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RODRIGO FREIRE LINS

INFLUENCE OF STAKEHOLDER PRESSURES ON CORPORATE SUSTAINABILITY REPORTING IN BRAZIL

Rio de Janeiro

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Master's dissertation presented to the COPPEAD Graduate School of Business, Universidade Federal do Rio de Janeiro, as part of the mandatory requirements in order to obtain the title of Master in Business Administration (M.Sc.).

Supervisor: Prof. Leonardo Marques, Ph.D.
Co-supervisor: Prof. Alice Erthal, Ph.D.

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RESUMO

LINS, Rodrigo Freire. **Influence of stakeholder pressures on corporate sustainability reporting in Brazil.** 2021. 49f. Dissertação (Mestrado em Administração) - Instituto COPPEAD de Administração, Universidade Federal do Rio de Janeiro, Rio de Janeiro, 2021.

Atualmente, empresas lidam com uma crescente pressão por parte dos *stakeholders* para serem mais transparentes quanto suas práticas e impactos. Especificamente, a extensão e a complexidade das cadeias de suprimento têm levantado diversas preocupações quanto ao nível de transparência que as empresas apresentam e o desalinhamento entre práticas/impactos reais e o que a empresa comunica. Isso é particularmente importante para empresas originárias de economias emergentes. Elas enfrentam barreiras adicionais para implementar políticas de sustentabilidade e recebem menos atenção da literatura, em comparação com empresas com base em países desenvolvidos. O presente estudo investiga as pressões de *stakeholders* e condições, tanto no nível das empresas quanto no nível setorial, que influenciam o reporte em sustentabilidade focado em tópicos de cadeia de suprimentos entre empresas brasileiras de capital aberto. O estudo analisou um painel não balanceado composto por 220 relatórios de sustentabilidade, referentes ao período de 2016 a 2018, que representam 88 empresas brasileiras listadas no mercado de ações nacional. Os resultados mostram que as pressões de organizações não-governamentais ligadas a questões sociais, bem como de investidores e credores são significativa e positivamente relacionadas a maiores níveis de relato de tópicos sobre cadeia de suprimentos. Além disso, a adoção do padrão Global Reporting Initiative (GRI) e o tamanho das empresas são preditores relevantes para explicar o relato de mais informações e transparência no tocante ao tema.

Palavras-chave: Transparência em cadeias de suprimento; relato em sustentabilidade; Global Reporting Initiative; teoria dos stakeholders

ABSTRACT

LINS, Rodrigo Freire. **Influence of stakeholder pressures on corporate sustainability reporting in Brazil.** 2021. 49f. Dissertação (Mestrado em Administração) - Instituto COPPEAD de Administração, Universidade Federal do Rio de Janeiro, Rio de Janeiro, 2021.

Companies currently deal with increasing pressure from multiple stakeholders to be more transparent about their practices and impacts. Specifically, the extension and complexity of supply chains (SCs) have raised many concerns about the level of transparency companies have and the mismatch between actual practices/impacts and what a company communicates. This is particularly important for companies headquartered in emerging economies. They face additional barriers to implement sustainability policies and receive less attention from the literature, in comparison to developed countries-based companies. The present study investigates the stakeholder pressures and conditions at both company and industry-level that influence sustainability reporting focused on SC issues for Brazilian listed companies. The study has analyzed an unbalanced panel data of 220 sustainability reports from 2016 to 2018, representing 88 Brazilian companies listed on the national exchange market. It was found that non-governmental organizations devoted to social issues, in addition to shareholder and creditor pressures are significant and positively related to higher levels of SC reporting. In addition, the adoption of the Global Reporting Initiative (GRI) methodology and company size are relevant predictors for more information and SC transparency regarding sustainability issues.

Keywords: Supply chain transparency; sustainability reporting; Global reporting initiative; stakeholder theory

LIST OF TABLES

LIST OF ILUSTRATIONS

LIST OF ABREVIATIONS

CSR	Corporate Social Responsibility
GHG	Greenhouse Gas
GRI	Global Reporting Initiative
IBAMA	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis
ILO	International Labor Organization
ISE	Índice de Sustentabilidade Empresarial
NGO	Non-Governmental Organization
SC	Supply Chain
SCM	Supply Chain Management
SSC	Sustainable Supply Chain
SSCM	Sustainable Supply Chain Management

CONTENTS

1 INTRODUCTION

Corporate transparency has become an increasingly important topic on organizational studies, embedded on many contemporary socio-political discourses (Albu & Flyverbom, 2019). Problems related to climate change, poverty, human rights, violations, and legal compliance have urged, making companies more aware of their social and environmental impact (Yadava & Sinha, 2016). In consequence, leaders of their industries are expanding the boundaries of supply chain (SC) information reporting (Marshall et al., 2016). Thus, demands from a diverse range of stakeholders have emerged.

The growth of environmental and social concerns is translated into the attention that many stakeholders and investors have been paying to how their pressures and investments can contribute to a better (or worse) social welfare and environmental good, beyond short-term investments returns (Yadava & Sinha, 2016). Capital market actors are now concerned, not only about short-term profitability, but also about social and environmental impacts that influence cash flows in the long term, such as climate-related topics (Reimsbach et al., 2019). Topics such as energy consumption (Reimsbach et al., 2019), along with requirements of environmental and labor regulations (Silva & Figueiredo, 2017), have guided the attention given to sustainability performance. As social media becomes a dominant source of information, the “super-transparency” phenomena has amplified the benefits and the risks of doing business (Austin & Upton, 2016), which also include social and environmental dimensions (Xu et al., 2019).

Recent incidents show that non-compliant behavior often happens beyond the purview of the focal company, along their dispersed SC (Marques, 2019). Wilhelm et al. (2016) mention some examples of “invisible” practices that occur along SCs, such as excessive working hours and sexual harassment. Ultimately, this is reflected on the quality and coverage of sustainability reports. Many companies still lack visibility of their SCs in order to manage it properly (Sodhi & Tang, 2019). This poses a challenge for companies that should track practices along their SCs avoiding decoupling between practices and communication (Huq & Stevenson, 2018).

Considering the increasing pressure for trustworthy sustainability data and reporting, the importance of international reporting methodologies, such as the Global Reporting Initiative (GRI), increases (Islam et al., 2016). Best practices on sustainability reporting, particularly those aligned with such methodologies, help demonstrating to stakeholders that

"good governance, as well as environmental and social issues are taken into consideration in the management of the supply chain" (Okongwu et al., 2013, p. 828). They intend to support companies in communicating to their audience how they are dealing with salient topics related to their SCs' operations. Given that scenario, the present study explores the importance of GRI in driving the attention given by sustainability reports to sustainable supply chain (SSC) issues.

Supply chains in emerging regions face additional barriers to implement innovative and sustainable ways of production (Silvestre, 2015b). This is particularly important for the present study, as it aims to investigate an emerging country in economic development terms, namely Brazil. In the food global chain, for example, products transit through emerging countries until end-market nations with diverse socioeconomic realities (Gold et al., 2017). This calls attention to the relevance of the players of the global SCs located in emerging economies.

To sum up, the present study aims to investigate the stakeholder pressures and conditions that significantly influence the level of reporting covering SC issues for listed companies in Brazil. First of all, GRI Topics for Sectors was accessed to define what are the most critical industries in terms of sustainable supply chain management (SSCM). Next, a quantitative content analysis was made among corporate sustainability reports to check the attention given to SSC matters. Finally, the study checked for correlations between several stakeholder pressures and reporting levels. Non-governmental organization (NGO) devoted to social issues, creditor and social government pressures were found positive and significant in the present model, in addition to the adoption of GRI and the size of the companies.

It is already known that stakeholders do have a role in corporate reporting (Chen & Kitsis, 2017; Meixell & Luoma, 2015; Sodhi & Tang, 2019). However, less is known about what types of stakeholders contribute more to sustainability reporting in SC issues. Only one study covered in the literature review directly assessed reporting practices focused on SCs (Okongwu et al., 2013). Also, even though the existence of a diverse body of publications on corporate sustainability reporting, much research is concentrated on US-based companies (Tate et al., 2010) and developed countries in general (Kuzey & Uyar, 2017). Thus, there is a lack of knowledge on how reporting covers SC issues in emerging economies (Silvestre, 2015b). The present study aims to fulfill the mentioned gaps.

In the following sections, the study presents the definition and implications of corporate sustainability reporting practices. Next, stakeholder theory is defined, and how social constituents can influence the level of SSC reporting in order to enhance businesses'

reputation and legitimacy. Finally, considerations about SSCM and the risks and impacts on sustainability performance are presented. After this, the method is explained in details, followed by the presentation and analysis of findings and their impacts for practitioners and the SSCM literature.

2 LITERATURE REVIEW

2.1 Corporate Sustainability Reporting

Information reporting permits observability, certainty, and accountability (Albu & Flyverbom, 2019) between the companies and their stakeholders, decreasing the information asymmetry between them. Through sustainability reporting, companies disclose their performance regarding economic, social and environmental issues during a period of time, usually a fiscal year (Dilling & Harris, 2018). The ultimate goal is to embed sustainability into the business strategy and to develop competitive advantage (Whitehead, 2017).

Corporate sustainability reports have been employed to cover a broad range of topics, including economic related topics (Wu et al., 2018), labor practices, communities activities (Fuente et al., 2017), energy usage, biodiversity (Reimsbach et al., 2019), among others. This type of reports has been helping companies to create value and legitimize actions in face to stakeholders' demands (Fuente et al., 2017). Also, internally, such reports are a mechanism for management and control, assisting companies to detect and correct poor sustainability performance, implement policies and review their results (García-Sánchez et al., 2019b). When companies engage on sustainability reporting, they show commitment to transparency and consequently attract more investors and customers, enhancing operational efficiency and so on (Okongwu et al., 2013).

