Which Factors Moderate the Relationship between Sustainability Performance and Financial Performance? A Meta-Analysis Study

Article *in* Journal of International Accounting Research · March 2015

DOI: 10.2308/jiar-51103

CITATIONS
113

READS
5,129

2 authors:

Lucy Lu
Bradley University
3 PUBLICATIONS **113** CITATIONS
SEE PROFILE

Martin E Taylor
The University of Texas at Arlington
12 PUBLICATIONS **1,152** CITATIONS
SEE PROFILE

JOURNAL OF INTERNATIONAL ACCOUNTING RESEARCH
Vol. 15, No. 1
Spring 2016
pp. 1–15

American Accounting Association
DOI: 10.2308/jiar-51103

Which Factors Moderate the Relationship between Sustainability Performance and Financial Performance? A Meta-Analysis Study

Wenxiang (Lucy) Lu
Bradley University

Martin E. Taylor
The University of Texas at Arlington

ABSTRACT: The relationship between corporate sustainability performance (CSP) and corporate financial performance (CFP) has long been debated. Ullman (1985) pointed out that the conflicting results could be influenced by many factors, such as sample size, industrial context, inconsistent measurement of CSP and CFP, research methodologies, and procedures for data collection and analysis. This paper addresses Ullman's (1985) concerns by providing a more methodologically rigorous review of the CSP-CFP relationship than prior research studies. A meta-analysis of 198 studies yields a total sample size of 31,514 observations. The meta-analytic findings suggest that sustainability performance likely increases a firm's financial performance, especially in the long run. Compared to social sustainability, environmental sustainability, to a larger extent, contributes to the positive CSP-CFP relationship. In addition, CSP appears to be more highly correlated with accounting-based measures of CFP than with market-based indicators. Multi-industry, pre-2000 studies, and non-U.S. sample firms seem to show a stronger impact on the positive relationship between CSP and CFP than other sample indicators. A final finding is that the methodology used in the analysis has a significant impact on the results.

Keywords: meta-analysis; sustainability performance; financial performance; moderators.

I. INTRODUCTION

In a global economy, competition among companies occurs not only in financial numbers, but also in sustainability development. Sustainability performance and disclosure become increasingly important factors in the competitive success of companies. The term "sustainability" means different things to different stakeholders, because different stakeholders have different concerns. For example, environmentalists may be more concerned with the reduction in air pollution and water usage, and in the recycling of waste. Customers, on the other hand, may have concerns related to product quality and product safety. In this paper, we use the definition from the American Institute of Certified Public Accountants (AICPA) that defines "sustainability" as follows:

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

The authors thank Ervin L. Black (editor) and two anonymous reviewers for their constructive comments. In addition, helpful feedback was gained when the paper was presented at the 2014 American Accounting Association International Accounting Section Meeting.

Supplemental materials can be accessed by clicking the links in Appendix A.

Editor's note: Accepted by Ervin L. Black.

Submitted: February 2014
Accepted: March 2015
Published Online: March 2015

[1] The term "sustainability" is often used interchangeably with "sustainable development," "corporate social responsibility," "corporate responsibility," "corporate citizenship," and "social enterprise." Although these terms are different, they all point in the same direction: the responsibility of a company toward stakeholders.

There is a large body of literature that has produced conflicting results in explaining the relationship between corporate sustainability performance and corporate financial performance. Prior research on the relationship between corporate sustainability performance (CSP) and corporate financial performance (CFP) suggests that the current findings are too mixed to draw a generalizable conclusion. Ullman (1985) pointed out that the conflicting results could be attributed to many factors including variations in sample size, and different industrial contexts, inconsistent measurement of CSP and CFP, as well as different research methodologies and procedures for data collection and analysis. Most of the research on the relationship between CSP and CFP has used either market-based or accounting-based measures for financial performance.

To address the issues raised by Ullman (1985), the current study applies meta-analysis procedure to get a better understanding of the factors that affect the relationship between corporate sustainability performance and corporate financial performance. Meta-analysis is a statistical method of integrating research results across studies on the same subject (Hunter and Schmidt 2004). It is often used when there are many studies with conflicting empirical results.[2]

Orlitzky, Schmidt, and Rynes (2003) applied meta-analysis to 52 studies and documented that corporate virtue in the form of social responsibility and to a lesser extent, environmental responsibility, is likely to be beneficial to future financial performance. Orlitzky et al. (2003) also found that corporate reputation appears to be an important mediator of the CSP-CFP relationship.

Why is a new meta-analysis necessary? While Orlitzky et al. (2003) looked at the moderating effect of CSR measures, this study extends Orlitzky et al.'s (2003) study by looking at different measures of financial performance as well. Accounting-based measures and market-based measures may account for some of the variance found in the prior literature. The authors also investigate the moderating effect of the short-term versus long-term CSP-CFP relationship. In addition, to address Ullman's (1985) concern, sample characteristics (for example, sample size, sample period, country, and industry) and analysis methodologies are also examined.

Since Orlitzky et al.'s (2003) meta-analysis was published, sustainability reporting has increased significantly. Most notably, companies are increasing their voluntary sustainability reporting or are required to disclose some of their sustainability performance on their SEC filings (such as form 10-K and 20-F). The United Nations has recommended that all big companies be required to publish corporate sustainability reports by 2030 (United Nations [UN] 2013).

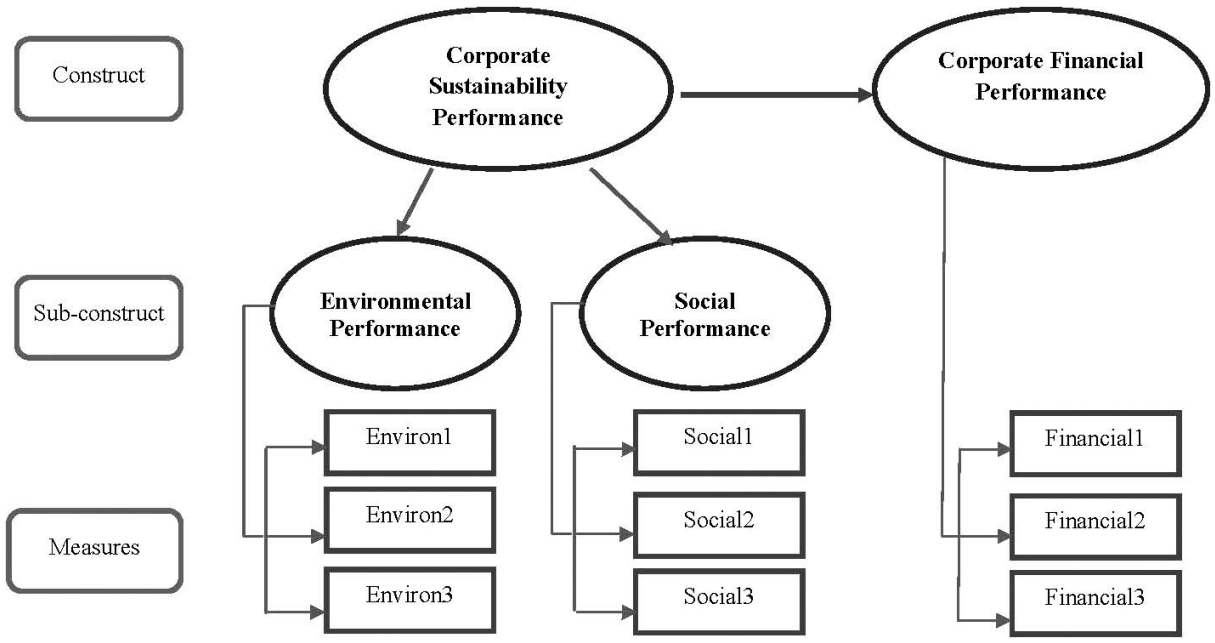
This paper contributes to the current literature of the CSP-CFP relationship in the following ways. The meta-analysis provides a more rigorous review of past research. Traditional literature reviews of the CSP-CFP relationship have relied mostly on narrative reviews. Summaries from narrative literature reviews do not consider sampling and measurement errors and false inferences could be drawn from such reviews. Meta-analysis, however, considers cross-study variation in correlations between CSP and CFP and therefore renders more reliable inferences. These factors include sample size, sample period, measurement methods, industry differences, etc. For example, small sample sizes would show a relatively large sampling error. The focus of this study is not only to test the null hypothesis, but also to tell precisely how large the effect sizes really are. Sample-adjusted correlations were examined to compute the mean effect size and found that the effect size is medium according to Cohen's (1988) rule of thumb (medium effect if the mean weighted corrected correlation is greater than 0.10 but less or equal to 0.25). In addition to averaging research results, meta-analysis can also be helpful in finding potential moderators for future research. The moderator variable is used to split the studies into subsets. For each subset, meta-analysis is applied separately. A moderator is present if there are large differences in subset means. By breaking down the whole dataset into subsets to compare the relative magnitudes of correlations arising from different CSP and CFP sample size categories, this paper found the following moderators: accounting-based measures versus market-based measures; U.S. firms versus non-U.S. firms; and environmental versus social studies. Analyzing methods used in individual studies can also affect the results. This study also addresses how different measures of sustainability performance and financial performance affect the CSP-CFP relationship. Meta-analysis suggests that CSP appears to be more highly correlated with accounting-based measures of CFP than with market-based indicators. This study includes 198 effect sizes from 36 articles[3] and yields a total sample size of 31,514 observations. It was found that environmental responsibility contributes to a positive CSP-CFP relationship to a larger extent than social responsibility. In addition, multi-industry, pre-2000 studies, non-U.S. sample firms seem to show a stronger impact on the relationship between CSP and CFP than other sample indicators. The meta-analytic findings suggest a direction for future research.

