CSR AND FIRM PERFORMANCE: REAL BENEFIT OR HAPPY MARKETS?
EVIDENCE FROM LEADING LISTED COMPANIES*

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ABSTRACT

Humankind is currently faced with a series of social, economic and ecological challenges that necessitate firms'compliance with novel standards and expectations.

Despite consensus regarding the existence of a green trend, equal consensus with respect to the view that markets take on the matter is not met.

The present study aims to test the impact of the CSR level adopted by firms (measured by a "green score") on their operating (ROIC) and financial performance (ROE), as well as market perception towards them (Tobin's Q).

Our findings are consistent with current literature, highlighting a positive relationship between firms' environmental standards and their profitability and market performance. Different significance levels and temporal effects characterize the relationships.

KEY WORDS

CSR, OPERATING PERFORMANCE, FINANCIAL PERFORMANCE, SUSTAIN-ABILITY, GREEN SCORE, MARKETS

1. INTRODUCTION

Sustainability has become a mantra for the 21st century (Dyllick, 2002). Humankind is facing various social, ecological and economic challenges in modern times. Climate change and scarcity of resources, among them, gain additional significance because of their impact on all three fields. These issues have taken global dimensions and posed new challenges for governments, as well as public and private institutions worldwide. A commonly shared idea is that a transition to more environmentally and socially responsible conducts would allow preserving the earth's ecosystem and drive economic growth.

In an era that views firms as a disconnected part of societies and a source of externalities, the corporate world is met with the challenge to falsify skepticism around the contribution of companies to their environment and society that goes beyond their profit-related objectives.

Among management scholars, environmental capabilities are one of the most debated issues of recent years. Various academics have investigated how managers choose among various strategies able to improve a firm's environmental and financial performance (Dowell, 2000; King, 2001 and 2002). Another branch of researchers, instead, has explored when managers select to have their firms participate in various forms of self-regulation in order to improve green management practices (Berchicci, 2007).

We commence our study with a review of current literature addressing the effect of environmental practices on firms' performance and the development of our hypotheses. Proceeding, section 3 elaborates on the data selection and sample construction process, while the applied methodology is explained in section 4. The findings of the present study are outlined in section 5. Concluding, section 6 further discusses the study's outcomes along with their major implications and provides insights for future developments in the field of interest.

2. LITERATURE REVIEW AND HYPOTHESES

For many years, scholars have assumed that investments to protect the earth's ecosystem provide low financial benefits for firms. Recently, however, due to the growing importance of the concept of CSR, the linkage between society and firms has become a pillar of modern corporate strategy. Researchers agree that investments in this field can provide benefits both for the environment and for firms (Nelson, 1994).

Nevertheless, the mechanisms underlying this relationship (Russo and Fouts, 1997), with a particular focus on the "reverse causality" effect (Hart, 1996; King, 2001), are still the center of debate. Although an extended amount of academic works finds a strong relationship between green and financial

performance of firms, it still remains to be verified whether it is indeed CSR improvements that drive higher financial benefits or the other way around.

In 1995, Porter and van der Linde proposed, in an innovative article, that *"by stimulating innovation, strict environmental regulations can actually enhance competitiveness"* and thus *"partially or more than fully offset the costs of compliance"* (Porter hypothesis). This claim stimulated organized research in the field of the link between environmental and financial goals (Berchicci, 2007).

According to a recent U.S. research, people are willing to pay more for products that save the environment (Rosewicz, 1990). Shareholders reflect a similar approach. In fact, many international firms now publish separate annual environmental performance reports (Klassen, 1996) as a response to the latter.

Strong environmental management is viewed either as a competitive asset or a liability for firms. Interestingly enough, there is a lack of consensus around this aspect through literature in the field, despite the fact that the majority of researchers posit that a relationship between environmental and economic performance exists and it is positive and statistically relevant (Kim, 2014).

Even with respect to the mere definition of CSR there seems to be no wide ground of consensus regarding practices and conducts involved. According to Aguinis (2012), *"the definition of CSR refers to policies and actions by organizations, such policies and actions are influenced and implemented by actors at all levels of analysis (e.g., institutional, organizational, and individual)"*. Corporate sustainability can also be defined as *"meeting the needs of a firm's direct and indirect stakeholders (such as shareholders, employees, clients, pressure groups, and communities), without compromising its ability to meet the needs of future stakeholders as well."* (Brundtland, 1987).

