Are Natural-RBV Strategies Profitable? A Longitudinal Study of the Brazilian Corporate Sustainability Index

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Abstract

Purpose – The aim of this research is to analyze whether natural resource-based view (NRBV) strategies lead to financial performance, represented by market value in the Brazilian stock exchange (B3) Corporate Sustainability Index (ISE).

Theoretical framework – The NRBV foresees three green strategies to achieve sustainable competitive advantage: pollution prevention, product stewardship and sustainable development. Many studies have tested one or two of those strategies. We tested if all three strategies are related to the financial performance of companies in the ISE index.

Design/methodology/approach – We collected five years of data from 18 companies that compose the ISE index and employed panel data analysis in this longitudinal study.

Findings – All three strategies of the NRBV are related to the companies' market value in different ways. The results diverge from the current literature because we found positive and negative links between environmental strategies and financial performance.

Practical & social implications of research – This study contributes with empirical results from the B3 to analyze the ISE index using the NRBV approach as a theoretical basis. It suggests that not all environmental initiatives increase companies' market value, as some actions may end up achieving the opposite outcome. Investors and society, in general, are entitled to know how companies implement sustainable strategies that go beyond those required by law.

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Originality/value – The major contribution of this study is it addresses all three NRBV strategies to investigate if it pays to be green in terms of market value, by analyzing the Brazilian sustainable organizations that compose the ISE index.

Keywords – NRBV, corporate sustainability, financial performance, market value, sustainable development.

1 Introduction

The core assumption of environmental sustainability lies in the need to balance the production, exploitation, consumption, and preservation of natural resources (Kanchan et al., 2015; United Nations Framework Convention on Climate Change, 2008). Key government actors, organizations, and environmentalists have created regulations and laws and promoted conferences in an attempt to reduce the carbon footprint in the long run. Since the United Nations Conference on the Human Environment in 1972 until today with annual conferences (such as COP25, held in 2019), world leaders have discussed the consequences of global warning. The Kyoto Protocol and the Paris Agreement (COP21) are both proposals to mitigate climate change problems by specifying goals to reduce greenhouse gas emissions and global warming (Maamoun, 2019; Schneider & Theuer, 2019). The reckless interference of humankind in nature has extensive consequences. Some researchers have related the COVID-19 pandemic to the natural exploitation that causes wild animals—in this case, bats—to approach human beings (Zhou et al., 2020). Cui et al. (2019) explain that "the constant spillover of viruses from natural hosts to humans and other animals is largely due to human activities, including modern agricultural practice and urbanization."

On the other hand, some governments have recently denied the effects of global warming and acted against environmental preservation. Even though the USA signed the Paris Agreement in 2016, President Trump decided to quit the agreement, declaring that global warming is not a priority to the federal administration (Pickering et al., 2018; United Nations, 2019). Later, his successor, President Biden, rejoined the agreement, recognizing the importance of the climate change agenda. Following Trump's path, the President of Brazil, Jair Bolsonaro, threatened to quit the agreement during his campaign for the election in 2018 (Esteves, 2018). But for now, Brazil remains in the agreement.

Brazil is well known because of its natural resources, such as the Amazon rainforest. However, political and economic players have prioritized profit over the environment. Examples include the dam failure mining disasters that happened in Mariana and Brumadinho (both in Minas Gerais state), the increasing devastation of the Amazon, and the Amazon fires in 2019 (Hughes, 2019). An OECD report claimed that Brazil is far from achieving a comprehensive sustainable system and called for improvements in macroeconomic policies and economic governance (Organisation for Economic Co-operation & Development, 2018).

For a long time, the business administration literature has engaged in this discussion by proposing theoretical perspectives to understand how organizations are responsible for global sustainable development and can profit from environmental concerns (Elkington, 2018; Hart & Dowell, 2011; Lins et al., 2017). In this sense, Hart (1995) developed the natural resource-based view (NRBV), which is based on Barney's (1991) (Barney, 1991) resource-based view (RBV) perspective. The NRBV states that sustainable competitive advantage is related to three green strategies—pollution prevention, product stewardship, and sustainable development—when the resources are valuable, rare, inimitable, and non-substitutable (VRIO) (Barney, 1991; Barney et al., 2001; Hart, 1995; Hart & Dowell, 2011).

