CORPORATE SOCIAL RESPONSIBILITY AND ITS RELATION WITH PERFORMANCE AND EARNINGS MANAGEMENT

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ABSTRACT

The aim of this study was to examine the relationship among corporate social responsibility (CSR), earnings management (EM) and the performance of entities. The sample was composed by 227 public companies listed for trading on the BM&FBovespa between 2009 and 2011. The CSR was measured by Global Reporting Initiative (GRI) as a categorical variable that indicated if the entities disclose information on CSR to GRI or not. The Jones Model and its variations were used to measure EM by means of discretionary accruals (DA). The performance was measured by the return on assets (ROA). In order to verify the influence of CSR and ROA, the CSR was measured by using the added value created and the distribution to government and employees, which extracted from the statement of value added (DVA), besides the voluntary disclosure of CSR to GRI. We find that presenting environmental information to the GRI does not influence the performance of the entities, either EM. We note that the DVA is an important information tool, both indicating the performance of companies and of EM. The main results indicate that firms with a higher ROA have higher added value, distributing their generated wealth more to the government and less to employees. With respect to EM, the larger companies perform less.

Keywords: Global Reporting Initiative; Accounting Choices; Wealth Generation; Earnings Management; Statement of value added

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1. INTRODUCTION

Entities' financial statements disclose their economic-financial position and performance. The statements are regulated by accounting norms in order to provide confidence and useful information to a wide range of users as far as economic decision making and comparability among companies.

In order to prepare the financial statements, managers make a series of estimates and judgments to interpret the firm's results and they also choose the best alternative for which accounting practices to adopt. This process of choice and judgment directly influences the book value of the company, as reflected in the accounting statements (Pelucio-Grecco, 2013).

Having flexibility with accounting standards allows managers to make choices and judgments based on self-interest as opposed to the information required by the public or users. It is important to highlight that according to IFRS (International Financial Reporting Standards), the usefulness of information required by the public users have to provide relevant information and faithful representation and it is enhanced whether it is comparable, verifiable, timely and understandable. The intentional manipulation of the results is referred to by academic literature as earnings management (EM).

Many articles have been published on EM, especially in the past two decades (e.g., Jones, 1991; Dechow et al., 1995, Kang & Sivaramakrishnan, 1995, Dechow & Dichev, 2002; Kothari et al., 2005; Ball & Shivakumar, 2008; Iatridis, 2012). Most of these studies are based on the Agency Theory, focusing on one kind of accounting users in particular: the investor. However, there are others users of accounting information, including suppliers, customers, employees, government, and finally, society as a whole.

It is important to point out that society's interest in the information of the firm goes beyond its financial position and performance. Concerns about the environment have led society to demand more environmental information from the companies.

Indeed, the requirement for information that qualifies and quantifies companies' environmental activities, referred to as corporate social responsibility (CSR), has been discussed in academic and business environments and gained increasing attention since the 70s (Tinoco, 1984; Gray et al., 1988; Christophe & Bebbington, 1992; Gray, et al., 1995; Ribeiro, 1998; Santos et al., 2007; Brown et al., 2009; Cormier et al., 2011; Campos, 2011).

Among the set of environmental information, in Brazil there is the statement of value added (DVA), which became mandatory for listed companies in 2008. The DVA provides a rich source of information about corporate performance as measured by wealth generated as well as details about how the company's wealth is distributed.

In order to provide transparency about business activities and their social and environmental impact, a global reporting initiative (GRI) derived from companies' sustainability reports were created.

GRI initiatives aim for the involvement of companies with respect to CSR. The initiatives designate a set of responsibilities known as the "triple

bottom line," which involve "people, planet, and profit." The responsibilities are laid out in social, environmental, and economic terms.

In order to make up the GRI, companies worldwide voluntarily send their sustainability reports. A GRI team then evaluates and classifies these reports, during which time the following questions often arise: Would the managers of the companies be motivated to generate environmental information to divert users' focus from possible manipulation of the results? On the other hand, would companies that voluntarily present environmental information be less likely to manipulate the results? Is there a relationship between the level of EM and their added value to society? Do companies that demonstrate better financial results have a greater environmental concern and offer more added value to society?

Some studies have focused attention to the relationship between corporate social responsibility and EM (e.g, Prior et al., 2008; Gargouri et al., 2010; Hong & Andersen, 2011; Yip et al., 2011). However, there were not found studies that exploring the relationship between CSR and EM were found in Brazil, according the bibliographic research conducted in this research in CAPES (Coordination for higher Education Staff Development) database.

The aim of this study is to examine the relationship among CSR, EM, as measured by discretionary accruals (DA), and the performance of entities, as measured by the return on assets.

Once the objective of the financial statements is to provide relevant information to a wide range of users in making economic decisions, it is important to analyze the quality of this information in order to ensure a correct decision-making of them. Additionally, these players, shareholders and stakeholders either, have different information needs, including CSR information, in this way it is important to analyze the CSR of the companies. In the DVA there are many economic and CSR information to explore and analyze for attending the needs of stakeholders.

We expect this study to contribute to society, by providing research on companies' involvement in environmental issues and the resulting impact on their performance. We also expect that it will contribute to the analysis of the importance of the information generated by the DVA, as parameter to the standard-setters from other countries where such financial statement are not required.