An effective and inclusive transparency strategy, bringing together all stakeholder to design sustainability reports, tends to generate several benefits to companies. Many authors stress possible outcomes for it, like the decrease of legal and financial risks and the increase of reputational capital and corporate value (Rashidfarokhi et al., 2018), trust (Albu & Flyverbom, 2019) and employee recruitment and retention (Soundararajan et al., 2019). Also, investments on social responsibility and responsiveness for transparency demands have a positive impact on company performance (Kang et al., 2016) and keep corporate competitive advantage (Marshall et al., 2016).

The definition of businesses practices on integrated reporting is important to understand in what extent companies are engaged to increase, maintain or restore the necessary legitimacy to operate in the socio-economic context (Vitolla et al., 2019). The proactiveness and anticipation towards external stakeholders' demands has the potential to avoid problems with reduced time for planning, participation and experimentation (Marshall

et al., 2016) and give rise to capabilities needed to respond to collective coercive pressure from buyers and improve chances of long-term survival (Huq & Stevenson, 2018). Through stakeholders' participation processes (Paula & Gil-Lafuente, 2018), companies in emerging economies can better shape their reporting practices to target what really matters to their salient stakeholders in terms of SC sustainability, and avoid negative reactions from unreliable (or omitted) information.

Some initiatives to either assure or standardize corporate transparency information and practices, like ISO, UN Global Compact membership and GRI have been developed, in order to respond to the crescent need to improve sustainability performance from companies (Whitehead, 2017). GRI guidelines – the framework studied in the present study - has pushed companies to commit themselves to ethical practices and maintain high standards of public integrity (Islam et al., 2016). GRI guidelines also have the power to ensure greater credibility and comparability of information (Cubilla-Montilla et al., 2019), including those related to SSC. In addition, the inclusion of salient topics for different stakeholders reinforce the importance of sustainability reporting (Whitehead, 2017) that follows best practices.

A key element to well-shaped reporting strategies is how companies engage (or not) with their stakeholders. After conducting a review in the literature, Rashidfarokhi et al. (2018) listed some motivations for companies to report their sustainability information, including the necessity to engage with stakeholders and address society's demands. Policies on corporate sustainability include interests of many stakeholder groups, like consumers, local communities and the natural environment (Zimon et al., 2019) and allow focal companies to nurture a network with suppliers, distributors, retailers, etc., to develop and manage sustainable business processes (Pohlmann et al., 2020). Those policies also permit the identification of critical aspects when designing, planning and operating SSCs (Dubey et al., 2017), which assists the formatting of transparency principles.

The role of the society on pushing companies to sustainability is central to this study. The consideration of stakeholders and their demands on the design of business policies is key to achieve sustainable development (Paula & Gil-Lafuente, 2018). Multinational companies, for example, have pushed their suppliers to comply with labor codes of conduct and improve work conditions often as a result of pressures by media and activist groups (Bird et al., 2019),. Since the subprime crisis of 2008, stakeholders have demanded companies to look forward on long-term value and avoid only short-term earnings (Dilling & Harris, 2018). Such pressures, particularly in disruptive moments, help to push focal companies to improve their strategies when dealing with sustainability and supply chain management (SCM).

2.2 Stakeholder Theory and its influence on Corporate Sustainability Reporting

The manner in which companies report their sustainability performance have been considered by many market and nonmarket stakeholders, ranging from customers to even the United Nations (Marquis et al., 2016). Beyond internal concerns, external pressure from legislation, peers' best practices and important stakeholders like NGOs (Marshall et al., 2016) and institutional investors (Hahn et al., 2015) influence the accountability perception and corporate behavior regarding sustainability topics. As a consequence, companies should consider stakeholder's engagement in corporate strategies (Paula & Gil-Lafuente, 2018).

The array that composes the stakeholder scheme may vary depending on the author's perspective, either narrower or broader. In this sense, some authors mention market analysts, consultants, media (Paula & Gil-Lafuente, 2018), academia (Paula & Gil-Lafuente, 2018; Salvia et al., 2019), natural environment (Miniaoui et al., 2019), industry or competitors (Salvia et al., 2019; Tate et al., 2010), community (Tate et al., 2010) and the general society (Hahn et al., 2015; Tate et al., 2010), besides including the most common ones, such as shareholders, customers, employees, governments and NGOs. The management of such complex frame, added to technological, economic and social changes (Paula & Gil-Lafuente, 2018), have posed a challenge for relationships management and, finally, affected the long-term survival of companies (Vitolla et al., 2019). This movement is particularly important in emerging countries like Brazil, where prior studies have not accessed such type of institutional background with proper intensity yet (Kuzey & Uyar, 2017).

Stakeholder theory allows the expansion of the notion of value creation to beyond shareholders' perspective (Soundararajan et al., 2019). Recently, a movement called long-termism have been established, in response to the unsustainable short-term orientation of past moments (Dilling & Harris, 2018). When the economic and social scenario changes, shared value creation actions, advocated by the stakeholder theory, may arise as an alternative to generation of benefits for all stakeholders, including the owners (Vitolla et al., 2019). Managers are responsible for promoting a more complete and strategic response to stakeholder expectations (Whitehead, 2017), where financial, social, environmental, and governance performance are simultaneously reached (Vitolla et al., 2019).

When stakeholders have an active participation on SCM policies, leading companies develop a close relationship with their suppliers to guarantee environmental compliance, enforcing its social values and adding value in a competitive cost (Tate et al., 2010). This

tends to avoid problems on institutional settings with strong civil society defenders, caused by harming-legitimacy actions (Marquis et al., 2016). On emerging countries' context, Silvestre (2015b) states that companies face additional barriers to implement sustainable practices due to the turbulence and uncertainty when compared to developed country-based companies. The author proposes that, in turbulent environments companies would follow a subtler trajectory of sustainability, while companies from more stable environments would reach high levels of sustainability faster. In addition, Barkemeyer et al. (2015) corroborate that idea, in that emerging countries face more acute social and environmental crises, most of which have been through political changes in terms of democratization, liberalization and privatization.

Many studies have assessed the influence of stakeholder pressures on sustainability reporting. Overall, all stakeholders, from internal (as employees) to external (such as NGOs and governments), have positively influenced SSCM actions. Companies which operate in environmentally sensitive industries, for example, face more pressure to provide significant amounts of sustainability information (Miniaoui et al., 2019; Mohammadi et al., 2018). Customer pressure was also found to be positively related to the transparency of sustainability reports (Fernandez-Feijoo et al., 2014) and the level of maturity on SSC reporting (Okongwu et al., 2013).

Through the employment of GRI and quantitative measures - to make sustainability more visible and comprehensive - companies can evaluate how well they are promoting an effective stakeholder communication (Yadava & Sinha, 2016) and adapt to the institutional influences of their context (Cubilla-Montilla et al., 2019), jointly with the improvement of sustainability reporting. Given such improvement, it is possible to reduce economic, social, and environmental uncertainties and help analysts generate more accurate forecasts (García-Sánchez et al., 2019a). This tends to enhance the acknowledge of sustainability performance indicators and consequently decision-making processes related to SSCM.

2.3 Reporting practices and its impacts on SSCM

The importance of SCM has been stablished since the nineties in the business literature (Davis, 1993; Ellram, 1991; Lee & Billington, 1995; Scott & Westbrook, 1991; Tan et al., 1999). More specifically, the study of SSCM has gained much attention in the last decade (Ansari & Kant, 2017; Jia et al., 2018). SSCM has emerged with the idea of incorporation and intersection of three spheres – environmental, social and economic performance – to business management (Ansari & Kant, 2017). While not considered in competitive strategies before the 1970s, strategies of SSCM has evolved to part of corporate

competitive advantage (Zimon et al., 2019). Now, companies that fail to consider, measure and/or control one of three dimensions are more susceptible to become unsustainable and incur in an ambiguous and risky path (Silvestre, 2015a).

SSCM literature classifies sustainable practices on upstream, focal company, and downstream (Zimon et al., 2019). Various dimensions may be cited as components of a SSCM, as pointed out by Dubey et al. (2017): environmental, social and ethical, economic, operational performance, internal and external factors. They influence the way SCs adapt their practices and improve SSCM performance, aligned with best reporting practices.

The management of sustainability-related risks has gained much importance for different companies from many industries (Xu et al., 2019). For example, the apparel industry is the second-largest polluter, considering problems of post-consumer waste and reverse logistics (Sodhi & Tang, 2019). Pollution is also a recurring problem for the consumer electronic goods industry - particularly in emerging regions like China (Wilhelm et al., 2016) - and CO_2 emissions for the food SC (Pohlmann et al., 2020). Risk management through voluntary reporting of SC information may limit reputational damages for companies and the exposition on the media, NGOs and government agencies even when publishing negative news (Sodhi & Tang, 2019), particularly in such environmental sensitive industries.

Xu et al. (2019) define three steps to evaluate SC sustainability risk: mapping, materiality assessment and its analysis. Mapping process, for example, happens when focal companies initially invest on the visibility of the SC for themselves, through audits and supplier interviews, to improve the level of transparency for stakeholders (Sodhi & Tang, 2019), acknowledging regional characteristics of the SC (Xu et al., 2019). Some features should be taken into consideration in this process, such as power asymmetries, which varies between industries (Wilhelm et al., 2016) or social issues, which are more challenging in emerging countries (Silvestre, 2015b), to cite a few.

In some SCs, environmental sustainability is more prominent, where the choice of suppliers, materials and transport modes affects businesses more decisively. At the same time, financial and social performance are more relevant to companies where the assemble of the final product relies on many other companies, like in the automotive and electronic industries (Tate et al., 2010). While transportation industry companies focus on environmental themes, services industry tend to focus on social and human capital themes (Wu et al., 2018). In addition, agricultural companies have been increasingly demanded to improve their sustainability practices (Whitehead, 2017), including aspects such as the employment of modern slavery working conditions. This is particularly important in emerging countries,

which are mostly dependent on rural activities, affecting the well-being and social condition of the population of these regions (Gold et al., 2017).

