Determinants of corporate sustainability performance – evidence from Brazilian panel data

Vicente Lima Crisóstomo, Fatima de Souza Freire and Maria Rafaela De Oliveira Freitas

Abstract

Purpose – *Over the past two decades, there has been an increasing interest on corporate social responsibility by a number of constituencies – corporate managers, research scholars, policymakers and investors. In this context, corporate sustainability performance (CSP) has been a central focus of attention. This paper aims to analyze CSP determinants in Brazil, an important emerging market. Firm CSP is proxied by the membership to the Corporate Sustainability Index (ISE) which comprises environmental, social, economic and governance issues.*

Design/methodology/approach – *Logit panel data models are estimated for a sample of 2,685 firm-year observations in the period of 2006-2015.*

Findings – *Results show that firms operating in environmental risky industries tend to be leading CSP firms in Brazil which might be a positive consequence of the Brazilian environmental legislation that could be forcing such firms to be more committed to environmental issues. High ownership concentration reduces the probability of a firm's membership to the ISE index signaling that large controlling blockholders may not see sustainability and governance concerns as relevant. Larger Brazilian firms and the ones with more growth opportunities tend to be CSP leaders. Additionally, the financial crisis of 2007-2009 had a negative effect on CSP in Brazil.*

Practical implications – *The implications of the present findings may be of interest to academics and firms' stakeholders. The fact that firms from environmental risky industries exhibit higher concerns with CSP, probably because of the Brazilian environmental rules that has advanced in the past decades, show the prominence of policymakers in the critical scenario of environmental issues. When designing regulation, policymakers should be conscious of the importance of social issues and pay attention to all ways available to foster firm sustainability concerns. The additional evidence that dominant shareholders do not appear to see CSP as a relevant concern in Brazil points out an agency conflict in which large blockholders' interests may be prevailing over other stakeholders' interests. That is important to academics who study the role played by ownership structure on firm's policies. Furthermore, larger firms, as well as the ones with more growth opportunities, seem to invest in CSP, possibly for seeing it as a way to generate competitive advantage.*

Originality/value – *As per the authors' knowledge this is the first paper to point out the relevance of industry environmental sensitivity over firm's commitment to sustainability issues in Brazil. Additional evidence is provided on the negative effect of ownership concentration on the probability of firm's membership to the ISE sustainability index using a longer period as well as robust logit panel data model estimates compared to previous studies. Unlike previous works, the paper analyzes the complexity of a sustainability index in the Brazilian market. Such index comprises corporate social responsibility, sustainability and corporate governance concerns. This set of concerns makes it a complex index and requires a deeper rationale for the determinants of CSP as proxied by the membership to it, under the stakeholder and agency theoretical frameworks.*

Keywords *Determinants, Brazil, Sustainability index, Corporate social and sustainability performance*

Paper type *Research paper*

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1. Introduction

Literature suggests that demands from a wide number of stakeholders have led firms to follow an ethical and sustainable behavior by integrating environmental, social, economic

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and governance concerns cooperatively (Harrison *et al.*, 2010). This range of stakeholders goes beyond the ones taken into account by the agency theory – shareholders, managers and creditors – and has caused a growing concern for firms about their operation, sustainability and relation with all stakeholders as predicted under the stakeholder theoretical framework. This means that the firm should not only worry about value creation for shareholders but also about the welfare of all social groups and the adequate interaction with the environment (Freeman and Phillips, 2002; Tullberg, 2013).

Corporate social responsibility (CSR) actions and the awareness to sustainability issues as a whole have been considered as able to improve firm's reputation, with possible benefits on firm's value, although the results are still inconclusive (Freeman *et al.*, 2004; Orlitzky *et al.*, 2003; Park *et al.*, 2014). In this context, the assessment of corporate sustainability performance (CSP), taking into account environmental, social and corporate governance (ESG) concerns, by specialized institutions has become usual, highlighting the importance given to social concerns and long-term sustainability of firms by market institutions (Chen and Nainggolan, 2018; Statman, 2006). The Corporate Sustainability Index (ISE) of BM&FBOVESPA which comprises ESG issues of the Brazilian firm was launched in 2005 (BM&FBOVESPA, 2015).

The motivating factors that drive corporate sustainability policy at the firm level have been highlighted as an important topic of research that requires additional attention (Dam and Scholtens, 2012; Aguilera *et al.*, 2007). Undertaking such research in emerging economies has also been highlighted as necessary (Ziegler and Schröder, 2010). In this regard, this work intends to advance research in the emerging markets framework by studying Brazil, an emerging economy with increasing international visibility, characterized by high private benefits of control, high ownership concentration and low protection of minority shareholders which favors the prevalence of controlling shareholders' interests (Dyck and Zingales, 2004; La Porta *et al.*, 1998). Besides, Brazil has faced some institutional advances in environmental protection in recent decades although there is still much to be done (Tollefson, 2016). Under the Brazilian environmental legislation, Law 10.165/2000 categorized industries' environmental risk and enforced government environmental control. At this moment, it is important to assess whether these institutional advances observed in the Brazilian environmental legislation have been able to produce effects on the firm level.

This research aims to analyze firm's attributes that are related to social and sustainability policies of Brazilian firms, focusing on firm's environmental risk and ownership concentration. In this regard, more recently, ownership structure has been suggested to play a role on firm's social and sustainability policies because of distinct shareholders' interests and the diversity in institutional contexts (Dam and Scholtens, 2012; Aguilera *et al.*, 2007; Li and Zhang, 2010), as well as the environmental risk of firm's activities (Adams, 2002; Crifo *et al.*, 2015; Hackston and Milne, 1996). Additionally, the study also searches for the effect of the financial crisis (2007-2009) on CSP and its eventual recovery in the aftermath.

To achieve this purpose, logistic regression models were estimated for a panel data set of 327 Brazilian listed firms, in a total of 2,685 firm-year observations, in the period of 2006-2015. The annual membership to the ISE of BM&FBOVESPA is used as proxy for higher CSP.

The results show that firm's membership to an environmental risky industry, according the Brazilian environmental law, is able to improve firm's CSP. In fact, firms from environmental risky industries are leading CSP firms in Brazil given that they present higher probability to be a component of the ISE sustainability index. The findings also indicate that CSP proxied by the membership to the ISE sustainability index is adversely affected by high ownership concentration. This reveals the presence of an agency conflict in which dominant shareholders' interests prevail over CSP, given that the presence of such shareholders lowers the probability that the firm becomes member of the annual Brazilian ISE. It is worth

mentioning that the negative effect of voting ownership concentration disappears with the presence of more large shareholders, taken into account by the voting ownership held by the four and five largest shareholders, signaling a possible contest power from other large shareholders who may favor CSR. Furthermore, other firm attributes also increase firm CSP, firm size and firm growth opportunities in Brazil.