CSR includes environmental management as an important, but not unique, corporate task. As a matter of fact, environmental management is one significant component of functional strategy. Given that strategy is defined as the pattern of structural and infrastructural choices that guide firm decisions and support objectives, environmental management affects both structural and infrastructural components and, as a consequence, the underlying management system. It is able to provide market gains and cost savings at the same time (Klassen, 1996). Due to the aforementioned reasons, to understand and measure the magnitude of the link between environmental and financial performance is crucial nowadays. Researchers have applied different statistical and econometrical models to test the hypothesis that a relationship between a firm's financial performance and degree of environmental responsibility exists. Notwithstanding this fact, there is an intense debate among managers, practitioners and academics around the *"does it pay to be green?"* question (King, 2001). Most recent literature has also used different financial and environmental measures to represent performances: (1) Tobin's Q, ROA, ROI, ROIC or ROE as financial performance indicators or (2) capital expenditure on

pollution control, emission of toxic chemicals, spills accidents, the percentage of emission reduction or the degree or resources reduction as environmental performance indicators (Hart, 1996; Hart, 1997; Khanna, 1999; Russo & Fouts, 1999; Christmann, 2000; King, 2001; Konar, 2001; Wagner, 2005; Link, 2006; Lech, 2013).

The results highlight, in many cases, a positive and statistically relevant relation between environmental and financial variables (Hart, 1996; Klassen, 1996; Russo & Fouts, 1997; Dowell, 2000; Christmann, 2000; King, 2001). Many researchers agree that superior environmental performance is linked to better financial performance (Porter, 1995). *"Moreover, they report a causal relationship in both directions: firms with slack resources invest more in environmental and social practices, but green practices help them to be more efficient and competitive"* (Berchicci, 2007). In contrast with the studies that support a connection between environmental and financial goals of firms, a series of authors indicate the existence of a null or negative relation between strong environmental practices and a firm's financial results (Kanna, 1999; Benito, 2005; Wagner, 2005; Link, 2006; Lech, 2013). According to the most recent literature in the field of green management, there is strong, but not unequivocal, empirical evidence that:

1. High level of emissions are associated with negative abnormal stock price returns;
2. Firms with strong environmental management achieve better stock price returns than firms with poor practices;
3. Environmental performance awards result in significant positive abnormal returns (Dowell, 2000).

This paper aims to test the relationship between a firm's environmental practices and its financial performance using an environmental management measure, as independent variable, created by the authors and labelled "green score". The "green score" variable derives from the firms' score on six environmental dimensions (variables) that synthetize the environmental conduct of the firm in a more inclusive and robust manner and provide a stronger measure of environmental practices. The dependent, independent and control variables are analyzed in detail in the methodology section. These variables have been chosen following the most relevant literature in the field (except for the environmental measure that has been tailored for this study).

We run three different regressions, using the multiple Ordinary Least Square (OLS) analysis in order to test the following hypotheses:

Hypothesis 1: Stronger environmental behavior (green score) in time period t enhances the firm's operating performance measured (ROIC) in time period t.

Hypothesis 2: Stronger environmental behavior (green score) in time period t enhances the firm's financial market performance (Tobin's Q) in time period t.

Hypothesis 3: Stronger environmental behavior (green score) in time period t enhances the firm's financial performance (ROE) in time period t.

3. DATA COLLECTION

The sample frame for this study was drawn from the S&P Global 1200 index[1]. Data regarding the environmental and financial performance of firms were originated from Thomson Reuters Datastream database[2]. The original sample has been initially downsized to account for companies that lacked relevant data. After adjusting the sample for this first criterion and in order to obtain a balanced panel dataset, a total of 689 firms' data were available. The sample has been further filtered down, in order to remove outliers (Stock & Watson, 2005). The final sample is comprised of 621 firms and 3,105 observations.

The period tested spans from 2009 to 2013. This period of analysis has been deliberately chosen both to cover a significantly long time period of analysis and to avoid the impact of the recent financial crises (2007- 2008) on the sample data, in particular with respect to measures reflecting financial performance. The sample is big enough to be considered free from a non-normal distribution bias, according to the central limit theorem and the law of large numbers. The central limit theorem states that the distribution of the sum (or average) of a large number of independent, identically distributed (i.i.d.) variables will be approximately normal, regardless of the underlying distribution (Stock & Watson, 2005). Tables 1 and 2 summarize the main descriptive characteristics of the final sample, in terms of geographic area3 and industry sector.

