

Track: Corporate Social Responsibility
ADHERENCE TO GLOBAL REPORTING INITIATIVE GUIDELINES
AND FINANCIAL PERFORMANCE

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Abstract

The objective of this paper is to study how companies' adherence to sustainability reporting guidelines affects their financial performance. The adherence measure comes from Global Reporting Initiative (GRI) data. The Global Reporting Initiative is an international organization that developed a widely used framework as benchmark for evaluating sustainability reports. Financial performance includes book value returns from public company reports on the Mergent Online database. The method to be applied is estimation of linear regression models, controlling for factors related to financial performance, industry sector, and region. The findings of this study are important as they provide evidence that suggests that sustainability reporting, on average, has a positive financial impact over different companies.

Keywords

Corporate social responsibility, international finance, international standards

Introduction

The words "corporate social responsibility" and "sustainability" have become more widely used due to increased awareness about their importance for present and future generations. But, what is sustainable development, what is a socially responsible company, and do these help to improve financial performance?

This research addresses these questions. It begins with a theoretical foundation describing past studies about sustainability reporting and financial performance. The next section states the main and secondary research objectives.

The methods used include ordinary least squares and robust regression and calculation of heteroscedasticity consistent standard errors. Data analysis and results suggest a positive link between adherence to global reporting initiative guidelines and financial performance. The last section presents the conclusions related to research objectives and implications of these findings for sustainable development and the need to consider its economic, social, and environmental dimensions.

Theoretical Foundation of the Problem

The Global Reporting Initiative (Global Reporting Initiative 2000-2006, p. 3) defines sustainability reporting as “the practice of measuring, disclosing, and being accountable to internal and external stakeholders for organizational performance towards the goal of sustainable development”. Sustainable development entails meeting the needs of both present and future citizens. It requires transparency so that all an organization’s stakeholders have access to relevant information to assess whether their needs are being met. Transparency helps improve the triple bottom line of sustainability – economic, social, and environmental performance, as organizations can be held accountable for their performance (Global Reporting Initiative 2000-2006, pp. 2-3). As for profit businesses attempt to achieve their financial performance goals, it is important to study whether a link exists between financial performance and social and environmental performance.

To this end, the Global Reporting Initiative (GRI) established a set of sustainability reporting standards as a benchmark against which triple bottom line performance may be assessed for individual companies. Based on these assessments, meaningful comparisons may be made regarding which companies are more environmentally, socially, and economically responsible.

Dimensions and Objectives of Sustainability Reporting

Environmental responsibility requires caring for the planet (Fortanier & Kolk 2007, p. 458). Examples are efforts to diminish pollution, energy consumption, depletion of natural resources, waste, and global warming (Roth 2008). Social responsibility means agreeing to be held accountable to the people (Fortanier & Kolk 2007; Ballou, Heitger, & Landes 2006). People include not only financial stakeholders (capital providers, employees), but also supply chain (customers, suppliers, contractors), regulatory (regulatory agencies, accounting standard setters), political (governments, international organizations), and social stakeholders (communities, academia, nongovernmental organizations). Economic responsibility deals with profits (Fortanier & Kolk 2007). Enhancements in profit may occur due to financial savings from reduced energy use and savings in recycling and waste disposal costs (Roth

2008). All three dimensions – environmental, social, and economic – are related to the concept of value, which must be aligned with organizational strategy, in order for sustainability efforts to be successful (Roth 2008).

The GRI standards consist of standard disclosures or required performance content and principles and guidelines to control the quality of sustainability reports (Global Reporting Initiative 2000-2006, pp. 3-4).

Content relies on the principles of materiality, stakeholder inclusiveness, sustainability context, and completeness (Global Reporting Initiative 2000-2006, p. 7). These principles may be described as follows.

1. Materiality – The report discloses the economic, environmental, and social impact of activities that may significantly affect stakeholders' assessments and decision making (Global Reporting Initiative 2000-2006, p. 8).
2. Stakeholder inclusiveness – The content identifies stakeholders who may reasonably expect and have an interest in a company having a satisfactory sustainability performance (Global Reporting Initiative 2000-2006, p. 10).
3. Sustainability context – There is information about the context, including resource limitations and conditions prevalent in corresponding sectors at the local, regional, and global level. Based on this context, expectations should be set about the company's contributions to the improvement or deterioration of economic, social, or environmental conditions (Global Reporting Initiative 2000-2006, p. 11).
4. Completeness – There is a sufficient coverage of relevant sustainability topics about the entities that are in control of the company for the corresponding reporting time period (Global Reporting Initiative 2000-2006, p. 12).

The quality assessment is based on the principles of balance, comparability, accuracy, timeliness, clarity, and reliability (Global Reporting Initiative 2000-2006, p. 14).

1. Balance – The report must disclose both – positive and negative effects – over performance (Global Reporting Initiative 2000-2006, p. 13).

2. Comparability – Information is presented in a consistent manner in different time periods and in such a way as to enable stakeholders to assess a company's performance relative to similar companies (Global Reporting Initiative 2000-2006, p. 14).
3. Accuracy – The concept of accuracy requires information of sufficient clarity, with enough but not excessive details about methods, assumptions and validity of evidence about sustainability (Global Reporting Initiative 2000-2006, p. 15).
4. Timeliness – Timeliness refers to reports being prepared at certain time intervals ensuring disclosure at a time that is as close as possible to the occurrence of the events that led to the actual sustainability performance.
5. Clarity – Usefulness of sustainability reports requires that they be understandable to a company's stakeholders (Global Reporting Initiative 2000-2006, p. 16).
6. Reliability – This principle is related to information truthfulness and satisfactory application of sustainability guidelines (Global Reporting Initiative 2000-2006, p. 17).

According to Herremans and Herschovis (2006), sustainability reporting serves several objectives. There are to build trust and credibility and to use information for internal decision making (Herremans & Herschovis 2006, p. 21). An example of internal decision making that can be improved through the process of preparing sustainability reports is that firms may monitor their risk management by becoming aware of relevant social and environmental threats. Besides contributing to these objectives, it provides the added benefit of permitting companies to communicate their values (Clikeman 2004).