The remainder of this paper is organized as follows: Section II discusses related theories, literature review, and hypothesis development; Section III describes dataset development, the coding scheme, and methodology; Section IV presents preliminary

[2] There are two types of meta-analyses: cumulation of p-values (significance level) and cumulation of the mean effect size ($\bar{r}$ or $\bar{d}$) across studies. In this study, we use the latter procedure to compute mean effect size.

[3] The list of articles included in the meta-analysis is available as a downloadable Word file, see Appendix A.

FIGURE 1
Constructs, Sub-Constructs, and Measures



In this chart, the constructs and sub-constructs are indicated by ellipses, i.e., corporate sustainability performance, corporate financial performance, environmental performance, and social performance. Measures are presented by rectangles, i.e., Environ1, Social2, and Financial3, etc. For example, environmental performance measures found in examined studies are chemical emission reduction, waste recycling, the U.S. Toxic Release Inventory (TRI) index, etc.; social performance measures include social responsible ratings (i.e., KLD social ratings or Dow Jones sustainability index), concerns about issues on human rights, gender equality and product quality, accommodation for disabilities, development of heritage conservation, promotion of customer relations, corporate charity giving, and collaboration with social projects, etc. Financial performance uses either accounting-based or market-based measures. Accounting-based measures include financial ratios such as return on assets (ROA), return on equity (ROE), return on sales (ROS), or earnings per share (EPS). Market-based measures include market value, market return, and Tobin's Q.

results including overall findings, moderator results, and univariate moderator analysis; Section V discusses empirical results and directions for future research.

II. THEORY, LITERATURE REVIEW, AND HYPOTHESIS DEVELOPMENT

This section provides a literature review of studies and theories related to corporate sustainability performance and corporate financial performance. This paper focuses on examining the relationship between corporate sustainability performance (CSP) and corporate financial performance (CFP). CSP and CFP are our two main constructs. Using the AICPA's definition of "sustainability," environmental performance and social performance were identified as two sub-constructs of CSP. Investors consider these two areas to be most important. For example, 83 percent of investors surveyed in 2010 by Institutional Shareholder Services said they believe environmental and social factors can have a significant impact on shareholder value over the long term (Ernst & Young [E&Y] 2011). About half of the 2011 shareholder proposals in proxy statements have centered on social and environmental issues (E&Y 2011). Figure 1 illustrates the constructs, sub-constructs, and the measurement of each sub-construct. The literature review on the relationship between sustainability performance and financial performance in the paper thus considers the link between environmental performance and financial performance and the link between social performance and financial performance.

In this meta-analysis study, the following common measures are found to be used to measure environmental performance areas, such as chemical emission reduction, waste recycling, the U.S. Toxic Release Inventory (TRI) index, etc. This meta-analysis study also found the following social performance measures used in individual studies, such as social responsible ratings (i.e., KLD social ratings or Dow Jones sustainability index), concerns about issues on human rights, gender equality and product quality, accommodation for disabilities, development of heritage conservation, promotion of customer relations, corporate charity giving, and collaboration with social projects, etc. In the examined studies, financial performance uses either accounting-based or market-based measures. Accounting-based measures include financial ratios such as return on assets

(ROA), return on equity (ROE), return on sales (ROS), or earnings per share (EPS). Market-based measures include market value, market return, and Tobin's Q.

Theories

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

The "traditionalist" view is rooted in neo-classical theory, which posits that pollution abatement measures are predicted to increase production costs and are assumed to have increasing marginal costs (Patten 2002).

The "revisionist" view, also called the Porter hypothesis, was initiated and developed mainly by Porter (Porter and van der Linde 1995) who theorized that pollution reduction provides future cost savings by increasing efficiency, reducing compliance costs, and minimizing future liabilities (King and Lenox 2001), thus increasing firm value. For example, costs incurred to reduce pollution would send a signal to the public that the company cares about the protection of the environment and the quality of life of the community, and thus may increase the positive image of the company. In addition, investment in pollution reduction, whether voluntary or legally imposed, would make a company appear to be a socially responsible company and increase a company's positive image. A better public image will bring a company positive benefits such as increased sales demands, less input waste in production, and less negative attention from regulators (Konar and Cohen 2001), and therefore increases the company's financial performance.

The two views and three theories are illustrated in Figure 2.

Agency theory provides a theoretical foundation for the "traditionalist" view. Agency theory as proposed by Jensen and Meckling (1976) states that one of the major functions of managers is to align companies' interest with shareholders' interest. Friedman (1970) used agency theory to examine companies' activity in corporate social responsibility (CSR). Friedman (1970) asserts that engaging in CSR is symptomatic of an agency problem or a conflict between the interest of managers and shareholders. He argues that managers use CSR as a means to pursue their own social, economic, political, and career goals. According to this view, investment in CSR would be more wisely used, from a social perspective, on the improvement to a company's efficiency. He further argues that every penny used in CSR activities is just spending somebody else's money and does not do much good for the company as a whole. This theory represents the "traditionalist view." Under this view, environmental costs used for environmental protection/improvement such as pollution abatement or air emission reduction are predicted to increase production costs and thus lower economic performance. Agency theory has been tested in several studies that examine the CSP and CFP relationship. For example, Wright and Ferris (1997) found that stock prices reacted negatively to announcements of divestment of business units in South Africa, which they interpreted as consistent with agency theory. Studies by Jaggi and Freedman (1992) and King and Lenox (2001) also find a negative relation between environmental performance and economic performance.