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[1] The S&P Global 1200 provides efficient exposure to the global equity market. Capturing approximately 70% of global market capitalization, it is constructed as a composite of 7 headline indices, many of which are accepted leaders in their regions. These include the S&P 500® (US), S&P Europe 350, S&P TOPIX 150 (Japan), S&P/TSX 60 (Canada), S&P/ASX All Australian 50, S&P Asia 50 and S&P Latin America 40. (Source: http://us.spindices.com/indices/equity/sp-global-1200)

[2] Thomson Reuters Datastream is the world's largest financial statistical database covering an unrivalled wealth of asset classes, estimates, fundamentals, indices, and economic data. This dataset offers more than 140-million-time series, over 10,000 data types, and over 3.5 million instruments and indicators. Source: http://financial.thomsonreuters.com

Table 1. Sample composition by geographic area

GEOGRAPHIC AREA[3]	NUMBER OF FIRMS	PERCENTAGE IN SAMPLE
U.S. and South America	314	50%
Europe	175	28%
Asia	115	19%
Rest of the world	17	3%
TOTAL	**621**	**100%**

Table 2. Sample composition by industry

INDUSTRY	NUMBER OF FIRMS	PERCENTAGE IN SAMPLE
Industrials	135	22%
Consumer Goods	104	17%
Consumer Services	83	13%
Basic Materials	64	10%
Technology	60	9%
Healthcare	56	9%
Oil & Gas	55	9%
Utilities	37	6%
Telecommunications	16	3%
Financials	11	2%
TOTAL	**621**	**100%**

U.S. and South America are the most representative geographic areas[1] including 50% of the entire sample firms, followed by Europe with 28% and Asia with 19% of the firms studied (other countries represent only 3% of the sample). Concerning the sample composition by industry, the industrial sector is the prevailing one with 22% over the whole sample, followed by consumer goods

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[1] U.S. and South America: Brazil, Canada, Chile, Mexico, and U.S.; Europe: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherland, Norway, Spain, Sweden, Switzerland, and U.K.; Asia: China, Hong-King; Japan, Republic of Korea, Singapore, and Taiwan; Rest of the world: Australia, and Bermuda

and consumer services with 17% and 13% respectively. These three sectors, considered together, represent 50% of the sample. The smallest presences, with around 3% each, are those of telecommunications and financial industry sectors.

4. METHODOLOGY

The aim of this paper is to measure the impact of a firm's CSR commitment, measured by a "green score", on its financial performance. We apply the multiple ordinary least square regression (OLS) in order to test our hypotheses in the empirical part of our study.

This paper aims to test the impact of the CSR level adopted by a firm on three different measures of financial performance. We try to decode if it *"really pays to be green"* when it comes to the firm's operating and financial performance (ROIC and ROE respectively), as well as its market performance (Tobin's Q).

The aforementioned variables are selected by the authors and widely applied in relevant literature (Santoso, 2014; Benito, 2005; Heras-Saizarbitoria, 2011; Hart, 1996; King, 2001) to depict different aspects of performance examined in this study.

4.1. DEPENDENT VARIABLES

1. ROIC: As a variable ROIC represents the return on invested capital. It is a measure of a firm's profitability calculated as net income divided by total assets[1]. ROIC gives a good indication of a firm's actual capacity to generate returns through the utilization of its entire productive asset base (such as equipment, goodwill, intangible assets) expected to generate earnings (Pätäri, 2011) without considering the firm's financial structure (as ROE does). ROIC reflects the operating performance of firms in this study's sample.

2. TQ: Tobin's Q is the variable selected to represent the firm's market performance. It is measured as the market value[2] of a firm relative to the replacement costs of its tangible assets

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[1] Total Assets represent the sum of total current assets, long-term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets. Source: Datastream, Thomson Reuters.

[2] Market value is the share price multiplied by the number of ordinary shares in issue. The amount in issue is updated whenever new tranches of stock are issued or after a capital change. Source: Datastream, Thomson Reuters.

(Lindenberg, 1981). The variable is used to capture a firm's marketability.

3. ROE: As a variable ROE represents the return on equity. It is a traditional measure of profitability calculated as the firm's net income[1] divided by its shareholder's equity[2]. ROE, in our case, is chosen in order to capture the financial performance of firms examined.