2. THEORETICAL FRAMEWORK

2.1 Corporative social responsibility and performance

The impact of corporate activities on the environment and on society have been increased the relevance of sustainable practices and its reports. The term sustainability reports refers to a broad and diverse array of disclosures, including labor practices and relations, supplier and customer interactions, community activities, charitable contributions and the effect of the company's products on consumer health and safety (Williams, 1999). Sustainability reports or CSR can be conceptualized as documents intended to inform all stakeholders about the triple bottom line (economic, social and

environmental) impact of corporate performance with respect to a given period. These disclosures represent management's communication with its stakeholder groups about issues that go beyond that of company profits (Gray et al., 1995), providing additional information on how profits are being generated, in addition to traditional financial statements (Williams & Pei, 1999).

The relation between the business world and society has suffered modifications with a redefinition of CSR entities (Sobczak & Martins, 2010). Investors in the stock market have also been affected by the growing interest in CSR by a part of the society. According to a study by Cormier et al. (2011), environmental information decreases informational asymmetry from the capital market.

The classification made by the GRI, upon the submission of sustainability reports by this organization is a standard practice of CSR for companies. Part of the GRI uses a three-tier classification, A, B, or C, to indicate if the transparent disclosure and the sustainability levels are advanced, intermediate, or preliminary. This disclosure level may be self-declared by the entity, be declared by the GRI team itself, or be declared by third parties.

Brown et al. (2009) highlighted the importance and success of the GRI, especially considering its short time in existence. They also pointed out the GRI's contribution to corporate governance. The DVA is a very important CSR component. It is an instrument for measuring and demonstrating an entity's capacity for generating and distributing wealth to other accounting information users. The wealth generated by an entity is the difference between its net sales and materials and the services it acquired from third parties plus the wealth transferred to it by other entities. The generation of wealth distribution is divided among the following groups: government, employees, funders, and owners.

The added value is directly related to a country's gross domestic product (GDP) formation and has been used in macroeconomics for measuring this value (Luca, 1998).

Donizetti Teodoro et al. (2012) made a collection of studies about the DVA and found that the trend toward of this research had been growing since 1998. Most of the studies are directed to performance analysis, disclosure, relevance, and remuneration for economic agents.

Taiarol et al. (2011) conducted an analysis of the DVA of Brazilian banking organizations and showed that the growth of internal social investment causes a rise in the amount of added value generated.

Santos et al. (2007) sought to identify the possible impact of privatization on a firm's means of wealth distribution, using DVA-extracted data. They pointed out a very significant reduction of personnel expenses in privatized companies. Additionally, Machado et al. (2009) observed that firms in the Brazilian the public electric sector spend more on their employees than do the private ones, with the differences lying in the amount of employees and from 2006 on better remuneration.

Follman et al. (2011) did a sectoral analysis of the distribution of wealth that results from the DVA and found no distribution pattern. They concluded that in 2008 and 2009, in Brazilian entities, the distribution to the government was the most significant in most of the sectors.

Campos (2011) analyzed the impact on added value by Brazilian companies that published the Social Balance in the period from 2004 to 2006. He showed that the variation in added value of the sample companies could be explained by the number of employees, the internal social indicators, and the remuneration incentive for the acting employees on companies.

Pelucio-Grecco et al. (2013) analyzed the disclosure of CSR practices on Brazilian and Spanish companies and their performance. They did not find evidence of a relation between CSR and performance in either country. Additionally, they showed that in Brazil the size of a company influences its CSR, which is not the case in Spanish companies.

In this study, we explore the influence that companies' wealth generation, their distribution of wealth to their employees and the government, and their voluntary disclosure of CSR information has on their performance. We note that the profit-and-loss (P&L) statement only generates information about the wealth distributed to the entity's owners, while the DVA focuses information about the wealth an entity generates and distributes for all of society.

2.2 Corporate Social Responsibility and Earnings Management

Financial statements are part of the set of information that firms make available to investors and contribute with the equilibrium of information between main (investors) and agent (manager) (Jensen & Meckling, 1976).

In the elaboration process of financial statements, the managers and accountants have to do choices about accounting policies and measurement of accounting elements. According to Fields et al (2001, p. 261), "accounting choice likely exists because it is impossible, or infeasible, to eliminate it. Accounting flexibility also mitigates managers' attempts to obtain desired accounting results by means of (presumably costly) real decisions". In this way Fields et al (2001, p. 261) concludes that the accounting choice may be part of an optimal solution to an agency problem.

According to Watts & Zimmerman (1986), earnings management occurs when managers exercise their accounting judgments with discretion in an opportunistic way.

Matsumoto & Parreira (2007) identified that the factors that lead managers to manage earnings is the lack of a range of standards for all possible situations and the existence of economic and financial incentives that they can obtain. According to Christie & Zimmerman (1994), managers' choices can be done in an efficient way, where the firm's value is maximized, or intentionally privilege their own interests over those of the investor.

Statements of economic value added or income are both extracted from accounting data. It is noteworthy that accountancy is based on two main premises: the accrual basis and operational continuity. In the accrual

basis, income and expenses must be recognized when they occur regardless of whether their financial settlement was received or paid.

The difference between the accrual basis and the cash basis are the accruals. EM occurs when a manager makes accruals to manipulate results, to the fullest extent permitted by the standardization of international accounting. To identify evidences of manipulated results through accruals, it becomes necessary to separate the ordinary expenses (nondiscretionary) from the abnormal ones (discretionary).

According to Healy (1985), nondiscretionary accruals (NA) refer to those accruals required by the accounting standardization that relate to the application of the accrual basis, such as accounting of assets and its systematic basis of depreciation, stock stated in the asset by the lower of market value or production cost, until the financial realization. Discretionary accruals (DA), on the other hand, refer to adjustments made intentionally by managers.

Because the DA are not observable, it is necessary to estimate them by calculating the difference between the total amount of accruals (A) and NA. By doing so, operational models developed for EM analysis address estimates of the total sum of A and NA.

