Corporate sustainability effectiveness: social and environmental reports grade of disclosure and economic performance

Donato Calace, Ph.D. Student

LUM Jean Monnet University

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1. BACKGROUND THEORY

*“development that meets the needs of the present
without compromising the ability of future
generations to meet their own needs”
Our Common Future (1987, p.41)*

«there's no alternative to sustainable development»

(Nidumolu, Prahalad, & Rangaswami, p.57, 2009)

Nowadays, the leading paradigm for future development is the sustainable one. There is a growing consensus from institutions, regulators, stakeholders, managers and researchers that believe in the “**sustainability imperative**” (Lubin & Esty, 2010)

A business case for sustainability

Most of research has proved a business case for sustainability, showing that social and environmental friendly policies and strategies pay in terms of superior financial, operative and competitive performance

Sustainability has found its conversion into the firm dimension. Concepts and theories such as corporate social responsibility (CSR), corporate sustainability, triple bottom line and sustainable entrepreneurship were born in order to describe whether and how sustainability exist at the firm level (Dyllick & Hockerts, 2002; Elkington, 1997; Van Marrewijk, 2003; Young & Tilley, 2006; Schaltegger & Wagner, 2011)

At the business level, the “mantra” of sustainability is “often equated with eco-efficiency”, disregarding the effectiveness of sustainable strategies and policies

(Dyllick & Hockerts, 2002)

There is a growing interest in finding in which terms and with which effects sustainability paradigm can exist at business level, i.e. “to bring sustainability down to earth” (Reinhardt, 1999;

Dyllick, 1999; Fussler & James, 1996).

the issue is not anymore whether being “green” or not, , but how being “green”, i.e. in which ways and following which principles sustainable strategies are implemented and carried out (Roca & Searcy, 2011; Smith, 2003)

“in general corporate sustainability and CSR refer to company activities – voluntary by definition – demonstrating the inclusion of social and environmental concerns in business operations and in interactions with stakeholders”

Corporate Sustainability theory

(Dyllick & Hockerts, 2002)

Corporate sustainability theory aims to **move beyond the efficiency** point of view, building an inclusive and effective framework of social, environmental and economic value

While efficiency deals with *doing things right*, effectiveness regards *doing right things*, that is meeting the objective being an *ecologically sustainable* company by answering the question: *how close is the firm to the environment's carrying capacity?* Efficiency “is not a strategy over the long term, because it does not reach deep enough” (McDonough & Braungart, p. 85, 1998)

The aim of this study **is not** to demonstrate whether being green pays or not

The analysis moves beyond the traditional question “does it pay to be green?”, exploring **how different sustainable stances determine financial performance.**

Level of disclosure in GRI reports is proposed as indirect proxy of corporate sustainability effectiveness

Higher levels of disclosure represent a **stronger attitude towards sustainability** (Dawkins & Fraas, 2010), enacted by effective sustainable strategies and policies

Level of disclosure and environmental performance

Figure 1: Curvilinear relationship between sustainable performance and sustainable disclosure. Author's elaboration on Dawkins and Fassin (2010)

- **Hard disclosure:** measurable, verifiable, non imitable, used to underline superior performance;
- **Soft disclosure:** unmeasurable, unverifiable, used to defend legitimacy

- Empirical evidence regarding level of disclosure and environmental performance **is mixed**;
- there are several both **internal and external factors**, further than the sustainable performance, inducing firms' disclosure: stakeholders' pressures, mandatory requirements, industrial peers' strategies, image and reputation, media coverage;
- There are two opposite stances: **voluntary disclosure theory** (positive relationship) and **socio-political theories** (negative relationship);
- Recent studies are trying to **overcome this dichotomy** in theory, looking for an integrative interpretation of the two stances. The *quality* of disclosure is the key in this process. "Companies with superior environmental performance [...] seek to reveal their performance type, something not directly observable to investors and other stakeholders, through direct voluntary disclosures that cannot be easily mimicked by poor performers" (Clarkson, Li, Richardson, & Vasvari, p.6, 2007).