The present work offers insights on the determinants of firm's social and sustainability policies in an important emerging market (Brazil). The research builds on stakeholder and agency theories by investigating the possible effect of industry environmental risk and ownership concentration on CSP as proxied by firm's membership to the Brazilian firm ISE. The study contributes to the literature that deals with firm membership to sustainability indices set by capital markets as a proxy for social and sustainability performance (Lourenço and Castelo Branco, 2013; Crisóstomo and Oliveira, 2016; Artiach *et al.*, 2010). Specifically, the paper complements prior studies in the Brazilian market about CSP determinants by taking into account the industry environmental risk, using a larger variety of proxies for ownership concentration, extending the period of study and using panel data methodology that provides even more robust results and allows better analysis on the CSP determinants.

2. Background and hypotheses

2.1 The assessment of corporate sustainability

Literature suggests that firms actions related to sustainability are associated with ethical, environmental and economic criteria of a firm's decision-making process to ensure business continuity, while corporate social policy may be more associated to the willingness of the firm to undertake actions that benefit stakeholders (Van Marrewijk and Werre, 2003). As a whole, corporate social and sustainability concerns integrate business ethics and stakeholder management, being all associated and complementary concepts under development (Sarkar and Searcy, 2016; Carroll and Shabana, 2010). Conceptual questions apart, assessing the degree of attention that a firm directs to social and sustainability concerns is a complex task and there is still no agreement on how it should be done. In fact, there are a variety of measures used in this context trying to adequately evaluate firm's social and sustainability concerns (Griffin and Mahon, 1997; Orlitzky *et al.*, 2003).

The assessment of CSP as a whole may take into account firm sustainability, firm social concerns, business ethics, stakeholder management and environmental issues. Specialized institutions have worked on it and created indices that intend to convey information about the level of firms' CSP (Statman, 2006). Examples of such indices are the ones created by market institutions like the Dow Jones Sustainability Index of the New York Stock Exchange; the FTSE-4Good in the London Stock Exchange; the Johannesburg Index in South Africa; and the Brazilian ISE set up by the Brazilian stock market.

2.2 The Brazilian corporate sustainability index

The ISE index is a theoretical portfolio, composed by up to 40 firms that are included into it based on an assessment process conducted by the ISE Advisory Committee. This committee is composed by 11 institutions[1], being headed by the São Paulo Stock Exchange (BM&FBOVESPA) (Cunha and Samanez, 2013; BM&FBOVESPA, 2015). The information used in the assessment process is supplied by the company through a questionnaire. A firm that intends to participate in the ISE assessment process must fulfill the following requirements (BM&FBOVESPA, 2015):

- the firm must be among the 200 most traded in the stock market in the past year;
- the firm must have been traded in at least 50 per cent of the stock exchange sessions in the preceding year; and

- the firm must comply with the criteria endorsed by the ISE Advisory Committee Executive Council.

The ISE assessment process comprises seven areas or axes, related to both CSR and sustainability, distributed along the questionnaire:

- The axis "general information" (14 per cent of the questions) assesses how the firm behaves in relation to global agreements and whether the firm publishes social reports.
- The axis "nature of the product" (9.5 per cent of the questions) requires information about the risks and damages for human health associated with the firm's products.
- The axis "corporate governance" (17 per cent of the questions) intends to evaluate shareholders relationships and the quality of the firm's corporate governance system.
- The axis "financial-economics" (10 per cent of the questions) captures information about firm's strategic planning, risk management and financial performance.
- The axis "social" (14 per cent of the questions) tries to assess firm's relations with workers, suppliers and clients.
- The axis "climate change" (25 per cent of the questions) appraises whether the company is actually committed to policies for climate change prevention.
- The axis "environmental" (14 per cent of the questions) assesses firm's concern with the natural environmental through the analysis of the number of problems with environmental licenses, or criminal prosecution because of environmental crimes.

Invited firms respond the ISE questionnaire in a voluntary manner. Firm assessment is based on quantitative and qualitative analyses. The quantitative analysis is based on the questionnaire score, in which all CSP axes have the same weight, with specific criteria and indicators in each axis. The qualitative analysis is based on the checking of supporting documents that are also requested from companies. Then, cluster analysis is run with the purpose of identifying groups of firms with similar CSP and make up firm ranking to compose the ISE portfolio that integrates up to the 40 best performing firms (BM&FBOVESPA, 2015).

2.3 Determinants of corporate sustainability performance

The determinants of CSP are analyzed under distinct theoretical frameworks. Some firm's attributes have been seen as able to affect CSP. Among such factors are, for example, firm size, profitability and leverage. More recently, agency conflicts, firm industry environmental risk as well as growth opportunities have also been considered.

There is evidence that ownership structure moderates agency conflicts among the main firm stakeholders. For instance, agency conflicts between shareholders and managers are moderated by ownership structure (Shleifer and Vishny, 1986; Shleifer and Vishny, 1997). Furthermore, there is evidence that ownership structure matters for firm value and performance as well as for firm strategic and financial policies (Allen and Phillips, 2000; Goergen and Renneboog, 2001; Schiantarelli and Sembenelli, 2000). Thus, it is plausible to suggest that ownership structure may also influence firm's sustainability policy (Aguilera *et al.*, 2007).

Research in different markets signals that ownership structure characteristics may matter for firm's sustainability policy, under distinct arguments, although with inconclusive results (Faller and zu Knyphausen-Aufseß, 2016). For example, there is a positive effect of high firm ownership concentration in hands of the main shareholder on CSR in Spain (Godos Díez *et al.*, 2012). Equity ownership held by individual shareholder types has also received special attention. Institutional investors have a positive effect on CSR in USA

(Harjoto and Jo, 2008). Government ownership favors CSR in Singapore and Malaysia (Eng and Mak, 2003; Said *et al.*, 2009). In USA, internal ownership has a negative impact on CSR (Barnea and Rubin, 2010) and non-state ownership has an adverse effect on CSR in China (Li and Zhang, 2010). In Europe, ownership concentration held by the main shareholder is also detrimental to CSR (López-Iturriaga and López-de-Foronda, 2011). Ownership structure playing a role on firm's policies is closely linked to the agency theory given that its influence may raise or minimize agency conflicts.