Prior et al. (2008) analyzed the relationship between EM and CSR. Based on the premise that managers' manipulation of results affects the interests of stakeholders, they put some pressure on management and the internalization of that negative impact on part of the managers motivates the search for compensation through the best practices of CSR. Based on this, the authors hypothesized that a positive association exists between the best practices of EM and CSR activities. Using data consisting of 593 companies from 26 countries for the years between 2002 and 2004, they demonstrated that a positive relation exists between EM and CSR. They found evidence that the combination of EM and CSR has a negative effect on the financial performance of entities.

Hong & Andersen (2011) demonstrated that American companies with a higher level of social responsibility show a better level of accounting quality and less EM. Gargouri et al. (2010) show evidence of the contrary in Canadian companies.

3. RESEARCH DESIGN

The population of this study is formed entirely of nonfinancial firms listed for trading on the BM&FBovespa as of October 2, 2012. The sample is nonprobabilistic and by convenience, once after 2009 we can extract IFRS accounting information for all public companies. The data were collected manually from the Web site of *Comissão de Valores Mobiliários* (CVM) (Brazilian Securities and Exchange Comission), available in its system (Empresas.NET).The data was formatted in spreadsheet (Excel) and after that processed in Eviews program for extracting the statistics results.

The final sample is composed by 681 observations referring to 293 companies in the studied period (2009-2011). The Table 1 shows the sample by industry:

Table 1 – Sample by industry

Industry	2009	2010	2011	Total	%
Capital goods & services	27	28	28	83	12%
Consumer cyclical	37	39	54	130	19%
Construction & Trasportation	45	44	51	140	21%
Consumer non cyclical	31	35	35	101	15%
Basic Materials	24	23	32	79	12%
Oil Gas & Biofuels	2	2	5	9	1%
Telecommunications	3	3	10	16	2%
Information technology	4	4	6	14	2%
Utilities	37	28	44	109	16%
Total	**210**	**206**	**265**	**681**	

Source: research data

We used the estimation of the coefficient by least squares and White correction for heteroscedasticity, as suggested by Gujarati & Porter (2008, p. 414). Regarding normality of residuals, we pointed out that according to the central limit theorem, sufficiently big samples have an approximately normal distribution function (Gujarati & Porter, 2008: 119).

3.1 Empirical Model to Test the Relation Between Performance and CSR

To test the relation between performance and CSR, we developed the model shown in Equation 1. Here, we used the return on assets (ROA) as the dependent variable. We obtained the ROA from the company's net income divided by its total assets. We choose ROA because, according to Oyadomari et al (2011), it is generally used for measuring the performance based on financial indicators. ROA shows the efficiency at using companies´ assets to generate earnings (Cupertino, Martinez & da Costa Jr., 2016).

To verify the influence of CSR on ROA, we used the following as independent variables: the company's voluntary disclosure to GRI and, as extracted from the DVA, the added value created and the distribution to government and employees.

We additionally included the following control variables: the corporate governance (CG), firm size (SIZE), and leverage level (LEV).

In Brazil, according to the CVM classification, the novo mercado (new market) (NM) is the highest level of corporate governance that a company can be designated on the São Paulo Stock, Mercantile and Futures Exchange (BM&FBovespa), and according to it companies that participate in this exchange can only issue common shares (voting shares). Nível 1 (Level 1) demands that companies adopt practices that promote transparency and information access for investors. Companies listed as Level 2 must comply with the obligations of being designated as NM but are granted some exceptions and are permitted to keep preferred shares. According to Santos et al. (2011), Iatridis (2012) and Chen et al. (2010) the corporate governance is a counterincentive to EM, reduce agency costs and increased assessment of

accounting by investors. In this way, we expect that best practices of corporate governance companies will have less EM and more transparency in social and environmental information.

We used the firm's size (SIZE) as a control following Ghosh et al. (2010) and Jouber & Fakhfakh (2012) among other authors. The indebtedness level (LEV), according to Rodríguez-Pérez & Van Hemmen (2010) and Nardi et al. (2009) increases in debts produces incentives for managers to manipulate earnings.

Equation 1 follows:

$$ROA_{it} = \alpha + \beta_{1i}GRI_{it} + \beta_{2i}(AV_{it}/A_{it}) + \beta_{3i}(GOV_{it}/AV_{it}) + \beta_{4i}(EMP_{it}/AV_{it}) + \beta_{5i}CG_{it} + \beta_{6i}SIZE_{it} + \beta_{7i}LEV_{it} + \beta_{8i}PorL_{it} + \epsilon_{it} \quad (1)$$

ROA_{it} = return on assets (net income divided by total assets) of firm *i* in period *t*

GRI_{it} = a categorical variable; a value of 1 was applied if firm *i* discloses information on CSR to GRI in year *t*, and zero was applied otherwise

AV_{it}/A_{it} = the added value created by firm *i* in year *t*, divided by the total assets

GOV_{it}/AV_{it} = the added value that the firm *i* distributed to government in year *t*, divided by the total added value

EMP_{it}/AV_{it} = the added value that the firm i distributed to its employees in year *t*, divided by the total added value

CG_{it} = a categorical variable; a value 1 was applied if firm *i* has a CVM classification of NM, N1, or N2 in year *t*, and zero was applied otherwise

$SIZE_{i,t}$ = the size of firm *i* in year *t*; measured as the natural logarithm of total assets

$LEV_{i,t}$ = the leverage of firm *i* in year *t*; measured as the ratio of total liabilities (current and long-term) divided by the total assets

$PorL_{i,t}$ = a categorial variable; a value 1 was applied if firm *i* has profit in the year *t*, and zero was applied otherwise.