Prior Sustainability Reporting and Performance Research

Roman, Hayibor, and Agle (1999) and van Beurden and Gössling (2008) review literature about the relationship between social and financial performance. While, according to these reviews, most studies performed during the past four decades find a positive relationship between both kinds of performance, the findings of the majority of the remaining studies suggest that this evidence is either insignificant or inconclusive.

Sustainability reporting under prior research considers alternative sustainability indicators to those of the GRI.

Cochran and Wood (1984) employed a three scale reputation index to find an inconclusive positive relationship between social responsibility and financial performance. However, they did find that companies with older assets, as measured by lower net fixed assets to gross fixed assets ratio, tended to have lower reputation index ratings. An explanation offered for this result was that assets acquired in most recent years are more compliant with environmental regulations.

Another sustainability indicator is the Dow Jones Sustainability Index (DJSI), which is a market index of worldwide companies (McPeak & Tooley 2008). McPeak and Tooley (2008) study the performance of the 56 United States companies that were members of the DJSI in December 2006, most of which belonged since the year 2002. The researchers aimed to determine if these industry leaders had better financial performance. One of the performance measures used was actual monthly excess company returns over market returns for the 2002 to 2007 period. Expected company returns were risk-based and estimated through the Capital Asset Pricing Model.

The major findings for this research were that about two thirds of the United States DJSI companies, on average, had positive excess returns. These led to the conclusion that DJSI companies performed better than the market, represented by the Standard & Poor's 500 Index (S&P 500), during the 2002 to 2007 period (McPeak & Tooley 2008).

López, Garcia, and Rodriguez (2007) also used the DJSI as a sustainability measure, using performance measures based on accounting data. They compared the performance of European companies listed on the Dow Jones Sustainability Index with that of European companies on the Dow Jones Global Index, but not on the Dow Jones Sustainability index. The findings provide evidence of a short-term negative effect over the performance of DJSI firms, measured through their profits before taxes, that is offset over the six year period, 1999-2004.

Another performance measure was the return on equity. Return on equity (ROE) is an important performance measure because it summarizes the results of operating profitability, asset management, and leverage or greater debt in a company's capital

structure (McPeak & Tooley 2008). Improvements in any of these increase ROE, as long as returns exceed the financing costs of debt.

The results for the ROE measure were similar to those of the excess returns. The average increase in ROE for the United States DJSI companies was greater than the average increase in ROE for the S&P 500 for the period under study (McPeak & Tooley 2008). This evidence supports the hypothesis that corporate socially responsible leaders do perform better financially.

Jones, Frost, Loftus, and Van Der Laan (2007) performed a similar study for the country of Australia. However, in this case, the relationship between sustainability reporting and financial performance was reversed to determine if superiorly performing companies engage in sustainability reporting. A sustainability index was developed, based on GRI guidelines, for the top 100 publicly listed companies in Australia. The financial performance variables included ROE and other ratios based on financial statement data. The results were a significantly positive relationship between most measures of financial performance and sustainability reporting (Jones, Frost, Loftus, & Van Der Laan 2007).

In another research about Australian companies, Kristoffersen, Gerrans, and Clark-Murphy (2008) concluded that higher corporate social performance ratings (based on a five point scale) led to better performance. Their study controlled for differences in industry groups and found that companies in the banking, diversified financials, insurance, and telecommunications industries showed the best financial performance.

When considering the combined evidence between the United States study (McPeak & Tooley 2008) and those of Australia (Jones, Frost, Loftus, & Van Der Laan 2007; Kristoffersen, Gerrans, & Clark-Murphy 2008), it suggests that there is a positive relationship between sustainability reporting and financial performance. However, it is not possible to infer the direction of this relationship: whether it is that sustainability reporting drives financial performance or whether it is superior financial performance what leads to higher quality sustainability reporting. In addition, since both are single country studies, the findings may not be generalized to all world regions.

A more recent paper presents evidence that seems to contradict the before mentioned findings (Nelling & Webb 2009). This study refers to a “virtuous cycle”, in

which social responsibility improves financial performance, which in turn, leads to higher social responsibility.

Waddock and Graves (1997) had previously explained and analyzed this virtuous cycle. Superior performance may enable firms to accumulate slack resources for investment in sustainability. In this manner, better financial performance would result in better sustainability performance. However, company managers that make social performance a priority may achieve better relationships with their stakeholders, such as employees and clients. By investing on building stakeholder loyalty, through sustainability efforts, these firms may be rewarded with improvements in financial performance. There could exist either a positive (for example, increased sales due to higher customer loyalty more than offsetting incurrence of higher costs to attain sustainability) or negative relationship (additional costs greater than potential increase in benefits) between sustainability and financial performance.

Nelling and Webb (2009) calculated a weighted social responsibility score (WSRS) based on several sustainability attributes, such as employee and community relations and environment. Their study covers United States and non-United States companies. ROA and common stock returns, obtained from Compustat, were selected as performance measures. The time period was the years 1993 to 2000. The first set of ordinary least squares regression models defined the WSRS index, for a particular year, as the dependent variable and a financial performance measure, for the previous year, as the major independent variable. These results support the previous findings of a positive relationship between sustainability reporting and financial performance. The reverse relationship was analyzed as well. In the second set of ordinary least squares regression models, a particular year's financial performance measure was regressed against the previous year's social responsibility score. Similar results were found as those under the first set of regression models. However, when controlling for individual firm effects, the second set of regression models does not show a significant relationship between financial performance and previous year's WSRS score (Nelling & Webb 2009).

Research Objectives

The main objective of this paper is to study how companies' adherence to sustainability reporting guidelines affects their financial performance. The adherence to sustainability reporting guidelines information was obtained from the Global Reporting Initiative webpage data for sustainability reports published in 2009. Financial performance is defined in terms of returns based on accounting data for publicly listed companies, from different industries and world regions, with financial data available on the Mergent Online database for the year 2008.