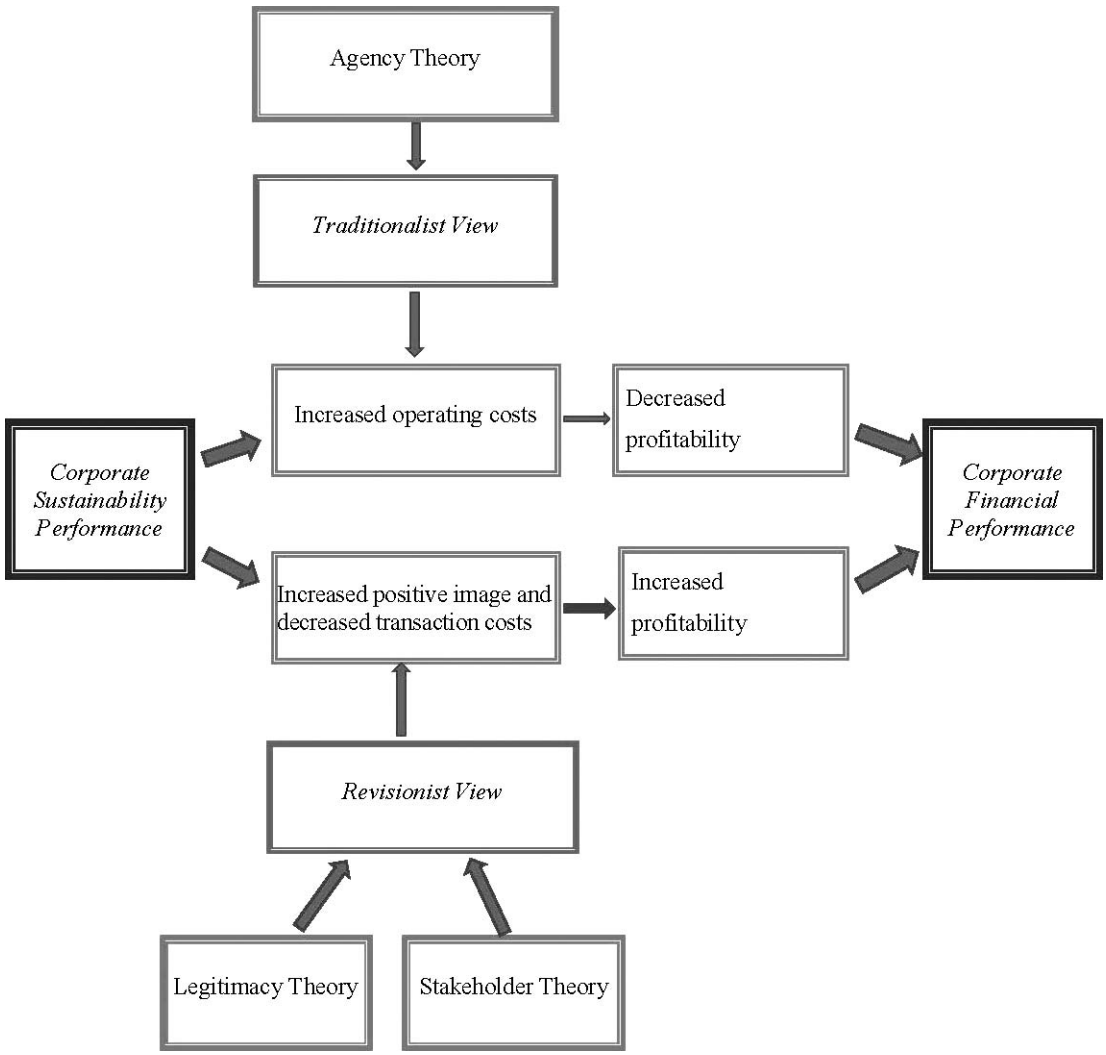
Legitimacy theory, originated by Davis (1973), states that "society grants legitimacy and power to business. In the long run, those who do not use power in a manner which society considers responsible will tend to lose it" (Davis 1973, 314). Legitimacy theory posits that organizations are continually seeking to ensure that they operate within the bounds and norms of their respective societies (Deegan and Unerman 2006). Under legitimacy theory, corporations should be socially responsible and accountable to society in order to legally operate their business (Simnett, Vanstraelen, and Chua 2009; Dowling and Pfeffer 1975; Deegan 2002; O'Donovan 2002; de Villiers and van Staden 2006; van Staden and Hooks 2007; Cong and Freedman 2011).

Stakeholder theory, first proposed by Freeman (1984), provides a discussion of the links between external stakeholders and company functions. Freeman (1984) defines stakeholders as "any group or individual who can affect or is affected by the achievement of the organization objectives." The main stakeholders are customers, employees, local communities, suppliers and distributors, the public, regulators, government, policymakers, and shareholders (Friedman and Miles 2006).

Both legitimacy theory and stakeholder theory have developed from the broader political economy perspective (Gray, Owen, and Adams 1996; Deegan 2002; Van der Laan 2009). The two concepts overlap (Gray, Kouhy, and Lavers 1995). They both focus attention on the nexus between the organization and its operating environment (Neu, Warsame, and Pedwell 1998).

While the stakeholder approach is suggested as the best theory to explain managerial behavior, legitimacy theory deals with "perceptions and the processes" involved in the notions of power relationships (Moerman and Van Der Laan 2005).

FIGURE 2
Theories of the Relationship between Corporate Sustainability Performance and Corporate Financial Performance



Literature Review and Hypothesis Development

Corporate Sustainability Performance and Corporate Financial Performance

In this section, a brief literature review is provided on the link between corporate sustainability performance and corporate financial performance. On one hand, one stream of sustainability studies has examined the association between corporate social performance and corporate financial performance. The empirical results are generally mixed. Some studies found a positive correlation between social performance and economic performance (Bragdon and Marlin 1972; Moskowitz 1972; Sturdivant and Ginter 1977), and some found a negative correlation (Vance 1975; Spicer 1978), and others found no correlation (Alexander and Buchholz 1978). On the other hand, another stream of sustainability studies has focused on the relationship between environmental performance and financial performance. One group of researchers has documented that the high environmental performance of firms increases firms' financial performance. Another group of researchers has documented that financial performance is negatively associated with environmental performance such as pollution index.

Some research on the link between environmental performance and financial performance argues that there is a conflict between the competitiveness of firms and their environmental performance (Walley and Whitehead 1994). The discussion posits that firms in industries with higher environmental compliance costs face a competitive disadvantage, because compliance costs of production activities outweigh the value added to the firm (for example, Jaggi and Freedman 1992; Blacconiere and

Patten 1994; Cordeiro and Sarkis 1997; McPeak, Devirian, and Seaman 2010; King and Lenox 2001; Lorraine, Collison, and Power 2004; Murray, Sinclair, Power, and Gray 2006). Other researchers, however, argue that the improved environmental performance is a potential source for competitive advantage as it can lead to more efficient processes, improvements in productivity, lower costs of compliance, and new market opportunities. (Hart and Ahuja 1996; Russo and Fouts 1997; Judge and Douglas 1998; Sroufe 2003; Al-Tuwaijri, Christensen, and Hughes 2004; Clarkson, Li, Richardson, and Vasvari 2008, 2011; Montabon, Sroufe, and Narisimhan 2007; Porter 1991; Porter and van der Linde 1995; Schmidheiny 1992).

A small group of research studies found no relationship between environmental and financial performance. Using the Pearson Correlation method, Yu, Ting, and Wu (2009) examine 51 European companies from 14 industries across 15 countries to investigate the possible relationship, and find there is no correlation. Although it was not able to find a positive association between environmental performance and financial performance, Yu et al. (2009) state that being perceived as a green company may improve a company's image and reputation, thus attracting more talented workers and green-conscious customers. Wagner (2005) finds a negative (for the emission-based index) and no (for the inputs-based index) relationship between environmental and economic performance.