We did not formulate hypotheses and therefore had no prior expectation of the signal that would be obtained by the CSR coefficients in this model, and the previous studies (Pelucio- Grecco, 2013) about this relation were not conclusive.

However, we did expect the CG and SIZE variables coefficient to be positive. The performances of the biggest firms and those firms that have corporate governance practices tend to be better. Additionally, we expected the LEV variable coefficient to be negative, once firms with higher indebtedness had less ROA than others.

3.2 Empirical Models to Determine the Existence of EM by DA

The total accruals can be obtained directly by calculating the difference between reported, or estimated (DeAngelo, 1986, p. 410), earnings and operating cash flow in the accounting statements. They can be estimated using data from the balance sheet and income statement according to Equation 2 (Jones, 1991, p. 211; Dechow et al., 1995, p. 203):

$$TA_t = \frac{(\Delta CA_t - \Delta Cash_t) - (\Delta CL_t - \Delta STD_t) - Dep_t}{A_{t-1}} \quad (2)$$

In this equation:

TA_t = the total accruals of the firm in period *t*

ΔCA_t = the variation of current assets from the end of period *t* – 1 to the end of period *t*

$\Delta Cash_t$ = the variation of cash and cash equivalents from the end of period *t* – 1 to the end of period *t*

ΔCL_t = the variation of current liabilities from the end of period *t* – 1 to the end of period *t*

ΔSTD_t= the variation of short-term debt from the end of period *t* – 1 to the end of period *t*

Dep_t = the amount of depreciation and the amortization expense during period *t*

A_{t-1} = the total assets at the end of period *t* – 1

In studies that analyze DA, after observing or estimating the total accruals, the next step is to estimate the amount of these accruals that are normal (nondiscretionary) and the amount that are abnormal (discretionary).

The models to detect DA are widespread in academic literature are: the Jones model (Jones, 1991) and its variations and the KS model (Peluccio-Grecco, 2013).

In applying the Jones model, the estimate of accruals is controlled by the entity's changes in economic circumstances. To obtain nondiscretionary accruals, it is necessary to apply the regression shown in Equation 3:

$$\frac{TA_{it}}{A_{it-1}} = a\left(\frac{1}{A_{it-1}}\right) + \beta_1(\Delta REV_{it}/A_{it-1}) + \beta_2(PPE_{it}/A_{it-1}) + \epsilon_{it} \quad (3)$$

In this equation:

ΔREV_{it} = firm *i*'s revenues in period *t* minus its revenues in period *t* – 1

PPE_{it} = firm *i*'s property, plant, and equipment in period *t*

A_{it-1} = firm *i*'s total assets of in period *t* – 1

ϵ_{it} = firm *i*'s regression error in period *t* (measurement of DA)

Dechow et al. (1995) observed that the modified Jones model (MJ) takes into consideration that revenue cannot be manipulated. This is not always the case, so revenue also should be considered as a discretionary element. The authors thus proposed altering the formula of the MJ, which is

customarily called the modified Jones model in the literature, including the variation of accounts receivable (ΔREC_t) as done in Equation 4:

$$\frac{TA_{it}}{A_{it-1}} = \alpha\left(\frac{1}{A_{it-1}}\right) + \beta_1\left[\frac{(\Delta REV_{it} - \Delta REC_{it})}{A_{it-1}}\right] + \beta_2(PPE_t/A_{it-1}) + \epsilon_{it} \quad (4)$$

Kothari et al. (2005), based on the observations of Dechow et al. (1995), pointed out that the modified Jones model is susceptible to presenting higher DA when firms are growing. Therefore, they presented another modification of the MJ that includes ROA, shown in Equation 5:

$$\frac{TA_{it}}{A_{it-1}} = \alpha\left(\frac{1}{A_{it-1}}\right) + \beta_1\left[\frac{(\Delta REV_{it} - \Delta REC_{it})}{A_{it-1}}\right] + \beta_2(PPE_{it}/A_{it-1}) + \beta_3(ROA_{it}) + \epsilon_{it} \quad (5)$$

Kang & Sivaramakrishnan (1995) developed another model to detect EM, known in the academic literature as the KS model, represented by Equation 6:

$$TA_{it} = \alpha + \beta_1(\delta_1 REV_{it}) + \beta_2(\delta_2 EXP_{it}) + \beta_3(\delta_3 GPPE_{it}) + \epsilon_{it} \quad (6)$$

Here:

$\delta_1 = REC_{i,t-1}/REV_{i,t-1}$

$\delta_2 = (INV_{i,t-1} + OCA_{i,t-1} - CL_{i,t-1})/EXP_{i,t-1}$

$INV_{i,t-1}$ = the balance of firm *i*'s inventories in period *t* – 1

$OCA_{i,t-1}$ = firm *i*'s other current assets (prepaid expenses) in period *t* – 1

$CL_{i,t-1}$ = firm *i*'s balance of accounts payable in the current liabilities in period *t* – 1

EXP_{it}= firm *i*'s expenses of in period *t*, excluding expenses for depreciation and amortization at the end of period *t* – 1

$\delta_3 = DEP_{i,t-1}/GPPE_{i,t-1}$

$DEP_{i,t-1}$ = firm *i*'s amount of expenses from depreciation and amortization in period *t* – 1

$GPPE_{i,t-1}$ = firm *i*'s balance of gross property, plant, and equipment in period *t* – 1

$\alpha, \beta_1, \beta_2, \beta_3$ = estimated coefficients of the regression

ϵ_{it}= regression error

In Equation 6, showing the application of the KS model, the net fixed value has been used to replace the gross fixed asset; the data available in the standard financial statements by CVM did not have this information.