4.2. INDEPENDENT VARIABLE

A wide stream of research has measured environmental performance as the degree to which firms cause toxic pollution (Hart, 1996; Khanna, 1999) or as the emissions, or resources, reduction (as a percentage) during the time period considered (Christmann, 2000; Kim, 2014).

Our contribution to existing literature is the examination of the widely studied relationship between environmental performance and a firm's profitability employing a more inclusive and robust measure for environmental performance. Past research in the field has managed to produce invaluable insights regardingthe connection between CSR commitment and the financial performance of firms, applying different methodologies and various measures to capture both performance metrics, as previously analyzed, and environmental conduct. However, the latter has widely been depicted in studies through variables that reflect single dimensions of CSR practices.

The purpose of this paper is to approach sustainability attempts realized by firms in a more elaborate and comprehensive manner, creating a clear definition of environmental responsiveness. Thus, we created an independent variable, called "green score" (GS), which reflects the overall firm's environmental performance with respect to six different CSR dimensions.

"Green score" derives from the consideration of four dummy and two continuous variables (later transformed in dummy variables). Each of the sample's firms is assigned with a score with respect to each CSR dimension examined. Values equal to 1 represent positive environmental performance, while values equal to 0 represent low environmental performance with respect to the underlying CSR dimension.

The six CSR dimensions that give birth to our independent variable are the following:

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[1] Net Income – bottom line represents income after all operating and non-operating income and expense, reserves, income taxes, minority interest and extraordinary items. Source: Datastream, Thomson Reuters.

[2] Common Equity represents common shareholders' investment in a company. Source: Datastream, Thomson Reuters.

1. **CSR Sustainability Committee**: does the company have a CSR committee or team? The variable assumes value 1 if the company has a CSR committee or team and value 0 if the company does not have it;
2. **CSR Sustainability Index**: does the company report on belonging to a specific sustainability index? The variable assumes value 1 if the company reports on belonging to a specific sustainability index and value 0 if the company does not report so;
3. **CSR Sustainability Reporting**: does the company publish a separate sustainability report or a section in its annual report on sustainability? The variable assumes value 1 if the company publishes a separate sustainability report or a section in its annual report on sustainability and value 0 if the company does not do so:
4. **Corporate Responsibility Awards**: Has the company received any award for its social, ethical, community, or environmental activities or performance? The variable assumes value 1 if the company has received one or more awards for its social, ethical, community, or environmental activities or performance and value 0 if the company has not received any such awards;
5. **Emission reduction**: It is a continuous variable that we transformed in a dummy variable assuming value 1 if the firm's emission reduction value was bigger than the median value of the whole sample emission reduction values and value 0 if it was smaller than the median;
6. **Resources reduction**: It is a continuous variable that we transformed in a dummy variable assuming value 1 if the firm's resources reduction value was bigger than the median value of the whole sample resources reduction values and value 0 if it was smaller than the median.

The distinction between positive and negative performances is conducted upon the basis of sample mean values regarding each CSR practice. Further on, firms receive an overall scoring by summing their respective performance on each of the six CSR related sectors. As implied, the "green score" variable can take values from 0 to 6.

Based on the latter, we finally separate the firms observed into two groups: environmentally responsible firms, which are represented by "green score" values higher than 3, and less responsible firms, which present "green score" values lower or equal to 3. All data representing the CSR aspects considered come from Datastream.

4.3. CONTROL VARIABLES

The last group of variables includes a series of control variables commonly used in literature (Hart, 1996; King, 2001) to support our analysis:

1. **FS**: The variable represents firm size calculated as the natural logarithm of the company's total assets.
2. **LEV**: The variable represents the firm's leverage calculated as its total debt divided by the shareholder's equity.
3. **R&D I**: The variable represents the firm's research and development intensity calculated by research and development expenses divided by the firm's net sales or revenues[1].
4. **E%:** The variable represents the firm's EBITDA margin, a measure of the firm's profitability calculated by dividing EBITDA[2] by net sales or revenues.

Before proceeding with the analysis method, Table 3 provides the matrix correlation concerning the dependent, independent and control variables considered in our study. As noted, the correlation coefficients among variables are low and only in one case (between R&D intensity and EBITDA margin) such coefficient exceeds the value 0.5 (positive or negative). The highest correlation coefficient (0.74) is present between two of the dependent variables (ROE and ROIC), so we can exclude the case for collinearity bias in the sample.