Due to the mixed results found in prior literature, the hypothesis was therefore developed as a null form.

Hypothesis: There is no relationship between corporate sustainability performance and corporate financial performance.

III. DATASET DEVELOPMENT, CODING SCHEME, AND METHODOLOGY

Dataset Development

We identified extant empirical research studies focusing on the relationship between sustainability performance and corporate financial performance. In order to locate as many relevant articles as possible from the existing literature, we conducted keyword searches of appropriate electronic databases for both published and unpublished (working) papers. To identify published articles for the meta-analysis dataset, Business Source Complete was used. The Business Source Complete database provides easy access to over 4,000 academic peer-reviewed journals covering all fields of business, in which over 3,000 journals provide full-text articles, and the remaining 1,000 journals offer indexing or abstracts. Since this study focuses only on one relationship—corporate sustainability performance and corporate financial performance—we used the following words or terms to search published articles in the Business Source Complete database: "sustainability," "corporate social responsibility," "corporate responsibility," "corporate social responsibility performance," "CSR performance," "environmental performance," "social performance," "environmental disclosure," "CSR reporting," "economic performance," "financial performance," and "firm value."

To address the publication bias or the "file-drawer" problem, we also searched for relevant unpublished papers using keyword searches in the Social Science Research Network (SSRN) and Google Scholar. The keywords used in searching for unpublished articles were the same terms used for searching the Business Source Complete database.

After identifying these studies, we evaluated the appropriateness of each one to our research focus to determine whether it was an eligible study to be included in the meta-analysis. To be eligible, a study had to meet three criteria: (1) the study must specifically examine the CSP-CFP relationship, since our paper focuses only on the CSP-CFP relationship; (2) the study must be available online in a full-text format; and (3) the study examining the CSP-CFP relationship must have a correlation (r) or equivalent statistics reported. These r equivalents can be a student t-value (t), p-value (p), beta coefficient (β), or Chi-squared (χ^2) since the correlation coefficient (r) value is needed when conducting meta-analytical procedures.

Following the searching procedures and inclusion criteria listed above, a total of 36 primary articles were identified as eligible and their published journals included the following: *Accounting, Organizations and Society; Academy of Management Review; Journal of Accounting and Economics; Journal of Economics and Business; Business Strategy and the Environment; Accounting, Auditing & Accountability Journal; The Journal of Finance;* and etc. Although we would have liked to include published studies from leading accounting journals, our examination of these literature bases revealed theoretical, descriptive, or analytical work on sustainability performance that typically provides no equivalent correlation statistics to make their use possible in our meta-analysis. Additionally, the topics of some articles found in our searches did not address the CSP-CFP relationship, making their inclusion in our meta-analysis inappropriate.[4] The identified 36 articles yielded 198 effect sizes and a total of 31,514 observations.

[4] For example, we excluded Moser and Martin (2012), O'Dwyer (2009), Evans (2012), Hart (1971) from *The Accounting Review* due to their being solely theoretical (or descriptive) in nature. Similarly, we had to delete Kim, Myung, and Wier (2012), Dhaliwal, Oliver, Tsang, and Yong (2011), Dhaliwal, Radhakrishnan, Tsang, and Yong (2012), and Chun, Wu, and Zhang (2013) from *The Accounting Review* due to their non CSP-CFP relationship research. We also removed Ingram (1978) and Ingram and Frazier (1980) from *Journal of Accounting Research,* and Murphy (1985) from *Journal of Accounting and Economics*. Another two articles by O'Dwyer (2011) and Dillard (2011) from *Contemporary Accounting Research* were also excluded from our meta-analysis.

The effect size used in our meta-analysis is the point biserial correlation coefficient. It is an appropriate metric for our research because it is a commonly reported statistics metric in the existing studies. More importantly, it provides easy interpretation and meaningful comparison across studies with different sample sizes (Hunter and Schmidt 2004). Generally, two types of effect size measures are often seen: the sizes of associations or the sizes of differences. The correlation/regression coefficient r is most commonly known because r value ranges from -1 to $+1$, covering no relationship (i.e., $r = 0$) to a perfect relationship (i.e., $r = 1$ or -1). A correlation between two groups may have occurred by chance. The likelihood that an effect, such as a correlation seen in the data, may be assessed by p-value—the probability that a null is correct. This probability can be affected by the size of effect and the size of the sample. Specifically, the probability goes up (or down) as the size of the effect goes down (or up) and as the size of the sample goes down (or up). Thus, estimation of p-value alone can cause problems in interpreting a single relationship. In our study, our focus is not only to test the null hypothesis but also to tell precisely how large the effects really are. That is why we calculated effect sizes in our overall effect analysis and univariate analysis. We used Cohen's rules of thumb as a guide for interpreting these effect sizes, since Cohen was quite influential in the area of effect sizes. Cohen suggested that an r of $|0.10|$ be considered a "small" effect size, $|0.25|$ a "medium" effect size, and $|0.40|$ a "large" effect size (Cohen 1988). According to Cohen's terminology, a "small" effect size is one in which there is a real effect, but which you can only see through careful study. A "large" effect size is an effect that is big enough and/or consistent enough to be able to see it in our naked eye.

Coding Scheme

To be included in the meta-analysis, the correlation coefficient (r) and sample size must be collected. The standardized mean difference effect sizes (d) and the correlation coefficients (r) can be derived from summary statistics, such as t-test, F-test and χ^2, etc. This information is useful in the coding process. To perform a meta-analysis, all variables are coded either 1 or 0. Variables are categorized into four main categories: general, measures-related, sample-related, and methodology-related. Within each main category, additional information on different variables is collected. The following table shows the variables used in the meta-analysis. Descriptions of variables are given in Table 1.

Methodology Used in This Study

Meta-Analytic Procedures

We employed analytic techniques prescribed by Hunter and Schmidt (2004) in our data analysis. For the main effect of corporate sustainability performance, we calculated the weighted correlation (r_W) between corporate sustainability performance and corporate financial performance measures. This overall correlation weighted each eligible study by sample size and then averaged across all studies to ensure that sampling error is accounted for in the estimation. Then the average study variance (var_t) was computed and the heterogeneity (Chi-squared or χ^2) was estimated. A statistically significant χ^2 suggests the existence of moderating factors in explaining the variation in the effect of CSP on CFP. In order to interpret the significance of the correlation between CSP and CFP, we further computed the 95 percent bootstrapped confidence interval (CI_{BS}). The merit of using the 95 percent bootstrapped confidence interval is that it provides a more powerful estimate than the traditional confidence interval because it does not require an assumption of normal distribution of data. Finally, the fail-safe sample size ($NfsR$) was calculated to assess the possibility of publication bias or the "file-drawer" problem. A higher value of $NfsR$ suggests more robust and reliable results obtained.

Moderator Analysis Procedures

If the overall effect results of meta-analysis suggest the presence (a significantly high Chi-squared) of moderators, then to further examine and understand the role of moderators in the CSP-CFP relationship, we performed a weighted generalized least squares regression (GLS). Following the prior meta-analytic approach (Raudenbush, Becker, and Kalaian 1988), we used the following equations to estimate the moderating effects:

$$\beta^* = (X'\Sigma^{-1}X)^{-1}X'\Sigma^{-1}d \tag{1}$$

$$d = X\beta + e \tag{2}$$

$$V_{\beta^*} = (X'\Sigma^{-1}X)^{-1} \tag{3}$$

where d is the transformed correlation associated with corporate sustainability effect coded from the dataset; X is the matrix of

TABLE 1

Variables and Coding Scheme

Panel A: General Variables

Variables	Description
General	
Authors	The authors of the studied paper (single, double, or multiple).
Year	The year the paper was published (posted for a working paper).
Journal	The journal in which the paper was published; if it is a working paper, then it is marked as WP.
Page	The page number that the main *r* value (or related statistics that can be converted to *r*) can be located.
Measures	
CSP Measure	The measure(s) of sustainability performance (CSP) variable: social and environmental.
CFP Measure	The measure(s) of financial performance (CFP).
Short Term vs. Long Term	The long- or short-term effect of corporate sustainability performance (CSP) and corporate financial performance (CFP).
Samples	
Sample Size	The size of the sample used in the study.
Sample Period	The sample period studied, 1 if post-2000 and 0 if pre-2000.
Country	The country where the sample firms studied are.
Multi-Industry	Single or multiple industries are involved in the sample.
Methodology	
Methodology	The methodology of analysis employed (regression, correlation coefficient, survey, two-stage least squares, three-stage least squares, etc.) in the examined studies.