Secondary objectives are to assess whether the relationship between adherence to sustainability reporting guidelines and financial performance varies between industries and between world regions.

It is not intended to test for the existence of a causal relationship between sustainability reporting and financial performance, but rather to study whether sustainability reporting is a good predictor of financial performance based on book value returns. Market value returns were not analyzed due to their not being readily accessible on the Mergent Online database, at a single point in time, namely 2008 year-end for all sample companies.

Methodology

The theoretical background discussed on this paper suggests, in general, that there is a positive link between sustainability reporting and financial performance. It is not clear what the direction is of the causality between these two concepts. It may very well be that there is a "virtuous cycle", in which both concepts interact with and enhance each other.

This research extends previous work by developing a model to verify if the positive relationship holds, when including companies from different countries and world regions and whether this relationship is stronger or weaker for particular industries or regions where firms are located. A previous study considered industries and regions, but only for self-reported economic impact (Fortanier & Kolk 2007). However, the GRI Report List used for this paper also considers social and environmental dimensions and GRI and third party checks to verify adherence to sustainability guidelines.

Empirical Data Sources and Data Sample

The sources of empirical data were the Global Reporting Initiative webpage and the Mergent Online database. From the Global Reporting Initiative webpage, a spreadsheet was downloaded. This spreadsheet includes lists of organizations that published sustainability reports (Global Reporting Initiative 1999-2009). The data is available for the years 1999 to 2009, for different industry sectors. The list of industry sectors was used to find profit public companies, belonging to these industry sectors, with financial information found on the Mergent Online database, for the year 2008 (Mergent Online 2010). These companies were identified and classified according to their Standard Industrial Code (SIC). It was assumed that if the reports were published in 2009, they referred to events for the prior period or the year 2008.

The Mergent Online database includes, among other data, financial statement and financial ratio information for public companies listed in world stock exchanges. The financial ratios selected were performance measures in the regression models, used to achieve the objectives of this study.

Regression Models and Statistical Tests

Using the STATA data analysis statistical package (StataCorp 2008), regression models were derived from the ordinary least squares method, including fixed effects or dummy variables for the categorical variables – an adherence measure and 16 different industry sectors (based on SIC codes). The dependent or response variables were either return on assets, return on equity or return on investment. The control variables or covariates were financial performance measures that may affect book returns.

The statistical tests performed included tests to detect multicollinearity and heteroscedasticity, included in the regression diagnostics option for STATA. The command “estat vif” was run to calculate variance inflation factors for all variables (Acock 2008, pp. 238-239). Variables with a variance inflation factor over 10 for the general regression model were dropped to reduce the impact that multicollinearity or correlation between predictor or independent variables may have over model estimates.

The test for homoscedasticity was the Breusch-Pagan/Cook-Weisberg test. The calculation for the test statistic follows:

$$BP = \frac{(SSE_1)/2}{(SSR/n)^2}$$

where SSE_1 is the model sum of squares for a regression of the squared ordinary least squares residuals against each of the independent variables, SSR is the residual sum of squares when regressing the dependent variable on the independent variables, and n is the number of observations. This test statistic has a chi-squared distribution, and the null hypothesis is that the residuals have equal variance (*A Note on Heteroskedasticity Tests in Stata*). Once there was evidence of heteroscedasticity, a robust estimator of the regression variance-covariance matrix was used to calculate heteroscedasticity consistent standard errors.

The robust estimator for the variance-covariance matrix was the following:

$$\Omega = (Z'Z)^{-1}Z' \left\{ \text{diagonal} \left[\frac{e_i^2}{(1 - h_{i,i})^2} \right] \right\} Z(Z'Z)^{-1}$$

where Z is the matrix of independent variable values, e_i^2 is the square of the estimated residual for a particular observation, $h_{i,i} = z_i(Z'Z)^{-1}z_i'$ and z_i is the i^{th} row of the Z matrix (Long & Ervin 2000, p. 218).

Residuals-versus-fitted plots allowed the observation of residuals to verify if they seemed to have a normal distribution. The STATA robust regression option, “vce(robust)” was used to calculate robust standard errors, without the need for the normality of residuals assumption of ordinary least squares (Acock 2008, pp. 230-232).

Data Analysis

This section presents the variables used in this research, the descriptive analysis for the variables and the results of diagnostic statistical tests.

Variables

The sustainability measure is adherence to global reporting standards' performance (AGP). This measure has a value of one, for companies listed in the Global Reporting Initiative spreadsheet for reports published on 2009, and zero, otherwise.

Besides AGP, there are 15 additional categorical variables for industry sectors – motor vehicles and car bodies (MVCB), air transportation (AT), medicinal and botanicals (MB), computer programming (CP), tires and inner tubes (TIT), cement, hydraulic (CH), petroleum and natural gas (PNG), electric services (ES), electronic components (EC), commercial banks (CB), meat packing plants (MPP), pulp mills (PM), biological products (BP), television broadcasting (TB), and iron ores (IO) – and 7 for world regions – Europe, Asia, North America, Latin America, Oceania, Caribbean, and Africa.

The performance measures are three profitability ratios – return on assets (ROA), return on equity (ROE), and return on investment (ROI). Profitability ratios assess a company's ability to incur expenses for amounts lesser than total revenues, in order to achieve a positive net income. Mergent Online defines these variables as follows.

1. Return on Equity (%) (ROE) =

$(\text{Income from continuing operations} / \text{Stockholders' equity (or Total partnership capital)}) \times 100$

2. Return on Assets (%) (ROA) =

$(\text{Income from continuing operations} / \text{Total assets}) \times 100$

3. Return on Investment (ROI) =

$(\text{Income from continuing operations} / (\text{Common stock} + \text{Preferred stock} + \text{Long-term debt})) \times 100$

All three measures relate income from continuing operations to investment measures. Return on equity focuses on investments made by owners (stockholders or partners) through their contributed capital and additional increases to equity or capital. Return on assets' emphasis is on investments by a company to acquire assets for their operations. Return on investment considers the investment made by major providers of long term financing sources – contributed capital from common and preferred stockholders and long-term debt owed to lenders.