Table 3. Matrix correlation

	R&D I	FS	LEV	E%	ROE	ROIC	TQ	GS
R&D I	1.00							
FS	-0.03	1.00						
LEV	-0.05	0.10	1.00					
E%	-0.59	-0.08	-0.04	1.00				
ROE	-0.19	-0.27	-0.05	0.38	1.00			
ROIC	-0.16	-0.27	-0.20	0.34	0.74	1.00		
TQ	0.16	-0.39	-0.23	0.08	0.43	0.47	1.00	
GS	-0.03	0.16	0.08	-0.04	0.01	-0.02	-0.16	1.00

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[1] Net Sales or Revenues represent gross sales and other operating revenue less discounts, returns and allowances. Source: Datastream, Thomson Reuters.

[2] Earnings Before Interest, Taxes and Depreciation (EBITDA) represent the earnings of a company before interest expense, income taxes and depreciation. It is calculated by taking the pretax income and adding back interest expense on debt and depreciation, depletion and amortization and subtracting interest capitalized. Source: Datastream, Thomson Reuters.

Table 4, instead, presents the descriptive statistics for the entire sample. As inferred by the similar values assumed by the mean and median, outliers do not affect the dataset.

Table 4. Descriptive statistics for the entire sample

	MEAN	MEDIAN	ST. DEV.	MIN	MAX
R&D I	0,03	0,01	0,14	0,00	5,40
FS	17,38	16,89	2,19	13,38	26,07
LEV	0,62	0,52	0,98	-35,70	2,30
E%	0,20	0,17	0,22	-5,88	1,66
ROE	13,75	12,67	14,46	-96,19	98,63
ROIC	10,10	8,86	11,62	-71,33	244,56
TQ	1,25	0,93	1,13	0,00	10,09
GS	0,63	1,00	0,48	0,00	1,00

Passing to the data analysis part of the paper, we apply the OLS regression. The OLS regression represents a statistical technique which attempts to find the function that most closely approximates the sample's data in order to explain if and to what extent a relationship between the dependent and independent variables used exists.

To test our hypotheses we run three versions of the model that show how the firm's degree of CSR commitment affects the three aspects (dependent variables) of performance examined here. *"This approach is currently used in empirical studies on the value relevance of financial and non-financial information"* (Lourenço, 2012). Moving forward, we ran the Hausman test to select between fixed and random effects analysis to make render our model more robust.

The Hausman test compares a more efficient model against a less efficient but consistent model to make sure that the more efficient model gives consistent results. *"Because firms may differ in ways that we do not capture with our independent variables, we include dummy variables that allow each firm to have a different constant value. This is a fixed effects analysis because it reduces the possibility that a firm's fixed attributes confound the analysis".*

This kind of regression requires that changes in independent variables be associated with changes in dependent variables (King, 2001). The test result suggests that we may use the fixed effects model for our sample. In sum, to run the regressions, we used a panel multiple OLS model with fixed effects controlled for temporal dummy variables. In this work, the equations used to

explain the relationship between CSR and firm's financial performance resulted to be the following:

$$ROIC = \alpha + \beta 1\ R\&D\ I + \beta 2\ FS + \beta 3\ LEV + \beta 4\ E\% + \beta 5\ GS + \varepsilon i$$

$$Tobin's\ Q = \alpha + \beta 1\ R\&D\ I + \beta 2\ FS + \beta 3\ LEV + \beta 4\ E\% + \beta 5\ GS + \varepsilon i$$

$$ROE = \alpha + \beta 1\ R\&D\ I + \beta 2\ FS + \beta 3\ LEV + \beta 4\ E\% + \beta 5\ GS + \varepsilon i$$

5. RESULTS

The main findings of our study are presented and analyzed in this section. Our results are robust to the effect of multicollinearity, outliers and non-linearity. We run a Variance Inflation Factor test (VIF) to be sure that multicollinearity does not affect the panel.

The highest VIF values in the three regression models are considerably within the limit, as none of VIF approached the critical value of 10 (Stock & Watson, 2005). Additionally, we run a White test to rule heteroskedasticity out as bias within the panel.

The test results permit us to consider heteroskedasticity a null issue. Furthermore, the results of the three models run to test our hypotheses are demonstrated in Table 5. A positive relationship between the firm's CSR level, measured by the "green score", and its operating performance (ROIC) exists and is significant at a 10% level, confirming Hypothesis 1.