Many issues may be cited as consequences of a poor monitoring routine for SSCM. Silvestre (2015a) list some of them when studied Petrobras' operations, a big Brazilian Oil and Gas company, like disturbing local fishing activities, proliferation of favelas, high levels of crime and violence, among others. Sodhi and Tang (2019) recall some scandals in corporations' history, like a fire in a supplier facility, resulting in a loss of € 400M for Ericsson in 2000; a layoff of 1,400 workers from an insolvent supplier of Land Rover in 2001; and, not forgetting to mention, the Rana Plaza event in 2013, killing more than one thousand people. Companies involved in such events generally face various types of problems, such as consumer backlash, product recalls, fines and loss of market share (Mani et al., 2018). Through the promotion of SC visibility, companies develop auditing/inspection mechanisms, aiming to "prevent or reduce reputation damages caused by the public exposure of unacceptable supplier practices or undesirable supply provenance" (Sodhi & Tang, 2019, p. 2950).

In a perfect scenario, buyer companies would monitor all the upstream suppliers to guarantee a transparent SC. However, the distance commonly encountered in these chains make collaborative technologies and monitoring difficult to be applied efficiently (Wilhelm et al., 2016). In these cases, leading companies have limited enforcement to make suppliers act accordingly to their sustainability standards. Wilhelm et al. (2016) support this idea stressing the important role played by first-tier suppliers, that act like interlocutors between the buying company and second-tier suppliers. Still on suppliers management, Huq and Stevenson (2018) point out the importance of suppliers selection and development for the management of social indicators as the diffusion of responsibility comes to light, when isolated actions from different constituents are viewed as part of just one single body (Eriksson & Svensson, 2016).

When companies have operational realities in their SCs, detached from what they communicate, the phenomenon of greenwashing takes place, according to the literature (Gold et al., 2017). In such cases, SC actors define standards to follow, but not necessarily put effort to seek for them (Soundararajan et al., 2019), lacking the capacity of enforcement. This has become particularly risky for businesses, as disruptions in both upstream and downstream levels, caused by a poor visibility, are now crucial to avoid negative impacts on sales (Sodhi & Tang, 2019).

In order to implement a more effective SSCM, it is important to focus on solutions to measure, track and improve results along the time. Companies' internal and external

stakeholders should be able to interpret sustainability information and make decisions, evaluating companies and driving improvements (Barkemeyer et al., 2015). However, in practice, companies have failed to provide not only quantified but also qualitative assessments of their social and environmental performance (Rashidfarokhi et al., 2018). Very few companies provide any information about suppliers beyond their first tier (Sodhi & Tang, 2019).

This directly affects the access of data from researchers (Jia et al., 2018), limiting the quantity of studies related to sustainability issues in SCs and the influence of stakeholders on SC reporting. GRI for example presents a gap on presenting SC assessments. While analyzing the mining industry, Mancini and Sala (2018) found that some health and safety aspects in mining communities are not included in the G4 guidelines (active version at that moment); same case for impacts of poor working conditions and inflation and rising costs for accommodations, which are indirectly or partially treated by GRI (Mancini & Sala, 2018). It becomes clear the importance given to the SSC, but difficult to evaluate the effectiveness of direct reporting approaches like GRI (Meckenstock et al., 2016). The truth is that they have limited potential to provide a real picture of lower-tiers realities to salient stakeholders, despite all the efforts employed.

Additionally, it is recurrent the major interest given by scholars to developed-country cases when studying SCs (Jia et al., 2018; Kuzey & Uyar, 2017; Silvestre, 2015a). Silvestre (2015a) points out the differences encountered in emerging environments, like the regulatory frame and social pressures, and the role of focal companies based on such regions, which possibly has notable distinctions. As a result, the literature on SSCM still has a long way to evolve in such questions (Dubey et al., 2017). Because of that, the present study aims to target this gap in the literature, by investigating different industries inserted in the Brazilian economy. In Table 1 it is presented some of the studies which have influenced the current investigation.

Kuzey and Uyar (2017)	Kalu et al. (2016)	Fernandez-Feijoo et al. (2014)	Okongwu et al. (2013)	Huang and Kung (2010)
Sustainability reporting	Voluntary carbon disclosure	Corporate social responsibility (CSR) reporting	Level of maturity on SSC reporting	Environmental disclosure level
Company size, Industry, Growth Opportunity, Leverage, Ownership Structure, Profitability, Free Cash Flow and Liquidity	Social, financial market, institutional and economic factors	Consumer-proximity, employee and investor-orientations and environmental sensitive industry, also employing three control variables	Type of industry (B2B, B2C, polluting industry or not)	External, internal and intermediary stakeholders
Manufacturing and bigger companies are more likely to engage in sustainability reporting. Leverage and liquidity are negatively associated with sustainability reporting. Sustainability reporting drives company financial performance.	Social and financial market were critical determinant factors, while economic and institutional factors did not achieve significant effect on voluntary carbon reporting	Investors as well as employees have the highest level of influence in CSR reporting transparency as stakeholders, while environment presents the lowest one. The four regressions also show the significance of all control variables, region, size, and quoted – this last one with a negative signal.	Disclosure maturity level is higher in business-to-consumer industries than in business-to-business industries on both social and environmental dimensions. The paper also shows that the highly polluting energy industry is the least advanced in disclosing SCS initiatives. Customer pressure is positively associated with SSC reporting	All stakeholders were positively related to environmental disclosure, except for suppliers

Li et al. (2020)	Chithambo et al. (2020)	Vitolla et al. (2019)	Rebs et al. (2019)	Svensson et al. (2018)
Green manufacturing	GHG (greenhouse gas) emission voluntary reporting	Integrated reporting quality	SSCM performance	Sustainability efforts on SCs
Government, Distributor, Suppliers, Society and Customers influence	Pressures from shareholders, employees, creditors, suppliers, etc., controlling for CEO characteristics, profitability and board size.	Customer, environmental protection org., employee, shareholder and government pressures, controlling for Age, Year of publication of reports, companies' location and ROE	Government, shareholders, and other external stakeholder pressures	Market, societal, upstream and downstream stakeholders
Government, Society and customers positively influence green manufacturing	Regulatory, mimetic, and shareholder pressures positively influenced the reporting of GHG information. Creditor pressure had a significant negative relationship with GHG reporting. Although CEO age had a direct negative effect, its moderation on regulatory pressure was found to be significant.	Results showed that pressure from customers, environmental protection organizations, employees, shareholders, and governments favors the publication of higher quality integrated reports.	Preferable mix of stakeholder pressures for superior SSCM is represented by weak governmental, strong shareholder, and very strong other external stakeholder pressure (given costs of applying SSCM)	Positive influence of market (end customers) and societal pressures (NGO, government and general public) on SC sustainability

Table 1. Articles reviewed on sustainability reporting and SSCM literature

Article	Tran and Beddewela (2020)	Soares et al. (2020)
Dependent variable	Sustainability disclosure	Environmental and social reporting
Independent variables	Institutional forces and several control variables	Political, financial, educational and labor systems, controlling for company size, ROA and leverage
Findings	Mandatory regulation and adoption of GRI were positively associated with the dependent variable. Legal system (civil or common law) was not significant in the model.	For companies operating in Brazil, the extent of environmental and social reporting is positively related to the political and labor systems, and negatively related to the financial system. In Canada, reporting is negatively influenced by the financial system and the education system. The control variables were not significant.

A variety of studies has aimed to establish connections between stakeholder pressures and corporate sustainability reporting or SSCM actions. The majority has found a positive relation between sustainability reporting and stakeholder pressures, including customers (Okongwu et al., 2013; Vitolla et al., 2019), investors (Chithambo et al., 2020; Fernandez-Feijoo et al., 2014; Vitolla et al., 2019), employees (Fernandez-Feijoo et al., 2014; Vitolla et al., 2019) and so on. Exceptions are rare, like in the example of Chithambo et al. (2020), which found a negative relationship between GHG emission disclosure and creditors pressure. In addition, the adoption of GRI is also a positive indicator of higher levels of reporting in sustainability issues (Tran & Beddewela, 2020). The present study will explore what stakeholder pressures are correlated with higher levels of reporting on SC matters in the Brazilian scenario. The adoption of GRI is also explored through the definition of the hypotheses.

2.4 Hypotheses definition

Customers “seek information on the environmental impact of production, customer health and safety, marketing and labelling, and customer privacy” (Vitolla et al., 2019, p. 1596). This is particularly important for companies which are known by their proximity to the

end consumer (Fernandez-Feijoo et al., 2014). Companies from the consumer goods industry, for example, have strong incentives to report their sustainability performance, as they are normally more exposed to the public and susceptible to boycotts and social scrutiny (Gamerschlag et al., 2011). Companies which are considered next to the end consumers are viewed as "high-profile" ones, as they are known by the most members of the society and their actions are more easily perceived (Branco & Rodrigues, 2008). Using consumer proximity as a proxy, it is supposed that customer pressure (Customer) is positively associated with SSC reporting.

H1. *Customer Pressure is positively associated with SSC reporting.*

The scenario where companies operate have decisively changed due to, among other factors, citizens' sensitivity to ecological issues (Vitolla et al., 2019). As a conclusion, it is reasonable to believe that the pressure for SC reporting in regards with environmental impacts become particularly important for companies perceived as the main contributors to problems like water pollution and greenhouse gases emissions. Some studies have investigated the influence of environment-related organizations and general society on sustainability reporting (Huang & Kung, 2010; Marquis et al., 2016; Vitolla et al., 2019). All of them found a positive relationship between the two. Hence, the expectation is to find a positive association between Environmental NGO Pressure and SSC reporting.