3.3 Empirical Model to Test the Relation Between EM and CSR

In order to test the relation between EM and CSR, as a dependent variable we used the values obtained by the estimated DA using regression error in Equations 3, 4, 5 and 6.

We developed a model, shown in Equation 7, using the following independent variables to measure the influence of CSR on EM: the company's voluntary disclosure to GRI and the total added value (AV),

extracted by DVA. We used corporate governance, firm size, leverage level, and ROA as control variables.

$$EM_{it} = \alpha + \beta_{1i} GRI_{it} + \beta_{2i}(AV_{it}/A_{it}) + \beta_{3i} CG_{it} + \beta_{4i} SIZE_{it} + \beta_{5i} LEV_{it} + \beta_{5i} ROA_{it} + \epsilon_{it} \quad (7)$$

In this equation:

EM_{it} = firm *i*'s EM obtained by DA in year *t*

GRI_{it} = a categorical variable; a value of 1 was applied if firm *i* discloses information on CSR to GRI in year *t*, and zero was applied otherwise

AV_{it}/A_{it} = the added value created by firm *i* in year *t*, divided by the total assets

CG_{it} = a categorical variable; a value of 1 was applied if in year *t* firm *i* has a corporate governance classification of NM, N1, or N2 for CVM, and zero was applied otherwise

$SIZE_{i,t}$ = firm *i*'s size of in year *t*, measured as the natural logarithm of total assets

$LEV_{i,t}$ = firm *i*'s leverage in year *t*, measured as the ratio of total liabilities (current and long-term) divided by the total assets

ROA_{it} = firm *i*'s return on assets (net income divided by total assets) of period *t*

Being that the previous empirical evidence about the relation between CSR and GRI is not conclusive, we are not predicting whether the signs of the GRI and AV coefficients will be positive or negative (Prior et al., 2008; Hong & Andersen, 2011; Gargouri et al., 2010). Because the results of previous studies are also not conclusive (Iatridis, 2012; Santos et al., 2011; Price et al., 2011), we are additionally not predicting whether the signs of CG and ROA variable coefficients will be positive or negative.

We expected the SIZE coefficient to be negative, whereas according to previous studies, the biggest firms show less EM (Pelucio-Grecco, 2013).

According to Rodríguez-Pérez & Van Hemmen (2010) and Nardi et al. (2009), increases in companies' indebtedness produce incentives for managers to manipulate the results, so we expect the variable LEV to be positive.

4. ANALYSIS OF THE RESULTS

4.1 Evidence of the Relationship Between Performance and CSR

In order to explore the influence of companies' wealth creation, their wealth distribution to employees and government (taxes payment), and the voluntary disclosure of CSR information related to their performance, we defined Equation 1.

We used panel data and processed it with Eviews software. To define the estimation method among an independently pooled panel, random effects model, and fixed effects model, we utilized Likelihood Ratio Test and

Hausmann Test. According to the tests, the pooled model is the most appropriate.

Table 2 shows the main statistics of the regression that we obtained from the model. We observe that, with a *p*-value equal to zero, it is possible to verify that the independent variables we used can explain the dependent variable (ROA).

Table 2: Main General Statistics Regression - ROA x RSC Model

Variable	Expected Signal	Coefficient	Prob.
GRI	?	-0,00553	0.3161
AV/A	?	0,184494	0.0017
GOV/VA	?	0,016424	0.0003
EMP/VA	?	-0,049979	0.0001
LEV	-	-0,042832	0.0000
PorL	?	0,128916	0.0000
SIZE	+	0,00387	0.0573
C		-0,142437	0.0005
R-squared		0.895905	
Adjusted R-squared		0.894823	
F-statistic		8.274.664	
Prob(F-statistic)		0.000000	
Akaike info criterion		-1.821.944	
Schwarz criterion		-1.768.804	
Hannan-Quinn criter.		-1.801.376	
Durbin-Watson stat		2.016.116	

$$ROA_{it} = \alpha + \beta_{1i}GRI_{it} + \beta_{2i}(AV_{it}/A_{it}) + \beta_{3i}(GOV_{it}/AV_{it}) + \beta_{4i}(EMP_{it}/AV_{it}) + \beta_{6i}SIZE_{it} + \beta_{7i}LEV_{it} + \beta_{8i}PorL_{it} + \epsilon_{it}$$

Source: research data

According to Collinearity Test, only the variables GOV/ VA and EMP/VA present multicollinearity. Therefore, we recalculated the regression estimations without the EMP/VA and the results and, consequently, the analysis did not change.

As we can see, the GRI variable has no statistical significance. Thus, we did not obtain evidence that companies that present information to the GRI voluntarily are those that perform better. All other independent variables present are significant at a level of 1 percent.

We note that companies that generate more wealth, according to the AV/A variable, perform better than others do. Additionally, the results show that companies that perform better are those that distribute more wealth to the government and less wealth to employees.

Companies with the highest level of leverage perform worse, as also expected.

4.2 Evidence of the Relationship Between CSR and EM

As previously mentioned, in this study, in order to measure EM by DA, we applied equations 3–6. In order to estimate DA, because it is a more appropriate means of doing so, we used cross-section criteria, as suggested by Chen et al. (2012). To expand the range of specifications models, we used polynomials of second, third, and fourth grades, as recommended by Gujarati & Porter (2008, p. 225–226). We applied the following polynomials, respectively: the Jones polynomial model (MJP), the Jones model modified by

Dechow et al. polynomial (MDP), the Jones model modified by Kothari et al. polynomial (MKP), and the KS model polynomial (MKSP).