Firm controlling shareholders, who are common in high ownership concentrated firms, are interested in improving firm reputation which may be obtained from social and sustainability policies according to the legitimacy and stakeholder theoretical approaches (Chiu and Sharfman, 2011). Thus, they may use social and sustainability policy to achieve this goal by prioritizing social and sustainability elements that may be more favorable to their purpose. High concentrated ownership, frequently associated to a reduced number of controlling shareholders, may promote the exacerbation of private benefits of control (Riyanto and Toolsema, 2008) and may also be detrimental to the adoption of good corporate governance practices under the argument that controlling shareholders benefit from weaker corporate governance (La Porta *et al.*, 1998; Bozec and Bozec, 2007; Renders and Gaeremynck, 2012). Sustainability indices, as is the case of ISE in Brazil, have corporate governance as a very relevant component as mentioned above (Section 2.2). In this context, high ownership concentration may also be negative to public firm accountability that tends to improve with a decrease in ownership concentration and more shareholders pressuring for better firm accountability in the opposite direction of high ownership concentration (Li and Zhang, 2010). Although stakeholders theorists claim the value creation capacity of social and sustainability performance, such capacity for value creation is still uncertain (Husted and Allen, 2007). This doubtful value creation capacity of firm's social and sustainability activities may discourage controlling shareholders to undertake social and sustainability policies. Besides, corporate governance which is not a priority for dominant blockholders is really important in the ISE sustainability index. Thus, it seems plausible to propose the hypothesis that dominant shareholders of the Brazilian firm are looking for private benefits of control and do not prioritize the improvement of firm sustainability in its entirety. This rationale leads to the proposal that voting ownership concentration is negative to CSP as proxied by the membership to the ISE sustainability index in the following terms:

H1. Ownership concentration has an adverse effect on the probability of the firm's membership to the ISE sustainability index which signals firm CSP.

Firm's commitment to social and sustainability issues have been proposed to be favorable to firm's image and reputation under the legitimacy and stakeholder theoretical frameworks (Bebbington *et al.*, 2008; Michelon, 2011). Nowadays, environmental concerns are relevant for firm's external valuation, and this reality has motivated more complete firm sustainability disclosure (Crifo *et al.*, 2015; Bouten *et al.*, 2011). In fact, empirical research has proposed and found evidence on the influence that environmental activities have on corporate reputation (D'Souza *et al.*, 2013; Cho *et al.*, 2012). Firms from environmental risky industries have more complex relation with the natural environment and external stakeholders tend to be more focused on such firms' concerns on environmental issues (Hackston and Milne, 1996; Adams, 2002; Patten, 2002; Campbell, 2003). Because of this higher vulnerability to environmental concerns and pressure from stakeholders, firms with activities that are more aggressive to the natural environment will try to signal stakeholders that they follow adequate sustainable practices through adequate sustainability disclosure (Campbell, 2003; Liu and Anbumozhi, 2009; Dyduch and Krasodomska, 2017).

In Brazil, it is important to evaluate the role played by firm industry environmental risk on CSP, given the raising relevance devoted to this issue since the enactment of important legal instruments. It is important to mention the Brazilian Environmental Policy Law 6,938/1981 (revised by Law 10,165/2000), and the Brazilian Constitution/1988 are influential legal

instruments that highlighted the importance of firm environmental concerns. Both these influential legal instruments highlighted the importance of firms' environmental concerns. The enactment of Law 10.165/2000 was a threshold for firms' environmental concerns in Brazil by stratifying firm industry under environmental risk layers (low, medium and high), establishing the Control and Environmental Inspection Fee for all firms from stratified sectors, and also by compelling stratified firms to report annual activities to the government. Firm's relation with the government and with the natural environment is crucial under the *stakeholder* theoretical framework. Thus, together with increasing social pressures, Brazilian institutional setting has faced advances in environmental legislation to impose stricter rules on firms in relation with the natural environment. The advances in legal rules, associated with local and international social pressures, tend to force firms to be more committed to environmental, social and sustainability issues which may also be reflected in the search for higher CSP and positive visibility through the presence in sustainability indices as proposed in the following hypothesis:

H2. Firms from environmental risky industries are more prone to have higher CSP which is signaled by firm's membership to the ISE sustainability index.

The stakeholder theory proposes the virtuous cycle between social responsibility and firm performance under the rationale that social responsibility actions are able to create value for the firm because society has a positive sensitivity to this type of corporate action (Freeman *et al.*, 2004; Waddock and Graves, 1997). Stakeholder theorists indeed contend that under the perspective that the firm must be concerned with a broad spectrum of stakeholders, the company must look for maximizing not only shareholders' interests but also all other stakeholders' interests, which may be achieved through the commitment to ESG issues that are related to a wider range of stakeholders. They advocate that such commitment is able to foster the virtuous cycle between social responsibility and firm's performance. In fact, prior research on the relationship between CSP and firm profitability has seen it as dynamic with results revealing profitability as a determinant of CSP and also the opposite (Garcia-Castro *et al.*, 2010; McGuirre *et al.*, 1988). Thus, firm's perspective is expanded by integrating an ethical and responsible conduct (Harrison *et al.*, 2010). Such ethical conduct has been seen as able to improve firm's image and create value in the mid- and long-run by promoting a virtuous cycle between firm and its stakeholders, favoring firm's market share and competitive advantage (Waddock and Graves, 1997; Orlitzky *et al.*, 2003). The argument about the effect of profitability on sustainability is associated with the fact that firms with higher profitability, under the financial slack resources theoretical framework, tend to have more funds available to undertake social and environmental actions (Husted and Salazar, 2006; Waddock and Graves, 1997). Following this argument, it seems appropriate to hypothesize that profitability contributes to higher CSP:

H3. Profitability has a positive effect on CSP which is signaled by firm's membership to the ISE sustainability index.

Firm size has often been suggested as able to moderate firm social and sustainability policies and, indeed, it has been used as an important control variable in this context, although the arguments about the possible effect of firm size on these policies are still controversial (Baumann-Pauly *et al.*, 2013; Orlitzky, 2001; Udayasankar, 2008). It is postulated that larger firms are able to provide more resources to support firm's social and sustainability policy. Additionally, as the firm becomes larger, it interacts with a wider scope of stakeholders and, this way, experiences greater appeal for ESG concerns. In this vein, such concerns tend to be more relevant to larger firms which are more compelled to follow ethical behavior and integrate better corporate governance practices (Ullman, 1985; Ziegler and Schröder, 2010; Lourenço and Castelo Branco, 2013). Following this rationale, we propose that larger firms are more prone to be committed with sustainability issues as summarized in the following hypothesis:

H4. Larger firms are more likely to have higher CSP which is signaled by firm's membership to the ISE sustainability index.

There are arguments suggesting that innovation process, which is closely related to growth opportunities, is positive to the firm production system by making it more effective, given that innovation leads to optimizing the consumption of energy and natural resources, and thus reducing its effect on the natural environment. This may lead to better corporate sustainability related to products and processes (Padgett and Galan, 2010; Lourenço and Castelo Branco, 2013; Artiach *et al.*, 2010). Besides, firm's growth opportunities have been considered to be related to firm's commitment to sustainability given that the firm needs to signal to the market that it is sustainable to be able to access external funds to seize its growth opportunities. Thus, to better maximize its growth opportunities, which is closely related to innovation process that is beneficial to firm's sustainability, the firm needs to show that it is committed to sustainability in terms of natural environment concerns, stakeholder management and business ethics, which involves good standards of corporate governance, adequate relations with clients and supply chain and natural environment concerns. This rationale motivates the following hypothesis:

H5. Growth opportunities have a positive influence on the CSP which is signaled by firm's membership to the ISE sustainability index.