Panel B: Coding Scheme

Variables	Coding
Corporate Sustainability Performance (CSP)	1 if environmental issues and 0 if social issues are addressed in the article.
Corporate Financial Performance (CFP)	1 if financial performance (CFP) is measured using accounting numbers or ratios, and 0 if market-based measures.
Long-Term Effect	1 if short-term and 0 if long-term effect of corporate sustainability performance on the corporate financial performance is examined in an individual study.
Sample Period	1 if sample period studied is after year 2000 (post-2000), and 0 if before 2000 (pre-2000).
Industry	1 if sample firms are from multiple industries, and 0 if from a single industry.
Country	1 if sample firms are all U.S. firms, and 0 if non-U.S. firms
Methodology	1 if a complex method (such as two-stage least squares or three-stage least squares regression) is used, and 0 if a simple method (such as correlation coefficient, regression, or survey method) is used in the examined studies.

moderators; β, the vector of regression parameters, is estimated by Equation (2); and β^* is estimated via the variance-covariance matrix with Equation (3). $\sum$ is a diagonal vector of the variance assigned to each observation.

IV. RESULTS

Main Effects

This section provides the meta-analytic results for the overall sustainability performance effects.[5] Table 2 presents the overall results of the main effects associated with sustainability performance.

[5] We used MetaWin computer software to perform meta-analysis because MetaWin offers the distinctive features of an effect size calculator, and more conservative results as well as the graphical presentation. According to Hunter and Schmidt (2004), there are several commercial programs available for different types of meta-analysis: D-stat (Johnson 1989), Advance BASIC Meta-Analysis (Mullen 1989), and MetaWin (Rosenberg, Adams, and Gurevitch 1997). The first two programs are limited to fixed-effects meta-analysis models, while MetaWin allows for both fixed- and random-effects meta-analysis models. Bax, Yu, Ikeda, and Moons (2007) studied four commercial meta-analysis programs (Comprehensive Meta-Analysis (CMA), WEasyMA, MetaWin, and MetAnalysis) and two free programs (RevMan and MIX) and found that MetaWin's results are slightly more conservative, since the confidence intervals are based on bootstraps.

TABLE 2

Main Effect Results for Corporate Sustainability Performance

	Number of Samples (k)	Number of Sample Observations (n)	Mean Correlation (r)	Weighted Correlation (r_W)	Mean Study Variance (var_t)	95% Confidence Interval (I_{BS})		Effect Size	Unaccounted Variance (χ^2)	Fail-Safe Sample Size (N_{fsR})
Corporate Financial Performance	198	31,514	0.1699*	0.1737	0.0313	0.1468	0.2024	Medium	837.2772*	57,637

* $p \leq 0.05$.

Our hypothesis predicts there is no relationship between corporate sustainability performance and corporate financial performance. The meta-analysis in Table 2 shows that the correlation between corporate sustainability performance and corporate financial performance is 0.1737 (The uncorrected correlation is 0.1699.) As such, the effect is medium-sized (Cohen 1988). This suggests that the level of financial performance is significantly associated with the level of sustainability performance. The 95 percent bootstrapped confidence interval around the mean correlation ranges from 0.1468 to 0.2024, indicating the effect size is significant (because 0 is not in this range). Rosenthal's (1979) fail-safe $N(N_{fsR} = 57{,}637)$ suggests that publication bias (the file-drawer problem) is not a problem. An additional 57,637 studies would need to be added to the meta-analysis in order to yield a statistically nonsignificant overall effect. Given the heterogeneity present within the dataset ($\chi^2(198) = 837.2772$, $p < 0.01$), an examination of key moderators to the relationship between sustainability performance and financial performance is warranted. The moderator analysis will be discussed after the main effect results are presented.

Moderator Results (Full Sample)

In addition to integrating the results across studies, meta-analytic procedures can help find factors that moderate the relationship between corporate sustainability performance and corporate financial performance. In this section, the whole dataset is split into several pairs of subsets. Then the generalized least squares (GLS) analysis for the moderator effects was performed. Before running GLS, outliers were examined by calculating Huffcutt and Arthur's (1995) sample-adjusted meta-analytic deviancy (SAMD) statistic. The final dataset for moderator analysis includes 198 effect sizes. Table 3 presents an overview of the GLS results. The results show that in addition to the positive correlation observed in prior research between sustainability performance and financial performance, other moderators also contribute to the CSP-CFP relationship. These moderator variables are listed in Table 3.

As shown in Table 3, variable measurement issues (for example, environmental versus social issues; accounting-based versus market-based; the short-term versus long-term impact of sustainability engagement), samples used (for example, multi-industry versus single industry; U.S. firms versus non-U.S. firms), as well as statistical methodologies employed (simple versus complex) have important moderating effects on the link between sustainability performance and financial performance. A simple method refers to a correlation coefficient, regression, or survey method; and a complex method refers to a two-stage least squares or three-stage least squares regression method employed in the examined studies. To further understand the nature (including the magnitude and direction) of the moderator effects, a univariate analysis was conducted on each moderator that was found to be significant in the GLS analysis. The procedure for univariate analysis is similar to the overall analysis except that no test is needed for the fail-safe (N_{fsR}). The overall results are reported in Table 4.

Depending on the nature of the impact, the results were reported from *post hoc* analyses in three categories: measurement-related moderator effect, sample-related moderator effect, and methodology-related moderator effect. In the next section, results of the GLS analyses for each moderator examined were reported, as well as significant findings from the *post hoc* univariate analyses.

Measurement-Related Moderators of Corporate Sustainability Performance Effects on Corporate Financial Performance

In the dataset, different measures of the dependent variable (financial performance) and independent variable (sustainability performance) play significant moderating effects on the financial-sustainability relationship. For sustainability performance measures, results in Table 3 indicate that studies where the sustainability issue is related to the environment are significantly different from those studies where the examined studies are related to social issues ($\beta = 2.5451$, $p < 0.01$). *Post hoc* analyses in Table 4 reveal that the correlation between sustainability performance and financial performance is significantly greater when the examined issue is environmental-related ($r = 0.2035$, $p < 0.01$) than where the issue is social related ($r =$

TABLE 3

Moderator Results for Corporate Sustainability Performance Correlations

Factor	*Corporate Financial Performance*
Nature of variable measurements	
Environmental versus social	2.5451*
Accounting-based versus market-based	5.5254*
Short-term versus long-term	−13.9943*
Nature of the sample	
Post-2000 versus pre-2000	−19.0246*
Multi-industry versus single industry	9.7899*
U.S. firms versus non-U.S. firms	−2.8029*
Method of analysis	
Complex versus simple	16.5990*
Number of observations	198

* $p \leq 0.01$.
The correlations reported above are weighted by sample size.