We utilized the Eviews software to obtain the results. We estimated the coefficients using the least squares method and implemented the White heteroskedasticity correction, as suggested by Gujarati & Porter (2008, p. 414). Regarding the normality of the residuals, we note that as the central limit theorem, large samples have approximately normal distribution (Gujarati & Porter, 2008, p. 119).

The main general statistics of the regressions that we obtained from applying management result models are shown in Tables 3–6.

Tabel 3: Main General Statistics Regression – Polynomial Jones Model

	2009		2010		2011	
Variable		Prob,		Prob,		Prob,
ΔREV/A	0,08402	0,08630	0,20864	0,00610	0,20351	0,00910
$\Delta REV/A^2$	0,34760	0,00110	-0,07823	0,09220	-0,20693	0,48740
$\Delta REV/A^3$	-0,31371	0,00270	-0,11435	0,01560	0,00642	0,98860
$\Delta REV/A^4$	-0,31611	0,00110	0,04861	0,02140	0,04353	0,79470
PPE/A	-0,68297	0,00340	-0,41079	0,26290	0,01160	0,93920
PPE/A^2	1,63992	0,00520	0,90066	0,49130	-0,32723	0,41710
PPE/A^3	-1,42610	0,00750	-0,84577	0,60230	0,33925	0,32840
PPE/A^4	0,35624	0,00760	0,26103	0,68120	-0,08723	0,28630
C	0,02937	0,30990	0,03574	0,18430	-0,00189	0,87660
R-squared	0,15927		0,09751		0,11112	
Adjusted R-squared	0,13226		0,06123		0,08366	
F-statistic	5,89636		2,68771		4,04704	
Prob(F-statistic)	0,00000		0,00793		0,00015	
Akaike info criterion			-1,28372		-1,62119	
Schwarz criterion			-1,13930		-1,50059	
Hannan-Quinn criter.			-1,22532		-1,57275	
Durbin-Watson stat			1,90614		1,88965	

* Significant at 5%; ** Significant at 1%.

$$\frac{TA_{it}}{A_{it-1}} = a_{it}\left(\frac{1}{A_{it-1}}\right) + \beta_{1i}(\Delta REV_{it}/A_{it-1}) + \beta_{2i}(PPE_{it}/A_{it-1}) + \epsilon_{it}$$

Source: research data

Tabel 4: Main General Statistics Regression - Polynomial Jones Model Modified by Dechow

	2009		2010		2011	
Variable		Prob,		Prob,		Prob,
(ΔREV-ΔREC)/A	-0,03430	0,57660	-0,15499	0,15050	0,03241	0,73240
$(\Delta REV-\Delta REC)/A^2$	0,17675	0,31660	0,07639	0,32340	-0,16847	0,67350
$(\Delta REV-\Delta REC)/A^3$	-0,11924	0,45590	0,11329	0,12280	0,26010	0,67630
$(\Delta REV-\Delta REC)/A^4$	-0,15252	0,34410	-0,04932	0,19100	-0,08598	0,71830
PPE/A	-0,72724	0,00310	-0,36370	0,33200	0,03220	0,83130
PPE/A^2	1,65675	0,00660	0,71219	0,59700	-0,38822	0,34080
PPE/A^3	-1,38833	0,01070	-0,64332	0,69880	0,39948	0,26470
PPE/A^4	0,34099	0,01140	0,20091	0,75470	-0,10246	0,22990
C	0,04700	0,12570	0,06819	0,03520	0,00762	0,55250
R-squared	0,13729		0,07347		0,06860	
Adjusted R-squared	0,10957		0,03622		0,03983	
F-statistic	4,95300		1,97245		2,38459	
Prob(F-statistic)	0,00001		0,05162		0,01704	
Akaike info criterion	-1,50401		-1,25742		-1,57447	
Schwarz criterion	-1,38007		-1,11301		-1,45388	
Hannan-Quinn criter.	-1,45418		-1,19903		-1,52603	
Durbin-Watson stat	1,75614		1,73076		1,95413	

$$\frac{TA_{it}}{A_{it-1}} = \alpha_1\left(\frac{1}{A_{it-1}}\right) + \alpha_2[\frac{(\Delta REV_{it} - \Delta REC_{it})}{A_{it-1}}] + \alpha_3(PPE_t/A_{it-1}) + \epsilon_{it}$$

* Significant at 5%; ** Significant at 1%. Source: research data

Tabel 5: Main General Statistics Regression – Polynomial Jones Model Modified by Kothari et al. (2005)

	2009		2010		2011	
Variable		Prob,		Prob,		Prob,
(ΔREV-ΔREC)/A	-0,08421	0,15230	-0,19746	0,08450	-0,11637	0,18580
(ΔREV-ΔREC)/A²	-0,09422	0,60750	0,08960	0,29590	0,03682	0,91620
(ΔREV-ΔREC)/A³	0,14499	0,34710	0,14101	0,07540	0,25661	0,66550
(ΔREV-ΔREC)/A⁴	0,11366	0,48420	-0,05633	0,16900	-0,12430	0,59780
PPE/A	-0,73239	0,00250	-0,40252	0,29080	0,14855	0,31960
PPE/A²	1,60526	0,00620	0,95933	0,50370	-0,54443	0,16760
PPE/A³	-1,31880	0,01030	-1,06957	0,55460	0,45967	0,17720
PPE/A⁴	0,32280	0,01080	0,41124	0,56380	-0,10888	0,17640
ROA	0,13032	0,22790	0,16431	0,26950	0,29484	0,00920
ROA²	-0,23411	0,49070	-1,53164	0,00380	-0,45710	0,11500
ROA³	0,03697	0,86890	-1,31759	0,10930	-0,19816	0,67590
ROA⁴	0,86646	0,08180	1,13652	0,04500	-0,01818	0,80810
C	0,05201	0,09040	0,07820	0,01500	-0,00988	0,45710
R-squared	0,19476		0,11741		0,15177	
Adjusted R-squared	0,15532		0,06310		0,11185	
F-statistic	4,93812		2,16170		3,80212	
Prob(F-statistic)	0,00000		0,01497		0,00003	
Akaike info criterion	-1,54195		-1,26755		-1,63815	
Schwarz criterion	-1,36293		-1,05895		-1,46396	
Hannan-Quinn criter.	-1,46996		-1,18320		-1,56819	
Durbin-Watson stat	1,76536		1,74421		1,92334	