Creditors are usually effective in pressing for the meeting of their demands, as they finance firm's investment and need guarantees for the return of their funds. This situation sometimes leads to firm monitoring if the firm increases its indebtedness (Artiach *et al.*, 2010). Thus, in low leveraged firms, creditors exert less pressure over their rights. On the other hand, more indebted firms are more committed to creditor rights. The financial obligations with creditors may lead to reduced slack resources and to lower firm's capacity to undertake social and sustainability actions which require available funds, constraining the firm to direct funds to CSR activities (Brammer and Pavelin, 2008). These arguments lead to the hypothesis proposal that debt may inhibit firm sustainability policy as follows:

H6. Debt has a negative influence on the CSP which is signaled by firm's membership to the ISE sustainability index.

3. Empirical research

3.1 Sample

The sample is composed of 2,685 firm-year observations from 327 firms, covering the period of 2006-2015. The year 2006 corresponds to the first year of the Brazilian Firm ISE. Firms financial and ownership data were obtained from Economatica database. Every firm's sector was checked in Law 10.165/2000 to categorize each one according to the industry environmental risk. The status of composing the annual ISE, that is the proxy for higher CSP, was collected at the ISE website at BM&FBOVESPA. The sample period is also relevant given that it allows assessing the effect of the financial crisis (2007-2009) on CSP and eventual recovery in the aftermath. The whole sample of firms is distributed among several sectors of the economy (Table I). As can be observed in Table I, membership to the ISE seems to attract firms from all industries. It is worth mentioning that three sectors – "Chemicals, paper products, metal-mechanical", "Financial" and "Electrical, Water supply and sanitary services" – exhibit higher proportions of firms in the ISE than out of it. This can be motivated by characteristics of firms' interests on positive visibility and also because of industry regulation. For example, in Brazil, the National Agency of Electrical Energy establishes specific sustainability guidelines for the energy sector (Braga *et al.*, 2014).

3.2 Models and method

The difficulties in finding adequate measures for firms social and sustainability concerns are probably because of the diversity of actions a firm may undertake in such framework, the

Table I Sample distribution by industry

Industry	*Full sample* n	*(%)*	*Leading CSP firms (ISE firms)* n	*(%)*	*Other firms (non-ISE firms)* n	*(%)*
Petroleum and fuel products	50	1.86	2	0.62	48	2.03
Chemicals, paper products and metal-mechanical	390	14.53	55	16.98	335	14.19
Equipment, electrical machinery and transport equipment	231	8.60	19	5.86	212	8.98
Building and transportation	288	10.73	23	7.10	265	11.22
Food products, beverages and tobacco	255	9.50	14	4.32	241	10.21
Textile, clothing, leather and footwear	344	12.81	13	4.01	331	14.02
Communication	74	2.76	16	4.94	58	2.46
Electrical, water supply and sanitary services	379	14.12	114	35.19	265	11.22
Financial	268	9.98	45	13.89	223	9.45
Others	406	15.12	23	7.10	383	16.22
Total	2,685	100.00	324	100.00	2,361	100.00

absence of uniform disclosure format and also its non-mandatory nature (Orlitzky *et al.*, 2003; Aguinis and Glavas, 2012). Sustainability concerns are associated with firm's environmental concerns and also with firm's capacity to maintain performance and competitive advantage which may be dependent on good management and corporate governance practices, which signals the relevance given to the economic pillar of sustainability (Moldan *et al.*, 2012). All this means that CSP indices are subject to complex measuring strategies as can be seen in the multiplicity of indices used (Li and Tang, 2007; Hodgson *et al.*, 2011).

This work uses the membership to the Brazilian Firm ISE as proxy for the level of firm CSP given that it integrates CSR and sustainability concerns. The annual membership to the ISE is the dependent variable (CSP) in the logit panel data model of equation (1):

$$CSP_{i,t} = \beta_0 + \beta_1 OWNC_{i,t} + \beta_2 RSKIND_{i,t} + \beta_3 ROA_{i,t} + \beta_4 SIZE + \beta_5 GOPP_{i,t} + \delta_t + \alpha_i + \mu_{i,t} \quad (1)$$

In model of equation (1), the dummy variable CSP, is set to 1 if firm *i* is present in the ISE at year *t*, meaning high CSP, and 0 otherwise. OWNC is a measure of ownership concentration in hands of the first up to the fifth main stockholder. It corresponds to the voting capital held by the main stockholder (OWNC1), the sum of voting capital in hands of the two main stockholders (OWNC2) and so forth up to the sum of voting stocks held by the five main stockholders (OWNC5). Additionally, for sensitivity analysis, we also estimate alternate logit panel data models. First, we use the annual Herfindahl index of voting ownership concentration in hands of the five main voting shareholders for each firm-year observation (HI5). The Herfindahl index corresponds to the sum of squares of voting stocks held by each of the five main shareholders following previous literature (Maury and Pajuste, 2005). Second, we use a dummy variable for the presence of a dominant controlling shareholder, i.e. a stockholder that holds more than 50 per cent of voting capital (MAJOR).

Environmental risky industry (RSKIND) was taken into account based on the Brazilian Law for the Natural Environment (Law 10.165/2000). Such law created a fee for environmental control and inspection that are to be paid by firms from environmental risky industries. Law 10.165/2000 lists which are those environmental risky industries in terms of the potential to damage the natural environment. Thus, RSKIND is a dummy variable that is set to 1 if the firm sector is in the list of environmental risky industries, and is set to 0 otherwise.

Growth opportunities (GOPP) is proxied by Tobin's *q* which is calculated as the ratio between firm's market value plus debt, and firm's accounting value, as usual in the literature (Villalonga and Amit, 2006). Return on assets (ROA) proxies for firm's profitability. Finally,

also as common in the literature, natural logarithm of firm's total assets is used as proxy for firm's size (SIZE). In equations (1) and (2), *i* refers to firm; *t* is related to period; δ_t is the error term related to time-specific effects; α_i is the error term associated with firm-specific effects (which includes unobservable firm-specific characteristics); and $\mu_{i,t}$ is the random error term.

Alternate models [equation (2)] include the variable firm debt (DEBT), being measured by the ratio of total debt over total assets. These logit panel data models (for all measures of ownership concentration) are estimated for the subsample of non-financial firms, for which debt emerges as an important control variable commonly mentioned in the literature.

$$CSP_{i,t} = \beta_0 + \beta_1 OWNC_{i,t} + \beta_2 RSKIND_{i,t} + \beta_3 ROA_{i,t} + \beta_4 SIZE + \beta_5 GOPP_{i,t} + \beta_5 DEBT_{i,t} + \delta_t + \alpha_i + \mu_{i,t} \quad (2)$$

Models are estimated using panel data logistic regression model ("xtlogit" command in STATA). Panel data methodology allows the treatment of unobservable heterogeneity associated with fixed firm effects which are those specific firm attributes that do not change over time. With the purpose of having robust results, we kept in the panel data only firms with at least four years of available data. Description of models variables are summarized in Table II trying to make it clearer.