Economic performance

Academic positions regarding the effects of firms' sustainable strategies and policies on economic performances are various.

On one side, there are scholars who believe that a **sustainability-driven attitude leads firms to increasing efficiency, strengthening brand and market value, and improving competitiveness** (Hart & Ahuja, 1996; Porter & Van der Linde, 1995; Porter & Kramer, 2011).

On the other side, there are opposing views according to which **the only responsibility of a company is the use of its resources to engage in activities designed to increase profits** (Friedman, 1970; Bragdon & Marlin, 1972; Vance, 1975; Brammer, Brooks, & Pavelin, 2006)

Concerning economic measures, researchers distinguish between financial performance and operating results. This study uses **market capitalization** as measure of economic performance.

Empirical results show that **sustainable performance has higher significance in terms of financial measures**, insofar as these last **better stand for long-term outcomes**: improvements in the short-term are marginal or not significant at all (Pogutz & Russo, 2009; Connelly & Limpaphayom, 2004; Lee, Faff, & Langfield-Smith, 2009)

Hypotheses development

Hypothesis 1: The issuance of a GRI referenced sustainability report has a positive impact on firms' market value

The publication of a report, even if guided by GRI guidelines, **does not represent the maximum level of disclosure**. "it may be that companies that have adopted **a full disclosure** have done so because they fundamentally believe that their strengths outweigh their weaknesses and are **committed to environmental disclosure as a matter of value**".
(Dawkins and Fraas, 2010, p.385-386)

Hypothesis 2: the issuance of a full-disclosed GRI report has a higher positive impact on firms' market value than the single publication of a GRI report

2. METHODOLOGY

The sample

In recent years **large multinational enterprises** have dominated sustainability reporting. (Brown, de Jong, & Levy, 2009),

I have selected the companies listed in the **Fortune Global 500 2012** ranking as the sampling frame. I have collected financial data for a **period of analysis of three years** (2010, 2011, 2012), thus originating a dataset of **1500 firm-year observations**.

After having **excluded** outliers, firms missing financial data and companies belonging to the banking, financial and insurance industries, the final sample results in a **balanced panel consisting of 537 observations, 179 per year**.

Other researchers have encouraged **a longitudinal study approach**, as “the application of voluntary disclosure theory to a cross-sectional comparison of environmental disclosures may be partly unsuitable” (Clarkson, Li, Richardson, & Vasvari, 2011, p.55).

The sample

The final sample includes companies operating in **7 industries** (agriculture, chemicals/heavy industry, light industry, services/IT, energy, shipping/transport/distribution and wholesale/retail/food), coming from **26 different countries representing 6 world areas** (North America, South America, Europe, Asia, Far East, Oceania).

industry	No. of firms	Avg. profits (B. \$)	Std. Dev. Profits (B. \$)	Avg. Assets (B. \$)	Std. Dev. Assets (B. \$)	Avg. net revenues (B. \$)	Dev. Std. net revenues (B. \$)
agriculture	4	2,71	1,70	38,81	10,67	49,30	31,74
chemicals/ heavy industry	24	7,36	6,06	87,02	37,94	64,18	50,03
energy	29	10,36	12,53	125,44	109,45	117,92	122,14
light industry	55	3,46	5,28	85,00	118,94	63,06	55,57
services/IT	23	5,85	5,20	103,37	78,34	66,70	33,65
shipping/ transport/ distribution	16	2,12	2,18	62,18	70,04	62,70	31,88
Wholesale/ retail/food	28	3,61	4,11	52,12	45,43	72,31	82,71

Why GRI level of disclosure?

This measure has **three** main advantages.