* Significant at 5%; ** Significant at 1%.

$$\frac{TA_{it}}{A_{it-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{it-1}}\right) + \alpha_2[\frac{(\Delta REV_{it} - \Delta REC_{it})}{A_{it-1}}] + \alpha_3(PPE_{it}/A_{it-1}) + \alpha_4(ROA_{it}) + \epsilon_{it}$$

Source: research data

Tabel 6: Main General Statistics Regression – Polynomial KS Model-

	2009		2010		2011	
Variable		Prob,		Prob,		Prob,
δ_1 (REV)	0,26669	0,52450	-0,16813	0,74970	0,31753	0,28320
δ_1 (REV)²	-1,21546	0,52910	4,21196	0,22590	0,06275	0,96920
δ_1 (REV)³	1,27007	0,58920	-8,64619	0,22710	-0,64322	0,80980
δ_1 (REV)⁴	-0,21315	0,60260	4,32289	0,25390	0,33194	0,78770
δ_2 (EXP)	-0,06801	0,19900	0,04178	0,49890	0,04588	0,55310
δ_2 (EXP)²	-0,05895	0,41310	-0,00351	0,80840	-0,28735	0,47690
δ_2 (EXP)³	0,08190	0,19020	-0,00214	0,72270	-0,74032	0,01080
δ_2 (EXP)⁴	0,01635	0,06360	-0,00012	0,89270	-0,71712	0,41140
δ_3 (GPPE)	-7,38873	0,00060	-0,86974	0,05810	1,76135	0,51310
δ_3 (GPPE)²	1,18363	0,03850	-6,92658	0,00990	-8,95065	0,33220
δ_3 (GPPE)³	-8,55598	0,10350	9,27310	0,01170	1,04565	0,36860
δ_3 (GPPE)⁴	2,05794	0,15170	-1,93862	0,01830	-3,91631	0,39600
C	0,09523	0,00700	-0,00023	0,99140	-0,03921	0,16570
R-squared	0,25875		0,23210		0,16697	
Adjusted R-squared	0,22244		0,18485		0,12777	
F-statistic	7,12684		4,91163		4,25928	
Prob(F-statistic)	0,00000		0,00000		0,00000	
Akaike info criterion	-1,62475		-1,40675		-1,65623	
Schwarz criterion	-1,44572		-1,19816		-1,48205	
Hannan-Quinn criter.	-1,55276		-1,32241		-1,58627	
Durbin-Watson stat	1,82189		1,81932		2,04359	

* Significant at 5%; ** Significant at 1%.

$$\frac{TA_{it}}{A_{it-1}} = \emptyset_0 + \emptyset_1\left(\delta_1 \frac{REV_{it}}{A_{it-1}}\right) + \emptyset_2\left(\delta_2 \frac{EXP_{it}}{A_{it-1}}\right) + \emptyset_3\left(\delta_3 \frac{GPPE_{it}}{A_{it-1}}\right) + \epsilon_{it}$$

Source: research data

We find that, according to the *F* statistic and *p*-value, all models are statistically significant at the usual levels of confidence intervals in all periods. It is noteworthy that the MKSP has the best information criteria among the models that were used (adjusted R^2, Akaike, Hannan-Quinn, and Schwarz).

We utilized the residuals from the four models, by company and by period, as the dependent variable (EM), as shown in Equation 7. We used panel data to study the variables over time. In order to define the estimation method among the independently pooled panel, random effects model, and fixed effects model, we utilized the likelihood ratio test and Hausmann test, the results of which are presented in Table 7.

Tabel 7: Model of pooled data, fixed effects or random effects - Analysis

Model	Fixed effects x Pooling	Random effects x Fixed effects					Conclusion - Estimation method most appropriate
	p-value Likelihood Ratio Test *	Cross-section random **	Adjusted R-SQUARED	p-value	Durbin-Watson	p-value (Hausmann Test) ***	
MJP	0.9737	0.1567	0.192672	0.000029	3.447.447	0.0044	Pooling
MDP	0.9745	0.1769	0.219803	0.000002	3.398.242	0.0010	Pooling
MKP	0.9749	0.1672	0.192351	0.000030	3.447.811	0.0096	Pooling
MKSP	0.9978	0.0840	0.109794	0.010924	3.485.076	0.0091	Pooling

*Teste Likelihood Ratio (TLR) If < 0,05 then fixed effects model is better.
** the closer to 1, the random model approaches the fixed, the closer to 0 the closest estimation by pooled data.
*** Teste Hausman (TH). If >0, random effect model is better, residues uncorrelated with the explanatory variables. Otherwise, the fixed effect model is better correlated with the explanatory variables residues.
Source: research data

According to Table 7, the likelihood ratio test shows a *p*-value closer to 1 than to zero. We observe that the fixed effects are redundant, proving that the pooled data model is more appropriate than fixed effects model. We also note that the specification of the effects observed in the outputs of the regressions (random cross-section) show that random effects model apparently has a greater proximity of pooled data model than fixed effects model. We conclude, with the performed tests, the pooled data model is most appropriate.