4. Results

Data on voting ownership concentration and other model variables are depicted in Table III. Average voting shares held by the main stockholder (OWNC1) is 52.5 per cent and the

Table II Description of model variables

Variable name	*Variable construct*
OWNC	OWNC refers to ownership concentration that is proxied for different variables used in distinct models for robustness of results: OWNC1, OWNC2, OWNC3, OWNC4, OWNC5, HI5 and MAJOR
OWNC1, OWNC2, OWNC3, OWNC4 and OWNC5	Each of the five variables refers to the sum of voting shares (%) held by the main first, the two main shareholders, the three main shareholders, the four main shareholders and the five main shareholders
HI5	Herfindahl index for voting ownership concentration held by the five main shareholders Herfindahl index of voting ownership concentration in hands of the five main voting shareholders for each firm-year observation
MAJOR	Dummy variable that takes into account the presence of a dominant controlling shareholder. MAJOR is set to 1 if there is stockholder holding more than 50% of voting capital in year *t*
RSKIND	Dummy variable that is set to 1 if the firm sector is in the list of environmental risky industries, and is set to 0 otherwise. The list of environmental risky industries is based on the Brazilian Law for the Natural Environment (Law 10.165/2000)
ROA	Return on assets calculated as the ratio between net profit and total assets
SIZE	Firm size proxied by Ln of total assets
GOPP	Growth opportunities, proxied by Tobin's *q*, which is calculated as the ratio between firm market value plus debt, and firm accounting value, as usual in the literature
DEBT	Debt is the annual firm leverage calculated as the ratio between total debt and total assets

Table III Descriptive statistics and test for the difference in means of explanatory variables between leading CSP firms and others

	Whole sample					Leading CSP firms (ISE firms)	Other firms (non-ISE firms)	t test	Mann–Whitney test
Variable	*Mean*	*CV*	*Median*	*Minimum*	*Maximum*	*Mean*	*Mean*	p-*value*	p-*value*
OWNC1	0.525	0.509	0.512	0.001	1.000	0.491	0.530	0.0064	0.0117
OWNC2	0.657	0.381	0.667	0.001	1.000	0.638	0.660	0.0692	0.0434
OWNC3	0.714	0.324	0.741	0.001	1.000	0.685	0.718	0.0080	0.0007
OWNC4	0.743	0.292	0.777	0.001	1.000	0.711	0.747	0.0022	0.0001
OWNC5	0.759	0.276	0.793	0.001	1.000	0.723	0.764	0.0005	0.0001
HI5	0.388	0.746	0.321	1.96e-06	1.000	0.338	0.395	0.0005	0.0122
GOPP	1.215	0.965	0.855	0.008	6.220	1.456	1.181	0.0000	0.0001
ROA	0.057	1.906	0.047	−0.151	0.479	0.098	0.051	0.0000	0.0001
DEBT	0.202	0.976	0.166	0.000	1.053	0.183	0.205	0.0376	0.5936
SIZE	13.582	0.136	13.595	4.997	20.074	15.718	13.289	0.0000	0.0001

Notes: CV = Coefficient of variation. HI5 is the Herfindahl index for voting ownership concentration held by the five main shareholders. OWNC (1-5) refers to the sum of voting shares (%) held by the main first up to the five main shareholders. ROA is return on assets. GOPP stands for growth opportunities, proxied by Tobin's *q*. DEBT refers to firm leverage (ratio of total debt to total assets). SIZE proxies for firm size (Ln of total assets)

three main shareholders have 75.9 per cent of voting shares. The fairly low coefficient of variation (CV) also signals that there is little variation in the high levels of concentration. These numbers show that indeed ownership of Brazilian firm is highly concentrated as previously documented (Carvalhal, 2012). The reality of high concentrated ownership may lead to specific effects on certain firm strategic policies as abovementioned, including CSP as hypothesized in this work.

Table III also contains tests for the difference in means for model variables between leading CSP firms (ISE firms) and the other firms (non ISE firms). As can be observed, leading CSP firms (firms at the ISE index) present lower level of voting ownership concentration (OWNC), have more growth opportunities (GOPP), present higher profitability (ROA) and are larger (SIZE). Additionally, the proportion of firms from environmental risky industries in the group of leading CSP firms is 73.15 per cent which is significantly higher than 26.85 per cent from other sectors as detected by the test of difference in proportions (*p*-value = 0.000) (Table IV).

Table IV shows the frequency of firm's year observations (absolute and relative) of firm membership to ISE and industry environmental sensitivity (firm from environmental risky industries or not). Test for the difference in proportions indicates that the number of firms in each situation are not balanced (χ^2 test, *p*-value = 0.000). Worth noting is that 59.81 per

Table IV Number of firm year observations at the ISE and from environmental risky industries

	Firm membership to ISE index		
Firm from	*Non-member*	*Member*	*Total*
Non environmental risky industry (Law 10,165)	992	87	1,079
% line	91.94	8.06	100.00
% column	42.02	26.85	40.19
% total	36.95	3.24	40.19
Environmental risky industry (Law 10,165)	1,369	237	1,606
% line	85.24	14.76	100.00
% column	57.98	*73.15*	*59.81*
% total	50.99	8.83	59.81
Total	2,361	324	2,685
	87.93	12.07	100.00

Notes: Test for the difference in proportions of firms that are ISE members and from high environmental risk industries. Pearson $\chi^2(1) = 27{,}256$; *p*-value = 0.000

cent of firm-year observations (1,606) are from environmental risky industries which means that Brazilian legislation has expanded more effective environmental control to a broad spectrum of industries. Among the firms that are members of the ISE sustainability index, the highest proportion is relative to environmental risky industries (73.15 per cent), while only 26.85 per cent are from other industries. That is a strong indication in the direction of *H2* which predicts that firms from environmental risky industries are more prone to have greater CSP.

Results for model estimates of equation (1) for the whole sample are exhibited in Table V. Alternate models that include debt as explanatory variable were estimated for the subsample of non-financial firms (Table VI).