Other measures serve as control variables. There are two debt management measures – total debt to equity (TDE) and long-term debt to equity (LTA). The definition for total debt to equity is presented below.

Total debt to equity = (Long-term debt + Current portion of long-term debt + Current portion of capital lease obligations) / ((Stockholders' equity + Treasury preferred stock) - (Preferred stock + Preferred paid-in capital))

Total debt to equity (TDE) relates long-term and current liabilities arising from long-term debt to total common stockholders' equity or total stockholder's equity net of preferred stockholders' equity. Long-term debt to equity (LTDE) compares size of long-term debt relative to that of the other major long-term financing source, equity capital. Debt management is important to ensure that a company has an optimal mix of debt and equity. Higher debt levels increase the potential returns for equity holders, but it has the added cost of higher default risk or inability to pay debt principal and/or interest owed.

Net Property, Plant, and Equipment turnover (NPPET) and total asset turnover (TAT) are asset management measures. Asset management has to do with the ability of a company to make an efficient use of invested assets to generate revenues from their operations. Turnover measures relate total revenues to assets (net property, plant, and equipment or total assets).

Liquidity measures include net current assets as percent of total assets (NCAPTA) and net property, plant, and equipment as percent of total assets (NPPEPTA). Assuming that current assets other than cash are readily convertible to cash, higher amounts of current assets as a percent of total assets may increase a company's liquidity or ability to pay current liabilities as they become due.

An additional measure, logarithm of total assets (LTA) is used as a proxy for company size. This measure controls for differences in company performance that may be explained by a company being of large, medium, or small size.

Descriptive Analysis

Table 1 (see tables in Appendix A) shows descriptive statistics for financial performance measures used in the regression analysis. The performance measures include profitability ratios as dependent variables – return on assets (ROA), return on equity (ROE), and return on investment (ROI) – while the control variables are either asset management – total asset turnover (TAT) and net property, plant, and equipment turnover (NPPET) – or debt management ratios – long-term debt to equity (LTDE) and

total debt to equity (TDE) – or liquidity indicators – net current assets percent to total assets (NCAPTA) and net property, plant, and equipment percent to total assets (NPPEPTA). An additional independent variable is size of company, for which logarithm of total assets (LTA) serves as proxy; while adherence to GRI principles (AGP) is the main independent variable, and is a dummy variable with a value of 1 for adherence and 0, otherwise.

Most measures have a mean greater than zero. Their range from minimum to maximum value varies from positive values to negative and positive values. For unknown reasons, NCAPTA and NPPEPTA's maximum values are greater than 100. However, these values over 100 only happened for two and twelve observations, for NCAPTA and NPPEPTA, respectively, out of 861 total observations. LTA may assume negative values, due to total dollar amounts being, typically expressed in thousands or millions, and having companies of varying sizes in terms of total assets.

Results of Diagnostic Statistical Tests

According to the results for the ordinary least squares regression models with return on assets, return on equity, or return on investment performance measures as dependent variables (see Tables 2, 3, and 4), there is not a significant relationship between adherence to sustainability reporting guidelines and financial performance.

However, after dealing with multicollinearity and heteroscedasticity issues, the evidence suggests a positive relationship between the adherence and the financial performance measures, as can be observed in Tables 5, 6, and 7.

Figure 1 (see figures in Appendix B) presents a plot of the residuals versus fitted values for the first dependent variable. There appears to be evidence of non-normality as most residual observations lie on the rightmost area of the graph. Figures 2 and 3 show similar patterns for the second and third dependent variables.

In Tables 8, 9, and 10, the normality assumption is relaxed through robust regression. Again, the evidence suggests that higher adherence to global sustainability standards is associated, on average, with better financial performance.

Results

The results for models with each of three dependent financial performance variables provide evidence supporting the hypothesis of a positive relationship between adherence to sustainability reporting guidelines and financial performance.

This evidence suggests that, in general, companies that exhibit better sustainability performance are rewarded with better financial performance. However, the direction of causality cannot be inferred. This is due to the nonexistence of evidence as to whether managerial adherence to guidelines is what causes superior financial performance, or whether superiorly performing companies have slack resources available to engage in better quality sustainability efforts and disclosures.

The evidence for most models also suggests that companies from the cement, hydraulic (CH) industry sector and the Caribbean region, consistently, outperform, on average, other companies while the opposite occurs for companies from the biological products (BP) industry sector.

Apparently, companies belonging to these industries or region have competitive advantages that allow them to outperform others. There could be factors such as research and development and advertising intensity or location advantages, not explored in this study that may explain these advantages.

As expected, increases in total asset turnover (TAT) have a positive effect over all three profitability performance dependent variables, return on assets (ROA), return on equity (ROE), and return on investment (ROI). These results may be observed in Tables 5 to 10 and are due to the beneficial effect that better asset management has over a company's profitability.

Conclusions

This research aimed to describe the relationship that exists between companies' adherence to sustainability reporting guidelines and their financial performance. Sustainability reporting data was obtained from the Global Reporting Initiative webpage data for sustainability reports published in 2009. Financial performance based on accounting returns was available on the Mergent Online database for the year 2008. The major findings of this study suggest a significant positive relationship between adherence to GRI guidelines and financial returns.

The evidence generally suggests the absence of significant performance differences between industries and regions, with the notable exceptions of the cement, hydraulic (stronger performance) and biological products (weaker performance) industries and the Caribbean region, whose companies appear to perform better than those located in other regions.

Based on these results, it is recommended that future research be done to compare results of using different measures of sustainability that focus on its individual dimensions – environmental, social, and economic – and underlying principles, defined by the Global Reporting Initiative.