Variable Definitions:
Corporate Sustainability Performance (CSP) = 1 if environmental issues and 0 if social issues are addressed in the article;
Corporate Financial Performance (CFP) = 1 if financial performance (CFP) is measured using accounting numbers or ratios, and 0 if market-based measures;
Long-Term Effect = 1 if short-term, and 0 if long-term effect of corporate sustainability performance on corporate financial performance is examined in an individual study;
Sample Period = 1 if sample period studied is after year 2000 (post-2000), and 0 if before 2000 (pre-2000);
Industry = 1 if sample firms are from multiple industries, and 0 if from a single industry;
Country = 1 if sample firms are U.S. firms, and 0 if non-U.S. firms; and
Methodology = 1 if a complex method (such as two-stage least squares or three-stage least squares regression method) is used, and 0 if a *simple* method (such as correlation coefficient, regression, or survey method) is used in the prior studies.

0.0689). For financial performance measures, results in Table 3 indicate that sustainability performance effects vary significantly depending on whether the financial performance is using an accounting-based measure or market-based measure ($\beta = 5.5254$, $p < 0.01$). Studies that use accounting-based measures (for example, accounting ratios such as return on assets, return on equity, or return on sales) to proxy for financial performance find a stronger positive impact on the CSP-CFP relationship than studies that use market-based measures (for example, stock price or market return). Results in Table 4 indicate that sustainability performance effects are stronger in studies where accounting-based measures ($r = 0.1929$, $p < 0.01$) are used as compared to those where the market-based measures are used ($r = 0.1520$).

Results in Table 3 also suggest a significant difference between long-term and short-term effects of sustainability performance on financial performance ($\beta = -13.9943$, $p < 0.01$). Further analysis in Table 4 suggests that sustainability performance effects are stronger in the studies where the impact is examined in the long run ($r = 0.2143$, $p < 0.01$), as compared to those where the impact is examined in the short run ($r = 0.1576$). Sustainability performance has a stronger impact on financial performance when the examined relationship is long-term compared to short-term.

Sample-Related Moderators of Corporate Sustainability Performance Effects on Financial Performance

The mixed results observed in previous studies in our dataset can also be explained by differences in the sample firms used in the studies. The effects of sustainability performance are significantly different for studies whose samples are composed of multiple industries versus a single industry ($\beta = 9.7899$, $p < 0.01$). Multi-industry samples present a stronger impact on the financial-sustainability performance ($r = 0.1837$, $p < 0.01$) than a single industry ($r = 0.1339$).

The effects of sustainability performance are also significantly different for studies that examine U.S. firms versus non-U.S. firms ($\beta = -2.8029$, $p < 0.01$). Non-U.S. sample firms ($r = 0.1862$, $p < 0.15$) show a stronger impact on the CSP-CFP relationship than the U.S. sample firms ($r = 0.1662$).

The time when the sustainability performance is examined is also a significant moderator. There is a significant variation of sustainability performance effects according to whether or not the study was pre- or post-2000 ($\beta = -19.0246$, $p < 0.01$). A

TABLE 4

Univariate Results for Corporate Sustainability Performance Moderators

	Sample Size	Number of Observations	Mean Effect Size	Mean Study Variance
Nature of variable measurements				
Environmental*	166	24,574	0.2035	0.0346
Social	32	6,940	0.0689	0.0146
Accounting-based*	163	16,901	0.1929	0.0352
Market-based	35	14,613	0.1520	0.0133
Short term	129	22,530	0.1576	0.0242
Long term*	69	8,984	0.2143	0.0446
Nature of the sample				
Post-2000	42	8,855	0.1009	0.0115
Pre-2000*	156	22,659	0.2023	0.0367
Multi-industry*	126	25,079	0.1837	0.0114
Single industry	72	6,435	0.1339	0.0662
U.S. firms	118	19,676	0.1662	0.0438
Non-U.S. firms**	80	11,838	0.1862	0.1436
Method of the measure				
Complex	21	10,229	0.1480	0.0069
Simple*	177	21,285	0.1863	0.0342

*, ** $p \leq 0.01$ and $p \leq 0.15$, respectively.
Variables are defined the same as in Table 3.

stronger correlation between sustainability performance and financial performance is observed in post-2000 studies versus pre-2000 studies ($r = 0.2023$ versus $r = 0.1009$, $p < 0.01$).

Methodology-Related Moderators of Corporate Sustainability Performance Effects on Corporate Financial Performance

The methodology used in the analysis appeared to be a significant moderator of the financial-sustainability relationship. Results in Table 3 indicate that studies where complex methods (for example, two-stage least squares, or three-stage least squares regression method) are employed are significantly different from other simple methods (studies using regression, correlation coefficient, survey) ($\beta = 16.5990$, $p < 0.01$). *Post hoc* analyses in Table 4 reveal that the correlation between sustainability performance and financial performance is significantly weaker when complex methods are used ($r = 0.1480$, $p < 0.01$), as compared to those using simple methods ($r = 0.1863$).

Moderator Results (Subsample)

The previous subsection "Moderator Results (Full Sample)" reports the main moderator effect for the full sample consisting of 198 effect sizes. The results shown in Table 4 indicate that a positive correlation between CSP and CFP is more likely when the accounting-based measures of CFP or when simple methods are used.

This section investigates the significance and magnitude of individual moderators found in Table 4 using a subsample related to measurement and methodology issues. Procedures used in Table 3 and 4 were repeated to explore the moderating effect of individual accounting-based measures versus market-based measures and the moderating effect of simple versus complex methodologies used in the prior research. Table 5 shows the results of the moderator analysis and Table 6 presents the breakdown univariate results of these moderator effects using subsamples.

Results in Table 5 and Table 6 reveal that compared to the return on assets (ROA) measure, other accounting measures such as return on equity (ROE), return on sales (ROS), and earnings per share (EPS) or sales growth appear to have a stronger impact on the CSP-CFP relationship (significant at 1 percent level). In contrast, for market-based measures, share price and market return appear to have a stronger impact on the CSP-CFP relationship than Tobin's Q measure (significant at 5 percent level). Table 5 also reveals that the methodology employed in the previous studies is significant in the CSP-CFP relationship.

TABLE 5

Moderator Results for Subsamples

Factor	Z-value
Accounting-based measures (163 observations)	
ROA (return on assets)	26.4998*
ROE (return on equity)	59.2132*
ROS (return on sales)	25.9046*
EPS (earnings per share) or sales growth	35.7430*
Market-based measures (35 observations)	
Share price	15.3616*
Tobin's Q	17.7765*
Market return	23.3354*
Method of analysis (177 observations)	
Correlation coefficient	68.5181*
Regression	48.4871*
Survey	6.0550*

* $p \leq 0.01$.
The correlations reported above are weighted by sample size.

TABLE 6

Univariate Analysis (Subsample)

	Sample Size	Number of Observations	Mean Effect Size	Mean Study Variance
Accounting-based measures (163 observations)				
ROA	48	4,537	0.1836	0.0339
Non-ROA**	115	12,364	0.1963	0.0358
ROE*	36	2,456	0.3441	0.0290
Non-ROE	127	14,445	0.1676	0.0370
ROS*	35	7,467	0.1252	0.0204
Non-ROS	128	9,434	0.2479	0.0393
EPS or sales growth*	17	1,511	0.2799	0.0250
Non-EPS or sales growth	146	15,390	0.1844	0.0364
Market-based measures (35 observations)				
Share price*	4	411	0.3260	0.0192
Non-share price	31	14,202	0.1471	0.0126
Market return*	11	979	0.2593	0.0191
Non-market return	24	13,634	0.1445	0.0107
Tobin's Q	7	4,564	0.1106	0.0015
Non-Tobin's Q*	28	10,049	0.1708	0.0163
Method of analysis (177 observations)				
Correlation coefficient*	79	3,438	0.3224	0.0622
Non-correlation coefficient	98	17,847	0.1614	0.0117
Regression	95	17,634	0.1608	0.0113
Non-regression*	82	3,651	0.3157	0.0608
Survey	2	190	0.2081	0.0109
Non-survey	175	21,095	0.1861	0.0345

*, ** $p \leq 0.01$ and $p \leq 0.05$ respectively.