As hypothesized, voting ownership concentration of the Brazilian firm negatively affects its CSP, proxied by the probability of the firm being in the ISE index (Table V) (*H1*). This result is consistent to models estimated with different measures of ownership concentration, i.e. the presence of a major controlling shareholder (MAJOR) (Table V, column i), the sum of voting stocks in hands of the first up to the three main shareholders (OWNC1 to OWNC3) (Table V, columns iii, iv and v) and also by the Herfindahl index among the five main stockholders (HI5) (column ii). Taking into account that CSP includes ESG concerns such result is consistent with the argument that large controlling shareholders of the Brazilian firm may not see sustainability concerns as so relevant. Together, corporate governance and the economic pillar of sustainability are very important in the ISE index (approximately 30 per cent of the questionnaire). The high importance of corporate governance concerns embedded in the ISE sustainability index may be relevant for this inverse relation given that prior literature has pointed out ownership concentration is associated to weaker corporate governance (Shleifer and Vishny, 1997; Hu and Izumida, 2008; Brandão and Crisóstomo, 2015). Under the agency theoretical framework, this situation may contribute to a rise in agency conflicts among controlling, minority and external stakeholders. It is also noticed that the negative effect of ownership concentration over CSP is absent when considering

Table V Panel data logistic models of CSP on firm attributes for the whole sample

Variable	*(i)*	*(ii)*	*(iii)*	*(iv)*	*(v)*	*(vi)*	*(vii)*
MAJOR	−0.955**	–	–	–	–	–	–
HI5	–	−1.975**	–	–	–	–	–
OWNC1	–	–	−1.719*	–	–	–	–
OWNC2	–	–	–	−2.013**	–	–	–
OWNC3	–	–	–	–	−1.949*	–	–
OWNC4	–	–	–	–	–	−1.660	–
OWNC5	–	–	–	–	–	–	−1.651
RSKIND	1.863***	1.852***	1.844***	1.908***	1.883***	1.834***	1.820**
ROA	3.002	2.964	2.951	2.929	2.943	2.953	2.935
SIZE	2.283***	2.244***	2.258***	2.276***	2.271***	2.273***	2.274***
GOPP	0.807***	0.795***	0.805***	0.807***	0.806***	0.813***	0.816***
Constant	−38.74***	−37.95***	−38.00***	−37.92***	−37.74***	−37.89***	−37.89***
N. obs.	2,685	2,685	2,685	2,685	2,685	2,685	2,685
N. firms	327	327	327	327	327	327	327
Wald $chi^2(14)$	98.79	99.13	98.56	98.58	98.43	97.69	97.35
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: Estimates obtained from panel data logistic model. Dependent variable is the dummy variable CSP that is assigned 1 if the firm *i* is listed at the Corporate Sustainability Index of BM&FBOVESPA (ISE) in the year *t* and 0 otherwise. HI5 is the Herfindahl index for voting ownership concentration held by the five main shareholders. OWNC (1-5) refers to the sum of voting shares (%) held by the main one up to the five main shareholders. ROA is return on assets. GOPP stands for growth opportunities, proxied by Tobin's *q*. SIZE (Ln of total assets) proxies for firm size; ***, ** and * refer to 1, 5 and 10% significance levels

Table VI Panel data logistic models of CSP on firm attributes for the subsample of non-financial firms

Variable	*(i)*	*(ii)*	*(iii)*	*(iv)*	*(v)*	*(vi)*	*(vii)*
MAJOR	−1.086**	–	–	–	–	–	–
HI5	–	−2.142**	–	–	–	–	–
OWNC1	–	–	−1.976**	–	–	–	–
OWNC2	–	–	–	−2.152**	–	–	–
OWNC3	–	–	–	–	−2.010*	–	–
OWNC4	–	–	–	–	–	−1.722	–
OWNC5	–	–	–	–	–	–	−1.714
RSKIND	1.613**	1.711**	1.665**	1.763**	1.705**	1.618*	1.597*
ROA	2.724	2.707	2.683	2.652	2.633	2.646	2.624
SIZE	2.043***	1.986***	1.999***	1.999***	1.993***	1.997***	1.998***
GOPP	0.738***	0.732***	0.740***	0.737***	0.735***	0.740***	0.743***
DEBT	0.370	0.313	0.353	0.275	0.250	0.250	0.234
Constant	−34.64***	−33.72***	−33.64***	−33.32***	−33.14***	−33.29***	−33.26***
N. obs.	2,124	2,124	2,124	2,124	2,124	2,124	2,124
N. firms	277	277	277	277	277	277	277
Wald $chi^2(15)$	77.73	78.62	77.91	78.51	78.71	77.84	77.49
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: Estimates obtained from panel data logistic model. Dependent variable is the dummy variable CSP that is assigned 1 if the firm *i* is listed at the Corporate Sustainability Index of BM&FBOVESPA (ISE) in the year *t* and 0 otherwise. HI5 is the Herfindahl index for voting ownership concentration held by the five main shareholders. OWNC (1-5) refers to the sum of voting shares (%) held by the main one up to the five main shareholders. ROA is return on assets. GOPP stands for growth opportunities, proxied by Tobin's *q*. SIZE (Ln of total assets) proxies for firm size. DEBT is leverage measured as total debt divided by total assets; ***, ** and * refer to 1, 5 and 10% significance levels, respectively

ownership concentration is in hands of the four and five main shareholders (OWNC4 to OWNC5) (Table IV, columns vi and vii). That means that higher voting concentrated ownership among the four and five main large shareholders may signal that the presence of more than three large blockholders is able to reduce the detrimental effect of up to three controlling shareholders on sustainability performance. This finding is in the direction of the contest power of blockholders over the excess power of one or two large controlling shareholders (Jara-Bertin *et al.*, 2008). Besides the contest power, this could also be because of advances in blockholders' sensitivity to CSR issues in more recent periods because of local and global institutional pressures.

As proposed under the rationale of *H2*, an important firm attribute – the firm pertinence to an environmental risky industry (RSKIND) – may be an important determinant for the degree of firm CSP. In fact, firms from environmental risky industries seem to be more committed to social and sustainability issues signaling that such firms believe that higher CSP is an important instrument to improve firm reputation and legitimacy of its activities. The activities undertaken by such firms to manage environmental concerns may probably increase their punctuation in ISE's inquire at the same time that these firms are probably struggling to be a member of the annual ISE list as a way to show that they are actually concerned with sustainability issues. In fact, a detailed analysis of membership to the ISE sustainability index shows that firms seem to make an effort to be at the ISE index as depicted by the presence of firms in consecutive years. Among these persistent firms, many of them are from environmental risky industries, as is the case of AES ELETROPAULO, CEMIG, CPFL ENERGIA and BRASKEM which were present in ten periods at ISE, or GERDAU and SUZANO PAPEL which were at the ISE index in nine periods (Crisóstomo *et al.*, 2018).