Several researchers point out that empirical studies have focused on the pollution prevention strategy, leaving the other two (product stewardship and sustainable development) understated (Christmann, 2000; Hart & Dowell, 2011; Michalisin & Stinchfield, 2010). Moreover, most findings are limited to the Northern Hemisphere (Bhupendra & Sangle, 2017; Fernando & Saththasivam, 2017; Graham & McAdam, 2016; McLain et al., 2017; Svensson et al., 2018), failing to support underdeveloped countries empirically. Flammer (2013) for example, found in the US that the stock price increased for companies that acted responsibly towards the environment, whereas those firms involved in environmental scandals faced a

significant decrease. Although the literature that examines the relationship between environmental outcomes and financial performance is not scarce, the findings are still contradictory. Albertini (2013) explains that the link between corporate environmental management and financial performance is not straightforward, and additional investigation is needed.

Dixon-Fowler et al. (2013) claim that a longitudinal study is necessary to understand the impact of environmental initiatives on financial outcomes since short-term strategies favor immediate returns and long-term investments require time to pay off. Flammer (2013) also calls for studies that evaluate firm performance in the long run, as "one could regress the long-run measure of firm value (e.g., Tobin's Q) and firm performance (e.g., return on assets, net profit margin) based on proxies for environmental CSR" (p. 772). The Brazilian business administration literature is still incipient regarding environmental outcomes. Kannan et al. (2014) found that studies based on environmental criteria in developing countries are scarce, especially in the BRICS countries. Several authors posit that the Brazilian literature that relates corporate performance and green strategies is still engaged in a theoretical debate, as they call for further empirical research (Nobre & Ribeiro, 2013; Sato & Pedrozo, 2012; Sehnem et al., 2012; Silva & Balbino, 2013; Sousa-Filho & Barbieri, 2015).

Therefore, the objective of this research is to fill this gap by analyzing whether the three strategies of the NRBV perspective lead to financial performance (FP), represented by market value, in 18 companies that compose the Brazilian ISE sustainability index. The São Paulo stock exchange created its Corporate Sustainability Index (ISE) in 2005, following the example of London and the US. The ISE index is a tool designed to differentiate and highlight the performance of the companies committed to sustainability in terms of environmental, social, economic, and financial aspects.

This study intends to contribute to the discussion of green strategies and financial performance in Brazil using the NRBV approach as a theoretical basis. Through the lenses of a well-known framework, the findings of this study provide additional evidence to the literature that discusses not only if it pays to be green, but also deepens the understanding of how it pays to be green. The NRBV approach grounds the analysis of how each of the strategies and their dimensions relate to organizational financial outcomes, such as market value in developing economies.

This paper addresses recent calls for additional research in the literature about environmental performance that includes other factors such as corporate environmental strategies (Ong et al., 2019). Dixon-Fowler et al. (2013) call for longitudinal studies to capture the return of long-term investments in green strategies. Additionally, Gauthier (2018) argues that annual reports, archival data, and other sources "offer the potential to significantly increase our understanding of the mechanisms through which firms create value through sustainable business practices." The author calls for future research on sustainable practices that go beyond the survey method. In Brazil, Almada and Borges (2018) call for empirical research to test the NRBV strategies in the Brazilian context.

For practitioners, this research can offer empirical findings regarding whether developing and adopting green strategies can enhance a firm's financial performance. As Albertini (2013) argues, pollution prevention strategies, product-focused practices, and sustainable development are not simple practices organizations embed in their routines and processes. All these strategies must be considered in light of the environmental complexity and managerial decision-making so that organizations can devise complex sustainable capabilities. This study intends to shed light on this complexity by including all three strategies proposed in the NRBV theory.

This paper is structured in five sections, including the introduction. In the second section, we discuss how NRBV strategies are related to organizational outcomes, in particular to financial performance. In the third section, we explain the methodology of this research, and, in the fourth section, we present the results. Finally, we discuss the findings, implications, limitations, and conclusions in the last part.

2 Theory and hypotheses

Competitive advantage can be achieved when organizational resources and capabilities lead to superior performance. Sustainable competitive advantage (SCA) is the ability of a company to continuously create economic value in comparison to its competitors (Jones et al., 2018; Peteraf & Barney, 2003). The competitive advantage is sustainable when it perseverates over time, in which other organizations are unable to have the same resources or develop similar capabilities to threaten the market leader.

According to the resource-based view (RBV) approach, if organizational resources and capabilities are

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valuable, rare, inimitable, and non-substitutable (VRIO), the firm is more likely to achieve sustainable competitive advantage (Barney, 1991; Barney et al., 2001). The valuable component is related to the organizational ability to reduce costs in products or services or differentiate them enough to add value. Valuable resources can be a source of competitive advantage when they are also rare, as other companies are not able to compete. Valuable and rare resources are also inimitable when the firm can combine and use them in a way that its competitors cannot mimic. Finally, they are non-substitutable when the company's resources and capabilities are embedded in such a way that competitors are unable to implement similar resources or strategies to achieve a competitive advantage (Hart & Dowell, 2011).