Future research should also analyze the results of causality tests to determine which is the cause and which, the consequence – between adherence to sustainability reporting guidelines and financial performance, or if there is, indeed, a virtuous cycle.

If a similar study is performed for a longer time period, it may be determined if these results hold over time, or whether they are valid only for a short-term horizon.

It would also be beneficial to have additional research that explores distinguishing factors related to the cement and biological products' industries and location advantages of the Caribbean in relation to other world regions. This would serve to provide a deeper understanding about whether there are additional sources of competitive advantages or disadvantages.

Finally, there should be a study of the differences within companies in the same industry or region to evaluate what sets more successful companies apart and provide information to the academia and policymakers to develop local and regional economic sustainability strategies.

The findings of present and future investigations have important implications for sustainable development. If profitable companies engage in sustainability reporting, whether as part of a “virtuous cycle” or to build their reputation and stakeholder loyalty, current and future generations may benefit from their contributions to the economic, social, and environmental welfare. This is an essential requirement for a successful sustainable development to occur.

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Appendix A

Table 1

Descriptive Statistics for Financial Performance Measures of Regression Models

Measure	Mean	Standard		
		Deviation	Minimum	Maximum
ROA	-2.43	20.73	-244.43	67.97
ROE	-3.60	64.25	-616.26	1180.69
ROI	1.17	38.19	-289.41	641.80
LTDE	1.17	5.15	0.00	90.23
NCAPTA	6.76	20.44	-89.77	142.41
NPPEPTA	35.86	32.50	0.01	171.00
NPPET	6.71	31.21	0.01	705.90
TAT	0.56	0.62	0.01	4.36
TDE	1.35	5.37	0.00	90.23
LTA	-0.59	0.65	-2.00	0.64

Note. The first three measures, return on assets, return on equity, and return on investment are, separately, regressed using the remaining performance variables as control variables in the regression models.

Table 2

Effect of Adherence to Global Sustainability Guidelines over Return on Assets under Ordinary Least Squares

Predictors	Coefficient	Standard Error	t ratio	p value
AGP	2.86	4.08	0.70	0.48
MVCB	-9.94	8.68	-1.14	0.25
AT	-11.17	8.62	-1.30	0.20
MB	-12.66	8.87	-1.43	0.15
CP	-12.92	8.29	-1.56	0.12
TIT	-10.64	9.61	-1.11	0.27
CH	-7.90	8.65	-0.91	0.36
PNG	-8.24	8.22	-1.00	0.32
ES	-4.09	8.16	-0.50	0.62
EC	-14.40	8.44	-1.71	0.09 *
MPP	-9.98	9.78	-1.02	0.31
PM	-11.71	9.20	-1.27	0.20
BP	-19.95	8.93	-2.23	0.03 **
TB	-10.95	8.38	-1.31	0.19
IO	-4.16	9.36	-0.44	0.66
Europe	-4.20	8.59	-0.49	0.63

Table 2

Effect of Adherence to Global Sustainability Guidelines over Return on Assets under Ordinary Least Squares (continued)

Predictors	Coefficient	Standard Error	t ratio	p value
Asia	6.96	8.58	0.81	0.42
North America	-12.31	8.50	-1.45	0.15
Latin America	-4.74	8.89	-0.53	0.59
Oceania	-5.69	8.49	-0.67	0.50
Caribbean	5.37	11.43	0.47	0.64
LTDE	8.57	1.51	5.67	0.00 ***
NCAPTA	-0.10	0.04	-2.39	0.02 **
NPPEPTA	0.06	0.03	1.81	0.07 *
NPPET	-0.02	0.02	-1.02	0.31
TAT	2.86	1.90	1.51	0.13
TDE	-8.40	1.45	-5.79	0.00 ***
LTA	8.83	2.13	4.15	0.00 ***
Constant	16.18	11.80	1.37	0.17

Note. The model parameter estimates were obtained from applying the ordinary least squares regression method, with return on assets equal to (Income from continuing operations / Total assets) x 100. There were 861 company observations, adjusted R_squared equaled 0.17, and the F statistic (28, 832) was 7.14, significant at the 0.01 level. *p < 0.10, **p < 0.05, ***p < 0.01

Table 3

Effect of Adherence to Global Sustainability Guidelines over Return on Equity under Ordinary Least Squares

Predictors	Coefficient	Standard Error	t ratio	p value
AGP	5.82	11.24	0.52	0.61
MVCB	-15.65	23.91	-0.65	0.51
AT	-40.63	23.74	-1.71	0.09 *
MB	-20.63	24.42	-0.85	0.40
CP	-31.25	22.82	-1.37	0.17
TIT	-26.41	26.47	-1.00	0.32
CH	-21.13	23.81	-0.89	0.38
PNG	-28.54	22.64	-1.26	0.21
ES	-14.50	22.46	-0.65	0.52
EC	-31.81	23.26	-1.37	0.17
MPP	-28.66	26.92	-1.06	0.29
PM	-31.99	25.34	-1.26	0.21
BP	-41.68	24.60	-1.69	0.09 *
TB	-17.90	23.07	-0.78	0.44
IO	-13.42	25.76	-0.52	0.60

Table 3

Effect of Adherence to Global Sustainability Guidelines over Return on Equity under Ordinary Least Squares (continued)

Predictors	Coefficient	Standard Error	t ratio	p value
Europe	2.26	23.66	0.10	0.92
Asia	10.76	23.61	0.46	0.65
North America	-30.43	23.41	-1.30	0.19
Latin America	-24.13	24.48	-0.99	0.33
Oceania	-6.62	23.38	-0.28	0.78
Caribbean	17.39	31.47	0.55	0.58
LTDE	63.10	4.16	15.16	0.00 ***
NCAPTA	-0.21	0.12	-1.76	0.08 *
NPPEPTA	0.25	0.09	2.69	0.01 **
NPPEPT	-0.08	0.06	-1.22	0.22
TAT	9.28	5.22	1.78	0.08 *
TDE	-56.89	4.00	-14.24	0.00 ***
LTA	11.41	5.86	1.95	0.05 **
Constant	31.69	32.48	0.98	0.33