Hypothesis 2 is also confirmed and more strongly supported by data at a 1% significance level. Finally, Hypothesis 3 is not supported by our findings, where a positive but not significant relationship between environmental conduct and a firm's financial performance (ROE) is highlighted. R-square values (coefficient of determination), as shown in Table 5, range between 73% and 88%. We can, therefore, assume that there is a high explanatory power in our models.

Our results appear consistent with current literature in the field (Hart, 1996; Dowell, 2000; King, 2001; Kim, 2014).) and provide insight to a positive and significant relationship between the operating and market performance of companies and the level of environmental standards they employ.

The strong positive results evidencing a relationship between environmental conduct and a firm's profitability and marketability raise further interest into hypothesis 3. Our findings imply that firms with a higher degree of CSR-related activities in time period t do not perform better than firms with lower environmental behavior standards, in terms of return on equity.

In order to test whether ROE benefits of the firms' stronger environmental practices with a temporal lag, as suggested by Hart (1996) in his paper entitled *"Does it pay to be green?",* we test an alternative hypothesis (3b).

Hypothesis 3b: Stronger environmental management behavior (green score) in time period t enhances the firm's financial performance (ROE) in time period t+1. We test hypothesis 3b running a multiple GLS regression. However, the new model tests the dependent variable (ROE) for a one-year lag (ROE t+1).

Opposite to the initial model run for ROE, we support the testing of hypothesis 3b with a random effects analysis due to the results of the Hausman test. Results indicate that, in the alternative hypothesis, a positive relationship between "green score" and ROE exists and is significant at a 10% level. Hypothesis 3b, opposite to hypothesis 3, seems to be confirmed. The latter reinforces the concept that firms with stronger environmental performance achieve better financial outcomes, also in terms of return on equity.

The results of this study, consistent with the prevalent literature in the field of environmental management, suggest that it pays to be green. Better operating, financial and market performance can be expected by sustainable firms relative to competitors that appear less environmentally committed.

We, therefore, agree with Pätäri (2011), that *"investing in sustainable development does not have to be seen as a sacrifice or as a competing goal in relation to value creation. Instead, companies that are active in the CSR field are also generally more profitable"*.

Table 5. Impact of "green score" on ROE, ROIC, Tobin's Q and ROE t+1

PREDICTORS	DEPENDENT VARIABLES			
	ROE	ROIC	TOBIN'S Q	ROE t+1
CONSTANT	36.77	41.21**	11.47***	19.12***
	(33.35)	(21.26)	(2.64)	(1.91)
R&D INTENSITY	38.27***	24.39***	0.77*	1.83
	(8.36)	(5.63)	(0.39)	(2.25)
FIRM SIZE	2.07	-2.54**	-0.61***	0.86***
	(1.95)	(1.24)	(0.15)	(0.10)
LEVERAGE	0.68	-0.69	-0.02	0.18
	(0.54)	(2.47)	(0.01)	(0.21)
EBITDA MARGIN	48.83***	32.83***	0.65**	15.43***
	(6.90)	(4.69)	(0.27)	(1.27)
GREEN SCORE	1.12	0.88*	0.09***	0.85*
	(0.72)	(0.51)	(0.03)	(0.45)
ROE t+1	-	-	-	0.46***
				(0.02)
R^2 (LSDV)[10]	0.73	0.74	0.88	0.73
Number of firms	621	621	621	621
Number of observations	3,105	3,105	3,105	3,105

Note: temporal dummies are included but not presented in the model. Standard errors are in the parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$ (two-tailed test). LSDV[1]

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[1] LSDV10: Least Squares Dummy Variables.

6. CONCLUSION

A lower significance of the impact of environmental efforts on performance appears for the operating performance of the firm (ROIC), at 10%, and can be explained assuming that investments in sustainable activities would weaken the firm's ability to control its costs and their relative burden on profitability. In the light of these findings, hypotheses number one and two are confirmed. Stronger environmental management practices in time period t enhance the firm's operating and market performance measured respectively by return on capital employed (ROIC) and Tobin's Q in time period t.

