemical

releases from business activity). The final recoded RSEI mean score, $M = .26$, identifies

cutoff of potential risk related impact on chronic human health from TRI chemical

releases from business activity. A score at or below .26 (indicate there is a low potential

risk related impact on chronic human health), or above .26 (indicate there is a potential

risk related impact on chronic human health).

Table J1

Risk Screening Environmental Indicators Scoring

	Raw RSEI Score	Recoded RSEI Score
Valid	69.00	69.00
Missing	3.00	3.00
M	56.30	.26
SD	112.00	.44
SE	13.48	.05
Skewness (*SE*)	2.61(.29)	1.11(.29)
Kurtosis (*SE*)	6.90(.57)	-.78(.57)
Minimum	0.00	0.00
Maximum	226.00	1.00

Note. $N = 72$.