Note. The model parameter estimates were obtained from applying the ordinary least squares regression method, with return on equity equal to (Income from continuing operations / Stockholders' equity (or Total partnership capital) x 100. There were 861 company observations, adjusted R squared equaled 0.34, and the F statistic (28, 832) was 17.00, significant at the 0.01 level. *p < 0.10, **p < 0.05, ***p < 0.01

Table 4

Effect of Adherence to Global Sustainability Guidelines over Return on Investment under Ordinary Least Squares

Predictors	Coefficient	Standard Error	t ratio	p value
AGP	5.41	7.65	0.71	0.48
MVCB	-12.83	16.29	-0.79	0.43
AT	-10.57	16.17	-0.65	0.51
MB	-14.04	16.63	-0.84	0.40
CP	-10.12	15.55	-0.65	0.52
TIT	-13.54	18.03	-0.75	0.45
CH	-8.70	16.22	-0.54	0.59
PNG	-6.57	15.42	-0.43	0.67
ES	-0.40	15.30	-0.03	0.98
EC	-19.33	15.84	-1.22	0.22
MPP	-15.66	18.33	-0.85	0.39
PM	-12.60	17.26	-0.73	0.47
BP	-22.10	16.76	-1.32	0.19
TB	-8.93	15.72	-0.57	0.57

Table 4

Effect of Adherence to Global Sustainability Guidelines over Return on Investment under Ordinary Least Squares (continued)

Predictors	Coefficient	Standard Error	t ratio	p value
IO	-5.54	17.55	-0.32	0.75
Europe	-8.91	16.12	-0.55	0.58
Asia	1.44	16.08	-0.09	0.93
North America	-25.36	15.94	-1.59	0.11
Latin America	-8.95	16.68	-0.54	0.59
Oceania	-17.05	15.93	-1.07	0.29
Caribbean	5.16	21.44	0.24	0.81
LTDE	10.79	2.84	3.81	0.00 ***
NCAPTA	-0.18	0.08	-2.21	0.03 **
NPPEPTA	0.10	0.06	1.65	0.10 *
NPPET	-0.06	0.04	-1.51	0.13
TAT	12.87	3.56	3.62	0.00 ***
TDE	-10.57	2.72	-3.88	0.00 ***
LTA	9.45	3.99	2.36	0.02 **
Constant	22.72	22.12	1.03	0.31

Note. The model parameter estimates were obtained from applying the ordinary least squares regression method, with return on investment (ROI) equal to (Income from continuing operations/(Common stock + Preferred stock + Long-term debt)) x 100. There were 861 company observations, adjusted R squared equaled 0.14, and the F statistic (28, 832) was 5.86, significant at the 0.01 level. *p < 0.10, **p < 0.05, ***p < 0.01

Table 5

Effect of Adherence to Global Sustainability Guidelines over Return on Assets under Ordinary Least Squares, with Heteroscedasticity Consistent Standard Errors

Predictors	Coefficient	Standard Error	t ratio	p value
AGP	5.13	1.48	3.47	0.00 ***
MVCB	3.23	2.32	1.39	0.16
AT	-1.16	1.64	-0.70	0.48
MB	-0.53	2.79	-0.19	0.85
TIT	0.95	2.16	0.44	0.66
CH	5.59	1.07	5.20	0.00 ***
CB	-0.05	5.56	-0.01	0.99
MPP	1.10	2.04	0.54	0.59
PM	-1.43	2.20	-0.65	0.51
BP	-14.35	5.47	-2.62	0.01 ***
TB	-1.58	3.24	-0.49	0.63
IO	4.21	7.20	0.58	0.56

Table 5

Effect of Adherence to Global Sustainability Guidelines over Return on Assets under Ordinary Least Squares, with Heteroscedasticity Consistent Standard Errors (continued)

Predictors	Coefficient	Standard Error	t ratio	p value
Latin America	2.30	1.93	1.19	0.24
Caribbean	11.96	5.04	2.37	0.02 **
Africa	3.79	4.97	0.76	0.45
NCAPTA	-0.08	0.08	-1.07	0.28
NPPEPTA	0.04	0.03	1.35	0.18
NPPET	-0.03	0.03	-1.11	0.27
TAT	3.78	1.73	2.18	0.03 **
LTA	0.98	2.08	0.47	0.64
Constant	-4.68	3.60	-1.30	0.19

Note. The model parameter estimates were obtained from applying the ordinary least squares regression method, with return on assets equal to (Income from continuing operations / Total assets) x 100 and heteroscedasticity consistent standard errors. Variables with variance inflation factors greater than 10 were dropped from the model, to account for multicollinearity in the original model. There were 861 company observations, R squared equaled 0.08, and the F statistic (20, 840) was 5.64, significant at the 0.01 level. * p< 0.10, ** p< 0.05, *** p< 0.01

Table 6

Effect of Adherence to Global Sustainability Guidelines over Return on Equity under Ordinary Least Squares, with Heteroscedasticity Consistent Standard Errors

Predictors	Coefficient	Standard Error	t ratio	p value
AGP	13.88	4.24	3.27	0.00 ***
MVCB	12.92	6.15	2.10	0.04 **
AT	-7.66	6.65	-1.15	0.25
MB	4.34	9.05	0.48	0.63
TIT	1.88	6.47	0.29	0.77
CH	15.80	3.49	4.53	0.00 ***
CB	25.16	14.64	1.72	0.09 *
MPP	2.54	7.04	0.36	0.72
PM	-4.13	7.58	-0.55	0.59
BP	-29.61	11.47	-2.58	0.01 ***
TB	27.49	31.04	0.89	0.38
IO	12.45	9.84	1.26	0.21
Latin America	-10.00	12.00	-0.83	0.41
Caribbean	37.68	16.55	2.28	0.02 **
Africa	11.11	8.71	1.28	0.20
NCAPTA	0.11	0.18	0.58	0.56
NPPEPTA	0.31	0.12	2.58	0.01 ***
NPPET	-0.10	0.09	-1.16	0.25