- **First**, it is endowed with **hard disclosure**, which is verifiable, measurable and not imitable by poor sustainable performers. Therefore, it overwhelms the debate between the voluntary disclosure theory and the socio-political one, suggesting a combination of the two.
- **Second**, GRI Guidelines are **the most recognized framework** for sustainability reporting and exhibits several features of an established institution, such as broad uptake and legitimacy.
- **Third**, GRI reporting framework includes environmental, societal and economic disclosures, applying a **triple bottom line approach**.

The Global Reporting Initiative is a non-profit organization founded in 1997 in Boston. Initially, it was a department of the Coalition for Environmentally Responsible Economies (CERES) with the mandate to **develop an inclusive, multi-stakeholder reporting framework**. Today, the Sustainability Disclosure Database features more than **13000 reports from over 5000 organizations**.

GRI Application Level

The “Applications Levels” (AL) system **assesses the grade of disclosure**, giving a score that goes from **C (minimum disclosure)** to **A (full disclosure)**. Report makers self-declare their Application Level, and, in addition, they can have their self-declaration externally assured by a third party (receiving a “+” to their AL) and/or request the GRI to check the self-declaration.

Profile Disclosure	Report on: 1.1 2.1-2.10 3.1-3.8, 3.10- 3.12 4.1-4.4, 4.14-4.15	Report on all criteria listed for level C, plus: 1.2 3.9-3.13 4.5-4.13,4.16-4.17	Same as requirement for Level B
Disclosure on Management Approach	Not required	Management approach disclosure for each indicator category	Management approach disclosure for each indicator category
Performance Indicators & Sector Supplements Performance Indicators	Report fully on a minimum of any 10 performance indicators, including at least one from each of: social, economic, and environment.	Report fully on a minimum of any 20 performance indicators, including at least one from each of: economic, environment, human rights, labor, society, product responsibility	Respond on each core and Sector Supplement indicator with due regard to the materiality principle by either: A) reporting on the indicator or B) explaining the reason for its omission
Report Application Level	C	B	A

SAMPLE DATA

GRI Application Level	No. of firms	Third party checked - GRI checked
A	5	Yes
A+	75	Yes
B	9	Yes
B+	26	Yes
C	2	Yes
C+	3	Yes
Undeclared	1	Yes

Econometric model

Ohlson, (1995) provides a model for examining the variation of market value, or price, of the firm at date t when a vector of other value-relevant information changes. Burnett, Skousen, & Wright (2011) **use such model in their analysis of eco-effective management**, linking firm value and corporate sustainability.

GRI Application Level is an **ordinal, non-metric, scale**. Its values are rank-ordered, but are not equidistant one from the other. For this reason, statistical techniques such as correlation, regression, and analysis of variance are not suitable. I **converted the level of disclosure into two dichotomous variables**, GRI1 and GRI2.

GRI1	No issuance of a GRI report	Issuance of a GRI report in at least one of the three years of analysis
GRI2	Publication of a GRI report with an application level score lower than A in each of the three years of analysis	Publication of a GRI report with an A application level score in at least one of the three years of analysis
VALUE	0	1

Econometric model

$$MKV_{it} = a_0 + a_1TSE_{it} + a_2ROA_{it} + a_3CFO_{it} + a_4LEV_{it} + a_5GRI1_{it} + a_6GRI2_{it} + e_{it}$$

MKV_{it} = market capitalization of firm i at date t

TSE_{it} = total shareholder equity

ROA_{it} = return on activities

CFO_{it} = cash flow from operations

LEV_{it} = long-term debt/equity

With the aim of mitigating heteroscedasticity and controlling for size, **net revenues scale MKV, TSE and CFO**. Moreover, **industry, year and geographical dummies are included** in the analysis to control their effects. To test the validity of the model beyond endogeneity issues, I run a second version of the model **with MKV values of the subsequent years (MKV_{it+1})** as dependent variable. In this case, I drop observations from the last year of analysis, **studying a two-year (2010-2011) panel**.