Over the past decades, CSR has gained grounds as one of the most debated issues for the corporate world. Nevertheless, there are many schools of thought with respect to the real implications of CSR practices (Carraro & Siniscalco, 1996; Lyon & Maxwell, 1999; Segerson & Li, 1999; Alberini & Segerson, 2002). Among the scholars and practitioners in favor of a win-win CSR reality prevails the notion that environmentally responsible companies generate higher returns and achieve cost-cuttings through innovation (Porter & Kramer, 2011). In the meantime, opponents of such beliefs stay reluctant on the real association of CSR practices with the actual profitability of a firm and support a market trend approach on the matter. The latter bases CSR benefits mainly on the market's perception of a responsible company as reflected in its stock movement.

Opposite to the operating and market performance that seem to improve the more environmentally responsible practices are adopted, the financial performance of firms appears to improve, but statistically insignificantly so, for same year observations. In agreement with Hart (1996), a possible explanation of this phenomenon could be that ROE *"reflects not only operating efficiency, but also the capital structure of the firm. The impact of emissions reduction on ROE, thus, works through its effect on ROIC with capital structure as a confounding factor. Hence a relationship that is less immediate than that between emissions reduction and ROIC".*

In addition, it could be possible that a temporal lag is necessary in order for firms with a stronger environmental management to benefit from a cost of capital reduction (that influences ROE), since it is necessary that markets become aware of the firm's environmental performance reflecting such performance in the magnitude of the weighted average cost of capital.

To argue in favor of the latter come the findings that support hypothesis 3b, where ROE shows a significant improvement (significant at 10%) for firms adopting higher levels of CSR standards, but this time in year t+1. Another contribution of this study is its approach to the relationship between CSR commitment and firm performance through the lenses of whether the results btained reveal a real profitability improvement or a market acceptance through better valuations.

At this oint, the different levels of significance observed within the models testing the impact of CSR on erformance can infer crucial implications regarding the nature of such relationship. hile in all cases a positive relationship is outlined, the effect that "green score" creates on the marker erformance of the firm is significantly higher and more relevant, providing support to the idea that the major ontribution of CSR practices to a firm's performance derives from the market's perception of more or less esponsible firms incorporated in their respective market values.

This paper analysed whether firms with stronger environmental practices, measured by a proxy created by he authors and called "green score", perform better than firms with a lower eco-friendly approach. he crucial aim is to explore the relationship between CSR-related activities and firms' operating and inancial performance from different perspectives, including both the traditional operating and financial erformance measures and a market measure such as the Tobin's Q (Pätäri, 2011). e find evidence of a positive relationship between environmental performance and financial achievements but we cannot prove the direction of the causality (Hart, 1996; King, 2001).

Further work could xamine the "reverse causality" effect: do stronger environmental activities lead to enhanced profitability or o more profitable companies tend to invest in more environmental activities? In our case, no industry election has been performed, giving rise to an interest in the results obtained through studies with a specific ndustry focus, where the relationship investigated by us may appear less or more significant, practices may lter and time lags may be different.

Additionally, future studies can use different metrics to capture nvironmental performance based on even more CSR dimensions, as well focusing on the idiosyncratic CSR djustments of specific industries or geographic areas and time periods. Finally, it may prove of great otential researching the risk associated to CSR practices when those are not well adjusted to the firm or ppreciated by the market.

LITERATURE

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CSR I PERFORMANSE KOMPANIJE: STVARNI BENEFIT ILI SREĆNA TRŽIŠTA? PODACI IZ VODEĆIH KOMPANIJA NA BERZI*

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REZIME

Čovečanstvo se trenutno suočava sa nizom socijalnih, ekonomskih i ekoloških izazova koji primoravaju kompanije da se usklade sa novim standardima i očekivanjima. Uprkos konsenzusu o postojanju zelenog trenda, nije ostvaren jednak konsenzus u vezi sa stavom koji tržišta imaju po ovom pitanju. Ova studija ima za cilj da testira uticaj CSR nivoa koji su usvojile kompanije (meren pomoću; zelenog skora) na njihove operativne (ROIC) i finansijske (ROE) performanse, kao i tržišnu percepciju (Tobinov Q). Naši rezultati se poklapaju sa literaturom i naglašavaju pozitivan odnos između ekoloških standarda kompanija i njihove profitabilnosti i tržišne performanse. Različiti nivoi značajnosti i temporalni uticaji karakterišu ovaj odnos.

KLJUČNE REČI

CSR, OPERATIVNE PERFORMANSE, FINANSIJSKE PERFORMANSE, ODRŽIVOST, ZELENI SKOR, TRŽIŠTA