Table 6

Effect of Adherence to Global Sustainability Guidelines over Return on Equity under Ordinary Least Squares, with Heteroscedasticity Consistent Standard Errors (continued)

Predictors	Coefficient	Standard Error	t ratio	p value
TAT	10.11	4.83	2.09	0.04 **
LTA	-6.11	5.54	-1.10	0.27
Constant	-25.69	10.93	-2.35	0.02 **

Note. The model parameter estimates were obtained from applying the ordinary least squares regression method, with return on equity equal to (Income from continuing operations / Stockholders' equity (or Total partnership capital) x 100 and heteroscedasticity consistent standard errors. Variables with variance inflation factors greater than 10 were dropped from the model, to account for multicollinearity in the original model. There were 861 company observations, R squared equaled 0.05, and the F statistic (20, 840) was 5.31, significant at the 0.01 level. *p < 0.10, **p < 0.05, ***p < 0.01

Table 7

Effect of Adherence to Global Sustainability Guidelines over Return on Investment under Ordinary Least Squares, with Heteroscedasticity Consistent Standard Errors

Predictors	Coefficient	Standard Error	t ratio	p value
AGP	11.05	5.03	2.20	0.03 **
MVCB	1.38	4.34	0.32	0.75
AT	-1.51	4.70	-0.32	0.75
MB	-1.99	4.94	-0.40	0.69
TIT	-0.52	4.15	-0.13	0.90
CH	6.47	2.03	3.19	0.00 ***
CB	-5.38	8.81	-0.61	0.54
MPP	-5.44	5.61	-0.97	0.33
PM	-2.10	3.21	-0.65	0.51
BP	-18.31	8.01	-2.29	0.02 **
TB	-0.04	4.66	-0.01	0.99
IO	1.48	7.98	0.19	0.85
Latin America	8.16	4.70	1.74	0.08 *
Caribbean	20.12	10.79	1.87	0.06 **
Africa	12.09	7.91	1.53	0.13
NCAPTA	-0.16	0.12	-1.43	0.15
NPPEPTA	0.09	0.06	1.48	0.14
NPPET	-0.07	0.07	-1.11	0.27
TAT	14.77	5.69	2.59	0.01 ***
LTA	-0.73	3.77	-0.19	0.85
Constant	-8.90	6.62	-1.35	0.18

Note. The model parameter estimates were obtained from applying the ordinary least squares regression method, with return on investment (ROI) equal to (Income from continuing operations/(Common stock + Preferred stock + Long-term debt)) x 100 and heteroscedasticity consistent standard errors. Variables with variance inflation factors greater than 10 were dropped from the model, to account for

multicollinearity in the original model. There were 861 company observations, R squared equaled 0.09, and the F statistic (20, 840) was 6.37, significant at the 0.01 level. *p< 0.10, **p< 0.05, ***p< 0.01

Table 8

Effect of Adherence to Global Sustainability Guidelines over Return on Assets under Robust Regression

Predictors	Coefficient	Standard Error	t ratio	p value
AGP	5.13	1.42	3.61	0.00 ***
MVCB	3.23	2.26	1.43	0.15
AT	-1.16	1.61	-0.72	0.47
MB	-0.53	2.71	-0.20	0.85
TIT	0.95	2.04	0.46	0.64
CH	5.59	1.07	5.24	0.00 ***
CB	-0.05	5.43	-0.01	0.99
MPP	1.10	1.90	0.58	0.56
PM	-1.43	2.09	-0.69	0.49
BP	-14.35	5.36	-2.68	0.01 ***
TB	-1.58	3.21	-0.49	0.62
IO	4.21	6.83	0.62	0.54
Latin America	2.30	1.85	1.24	0.22
Caribbean	11.96	4.22	2.83	0.01 ***
Africa	3.79	4.67	0.81	0.42
NCAPTA	-0.08	0.08	-1.10	0.27
NPPEPTA	0.04	0.03	1.37	0.17
NPPET	-0.03	0.02	-1.73	0.08 *
TAT	3.78	1.70	2.23	0.03 **
LTA	0.98	2.05	0.48	0.63
Constant	-4.68	3.55	-1.32	0.19

Note. The model parameter estimates were obtained from applying the robust regression method, with return on assets equal to (Income from continuing operations / Total assets) x 100. Variables with variance inflation factors greater than 10 were dropped from the model, to account for multicollinearity in the original model. There were 861 company observations, R squared equaled 0.08, and the F statistic (20, 840) was 6.07, significant at the 0.01 level. *p< 0.10, **p< 0.05, ***p< 0.01

Table 9

Effect of Adherence to Global Sustainability Guidelines over Return on Equity under Robust Regression

Predictors	Coefficient	Standard Error	t ratio	p value
AGP	13.88	4.13	3.37	0.00 ***
MVCB	12.92	6.03	2.14	0.03 **
AT	-7.66	6.53	-1.17	0.24
MB	4.34	8.62	0.50	0.62
TIT	1.88	6.14	0.31	0.76
CH	15.80	3.45	4.58	0.00 ***
CB	25.16	14.30	1.76	0.08 *
MPP	2.54	6.58	0.39	0.70
PM	-4.13	7.21	-0.57	0.57
BP	-29.61	11.22	-2.64	0.01 ***
TB	27.49	30.56	0.90	0.37
IO	12.45	9.36	1.33	0.18
Latin America	-10.00	11.65	-0.86	0.39
Caribbean	37.68	13.66	2.76	0.01 ***
Africa	11.11	8.11	1.37	0.17
NCAPTA	0.11	0.18	0.59	0.56
NPPEPTA	0.31	0.12	2.62	0.01 ***
NPPET	-0.10	0.05	-1.99	0.05 **
TAT	10.11	4.72	2.14	0.03 **
LTA	-6.11	5.48	-1.11	0.27
Constant	-25.69	10.81	-2.38	0.02 **