H2. *Environmental NGO Pressure is positively associated with SSC reporting.*

According to the Global Slavery Index (The Minderoo Foundation, 2018), 24.9 million people were working under forced labor conditions in 2016 globally. The separated view of economic and social dimensions has led such phenomena. Suppliers may prefer short-term economic gains in detriment of social improvements (Huq & Stevenson, 2018), particularly among those which maintain high-productivity incentives due to buyers' pressure (Bird et al., 2019). G20 have sponsored global commerce with imports of at-risk products from emerging economies (The Minderoo Foundation, 2018).

In Bangladesh for example, after the Rana Plaza disaster, Huq and Stevenson (2018) found that child labor was moved from the garment industry to other more harmful activities, such as construction. In Brazil, even though the partnership between the Public Ministry of Labor and ILO have been intensified in the last years, the challenge of irregular work is still a

problem to overcome (SmartLab MPT/OIT, 2017). Considering three different sources to assess what are the most modern-slavery intensive industries in Brazil, the study expects that this type exposure to NGOs and the society in general positively impacts the level of SSC reporting among Brazilian companies.

H3. *Social NGO Pressure is positively associated with SSC reporting.*

There is a growing demand for companies that operate in multiple countries to adhere to voluntary commitments to monitor and report SC realities (Bird et al., 2019). This movement includes shareholders, who are now interested in aspects related to compliance with environmental and social standards, and costs and monetary benefits of actions associated to long-term strategies (Vitolla et al., 2019).

One example of a voluntary initiative in this area is ISE, the Corporate Sustainability Index created by B3, the Brazilian Stock market exchange. It is a portfolio composed by companies that are committed to report their performance regarding economic efficiency, environmental equilibrium, social justice and corporate governance issues (B3, n.d.). It is expected that shareholders who invest their money on companies which are members of ISE (Índice de Sustentabilidade Empresarial) demand higher levels of compliance with best practices on sustainability reporting. Considering this, shareholder pressure (Shareholder) is expected to be positively associated with SSC reporting.

H4. *Shareholder Pressure is positively associated with SSC reporting.*

In order to be updated about what companies are doing, creditors demand transparency and the report of information, including those related to environmental risks (Chithambo et al., 2020). In more debt leveraged companies, creditors become more influential, calling for more monitoring on opportunistic behaviors and corporate integrity, ultimately avoiding future penalties and fines (Huang & Kung, 2010). Considering this, for the present study, creditors pressure (Creditor) is expected to be positively associated with SSC reporting.

H5. *Creditor Pressure is positively associated with SSC reporting.*

Governments play a central role on the promotion of reporting practices, due to their power over companies (Vitolla et al., 2019). While still voluntary in most of the times,

particularly in Brazil, sustainability reporting needs the creation of urgency from such actor to drive coupled and sustainable operations along entire SCs. Government institutions may fine enterprises that violate environmental regulations or even make them cease their activities (Huang & Kung, 2010). Indeed, the mentioned authors found in their study that higher levels of environmental disclosure were positively related to fines paid due to violations of environmental legislation. Because of that, it is expected that companies which are penalized by government agencies and under higher regulatory pressure (EnvGov) are more prone to be active players on SSC reporting.

H6. *Environmental Government Pressure is positively associated with SSC reporting.*

In an instrumental perspective, companies which fail to attend regulatory requirements may face severe penalties, license revocations and negative media (Chithambo et al., 2020). Societal stakeholders, including regulators, were found to have a positive impact on sustainability efforts done by companies (Svensson et al., 2018). Investigating drivers to the adoption of sustainability in SCs operations – mainly on manufacturing companies, Faisal (2010) found that the regulatory framework was perceived by the interviewees as a high-driving power. Governmental pressure is also recognized as an important force in the Oil and Gas industry, aiming to improve SC practices among the players. (Wan Ahmad et al., 2017). Considering such evidences, this study uses a dataset to assess how many labor penalties each industry had per year analyzed. This proxy would reflect how well companies are managing the social dimension of their operations and adhere to the Brazilian labor enforcements. The expectation is that the higher the number of fines applied (SocGov pressure), higher the SSC reporting level.

H7. *Social Government Pressure is positively associated with SSC reporting.*

As internal stakeholders, employees are highly influential in their SCs regarding SCM issues (Meixell & Luoma, 2015). Vitolla et al. (2019) found that employee pressure affected the quality of integrated reporting among companies from different industries and regions. Same result was found by Huang and Kung (2010), which state that workers have the power to make use of organized unions to “make sure their voices reach the managerial levels in the firm” (Huang & Kung, 2010, p. 440) , claiming for a better SSCM and transparency. In addition, internal structures like unions contribute to more coupled labor of conducts and

labor practices among suppliers, even in emerging countries such as Brazil (Bird et al., 2019). As a conclusion, employee pressure (Employee), measured by union membership rates, is expected to also be positively associated with SSC reporting.

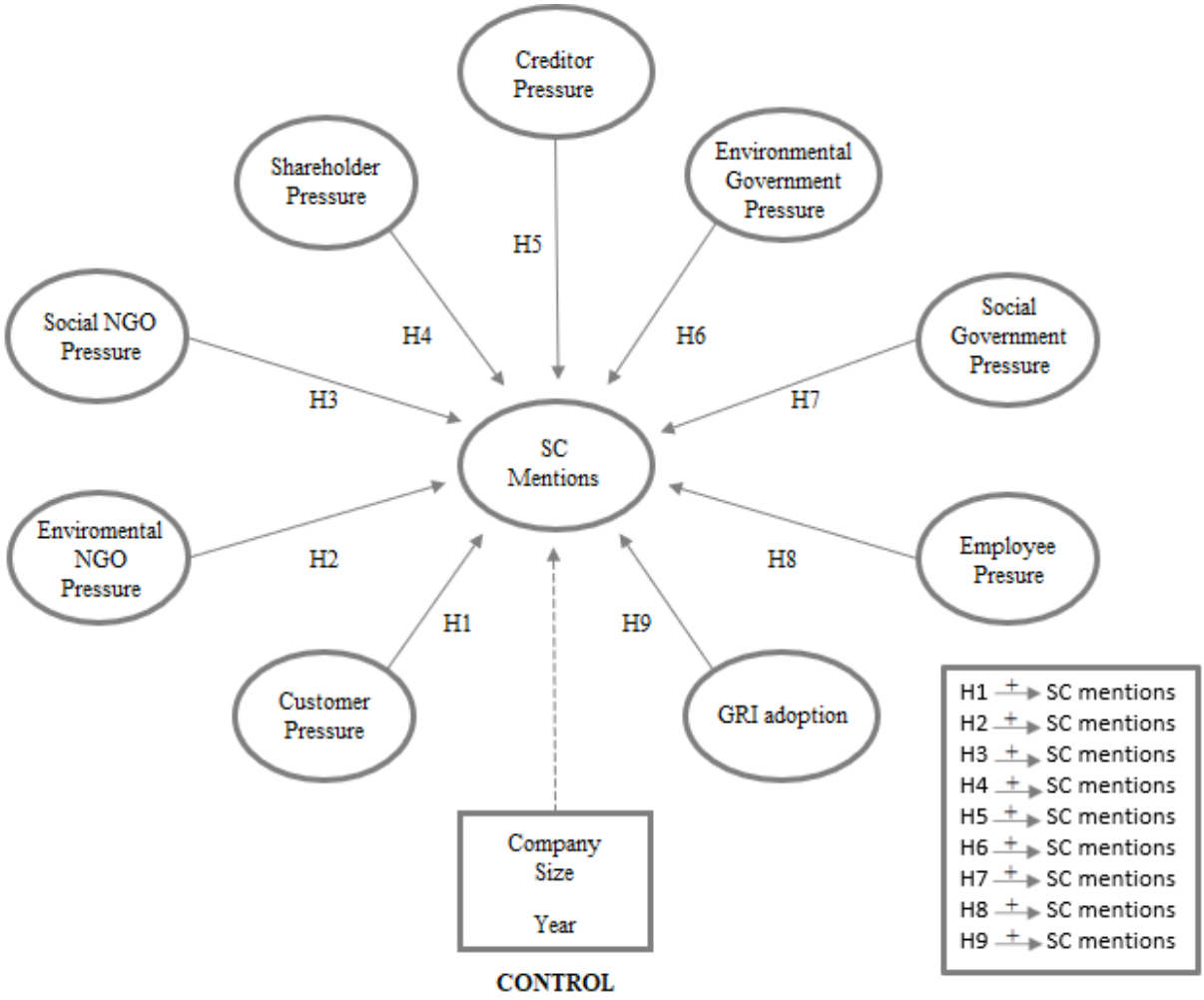
H8. *Employee Pressure is positively associated with SSC reporting.*

In addition to the previous variables, the adoption of GRI on reports was also defined as a factor to influence SSC reporting. Indeed, higher levels of sustainability disclosure were found to be highly and positive correlated to the adoption of the GRI framework (Kuzey & Uyar, 2017). Islam et al. (2016), for example, found a significant difference in the reporting levels after six large banks join GRI. Also, Barkemeyer et al. (2015) found that GRI promoted the dissemination of sustainability reporting around the world, particularly in Asian and South American countries. These evidences give hope to a significant impact of GRI on the SSC reporting. The expectation is that the association between GRI and SSC reporting is significantly positive.

H9. *GRI adoption is positively associated with SSC reporting.*

The following figure (Figure 1) summarizes the intended correlations to be investigated in the study, jointly with the control variables – explained in details afterwards:

Figure 1. Hypotheses tested



3 RESEARCH METHOD

In order to assess the level of SC reporting among Brazilian listed companies, the method adopted was a quantitative content analysis on their sustainability reports. Some specific terms were defined with the objective to know how much attention each report has given to SSC issues. The terms are presented in Table 2.