3. RESULTS

Model 1

Weighted Least Squares (WLS) following Mundlak (1978) technique and using 536 observations. Included 179 cross-sectional units per 3 years. Dependent variable: market capitalization. Weights based on per-units error variances.

	Coefficient	Std. Error	t-ratio	p-value	
const	-0.0138859	0.164685	-0.0843	0.93284	
Equity	1.02961	0.255027	4.0373	0.00006	***
Cash flow	0.910707	0.285011	3.1953	0.00148	***
ROA	-0.152596	0.297717	-0.5126	0.60848	
Leverage	0.00897531	0.0111752	0.8031	0.42226	
GRI1	0.292201	0.0349656	8.3568	<0.00001	***
GRI2	-0.416158	0.0383412	-10.8541	<0.00001	***
Mean equity	-0.486558	0.261224	-1.8626	0.06309	*
Mean cash flow	4.8357	0.398384	12.1383	<0.00001	***
Mean leverage	-0.0486779	0.0122448	-3.9754	0.00008	***
Mean ROA	1.95122	0.365727	5.3352	<0.00001	***
Industry control	Yes				
Geo control	Yes				
Year control	Yes				

*** indicate significance at $p \leq 0,01$

** indicate significance at $p \leq 0,05$

* indicate significance at $p \leq 0,1$

R-squared (0,88) and adjusted R-squared (0,87) show that more than two-thirds of the variance of the dependent variable are explained by the model.

The variables of interest, GRI1 and GRI2 are **both significant at 0,01 level**. GRI1 effect is positive, **confirming hypothesis 1**. Therefore, the issuance of a GRI report determines a significant positive effect on market capitalization. Surprisingly, GRI2 has a negative coefficient, **rejecting the proposition of hypothesis 2**. A full disclosure stance is not valued by the market, at least in the **period of observation**.

Model 2

Weighted Least Squares (WLS) following Mundlak (1978) technique and using 358 observations. Included 179 cross-sectional units per 2 years. Dependent variable: market capitalization $t+1$. Weights based on per-units error variances.

	Coefficient	Std. Error	t-ratio	p-value	
const	-0.254073	0.174866	-1.4530	0.14717	
Equity	-0.201208	0.344413	-0.5842	0.55947	
Cash Flow	-0.317027	0.514773	-0.6159	0.53841	
ROA	-0.715084	0.275153	-2.5989	0.00977	***
Leverage	0.0210082	0.0332721	0.6314	0.52820	
GRI1	0.327056	0.0305042	10.7217	<0.00001	***
GRI2	-0.503471	0.0354909	-14.1859	<0.00001	***
Mean equity	0.663248	0.355385	1.8663	0.06288	*
Mean cash flow	6.05749	0.650826	9.3074	<0.00001	***
Mean leverage	-0.0530417	0.0262284	-2.0223	0.04394	**
Mean ROA	2.45574	0.240566	10.2082	<0.00001	***
Industry control	Yes				
Geo control	Yes				
Year control	Yes				

*** indicate significance at $p \leq 0,01$

** indicate significance at $p \leq 0,05$

* indicate significance at $p \leq 0,1$

R-squared (0,94) and adjusted R-squared (0,93) confirm that the model explains most of the variation of the dependent variable.

This robustness check shows that the **predictors' effects are still significant at 0,01 level**. In particular, **the signs** of the variables of interest **are confirmed**. Thus, as before, data supports hypothesis 1 and rejects hypothesis 2. **GRI1** has a positive coefficient, **even greater** than the one depicted in Model 1, while **GRI2** has again a negative effect on market capitalization, with a **higher coefficient** than the one presented in Model 1. This may suggest that GRI2 sign could change if observed in a longer period.

Model 3: looking for long period advantages

Literature indicates that the outcomes of sustainable stances become manifest in **the long period**. As collected data covers **only a 3-years** period, **it is not sufficient** to draw conclusion regarding the long run.