Note. The model parameter estimates were obtained from applying the robust regression method, with return on equity equal to (Income from continuing operations / Stockholders' equity (or Total partnership capital) x 100. Variables with variance inflation factors greater than 10 were dropped from the model, to account for multicollinearity in the original model. There were 861 company observations, R squared equaled 0.05, and the F statistic (20, 840) was 5.82, significant at the 0.01 level. *p < 0.10, **p < 0.05, ***p < 0.01

Table 10

Effect of Adherence to Global Sustainability Guidelines over Return on Investment under Robust Regression

Predictors	Coefficient	Standard Error	t ratio	p value
AGP	11.05	4.85	2.28	0.02 **
MVCB	1.38	4.24	0.33	0.75
AT	-1.51	4.52	-0.33	0.74
MB	-1.99	4.81	-0.41	0.68
TIT	-0.52	3.96	-0.13	0.90
CH	6.47	2.00	3.23	0.00 ***

Table 10

Effect of Adherence to Global Sustainability Guidelines over Return on Investment under Robust Regression (continued)

Predictors	Coefficient	Standard Error	t ratio	p value
CB	-5.38	8.41	-0.64	0.52
MPP	-5.44	5.40	-1.01	0.31
PM	-2.10	3.06	-0.69	0.49
BP	-18.31	7.80	-2.35	0.02 **
TB	-0.04	4.61	-0.01	0.99
IO	1.48	7.58	0.20	0.85
Latin America	8.16	4.54	1.80	0.07 *
Caribbean	20.12	8.97	2.24	0.03 **
Africa	12.09	6.99	1.73	0.08 *
NCAPTA	-0.16	0.11	-1.46	0.14
NPPEPTA	0.09	0.06	1.54	0.13
NPPET	-0.07	0.04	-1.95	0.05 **
TAT	14.77	5.53	2.67	0.01 ***
LTA	-0.73	3.65	-0.20	0.84
Constant	-8.90	6.38	-1.40	0.16

Note. The model parameter estimates were obtained from applying the robust regression method, with return on investment (ROI) equal to $(\text{Income from continuing operations}/(\text{Common stock} + \text{Preferred stock} + \text{Long-term debt})) \times 100$. Variables with variance inflation factors greater than 10 were dropped from the model, to account for multicollinearity in the original model. There were 861 company observations, R squared equaled 0.09, and the F statistic (20, 840) was 6.74, significant at the 0.01 level. *p < 0.10, **p < 0.05, ***p < 0.01

Appendix B

Figure 1. Residuals for Return on Assets Ordinary Least Squares Regression Model versus Fitted

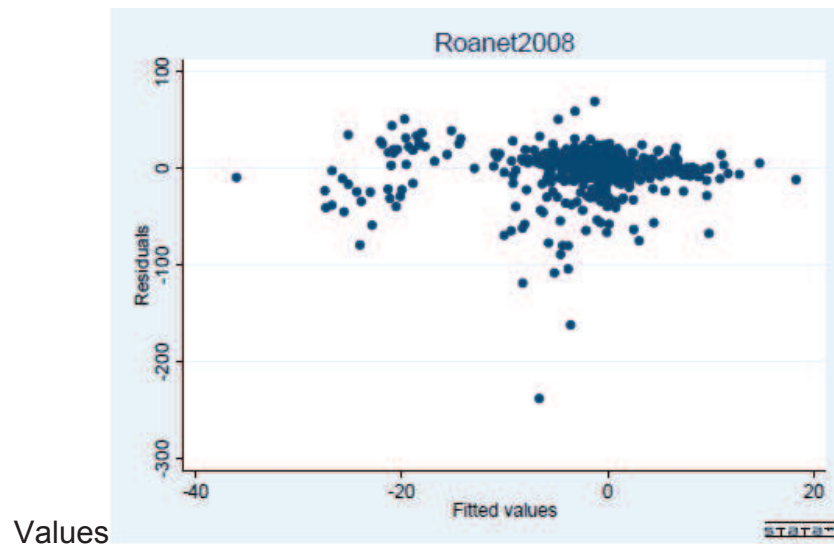


Figure 2. Residuals for Return on Equity Ordinary Least Squares Regression Model versus Fitted Values

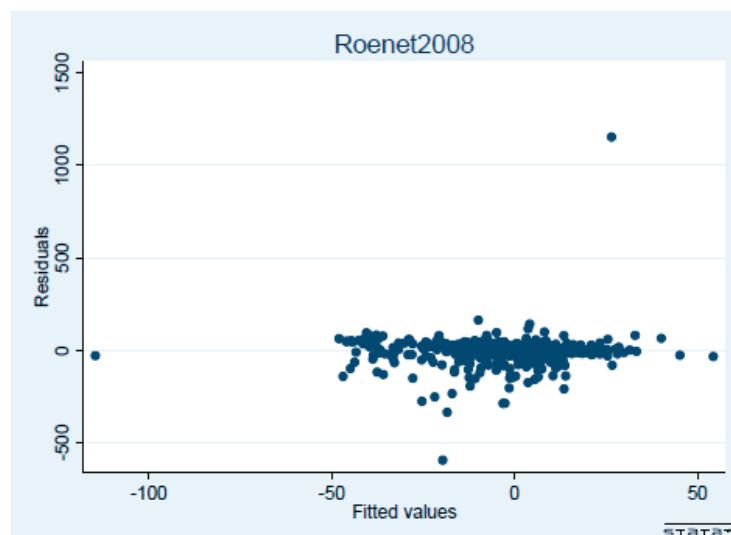


Figure 3. Residuals for Return on Investment Ordinary Least Squares Regression Model versus Fitted Values