Table 2. Terms related to SSC

In English	In Portuguese
suppl*	fornec*
Sourcing	Suprimento
purchas*	compra*
Procurement	contrata*
outsourc*	terceiriz*
third-party/third party	

Beyond sustainability reports, the study also analyzed the appearance of these predetermined terms on GRI Topics (2013) report. It was a study conducted by GRI, that involved 194 different organizations, representing all sort of stakeholder groups. It listed 1,612 material topics for 52 business activity groups and was supported by over 600 documental sources (GRI, 2013). Among the stakeholders included on the research, the report mentions “business associations, labor representatives, civil society organizations, information users, and experts” (GRI, 2013, p. 8). The search of the terms on GRI Topics (2013) was done to assess whether the most critical industries, in the eyes of the stakeholders surveyed in such report, have been reporting the reality of their SCs.

For the corporate sustainability reports, these terms were searched with the goal to count how many times they were mentioned with regards to sustainable SC topics. A further analysis was conducted to clean up the data and eliminate words that were not directly related to SSC. The number of mentions on each report represented its attention to SSC issues.

3.1 Sample Definition

A content analysis was conducted on GRI Topics (2013) report, to assess what industries were demanded to disclosure SSC issues from their stakeholders. In total, 159 out of 1,612 topics were found to be related to SSC issues; 9 of them were excluded because they did not deal with SC topics directly (they mentioned specific problems on materials

management and planning for example). Finally, 150 were computed. Industries with at least one topic related to SC were initially considered to the definition of the sample, i.e., thirty-three different industries.

From those 33 industries initially considered, eight of them had no companies included in the sample. NGOs and Public Agencies, for example, were excluded as their constituents are not for-profit organizations, a dissimilar type of business compared to the other companies. The other missing cases were mainly due to the absence of reporting. After that, an analysis was made to match the remaining 25 industries from GRI Topics for Sectors (2013) classification with the industry classification adopted by the Brazilian Stock exchange. The procedure was made through the description of economic activities. This resulted in a potential sample of 275 listed companies.

After excluding companies with no sustainability reports or reports without comprehensive SSC information, the final sample was composed by 220 reports. They are originated from 88 different listed companies on the Brazilian exchange market at the moment of the research (32% of the total 275), covering the period from 2016 to 2018. Either sustainability reports or annual/integrated reports were searched in companies' websites and/or GRI Database, a large index for research on sustainability reports.

The dates for collecting the reports encompassed May 25th to Jun 7th, 2020. The majority of reports were written in Portuguese, but some of them were found only in English (both were considered valid for the research). Table 3 presents the demographics of the sample by industries and years.

Table 3. Number of sustainability reports and companies analyzed, by industry and year

Industry	Number of Companies	Reports per Year			Total Reports
		2016	2017	2018	
Banks Diverse Financials and Insurance	17	14	15	16	45
Food and Beverage Processing	6	5	6	6	17
Oil and Gas	5	5	5	4	14
Retailing	6	4	5	5	14
Agricultural and Animal Source Food Production	4	4	4	4	12
Forest and Paper Products	5	4	5	3	12
Mining	5	3	5	4	12
Telecommunications Services	4	4	4	4	12
Automobiles and Components	5	3	4	2	9
Consumer Durables Household and Personal Products	3	2	3	3	8
Education Services	4	2	2	4	8
Pharmaceuticals Biotechnology and Life Sciences	3	3	3	2	8
Ground Transportation Highways and Railtracks	2	2	2	2	6
Chemicals	2	2	2	1	5
Construction Engineering and Home Building	3	3	1	1	5
Construction Materials and Building Products	2	2	2	1	5
Ground Transportation Trucking	2	1	2	2	5
Electrical Equipment and Machinery	2	1	2	1	4
Food and Consumers Staples Retailing	2	1	1	2	4
Aerospace and Defense	1	1	1	1	3
Air Transportation Airlines	1	1	1	1	3
Technology Hardware Equipment and Semiconductors	1	1	1	1	3
Trading and Distrib companies Com Serv and Supplies	1	1	1	1	3
Textiles Apparel Footwear and Luxury Goods	1	1	1	-	2
Professional Services	1	-	-	1	1
Total	88	70	78	72	220

As it is shown in the Table, the sample is composed of an unbalanced short panel data. The most representative industry was Banks, Diverse Financials and Insurance, with the contribution of 45 sustainability reports from 17 different companies. Also, it can be noticed that 2017 has the higher number of reports - 78 reports - compared to other years.

3.2 Dependent, Independent and Control Variables

After the content analysis, a multiple regression was performed in order to know which stakeholder pressures influence higher levels of SSC reporting. For the dependent variable, called “supply chain mentions”, or “SC mentions”, the total number of citations of each predefined term presented in Table 3 was identified on the sustainability reports of the sample, with a further qualitative analysis if the words were indeed related to SSC matters. In a second step, the quantity of citations was transformed into a natural log scale. This was done due to differences on the length of sustainability reports – naturally leading longer reports to

have higher number of SSC issues citations. This allowed the distribution of SCmentions to be free of outliers and less skewed.

For the independent and control variables, the following table (Table 4) presents the chosen ones for this study and their respective sources:

Table 4. List of independent/control variables

Independent Variable	Term used	Proxy	Level of analysis	Reference(s)
Customers Pressure	Customer	1 if consumer proximity industry*[1], 0 otherwise	Industry	Branco and Rodrigues (2008); Fernandez-Feijoo et al. (2014); Sweeney and Coughlan (2008); Vitolla et al. (2019)
Environmental NGO Pressure	EnvNGO	1 if environmentally sensitive industry*[2], 0 otherwise	Industry	Branco and Rodrigues (2008); Fernandez-Feijoo et al. (2014); Huang and Kung (2010); Kuzey and Uyar (2017); Liu and Anbumozhi (2009); Okongwu et al. (2013); Sweeney and Coughlan (2008); Vitolla et al. (2019)
Social NGO Pressure	SocNGO	1 for industries with the highest number of people rescued from modern slavery working *[3], 0 otherwise	Industry	N/A
Shareholders Pressure	Shareholder	1 if member of ISE during the year, 0 otherwise	Company	N/A
Creditors Pressure	Creditor	LTDebt/Equity ratio	Company	N/A
Environmental Government Pressure	EnvGov	1 if the company had any IBAMA*[4] fine during the year, 0 otherwise	Company	Huang and Kung (2010)
Social Government Pressure	SocGov	Natural log of number of fines applied due to labor penalties per year*[5]	Industry	N/A
Employee Pressure	Employee	Union membership rate (%) per year*[6]	Industry	N/A
GRI adoption	GRI	1 if GRI-based	Company	Kuzey and Uyar

		report, 0 otherwise		(2017); Tran and Beddewela (2020)
Control Variable	**Term used**	**Proxy**	**Level of analysis**	**Reference(s)**
Company Size	Size	Natural log of total employees	Company	Boakye et al. (2020); Gamerschlag et al. (2011); Lo et al. (2014)
Year 2016	Year_2016	1 if the company reported in 2016, 0 otherwise	Company	N/A
Year 2017	Year_2017	1 if the company reported in 2017, 0 otherwise	Company	N/A
Year 2018	Year_2018	1 if the company reported in 2018, 0 otherwise	Company	N/A

Notes: *[1] Consumer proximity industries - energy utilities, financial services, healthcare, household and personal products, waste management, retailers, telecommunications, textiles and apparel, food and beverage products, and water utilities.
*[2] Environmental sensitive industries - agriculture, automotive, chemical, construction, construction materials, energy (oil & gas), energy utilities, forest and paper products, metal products, mining, textiles and apparel and water utilities.
*[3] Modern slavery intensive industries - Agriculture, construction, forest and paper products, mining, textiles and apparel. Sources: Reporter Brasil (n.d.); SmartLab MPT/OIT (2017); The Minderoo Foundation (2018).
*[4] IBAMA is a Brazilian Institute responsible for monitoring and inspecting environmental activities and exert national policies regarding environmental issues. Source: IBAMA, (n.d.)
*[5] Source: Brazilian Ministry of Economy (n.d.).
*[6] Information provided by the National household sample survey (PNAD - 2018), developed by the Brazilian Institute of Geography and Statistics (IBGE). Source: IBGE (2019)

After the definition all the variables, it is presented the preliminary equation for the model proposed in the study. In total, nine independent variables - and four for control - are going to be analyzed whether they significantly influence SCMentions or not.

$$SCmentions_{it} = \beta_0 + \beta_1 Customer_i + \beta_2 EnvNGO_i + \beta_3 SocNGO_i + \beta_4 Shareholder_{it} + \beta_5 Creditor_{it} + \beta_6 EnvGov_{it} + \beta_7 SocGov_{it} + \beta_8 Employee_{it} + \beta_9 GRI_{it} + \beta_{10} Size_{it} + \beta_{11} Year_{2016} + \beta_{12} Year_{2017} + \beta_{13} Year_{2018} + \eta_i + \mu_{it}$$

where i accounts for individual variation, t for time variation, η_i represents unobserved company-specific characteristics and μ_{it} is the standard error term.

It is Important to mention that some variables are invariant through time - Customer, EnvNGO and SocNGO. Another factor is the variation within companies (Shareholder, Creditor, EnvGov, GRI and Size) or only within industries (Customer, EnvNGO, SocNGO, SocGov and Employee).

Financial information, including long-term debt (LTDebt) and equity were collected at Economatica Database. We choose LTDebt instead of the whole debt structure (short + long-term debt), which is more prominent in the literature (Chithambo et al., 2020; Kalu et al., 2016; Kuzey & Uyar, 2017), because short-term debtholders do not necessarily have enough power and interest to change corporate policies regarding long-term sustainability actions. They are most of the times interested in just have their loans paid, not considering environmental and social dimensions.

Some proxies were found to be new in the literature, like those applied to the government pressure. The obligation for companies to report their environmental and social performance is not applied for the Brazilian reality, as sustainability reporting is not enforced by law – they are mainly done in voluntary basis. Because of that, some alternative measures were defined to evaluate the enforcement of the regulation on companies. On EnvGov pressure, for example, a binary code was applied due to the dispersion of data – some companies were penalized with high amounts of fines while others have never been punished. Also, the inclusion of a social perspective to the NGO pressure was considered relevant to be included in the investigation, as most of the studies just operationalize this specific stakeholder pressure on environmental sensitive industries.