Contrary to our expectation, profitability is not a determinant for the degree of CSP (*H3*). In fact, the set of results in the literature are not conclusive about this effect. Perhaps, the

financial slack resources proposal may not hold for the Brazilian firm given that it faces financial constraints for investment (Crisóstomo *et al.*, 2014; Bassetto and Kalatzis, 2011) which may signal the absence of slack resources that could be used to fund social and sustainability activities. Other firm attributes have shown to be able to affect CSP. In fact, firm size has a positive effect over CSP as argued under *H4*, supporting the suggestion that larger firms are more capable of addressing social and sustainability concerns given that they tend to have more resources available for that (Udayasankar, 2008). Firm growth opportunities also have a positive effect over CSP as proposed under the rationale of *H5* that the need to seize growth opportunities will require more firm commitment to social and sustainability concerns, as well as with good corporate governance practices, given that this may be relevant in the search for funds to finance firms' investment projects.

The alternate models estimated for the subsample of non-financial firms with the debt variable (DEBT) included as an explanatory variable are shown in Table VI. As can be derived from models coefficients, the aforementioned results were confirmed. In fact, firms from environmental risky industries (RSKIND) present higher probability of being a leading CSP firm. High ownership concentration indeed has a negative effect on firm's CSP and the absence of such adverse effect for the concentration in hands of the main four and five shareholders (OWNC4 and OWNC5) signal that more large shareholders are able to minimize such negative effect on firm's social and sustainability concerns (Table VI, columns vi and vii). The same result holds for larger firms and firms with more growth opportunities.

As hypothesized, growth opportunities have a positive effect on Brazilian firm CSP proxied by the firm pertinence to the ISE index. Indeed, a firm with more growth opportunities needs all available funds to maximize them. For so, the firm must signal that it ratifies good corporate governance practices and has sustainability as a relevant concern. This is crucial in the financial market. This finding of the positive influence of growth opportunities on CSP is in accordance with previous results (Artiach *et al.*, 2010; Lourenço and Castelo Branco, 2013; Ziegler and Schröder, 2010).

The positive effect of firm size on CSP of Brazilian firm follows the theoretical proposal that larger firms are more able to undertake social responsibility actions (CSR) and, in parallel, are required to show more high standards of sustainability concerns. This finding is also consistent with previous studies in different markets, including Brazil (Artiach *et al.*, 2010; Lourenço and Castelo Branco, 2013; Nunes *et al.*, 2010).

Contrary to the expected negative effect, there is no effect of debt over CSP according to the results. In fact, debt costs and possible undesirable external control from creditors does not seem to adversely affect CSP. That could be because of the fact that more concern on firm sustainability is suggested to be positive to external financing given that the funding market may take such concern into account when analyzing firm funding requests (Magnanelli and Izzo, 2017; Brammer and Pavelin, 2008). This conflicting situation between favorable and unfavorable effect of debt over CSP may lead to the absence of association between debt and an index that incorporates CSR and sustainability.

Additional models were estimated to assess whether the financial crisis (2007-2009) which affected many countries, was able to deter CSP of Brazilian firms given its potential to decrease firms' financial performance with possible negative effect on CSP. Table VII summarizes results of model estimates that integrate period dummy variables that refer to the periods before, during and after crisis. The findings signal that indeed the crisis period had an adverse effect on CSP (Table VII; Panel A). Mainly, important is that in the period after crisis there has been observed a strong trend for improvement in Brazilian firms' CSP (Table VII; Panel B).

Overall, the findings show that indeed firm membership to an environmental risky industry is an important firm attribute for higher public accountability and better CSP. In fact, Brazilian

Table VII

Variable	*(i)*	*(ii)*	*(iii)*	*(iv)*	*(v)*	*(vi)*	*(vii)*
Panel A Panel data logistic models of CSP on firm attributes taking into account period before crisis and during crisis of 2007-2009							
MAJOR	−0.953**	–	–	–	–	–	–
HI5	–	−2.167**	–	–		–	–
OWNC1	–	–	−1.911**	–	–	–	–
OWNC2	–	–	–	−2.188**	–	–	–
OWNC3	–	–	–	–	−2.069**	–	–
OWNC4	–	–	–	–	–	−1.716*	–
OWNC5	–	–	–	–	–	–	−1.645*
RSKIND	1.772***	1.775***	1.767***	1.839***	1.806***	1.747***	1.726**
ROA	0.533	0.558	0.511	0.516	0.501	0.465	0.441
SIZE	1.905***	1.872***	1.882***	1.899***	1.893***	1.890***	1.889***
GOPP	0.588***	0.577***	0.587***	0.583***	0.584***	0.592***	0.594***
BEFORE_CRISIS	−0.534	−0.434	−0.460	−0.447	−0.466	−0.503	−0.515
CRISIS_2007-2009	−0.710**	−0.656**	−0.666**	−0.639**	−0.652**	−0.679**	−0.685**
Constant	−33.93***	−33.15***	−33.12***	−32.99***	−32.83***	−32.95***	−32.96***
N. obs.	2,685	2,685	2,685	2,685	2,685	2,685	2,685
N. firms	327	327	327	327	327	327	327
Wald $chi^2(14)$	99.30	100.29	99.83	100.24	99.94	98.87	98.39
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Panel B – panel data logistic models of CSP on firm attributes taking into account period before crisis and after crisis							
MAJOR	−0.953**	–	–	–	–	–	–
HI5	–	−2.167**	–	–	–	–	–
OWNC1	–	–	−1.911**	–	–	–	–
OWNC2	–	–	–	−2.188**	–	–	–
OWNC3	–	–	–	–	−2.069**	–	–
OWNC4	–	–	–	–	–	−1.716*	–
OWNC5	–	–	–	–	–	–	−1.645*
RSKIND	1.772***	1.775***	1.767***	1.839***	1.806***	1.747***	1.726**
ROA	0.533	0.558	0.511	0.516	0.501	0.465	0.441
SIZE	1.905***	1.872***	1.882***	1.899***	1.893***	1.890***	1.889***
GOPP	0.588***	0.577***	0.587***	0.583***	0.584***	0.592***	0.594***
BEFORE_CRISIS	0.175	0.222	0.206	0.191	0.185	0.175	0.170
AFTER_CRISIS	0.710**	0.656**	0.666**	0.639**	0.652**	0.679**	0.685**
Constant	−34.64***	−33.80***	−33.79***	−33.63***	−33.48***	−33.63***	−33.64***
N. obs.	2,685	2,685	2,685	2,685	2,685	2,685	2,685
N. firms	327	327	327	327	327	327	327
Wald $chi^2(14)$	99.30	100.29	99.83	100.24	99.94	98.87	98.39
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: Estimates obtained from panel data logistic model. Dependent variable is the dummy variable CSP that is assigned 1 if the firm *i* is listed at the Corporate Sustainability Index of BM&FBOVESPA (ISE) in the year *t* and 0 otherwise. HI5 is the Herfindahl index for voting ownership concentration held by the five main shareholders. OWNC (1- 5) refers to the sum of voting shares (%) held by the main one up to the five main shareholders. ROA is return on assets. GOPP stands for growth opportunities, proxied by Tobin's *q*. SIZE (Ln of total assets) proxies for firm size; ***, ** and * refer to 1, 5 and 10% significance levels, respectively