Here, I propose to **juxtapose the interaction between GRI1 and Leverage against GRI2 and Leverage**. Indeed, high levels of financial leverage have a negative effect on market value. Evidence from research indicates that **good environmental performers take advantage of a lower cost of capital** because moneylenders consider them less risky.

Model 3

Weighted Least Squares (WLS) following Mundlak (1978) technique and using 358 observations. Included 179 cross-sectional units per 2 years. Dependent variable: market capitalization $t+1$. Weights based on per-units error variances. Interactions: GRI1xLeverage and GRI2xLeverage

	Coefficient	Std. Error	t-ratio	p-value	
const	-0.11297	0.183506	-0.6156	0.53857	
Equity	-0.0710024	0.360769	-0.1968	0.84410	
Cash flow	0.0800377	0.534866	0.1496	0.88114	
ROA	-0.624383	0.313287	-1.9930	0.04708	**
Leverage	0.0784953	0.0249592	3.1449	0.00181	***
GRI1	0.642987	0.0773257	8.3153	<0.00001	***
GRI2	-0.765435	0.0861102	-8.8890	<0.00001	***
Mean equity	0.43112	0.372393	1.1577	0.24782	
Mean cash flow	5.9606	0.677354	8.7998	<0.00001	***
Mean leverage	-0.0634581	0.0288236	-2.2016	0.02838	**
Mean ROA	2.26089	0.283094	7.9864	<0.00001	***
GRI1xLeverage	-0.54138	0.0935644	-5.7862	<0.00001	***
GRI2xLeverage	0.443684	0.108271	4.0979	0.00005	***
Industry control	Yes				
Geo control	Yes				
Year control	Yes				

*** indicate significance at $p \leq 0,01$

** indicate significance at $p \leq 0,05$

* indicate significance at $p \leq 0,1$

Measures of fit suggest that most of the variation is explained by the model (R-squared = 0,95; adjusted R-squared = 0,94)

The proposed **interactions are both significant** at 0,01. Interestingly, **GRI1xLeverage has a negative slope, while GRI2xLeverage has a positive one**. This means that grade of leverage determines a positive effect on market value only for firms which adopt a full disclosure stance. Moneylenders considers these firms as **less risky**, so their **cost of debt is lower**.

4. DISCUSSION AND CONCLUSION

This paper contributes to corporate sustainability theory in two ways.

Firstly, it provides an **innovative indirect measure** for corporate sustainability effectiveness, which is level of disclosure in GRI reports.

Secondly, it considers **different approaches towards sustainability** and analyzes their effects in term of economic performances.

Findings suggest that sustainable operating firms **have economic returns** in the period of analysis, which is **short**. However, if one considers *how much* these firms are sustainable there are still **improvement margins**. Indeed, they **are not reporting on all GRI** framework items. Under this point of view, **their sustainable strategies are less effective** than those enacted by fully disclosing companies.

A **full disclosure** stance determines a **negative and statistically significant effect** on market value in **the period of analysis**. However, fully disclosing firms **take advantage of a lower cost of debt capital**, because moneylenders consider them **less risky** than firms with partial disclosure. In the **long run**, this could be a **source of competitive advantage** for fully disclosing firms against partially disclosing ones.

Limitations and further research

- **Size bias:** the Fortune Global 500 are the biggest companies in the world, thus generalization of results is limited to this kind of businesses;
- **lack of direct testing** of the relationship between level of disclosure and sustainable performance;
- Further research could build a **simultaneous equation model** or a structural equation model in order to test sustainable performance, level of disclosure and economic performance at the same time;
- This study focus on GRI Application Level as a whole: additional research could analyze the **disclosure of specific items** of GRI non-financial reports;
- It would be of interest to understand the components and indicators of **disclosure quality**, as well as to juxtapose the effects on firm performance of **hard disclosure against soft disclosure**.

Thank you.

Donato Calace, Ph.D. Student
LUM Jean Monnet University