4 FINDINGS

The descriptive statistics for the variables included in the model are presented in Table 5.

Table 5. Descriptive statistics of variables

Variables	Min	Mean	Median	Max	Std dev
SCmentions	0.00	3.66	3.81	5.74	1.10
Customer	0.00	0.50	0.50	1.00	0.50
EnvNGO	0.00	0.42	0.00	1.00	0.50
SocNGO	0.00	0.27	0.00	1.00	0.45
Shareholder	0.00	0.25	0.00	1.00	0.44
Creditor	-23.70	1.92	0.92	110.96	7.96
EnvGov	0.00	0.25	0.00	1.00	0.44
SocGov	7.50	9.32	9.27	11.18	1.28
Employee	0.05	0.17	0.17	0.24	0.04
GRI	0.00	0.83	1.00	1.00	0.37
Size	4.83	9.18	9.45	12.80	1.61

Regarding Customer pressures, the median is 0.5, meaning that half of the companies are from industries that are close to the final customer. The mean for EnvNGO and SocNGO are below 0.5. This means that the majority of companies in the sample is not under NGO pressure – either environmental and socially. In addition, most of companies did not receive any fine from IBAMA during the period searched - expressed by EnvGov pressure, which presented a median of zero with a mean close to the same number. Such finding may contradict the fact that most companies are classified as members of environmental sensitive industries. This leads to two possible interpretations: either companies have followed environmental regulations or the monitoring/execution of fines have not been properly applied.

Regarding Creditor pressures, some companies presented negative values. This is due to losses on net income for specific companies and years. Results from shareholder variable shows that, in general, companies are not involved in Brazilian voluntary best practices on sustainability reporting – 67 out of 88 companies did not join the ISE initiative in any of the years analyzed. However, the majority of the sample adopted the GRI framework during the three-year period (183 out of 220 reports).

Next, an analysis of the scores for the dependent variable, namely SCmentions, is presented. The results are shown per type of industry (Table 6).

Table 6. SC reporting performance per industry

	Quartile				
Industry	Q1	Q2	Q3	Q4	Total Reports
Banks Diverse Financials and Insurance	31%	27%	18%	24%	45
Food and Beverage Processing	0%	18%	29%	53%	17
Oil and Gas	50%	21%	7%	21%	14
Retailing	29%	29%	21%	21%	14
Agricultural and Animal Source Food Production	25%	33%	17%	25%	12
Forest and Paper Products	17%	8%	25%	50%	12
Mining	33%	25%	25%	17%	12
Telecommunications Services	0%	17%	67%	17%	12
Automobiles and Components	44%	11%	22%	22%	9
Consumer Durables Household and Personal Products	25%	13%	25%	38%	8
Education Services	50%	38%	0%	13%	8
Pharmaceuticals Biotechnology and Life Sciences	25%	25%	50%	0%	8
Ground Transportation Highways and Railtracks	50%	33%	17%	0%	6
Others	14%	35%	28%	23%	43
				Total (n)	**220**

The table presents how many reports were ranked from the 1st quartile (bottom 25% of reports) to the 4th quartile (top 25% of reports) per industry. In Banks, Diverse Financials and Insurance for example, 24% of 45 reports were included in top-performance reports in terms of SCmentions compared to the entire sample (n=220).

Some industries had good performance, while others had a poor performance on SC reporting level. On the positive side, industries such as Food and Beverage Processing, Forest and Paper Products and Telecommunication Services have dedicated above-average attention to SC issues in their sustainability reports (82%, 75% and 84% of reports classified into the first two quartiles respectively). Food and Beverage Processing industry, for example, was considered to present customer and both NGO pressures. This means that the industry is close to the end customer, added to the fact that is one of the industries that had the most modern slavery people rescued during the 2016-2018 period as described in Table 4. Also, it is considered to perform an environmental sensitive economic activity. Here, it can be said that the industry has responded to stakeholder pressures accordingly.

Same NGO pressures are encountered in the Forest and Paper Products Industry. The industry has problems with intensive modern slavery labor and it is an environmental

sensitivity activity as described in Table 4. Despite this fact, 75% of its reports – from five different companies – are positioned at the first two quartiles. It can be concluded that the industry has accomplished stakeholder demands in terms of level of information of their SC. However, it is also plausible to believe that the reporting practices of such companies have not covered the most salient topics of their activities. Companies may engage on selective reporting and disclosure only "good news" (Sodhi & Tang, 2019), not changing critical sustainability issues along SCs. A qualitative content analysis of sustainability reports can better evaluate what argument is valid.

On the negative side, industries such as Oil and Gas and Educational Services presented poor performance regarding SCmentions (71% and 88% of reports classified on the last two quartiles, respectively). This is not in line with the environmental sensitive status and the high union membership rate (the highest among all industries) related to these industries, respectively. Then, it can be said that at least one of the stakeholders analyzed here, namely EnvNGO and Employee, has either been neglected in corporate reports or not exerting its power to improve SC reporting levels among companies from such industries.

In order to complement the results found in the investigation of SC reporting levels, Table 7 shows the top and bottom-10 companies in terms of volume of SC reporting. It can be noticed that there is not any industry that concentrates top or bottom companies in terms of SC reporting. Banks, Diverse Financials and Insurance, for example, has companies well positioned in both ranks. Two companies have top performance, while other three present poor levels of SCmentions.

Table 7. Top and Bottom-10 companies on SC reporting score, per industry

Top 10 companies (3-years avg score)		Bottom 10 companies (3-years avg score)	
Banks Diverse Financials and Insurance	2	Banks Diverse Financials and Insurance	3
Food and Beverage Processing	2	Oil and Gas	2
Chemicals	1	Agricultural and Animal Source Food Production	1
Consumer Durables Household and Personal Products	1	Education Services	1
Forest and Paper Products	1	Ground Transportation Highways and Railtracks	1
Oil and Gas	1	Mining	1
Retailing	1	Retailing	1
Telecommunications Services	1		

This may indicate that there is a significant variability within the same industries regarding the attention given to SC issues. Such fact makes difficult to predict general corporate behavior in terms of SC reporting in Brazil. The absence of enforcement to sustainability reporting can lead to this heterogeneity. Companies seem to voluntary engage on SC sustainability reporting by their own efforts, seeking for differentiation (García-

Sánchez et al., 2019a) and, consequently, competitive advantage. Other factors to be considered are size and membership on initiatives like GRI and ISE. This is going to be explored during the multiple regression analysis.

Following, in order to run the regression model with no problems of multicollinearity, a Spearman correlation matrix is presented, with the respective correlations and significances among dependent, independent and control variables (Table 8 and Table 9).

Table 8. Spearman Correlation Matrix (including EnvNGO)

	SCmentions	Customer	EnvNGO	SocNGO	Shareholder	Creditor	EnvGov	SocGov	Employee	GRI	Size
SCmentions	1.00	**0.16****	0.11	**0.21*****	**0.36*****	**0.21*****	0.06	**0.13****	-0.06	**0.50*****	**0.39*****
Customer	**0.16****	1.00	**-0.51*****	**-0.22*****	**0.25*****	0.07	-0.02	0.03	**-0.40*****	0.04	**0.24*****
EnvNGO	0.11	**-0.51*****	1.00	**0.72*****	**-0.16****	-0.02	**0.11***	0.05	**0.32*****	0.06	0.00
SocNGO	**0.21*****	**-0.22*****	**0.72*****	1.00	**-0.12***	-0.03	-0.01	0.07	**0.35*****	**0.11***	0.08
Shareholder	**0.36*****	**0.25*****	**-0.16****	**-0.12***	1.00	**0.16****	-0.08	0.05	**-0.24*****	**0.18*****	**0.22*****
Creditor	**0.21*****	0.07	-0.02	-0.03	**0.16****	1.00	0.06	-0.09	**-0.15****	**0.13****	**0.11***
EnvGov	0.06	-0.02	**0.11***	-0.01	-0.08	0.06	1.00	-0.07	0.05	-0.04	**0.26*****
SocGov	**0.13****	0.03	0.05	0.07	0.05	-0.09	-0.07	1.00	**-0.30*****	0.10	0.10
Employee	-0.06	**-0.40*****	**0.32*****	**0.35*****	**-0.24*****	**-0.15****	0.05	**-0.30*****	1.00	0.06	**-0.12***
GRI	**0.50*****	0.04	0.06	**0.11***	**0.18*****	**0.13****	-0.04	0.10	0.06	1.00	0.07
Size	**0.39*****	**0.24*****	0.00	0.08	**0.22*****	**0.11***	**0.26*****	0.10	**-0.12***	0.07	1.00

Table 9. Spearman Correlation Matrix (excluding EnvNGO)

	SCmentions	Customer	SocNGO	Shareholder	Creditor	EnvGov	SocGov	Employee	GRI	Size
SCmentions	1.00	**0.16****	**0.21*****	**0.36*****	**0.21*****	0.06	**0.13****	-0.06	**0.50*****	**0.39*****
Customer	**0.16****	1.00	**-0.22*****	**0.25*****	0.07	-0.02	0.03	**-0.40*****	0.04	**0.24*****
SocNGO	**0.21*****	**-0.22*****	1.00	**-0.12***	-0.03	-0.01	0.07	**0.35*****	**0.11***	0.08
Shareholder	**0.36*****	**0.25*****	**-0.12***	1.00	**0.16****	-0.08	0.05	**-0.24*****	**0.18*****	**0.22*****
Creditor	**0.21*****	0.07	-0.03	**0.16****	1.00	0.06	-0.09	**-0.15****	**0.13****	**0.11***
EnvGov	0.06	-0.02	-0.01	-0.08	0.06	1.00	-0.07	0.05	-0.04	**0.26*****
SocGov	**0.13****	0.03	0.07	0.05	-0.09	-0.07	1.00	**-0.30*****	0.10	0.10
Employee	-0.06	**-0.40*****	**0.35*****	**-0.24*****	**-0.15****	0.05	**-0.30*****	1.00	0.06	**-0.12***
GRI	**0.50*****	0.04	**0.11***	**0.18*****	**0.13****	-0.04	0.10	0.06	1.00	0.07
Size	**0.39*****	**0.24*****	0.08	**0.22*****	**0.11***	**0.26*****	0.10	**-0.12***	0.07	1.00

*** Significant at 1%, ** significant at 5%, * significant at 10%

Multicollinearity occurs when independent variables have a significant correlation higher than +/- 0.7. This may lower the explanation power of the variables affected by such issue. Considering this, EnvNGO presented a high and significant correlation with another dependent variable, i.e. SocNGO pressure (0.72, p-value = 0.00) – see Table 8. As the former presented a less significant relationship with the dependent variable SCmentions, it was dropped from the equation. In conclusion, Hypothesis 2 could not be verified in this study.