The correlation coefficient method is more likely to be observed in a positive CSP-CFP relationship than the other two simple methods (for example, regression or survey).

V. DISCUSSION AND FUTURE RESEARCH

Using meta-analysis, this study examines the relationship between corporate sustainability performance and corporate financial performance. Recall that the hypothesis predicts that there is no relationship between CSP and CFP. The overall meta-analytic results suggest that corporate sustainability performance has a positive impact on corporate financial performance, especially in the long term. This implies that in the long run, market forces reward companies that are high in corporate sustainability performance. This may motivate managers to pursue CSP even though the company may not be profitable in the short run. In addition, the moderator effects analysis using the generalized least squares (GLS) method and meta-analytic procedures show that: (1) compared to social responsibility, environmental responsibility, to a larger extent, contributes to the positive CSP-CFP relationship, inconsistent with the findings of Orlitzky et al. (2003). Environmental issues, such as climate change, have gained a lot of attention not only from large companies, but also from medium and small enterprises. By engaging in environmental improvement, firms improve their relationship with regulators, stakeholders, and the general public. (2) CSP appears to be more highly correlated with accounting-based measures of CFP than with market-based indicators. Future research may be needed to explain why accounting-based measures are preferred. (3) The study also finds sample characteristics play a significant moderating role in the CSP-CFP relationship. Multi-industry firms, pre-2000 sustainability studies, and non-U.S. firms appeared to have a stronger impact on the positive relationship than other sample indicators. (4) The methodology used in the prior studies also matters. The simple methods (such as correlation coefficient, regression, and survey) appear to have a stronger impact on the relationship between CSP and CFP compared to complex methods (such as two-stage least squares and three-stage least squares).

This study can be extended to other sustainability-related areas. For example, sustainability disclosure and corporate governance may be examined to investigate their impacts on the sustainability performance.

In conclusion, this study contributes to the current corporate sustainability literature by providing an in-depth investigation of different measures used for CSP and CFP, closely examining sample characteristics, and comparing different methodologies used in prior literature by using meta-analysis.

REFERENCES

Alexander, G. J., and R. A. Buchholz. 1978. Corporate social responsibility and stock market performance. *Academy of Management Journal* 21: 479–486.

Al-Tuwaijri, S. A., T. E. Christensen, and K. E. Hughes II. 2004. The relations among environmental disclosure, environmental performance, and economic performance: A simultaneous equations approach. *Accounting, Organizations and Society* 29 (5–6): 447–471.

American Institute of Certified Public Accountants (AICPA). 2013. What is sustainability? In *Sustainability Accounting and Reporting – FAQ*. Available at: http://www.aicpa.org/InterestAreas/BusinessIndustryAndGovernment/Resources/Sustainability/Pages/SustainabilityFAQs.aspx

Bax, L., L. M. Yu, N. Ikeda, and K. G. Moons. 2007. A systematic comparison of software dedicated to meta-analysis of causal studies. *BMC Medical Research Methodology* 7 (1): 40.

Blacconiere, W., and D. Patten. 1994. Environmental disclosures, regulatory costs, and changes in firm value. *Journal of Accounting and Economics* 18 (3): 357–377.

Bragdon, J. H., and T. J. A. Marlin. 1972. Is pollution profitable? *Risk Management* 19 (4): 9–18.

Chun, K. H., Q. Wu, and H. Zhang. 2013. Is corporate social responsibility (CSR) associated with tax avoidance? Evidence from irresponsible CSR activities. *The Accounting Review* 88 (6): 2025–2059.

Clarkson, P. M., Y. Li, G. D. Richardson, and F. P. Vasvari. 2008. Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis. *Accounting, Organizations and Society* 33 (3): 303–327.

Clarkson, P. M., Y. Li, G. D. Richardson, and F. P. Vasvari. 2011. Does it really pay to be green? Determinants and consequences of proactive environmental strategies. *Journal of Accounting and Public Policy* 30 (2): 122–144.

Cohen, J. 1988. *Statistical Power Analysis for the Behavioral Sciences*. 2nd edition. Hillsdale, NJ: Lawrence Erlbaum.

Cong, Y., and M. Freedman. 2011. Corporate governance and environmental performance and disclosures. *Advances in Accounting* 27 (2): 223–232.

Cordeiro, J. J., and J. Sarkis. 1997. Environmental proactivism and firm performance: Evidence from security analyst earnings forecasts. *Business Strategy and the Environment* 6: 104–114.

Davis, K. 1973. The case for and against business assumption of social responsibilities. *Academy of Management Journal* 16: 312–322.

de Villiers, C. J., and C. J. van Staden. 2006. Can less environmental disclosure have a legitimizing effect? Evidence from Africa. *Accounting, Organizations and Society* 31 (8): 763–781.

Deegan, C. 2002. The legitimising effect of social and environmental disclosures—A theoretical foundation. *Accounting, Auditing & Accountability Journal* 15 (3): 282–311.

Deegan, C., and J. Unerman. 2006. *Financial Accounting Theory*. European edition. Boston, MA: McGraw-Hill, Maidenhead.

Dhaliwal, D. S., Z. L. Oliver, A. Tsang, and G. Y. Yong. 2011. Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *The Accounting Review* 86 (1): 59–100.

Dhaliwal, D. S., S. Radhakrishnan, A. Tsang, and G. Y. Yong. 2012. Nonfinancial disclosure and analyst forecast accuracy: International evidence on corporate social responsibility disclosure. *The Accounting Review* 87 (3): 723–759.

Dillard, J. 2011. Double loop learning; or, just another service to sell: A comment on "The case of sustainability assurance: Constructing a new assurance service." *Contemporary Accounting Research* 28 (4): 1267–1277.

Dowling, J., and J. Pfeffer. 1975. Organizational legitimacy: Social values and organizational behavior. *Pacific Sociological Review* 18 (1): 122–136.

Ernst & Young LLP (E&Y). 2011. *Action amid Uncertainty: The Business Response to Climate Change*. (EYG No. DK0054.) Available at: http://www.ey.com/Publication/vwLUAssets/Action_amid_uncertainty_-_The_business_response_to_climate_change/$FILE/EY_Action_amid_uncertainty_-_The_business_response_to_climate_change.pdf

Evans, J. H. 2012. A forum on corporate social responsibility research in accounting. *The Accounting Review* 87 (3): 721–722.

Freeman, R. E. 1984. *Strategic Management: A Stakeholder Approach*. Boston, MA: Pitman/Ballinger (Harper Collins).

Friedman, M. 1970. The social responsibility of business is to increase its profits. *The New York Times* (September 13): 122–126.

Friedman, A. L., and S. Miles. 2006. *Stakeholders: Theory and Practice*. New York, NY: Oxford University Press.

Gray, R., R. Kouhy, and S. Lavers. 1995. Corporate social and environmental reporting—A review of the literature and a longitudinal study of UK disclosure. *Accounting, Auditing & Accountability Journal* 8 (2): 47–77.

Gray, R., D. Owen, and C. Adams. 1996. *Accounting and Accountability: Changes and Challenges in Corporate Social and Environmental Reporting*. Englewood Cliffs, NJ: Prentice Hall.

Hart, D. J. 1971. Review of book *Corporate Social Responsibilities* by Clarence C. Walton. *The Accounting Review* 46 (2): 432.