Table 8 presents the main statistics we obtained using Equation 7. Here, it is observed that, with a *p*-value of zero, it is possible to verify that the independent variables are capable of explaining the behavior of the dependent variable (EM through DA).

According to the results presented in Table 8, the GRI and GC variables are not statistically significant in any of the EM models that we used. Thus, nothing can be said about the influence of the decision to highlight environmental information and corporate governance practice on EM. These

finds are aligned with the previews studies (Prior et al., 2008; Hong & Andersen, 2011; Gargouri et al., 2010; Iatridis, 2012; Santos et al., 2011; Price et al., 2011).

The AV/A variable has a statistical significance of 1 percent in the MDP and MJP models and of 5 percent in the MKSP and MKP models. The coefficient is negative in all models. The results suggest that there is an inverse relationship between EM and added value; in other words, companies that add value to society present less EM. This find emphasized the DVA power of information and their useful in relation the EM researches.

Tabel 8: Main General Statistics Regression –CSR x EM Model

Variable	Expected Signal	MKSP		MKP		MJP		MDP	
		Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
GRI	?	0.009230	0.449	0.009055	0.462	0.009326	0.439	0.010702	0.390
AV/A	?	-0.032022	0.039	-0.033827	0.044	-0.057453	0.001	-0.050556	0.007
GC	?	0.003563	0.663	0.014565	0.094	0.006627	0.447	0.012518	0.157
SIZE	-	-0.006045	0.024	-0.009577	0.000	-0.008339	0.003	-0.008190	0.004
LEV	?	0.005398	0.015	0.001374	0.472	0.005970	0.015	0.007784	0.004
ROA	?	0.099735	0.061	0.051224	0.269	0.134756	0.020	0.163954	0.010
C		0.088428	0.022	0.139167	0.000	0.127171	0.002	0.116510	0.005
R^2		0.023435		0.024860		0.033999		0.040714	
Adj R^2		0.014741		0.016179		0.025400		0.032175	
F-statistic		2.695674		2.863760		3.953685		4.767701	
Prob(F)		0.013592		0.009220		0.000678		0.000090	
Akaike		-1.621705		-1.541670		-1.515441		-1.486847	
Schwarz		-1.575207		-1.495173		-1.468943		-1.440349	
Hannan-Quinn		-1.603708		-1.523673		-1.497444		-1.468850	
Durbin-Watson stat		1.872425		1.794378		1.837713		1.787049	
Observations		681		681		681		681	

* Significant at 5%; ** Significant at 1%.

$$EM_{it} = \alpha + \beta_{1i} GRI_{it} + \beta_{2i} (AV_{it}/A_{it}) + \beta_{3i} CG_{it} + \beta_{4i} SIZE_{it} + \beta_{5i} LEV_{it} + \beta_{5i} ROA_{it} + \epsilon_{it}$$

Source: research data

According to Collinearity Test, the variables did not present multicollinearity.

The variable SIZE is statistically significant at the level of 1 percent on all models except the MKSP, in which it is significant at 5 percent. In all cases, the coefficient of this variable is negative. This result indicates that there is an inverse relationship between EM and firm size, or, in other words, larger companies manipulate their results less, as previously shown by Pelucio-Grecco (2013).

The variable LEV is positive in all models. It is significant at the level of 5 percent in the MKSP, MKP, and MJP models and at 1 percent in the MDP model. This result indicates that there is more manipulation of results by more

leveraged firms, as Rodríguez-Pérez & Van Hemmen (2010) and Nardi et al. (2009) claimed.

5. DISCUSSION AND CONCLUSIONS

The results of this study indicate that there is no relationship between CSR, as taken from the GRI information, and the performance of entities, as measured by the ROA. This indicates that the act of presenting environmental information does not influence the performance of companies. Apparently, the market did not react positively to an entity having a greater social engagement, in the way of sending information to the GRI. It does not reflect the performance of these entities.

Additionally, we note that firms with a higher ROA are those that create more wealth for society, that distribute more wealth to the government, and that distribute less wealth to their employees. We conclude that because the DVA provides information on the creation and distribution of wealth generated by businesses, its analysis is an important tool for doing performance analysis and providing information to society. According to this information, companies that pay more taxes to the government are the entities with higher performance. However, we note the same entities that are performing the best are the ones who pay less to their employees.

Furthermore, we conclude that good corporate governance practices have a positive effect on the performance of the entities partly because those companies with good governance practices are already the best performers. However, there is not a significant relationship between corporate governance and EM. This indicates that there should be a greater effort made to manage corporate governance practices in order to improve the constraint to EM.

Moreover, we find that there is not a relationship between CSR and EM. Thus, one cannot say that managers decide to generate environmental information to divert attention from the manipulation of results. It is not possible, however, to affirm that firms with greater social engagement do not manipulate earnings.

Nevertheless, we observe that companies that manipulate their results less often, as well as larger and less leveraged companies, are those that add more value to society. Thus, we conclude that debt is a motivation for manipulating results. We also conclude that the most reliable accounting information is provided by companies with greater added value and bigger companies.

This study was limited to the short period where it was mandatory to submit DVAs in Brazil, which only lasted for the year of 2008. Thus, we suggest that research on later periods be carried out in the future, which will enable the analysis of a higher quantity of observations. We also emphasize that according to the findings of this paper, the DVA can be an important tool for analysis of EM. We suggest for future research examining the relation between CSR and EM per industry and explore more the relation between CG and GRI.

Additionally, we suggest future research including the Corporate Governance Index (IGC) and Corporate Sustainability Index (ISE) from BM&FBOVESPA as variables.

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