Regarding the relationship between the independent variables with SCmentions, it is noticed that Customer (0.16, p-value 0.019), SocNGO (0.21, p-value 0.00), Shareholder (0.36, p-value 0.00), Creditor (0.21, p-value 0.00), SocGov (0.13, p-value 0.046), GRI (0.50, p-value 0.00) and Size (0.39, p-value 0.00) were found to have significant and positive correlation with SC mentions – see Table 9. Customer and SocGov had significance at 5% level, while the others were significant at 1% level.

Relationships between some stakeholder pressures deserve a further explanation. It is interesting to notice that industries with major union membership rates (Employee) tend to have more people rescued from modern slavery work conditions (SocNGO), 0.35, p-value 0.00, and less fines applied due to labor legislation penalties (SocGov), -0.3, p-value 0.00. In conclusion, it seems that the pressure imposed by organized workers in Brazil have had a positive impact on the application of labor law. Even though, it is not possible to affirm that companies have stopped to violate labor laws in the reality of their SCs, regardless of legal punishments.

Also, bigger companies (Size) were found to be significant and positively correlated with environmental law violations (EnvGov), 0.26, p-value 0.00, and membership on ISE (Shareholder), 0.22, p-value 0.00. The latter, incidentally, is generally related to the application of the GRI methodology (GRI). In this regard, it is perceived a movement from the same companies applying best sustainability reporting practices simultaneously. It is possible to state that marginal costs on joining similar initiatives are lower for them, compared to less responsible companies.

Following, multiple regressions were performed, using the three main approaches to panel data. Pooled OLS, fixed effects and random effects methods were run and test to know which one would result best estimates for the model proposed. Statistical results are presented in Table 10.

Table 10. Multiple regression models compared

	Pooled OLS			Fixed Effects			Random Effects		
	Coeff.	Std Error	p-value	Coeff.	Std Error	p-value	Coeff.	Std Error	p-value
Intercept	0.652	0.67	0.333	-	-	-	0.75	0.92	0.415
Customer	0.021	0.12	0.863	-	-	-	0.015	0.18	0.936
SocNGO	**0.390*****	0.13	0.004	-	-	-	**0.378***	0.2	0.060
Shareholder	**0.359*****	0.14	0.010	**0.468***	0.24	0.056	**0.415****	0.16	0.011
Creditor	0.006	0.01	0.400	**0.007***	0.00	0.063	**0.007***	0.00	0.069
EnvGov	0.061	0.13	0.644	0.041	0.10	0.686	0.048	0.09	0.600
SocGov	0.007	0.05	0.878	-0.061	0.18	0.732	0.017	0.07	0.794
Employee	-2.271	1.83	0.216	1.459	6.78	0.830	-1.573	2.38	0.508
GRI	**1.484*****	0.15	0.000	-0.217	0.47	0.643	**1.196*****	0.20	0.000
Size	**0.198*****	0.04	0.000	0.046	0.28	0.868	**0.188*****	0.05	0.000
Year_2016	0.07	0.15	0.632	-0.06	0.24	0.803	0.09	0.10	0.366
Year_2017	0.034	0.14	0.810	-0.056	0.18	0.762	0.036	0.09	0.684
Adj R^2		45.76%			0.00%			27.71%	
F-statistic (p-value)		17.80 (0.000)			0.96 (0.477)			80.81 (0.000)	

*** Significant at 1%, ** significant at 5%, * significant at 10%

Hausman test (χ^2) 16.28
p-value 0.061

Note: Year_2018 was excluded because its correlation with SCmentions was zero

Lagrange-Multiplier test was performed to know whether the model would consider effects and time variance (Appendix A, in Appendices). The null hypothesis was rejected (10.71, p-value 0.00), i.e., there is a significant effect to examine. After, the Hausman test (Appendix B, in Appendices) was run to assess what type of effect would be employed (fixed or random). It resulted in a Chi-square value of 16.28 (p-value = 0.061), accepting the null hypothesis in favor of the Random Effects model.

Breusch-Pagan test revealed that the random effects model was homoscedastic (Appendix C, in Appendices). The H_0 was accepted, with a value of 15.52 (p-value = 0.16). However, autocorrelation was detected in Breusch-Godfrey tests (Appendix D, in Appendices) for first and second orders (41.94, p-value 0.00; 44.80, p-value 0.00, respectively). To correct such problem and have lower standard error levels, it was employed the robust covariance matrix estimation. Huber & White cluster robust method was applied, generating the following results (Table 11).

Table 11. Random panel regression - Huber/White covariance robust matrix method

	Random Effects		
	Coeff.	Std Error	p-value
Intercept	0.75	0.86	0.386
Customer	0.015	0.17	0.931
SocNGO	**0.378****	0.17	0.023
Shareholder	**0.415****	0.17	0.015
Creditor	**0.007*****	0.00	0.000
EnvGov	0.048	0.07	0.517
SocGov	0.017	0.06	0.782
Employee	-1.573	2.13	0.460
GRI	**1.196*****	0.32	0.000
Size	**0.188*****	0.05	0.000
Year_2016	0.09	0.09	0.319
Year_2017	0.036	0.08	0.670
Adj R^2	27.71%		
F-statistic (p-value)	257.77 (0.000)		

*** Significant at 1%, ** significant at 5%, * significant at 10%

Customer and SocGov pressures, previously significant predictors of SCmentions individually (see Table 9), lost statistical significance when added to panel regression models (0.015, p-value = 0.93 and 0.017, p-value = 0.78, respectively). As a conclusion, H1 and H7 could not be accepted. In addition, it was not possible to demonstrate that the estimates for EnvGov (0.048, p-value = 0.52) and Employee pressures (-1.573, p-value = 0.46) are statistically different than zero. Thus, H6 and H8 were also not accepted.

In this final model, it was found that SocNGO (0.378, p-value = 0.02), Shareholder (0.415, p-value = 0.01) and Creditor (0.007, p-value = 0.00) pressures were significant and positively correlated with SCmentions. In conclusion, H3, H4 and H5 were confirmed. The adoption of GRI (1.196, p-value = 0.00) was also found to have a positive impact on the level of SC reporting. Therefore, H9 was confirmed. Finally, size, measured by the number of employees, was significant and positively correlated with SC mention (0.378, p-value = 0.02).

5 DISCUSSION OF FINDINGS

Customer pressures are related to higher levels of maturity on SSC reporting (Okongwu et al., 2013) and the adoption of sustainability on SCs (Svensson et al., 2018) including green manufacturing functions (Li et al., 2020). Public and potential customer value transparency (Hahn et al., 2015). Because of that, it is important that companies fulfill their expectations on SC reporting in order to avoid boycotts and bad publicity.

On the other side, suppliers per se are not motivated to tackle the growing interest of end customers to sustainability issues. Among German third-part logistic companies (Maas et al., 2018) and first-tier suppliers in Germany and Austria (Foerstl et al., 2015), pressure from direct clients, i.e., contractors, were perceived as more relevant, due to its proximity to them. In such cases, the importance of policies to effectively implement sustainability actions along SCs gains importance. However, among Brazilian companies which are close to their clients, it could not be possible to show their commitment to report SC information (H1 not accepted). One of the reasons is that they might been failing to communicate to lower-tier suppliers the urgency of sustainability issues to the final customers.

Pressure from the government is also generally considered in stakeholder and SSCM literature. Implementation of sustainability actions depends on public investment and efforts done by the multi-stakeholder arena, including national, regional and local governments (Salvia et al., 2019). Regarding this, Xu et al. (2019, p. 859) state that “local socioeconomic conditions largely determine the social risk of a supply chain”. Particularly in this study, the attempt was to reflect the reality of Brazil in social issues through the evaluation of effectiveness of public monitoring agencies. In a preliminary finding, from the correlation matrix on Table 9, it was indicated that industries which incurred in more violations of the labor regulation have dedicated more information about SC issues in their reports. However, when added to the multiple regression model, this hypothesis was not confirmed (H7 not accepted).

Kang et al. (2016) found that companies engage on CSR in response to poor SSCM on past events. The same was evidenced by Huq and Stevenson (2018), which discovered that garment factories in Bangladesh have banned child labor and some unsustainable practices after the Rana Plaza disaster. Differently from these evidences, Brazilian listed companies that have violated labor law do not seem to be willing to improve their sustainability practices

and, in an ultimate case, SC reporting levels. In the correlation matrix presented on Table 9, it was found a moderate positive correlation between SocGov and SCmentions. But, when added to the random panel regression, the relationship was not significant.

Same conclusion can be done for EnvGov and Employee pressures. It could not be possible to demonstrate that the estimates are statistically different than zero. In conclusion, H6 and H8 were also not confirmed. For employee pressure, for example, it was found that German third-party logistic companies have perceived internal stakeholders, such as employees, as the most influential driver for environmental practice adoption (Maas et al., 2018). However, in a different context like the one encountered in Brazil, the results were different. Perhaps these stakeholders have not perceived the value of good SSCM practices yet, including reporting and transparency on SCs' realities.