firms from environmental risky industries seem to be more eager to undertake social and sustainability actions as can be depicted from their strong presence at the ISE sustainability index. Additional evidence is provided about the adverse effect of high ownership concentration of Brazilian firms on CSP, revealing that large controlling shareholders are not so concerned with ESG issues. Perhaps, the great proportion of corporate governance and economic dimensions of the ISE index may be driving this result taking into account that previous literature has found important negative effect of ownership concentration over corporate governance (La Porta *et al.*, 1998; Brandão and Crisóstomo, 2015). Worth noting is the new evidence provided that more large blockholders seem to be able to reduce this negative influence of high ownership concentration over CSP which may signal the existence of an initial contest power in this specific firm policy. It is important to note the relevance of firm size and growth opportunities in improving CSP, and that the

macroeconomic conditions during the international financial crisis (2007-2009) had adverse effect on Brazilian firms' CSP. Table VIII summarizes all results found trying to leave it clearer.

5. Conclusions

The increasing relevance of CSP, which comprises ESG concerns, on business practices, has motivated research about its drivers. In this context, this work analyzes CSP determinants in an important emerging market, Brazil. CSP is proxied by the firm's annual membership to the Brazilian ISE. Firm's presence in the ISE index is conditioned on a tough competition among firms that fulfill a specific questionnaire comprising seven dimensions of corporate, social and sustainability concerns. A new large panel data set of Brazilian firms for the period of 2006-2015 was built, containing 2,685 firm-year observations with at least four years of observations for each firm.

Literature has suggested a set of firm attributes as able to affect firm CSP, as for example, firm size, firm performance, industry environmental sensitivity and ownership structure. This work provides evidence that firms from environmental risky industries are found to be leading CSP firms given that they have higher probability to be present in the Brazilian ISE. This reality shows that indeed firm's industry environmental sensitivity is relevant to CSP. This may be a consequence of stakeholders' pressure and institutional advances achieved in Brazilian Law for the Natural Environment which may be leading to positive enforcement results. It is important to highlight the negative effect of macroeconomic conditions during the financial crisis (2007-2009) on Brazilian firm CSP and that in the aftermath when such adverse situation seems to have faced a reversion.

Under the agency theoretical framework, high firm ownership concentration is proposed as able to align the principal and agent interests, at the same time that may favor the interests of controlling shareholders who become powerful enough to influence important firm policies, including social and sustainability responsibilities. The excess power of large

Table VIII Summary of results

Hypothesis	*Finding*
H1: Ownership concentration has an adverse effect on the probability of the firm's membership to the ISE sustainability index which signals firm CSP	Supported (negative effect found)
H2: Firms from environmental risky industries are more prone to have higher CSP which is signaled by firm's membership to the ISE sustainability index	Supported (positive effect found)
H3: Profitability has a positive effect on CSP which is signaled by firm's membership to the ISE sustainability index	Not supported (no effect found)
H4: Larger firms are more likely to have higher CSP which is signaled by firm's membership to the ISE sustainability index	Supported (positive effect found)
H5: Growth opportunities have a positive influence on the CSP which is signaled by firm's membership to the ISE sustainability index	Supported (positive effect found)
H6: Debt has a negative influence on the CSP which is signaled by firm's membership to the ISE sustainability index	Not supported (no effect)
Crisis (2007-2009) effect on CSP	Negative effect for the crisis period found. Positive time effect after the crisis period

blockholders has grounded the stakeholder framework used in this research that has documented an adverse effect of ownership concentration on Brazilian firm CSP. This result signals that controlling shareholders may not see the whole set of social and sustainability issues as a priority. It is important to highlight the new finding that more large stockholders appear to be able to contest the excess power of controlling blockholders and reduce the negative impact of high ownership concentration over CSP, signaling an emerging contest power in this context. Besides, larger Brazilian firms and the ones with more growth opportunities seem to be more committed to undertaking social and sustainability actions.

The contribution of the work is twofold and may be of interest to distinct constituencies. The research analyzes the composition of the ISE index (Brazilian ISE) which indeed integrates ESG concerns. For researchers, the index analysis is important given its relevance nowadays when social concerns in general have gained importance in financial markets. Starting from the ISE index analysis, the work provides additional evidence on the firm's attributes that influence CSP, as proxied by membership to the ISE index. Similar research may be undertaken in other markets using similar methodology, given that indices such as ISE do not publicize firm punctuation. New relevant evidence is provided about the fact that firms from environmental risky industries are linked to higher probability of composing the sustainability index and thus to higher standards of social and sustainability activities. This finding builds on stakeholder theory by highlighting positive results from the Brazilian environmental legislation, being an important discovery to both environmentalists and academics. The analysis of how voting ownership concentration affects firm's CSP builds on both agency and stakeholder theories by exposing agency conflicts and stakeholders' interests. This examination provides evidence that CSP is negatively affected by high ownership concentration in Brazil, in accordance with prior results but also pointing out the new finding that the presence of other large shareholders, who are associated to more ownership dispersion, seem to be able to contest the power of large controlling blockholders.

The paper concludes highlighting the importance of enforcing corporate social and sustainability institutionalization in Brazil. The positive effects obtained from the advances in environmental legislation must be taken into account to foster strengthening in other dimensions of CSP such as the relations with employees and civil society. Policymakers ought to observe society demands and the need to preserve the natural environment. In this regard, the encouragement of civil society to pressure government and firms for better CSP is very relevant.

The present findings are relevant to the ongoing debate on the importance of CSP and firms' attributes that influence on it. Thus, this work meets the request from international audience for this kind of research in emerging economies which present distinct institutional environments and incipient capital markets. The results refer to the 9^{a} economy in the world that is a BRIC member.

Some research lines are identified. Analyzing the seven ISE axes separately may be considered a limitation of this work while it is a challenge for future research. Studying the effect of other aspects of Brazilian firms' ownership structure also emerges as another insightful research as is the case of controlling blockholders' nature. Specific works may also try to capture the capacity of civil society organizations to pressure for CSP advances.

Note

1. Institutions that compose the ISE Advisory Committee: BM&FBOVESPA – São Paulo Stock Exchange; Abrapp – Brazilian Association of Closed Supplementary Pension Institutions; Anbima- Brazilian Association of Financial and Capital Markets Institutions; Apimec – Association of Investment Analysts and Professionals of the Capital Market; Gife – Group of Institutes, Foundations and Companies; IBGC – Brazilian Corporate Governance Institute; Ibracon – Institute

of Independent Auditors of Brazil; Ethos- Institute of Companies and Social Responsibility; Ministry of the Environment; IFC – International Finance Corporation; e PNUMA – United Nations Environment Programme.

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