Hart, S. L., and G. Ahuja. 1996. Does it pay to be green? An empirical examination of the relationship between emission reduction and firm performance. *Business Strategy and the Environment* 5: 30–37.

Huffcutt, A. I., and W. Arthur. 1995. Development of a new outlier statistic for meta-analytic data. *Journal of Applied Psychology* 80 (April): 327–334.

Hunter, J. E., and F. L. Schmidt, eds. 2004. *Methods of Meta-Analysis: Correcting Error and Bias in Research Findings*. Thousand Oaks, CA: Sage.

Ingram, R. W. 1978. An investigation of the information content of (certain) social responsibility disclosures. *Journal of Accounting Research* 16 (2): 270–285.

Ingram, R. W., and K. B. Frazier. 1980. Environmental performance and corporate disclosure. *Journal of Accounting Research* 18 (2): 614–622.

Jaggi, B., and M. Freedman. 1992. An examination of the impact of pollution performance on economic and market performance: Pulp and paper firms. *Journal of Business Finance & Accounting* 19 (5): 697–713.

Jensen, M. C., and W. H. Meckling. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3 (4): 305–360.

Johnson, B. T. 1989. *D-Stat: Software for the Meta-Analytic Review of Research Literatures*. Hillsdale, NJ: Lawrence Erlbaum.

Judge, W. Q., and T. J. Douglas. 1998. Performance implications of incorporating natural environmental issues into strategic planning process: An empirical assessment. *Journal of Management Studies* 35 (2): 241–262.

Kim, Y., S. P. Myung, and B. Wier. 2012. Is earnings quality associated with corporate social responsibility? *The Accounting Review* 87 (3): 761–796.

King, A., and M. Lenox. 2001. Does it really pay to be green? An empirical study of firm environmental and financial performance. *The Journal of Industrial Ecology* 5 (1): 105–116.

Konar, S., and R. A. Cohen. 2001. Does the market value environmental performance? *Review of Economics and Statistics* 83 (2): 281–289.

Lorraine, N. H., D. J. Collison, and D. M. Power. 2004. An analysis of the stock market impact of environmental performance information. *Accounting Forum* 28 (1): 7–26.

McPeak, C., J. Devirian, and S. Seaman. 2010. Do environmentally friendly companies outperform the market? *The Journal of Global Business Issues* 4 (1): 61–66.

Moerman, L., and S. Van Der Laan. 2005. Social reporting by the tobacco industry: All smoke and mirrors? *Accounting, Auditing & Accountability Journal* 18 (3): 374–389.

Montabon, F. R., R. P. Sroufe, and R. Narisimhan. 2007. An examination of corporate reporting, environmental management practices and firm performance. *Journal of Operations Management* 25 (5): 998–1014.

Moser, D. V., and P. R. Martin. 2012. A broader perspective on corporate social responsibility research in accounting. *The Accounting Review* 87 (3): 797–806.

Moskowitz, M. R. 1972. Choosing socially responsible stocks. *Business and Society Review* 1: 71–75.
Mullen, B. 1989. *Advanced BASIC Meta-Analysis*. Hillsdale, NJ: Lawrence Erlbaum.
Murphy, K. J. 1985. Corporate performance and managerial remuneration: An empirical analysis. *Journal of Accounting and Economics* 7 (1–3): 11–42.
Murray, A., D. Sinclair, D. Power, and R. Gray. 2006. Do financial markets care about social and environmental disclosure—Further evidence and exploration from the UK. *Accounting, Auditing & Accountability Journal* 19 (2): 228–255.
Neu, D., H. Warsame, and K. Pedwell. 1998. Managing public impressions: Environmental disclosures in annual reports. *Accounting, Organizations and Society* 23 (3): 265–282.
O'Donovan, G. 2002. Environmental disclosures in the annual report: Extending the applicability and predictive power of legitimacy theory. *Accounting, Auditing & Accountability Journal* 15 (3): 344–371.
O'Dwyer, B. 2009. Making sustainability work: Best practices in managing and measuring corporate social, environmental, and economic impacts. *The Accounting Review* 84 (3): 1001–1003.
O'Dwyer, B. 2011. The case of sustainability assurance: Constructing a new assurance service. *Contemporary Accounting Research* 28 (4): 1230–1266.
Orlitzky, M., F. L. Schmidt, and S. L. Rynes. 2003. Corporate social and financial performance: A meta-analysis. *Organization Studies* 24: 403.
Patten, D. 2002. The relation between environmental performance and environmental disclosure: A research note. *Accounting, Organizations and Society* 27: 763–773.
Porter, M. E. 1991. America's green strategy. *Scientific American* 264 (4): 96.
Porter, M. E., and C. van der Linde. 1995. Toward a new conception of the environment-competitiveness relationship. *Journal of Economic Perspectives* 9 (4): 97–118.
Raudenbush, S. W., B. J. Becker, and H. Kalaian. 1988. Modeling multivariate effect sizes. *Psychological Bulletin* 103: 111–120.
Rosenberg, M. S., D. C. Adams, and J. Gurevitch. 1997. *Meta-Win—Statistical Software for Meta-Analysis with Resampling Tests*. Sunderland, MA: Sinauer Associates, Publishing.
Rosenthal, R. 1979. The "file drawer problem" and tolerance for null results. *Psychological Bulletin* 85: 638–641.
Russo, M. V., and P. A. Fouts. 1997. A resource-based perspective on corporate environmental performance and profitability. *Academy of Management Journal* 40 (3): 534–559.
Schmidheiny, S. 1992. *Changing Course*. Cambridge, MA: MIT Press.
Simnett, R., A. Vanstraelen, and W. F. Chua. 2009. Assurance on sustainability reports: An international comparison. *The Accounting Review* 84 (3): 937–967.
Spicer, B. H. 1978. Market risk, accounting data and companies' pollution control records. *Journal of Business, Finance and Accounting* 5: 67–83.
Sroufe, R. 2003. Effects of environmental management systems on environmental management practices and operations. *Production and Operations Management* 12 (3): 416–431.
Sturdivant, F. D., and J. L. Ginter. 1977. Corporate social responsiveness: Management attitudes and economic performance. *California Management Review* 19 (3): 30–39.
Ullman, A. 1985. Data in search of a theory: A critical examination of the relationships among social performance, social disclosure, and economic performance. *Academy of Management Review* 10: 540–577.
United Nations (UN). 2013. *Cameron, UN Panel Call for Global Corporate Sustainability Reporting*. Available at: http://www.euractiv.com/sustainability/cameron-un-panel-call-global-cor-news-528162
van der Laan, S. 2009. The role of theory in explaining motivation for corporate social disclosures. *The Australasian Accounting Business and Finance Journal* 3 (4).
van Staden, C. J., and J. Hooks. 2007. A comprehensive comparison of corporate environmental reporting and responsiveness. *British Accounting Review* 39 (3): 197–210.
Vance, S. C. 1975. Are socially responsible corporations good investment risks? *Management Review* 64 (8): 19–24.
Wagner, M. 2005. How to reconcile environmental and economic performance to improve corporate sustainability: Corporate environmental strategies in the European paper industry. *Journal of Environmental Management* 76 (2): 105–118.
Walley, N., and B. Whitehead. 1994. It is not easy being green. *Harvard Business Review* 72 (3): 46–52.
Wright, P., and S. P. Ferris. 1997. Agency conflict and corporate strategy: The effect of divestment on corporate value. *Strategic Management Journal* 18 (1): 77–83.
Yu, V., H. I. Ting, and Y. C. J. Wu. 2009. Assessing the greenness effort for European firms—A resource efficiency perspective. *Management Decision* 47 (7): 1065–1079.

APPENDIX A

Articles Included in the MetaAnalysis: http://dx.doi.org/10.2308/jiar-51103.s01