Poor social performance on SCs may have a negative impact on the marketplace and society (Eriksson & Svensson, 2016). Private companies and governments from rich countries are importing "at-risk" products in an enormous scale – estimations are that this number is around US$ 354 billion annually for the top-5 products exported from each exporting country (The Minderoo Foundation, 2018). This promotes the tenacity of unsustainable practices among SCs. Hopefully, companies that have been pressured by NGOs committed to social causes in Brazil have reported more information about their SC (H3 accepted). This helps the achievement of social expectations regarding sustainability transparency on SCs (Islam et al., 2016). However, this initiative is not enough. Companies should go beyond SC reporting, and should implement real changes in SSCM practices, promoting what is called "sustainability as practice" (Silva & Figueiredo, 2017) to address rooted social unsustainable practices along entire SCs.

Strong pressure from shareholders contributes to long-term performance on SSCM (Rebs et al., 2019). The same can be translated into best reporting practices. Shareholder pressure was positively related to voluntary sustainability disclosure among 130 listed German companies (Gamerschlag et al., 2011). Also, integrated reporting quality, considering aspects like assurance, content and form, was positively influenced by higher levels of shareholder pressure (Vitolla et al., 2019). It can be concluded that shareholders, particularly those who invest their money on members of ISE, have an active voice on shaping corporate sustainability reporting practices in Brazil, including SC-related issues (H4 accepted).

Pressure from creditors are also found in the literature as a driver to SSCM and sustainability reporting practices. Kalu et al. (2016), for example, found a positive relationship between voluntary carbon disclosure and creditor pressure among Malaysian real

state companies. Yunus et al. (2020) found that the perceived influence of creditors among listed Australian companies drives carbon management strategies. Sustainability practices improve economic performance (Chen & Kitsis, 2017), a sensitive topic to debtholders. Because of that, when managerial decisions include environmental and social dimensions, economic goals and sustainability performance are simultaneously met. Brazilian financing companies seemed to understand such logic (H5 accepted).

Sustainability reports developed in GRI basis allow companies to identify concerns on environmental and social management and to ensure a proper communication with internal and external stakeholders (García-Sánchez et al., 2019b). Adjustments on reports considering such stakeholder demands, through the promotion of a set of core indicators (Barkemeyer et al., 2015) empower corporate transparency practices and promote a productive dialogue about environmental and social governance (Grushina, 2017). These facts give hope to a higher attention to SC matters from focal companies, what was indeed confirmed for the Brazilian reality, considering the sampled companies that adopted GRI as framework to develop their sustainability reports (H9 accepted).

Finally, size, measured by the natural log of total employees, was also positively correlated with better performance on SCmentions. This is in line with Gamerschlag et al. (2011) findings, while investigating the drivers for CSR disclosure. Same positive correlation was found by Chithambo et al. (2020) and Kalu et al. (2016) for carbon disclosure, but now considering number of assets as a proxy. The availability of resources may explain these evidences. The preparation and auditing of sustainability reports, along with the implementation of standards such as GRI, require the use of human and financial resources that, in most of the times, is not available for smaller companies (Svensson et al., 2018).

6 CONCLUSION

The growing interest on sustainability topics have shaped many corporate practices in the recent years. This movement has put pressure on companies to communicate their performance regarding environmental and social issues. This is particularly important for SSCM, as it is known that many incidents have occurred beyond focal companies' borders. Companies have a shared responsibility on what happens along their SCs, being in charge of reporting relevant events to stakeholders.

The presented study aimed to assess what stakeholder pressures influence higher levels of SC reporting among Brazilian listed companies. After a random effects modeling, employed on longitudinal data that comprised the years of 2016, 2017 and 2018, it was found that social NGO, shareholder and creditor pressures were significant and positively correlated with more SC reporting. Industries that had major numbers of people rescued from modern-slavery working conditions tended to report more information on SC sustainability - probably, most of it is related to social performance. This evidences that companies are prone to disclosure more SC information as they are scrutinized by past events that might damage their reputation.

For creditor pressure, there are evidences that lenders have interest on not only financial but also environmental and social performance issues. The use of long-term debt amount as a proxy for creditor pressure was due to the commitment of such stakeholders to the long-term value created and maintained by companies through time. Environmental and social performance are now seen as risks embedded on the overall corporate risk management equation. In result, high risks related to these areas may, ultimately, influence the availability of financial resources and raise the costs of capital for companies in Brazil.

GRI reporting and the membership on ISE were also positively related to SC reporting. Companies which apply best practices and make efforts on differentiate themselves in monitoring SC practices may obtain several benefits, such as brand recognition, better operational and financial performance and so on. Additionally, size was found to be a relevant predictor for higher levels of SC reporting. This may be explained by additional costs associated to the implementation of a monitoring routine of SC performance. Larger companies have better resources and capabilities that allow them to track their SCs. This helps to reinforce their leadership against smaller companies, which face additional barriers to implement SC reporting practices.

6.1 Managerial contributions

In terms of managerial impacts, the study aimed to recognize which factors have raised the importance for SC reporting. Pressures from NGOs which monitor social issues, such as modern slavery work, and investors, either stock and long-term debtholders, have been indicated as relevant stakeholders to be considered in emerging contexts like the Brazilian one. Consequently, the acknowledge of such stakeholders in sustainability reports, assessing sensitive topics to them, becomes key to companies' management. Surveys and materiality matrices are possible alternatives to assess key stakeholders' preferences and enable the design of better-shaped sustainability reports.

The absence of a systematic movement towards SC reporting in Brazil creates opportunities for managers and report-makers to implement a more serious routine on sustainability performance monitoring and communication. In sectors such as Banks, Oil and Gas and Retailing, where it is possible to notice companies with either top and poor performances on SC reporting (see Table 7), companies can develop a strategic plan of action to establish a leadership regarding sustainability reporting and differentiate themselves from players of their sectors. For Banks and Financial Services, for example, the implementation of more robust reports seems particularly important, as long-term creditors and shareholders were indicated as influential stakeholders to push companies in Brazil towards higher levels of SC information disclosure.

Also, for organizations such as GRI, that advocates best practices on sustainability reporting, the present study aims to bring up an overview of the *status quo* regarding sustainability reporting on SC performance in Brazil. There are evidences that the attention given to SC issues is not institutionalized among Brazilian companies. Moreover, some sectors such as Oil and Gas and Ground Transportation, even though having a significant impact on the environmental and the society, have neglected the realities on their lower tiers, compared to other sectors (see Table 6). In conclusion, there is a need to improve reporting practices in order to respond to the crescent demand for more responsible SSCM, exerted with more intensity by NGO devoted to social issues, share and debtholders.

6.2 Theoretical Contributions

From an academic perspective, the study advances in the sustainability reporting literature by analyzing a different context from those previously studied by the majority of

papers. The analysis of stakeholder pressures from emerging economies allows to expand the knowledge on SC reporting and SSCM. It also permits a better understanding on what level stakeholders drive (or not) companies to achieve higher levels of SC reporting in multiple contexts.

Moreover, it was found a gap regarding studies that deal with SC reporting. Only one study, from the literature reviewed, investigated SC reporting issues (Okongwu et al., 2013). Given such evidence, the present study advances on understanding sustainability performance of not only focal companies but also their suppliers. This is particularly important as many incidents and scandals are originated from lower-tier suppliers, most of the times "invisible" for the final customer and the society as a whole.

6.3 Limitations and Future Research

The employment of quantitative instead of qualitative content analysis does not allow for a more sensitive analysis regarding SC information published on the sustainability reports. The volume of mentions to SC issues does not guarantee that a minimum level of quality on reporting is met. In consequence, it is not possible to assess if companies are using their sustainability reports as a marketing tool or they are really engaged to monitor and measure economic, environmental and social performance responsibly. The fact that GRI, employed by the majority of the sample, is auto-declared opens up opportunities for opaque reporting. It is recommended, for future investigations, to analyze not only how much but what Brazilian companies are reporting as SC information.

The scarcity of studies on emerging economies brings an opportunity to the present study to compare the Brazilian results with the ones encountered on studies with developed-economy based companies. However, this same scarcity makes difficult to define the most appropriate proxies to measure stakeholder pressures and their relationship with SC reporting. Those related to regulation, for example, were particularly difficult to be set, due to the absence of systematic enforcement for companies to release sustainability reports in Brazil. Media coverage can be a possible alternative to measure such pressures in a more aggregated way.

Finally, the absence of non-listed companies in the sample is explained by the lack of information easily available. It is known that the majority of companies in Brazil is composed by small and medium companies. Because of that, the present study does not assess the entire

scenario of SC reporting in the country. Case studies and more in-depth documentation analysis may tackle such limitation.

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APPENDICES

APPENDIX A

Lagrange Multiplier Test for effects on panel data

```
        Lagrange Multiplier Test - (Honda) for unbalanced panels

data:  Y ~ X
normal = 10.714, p-value < 2.2e-16
alternative hypothesis: significant effects
```

APPENDIX B

Hausman Test for Random/Fixed effects on panel data

```
        Hausman Test

data:  Y ~ X
chisq = 16.279, df = 9, p-value = 0.06128
alternative hypothesis: one model is inconsistent
```

APPENDIX C

Breusch-Pagan Test for Homocedasticity

```
        Breusch-Pagan test

data:  random
BP = 15.524, df = 11, p-value = 0.1597
```

APPENDIX D

Breusch-Godfrey Test for Autocorrelation in orders 1 and 2

```
        Breusch-Godfrey test for serial correlation of order up to 1

data:  random
LM test = 41.943, df = 1, p-value = 9.398e-11

        Breusch-Godfrey test for serial correlation of order up to 2

data:  random
LM test = 44.799, df = 2, p-value = 1.87e-10
```