Several researchers have successfully related the RBV approach to organizational financial performance (Jeon et al., 2016; Newbert, 2008; Pavão et al., 2011); and the RBV-theory has also been developed for specific areas such as knowledge management (Pee & Kankanhalli, 2016; Singh et al., 2021;), stakeholder theory (Hoskisson et al., 2018), human resource management (Collins, 2021), and the natural environment (Hart, 1995). The sustainability approach has also been linked to green strategies and business performance. Wang et al. (2021) explain that organizational performance can be analyzed as a financial outcome or non-financial performance and conclude that green practices lead to firms' overall performance. In addition, Aboelmaged and Hashem (2019) argue that firms' adoption of green innovative practices varies as a result of different organizational capabilities that are derived from the natural resource-based view (NRBV) of the firm.

Hart (1995) proposed the study of the natural environment in the RBV theory because companies have to consider including green strategies as a means to achieve sustainable competitive advantage. The natural environment in the RBV approach has challenged companies to look at natural resources as limited and ephemeral to create value and obtain a sustainable advantage. Some companies that have successfully explored the green market have illustrated the NRBV theory, such as Patagonia, 3M, and Body Shop. Hart (1995) also pointed to paths to achieve SCA through the NRBV. He proposed that three interconnected strategies—pollution prevention, product stewardship, and sustainable development—would help companies in designing an organizational strategy to embrace the natural environment. Other studies have also tested and refined the NRBV propositions in different areas of the literature (Alam et al., 2019; Aragón-Correa & Sharma, 2003; Chan, 2005; Chatzoglou et al., 2018; Christmann, 2000; Cousins et al., 2019; Menguc & Ozanne, 2005).

Sustainable competitive advantage and financial performance are interconnected concepts. Competitive advantage refers to the economic value that firms create as a result of a combination of their resources and capabilities. Financial performance is the value a company has as a result of the commercialization of its products and services (Newbert, 2008). The interconnection exists because competitive advantage leads to superior financial performance (Lockett et al., 2009; Newbert 2008). Companies benefit from green strategies to improve their financial performance (Ong et al., 2019). Organizations that adopt simple initiatives like pollution prevention and waste mitigation are less likely to be involved in environmental accidents and subject to paying fines and making amends. In addition, such policies help in reducing costs of raw materials and production processes.

The literature provides some evidence that the connection between sustainable strategies and financial performance may vary somewhat due to economic, social, political, and legal factors. Rich countries can support environmental activities by reducing interest rates and discount rates, whereas poor countries may legislate against pollution prevention and nature preservation to value economic development. Developed countries face greater stakeholder pressure, social awareness, and government regulations geared towards sustainability. In a meta-analysis of 129 studies, Govindan et al. (2020) found that GDP is positively related to environmental concerns, in which the impact of pollution is greater in poor and densely populated countries. In a meta-analytical review of 893 results from 142 studies, Hang et al. (2018) found that the correlation between environmental performance and financial performance significantly diminished in BRICS countries. The authors argue that in these countries economic growth is preferred over green policies and practices.

2.1 NRBV strategies and financial performance

The pollution prevention strategy is a way for companies to reduce emissions, effluents, and waste through a set of policies and actions such as recycling and reusing, cleaning, waste management, and innovation, etc. (Hart,

1995). These policies and actions can vary from simple approaches, like installing pollution control equipment, to complex ones, which require the development of new products or redesign of the current production and managerial processes. Russo and Fouts (1997) classified these policies as a compliance strategy and proactive pollution prevention. Compliance or reactive strategies are those designed only to fulfill legislation and legal and environmental requirements (Sharma, 2000). On the other hand, proactive organizations are so engaged and committed to the environment that they incorporate the green culture in their strategies, processes, and management (Almada & Borges, 2018).

In the literature, it is not clear whether proactive or reactive organizations do better in terms of financial performance. For example, Dixon-Fowler et al. (2013) found that even companies that adopt low-cost strategies to avoid fines can be viewed as environmentally friendly, obtaining similar financial returns to those companies that develop complex approaches (innovation, employee engagement, mitigation management, and so forth). Therefore, pollution prevention has been positively linked to organizational outcomes because it reduces waste and production costs, simplifies processes, and meets stakeholders' expectations, creating market value (Aragón-Correa & Sharma, 2003; Graham & McAdam, 2016; Klassen & Whybark, 1999; Vachon & Klassen, 2008).

Moreover, investments in pollution prevention reduce the chances of a company getting involved in environmental accidents, thus avoiding fines and unexpected legal costs, and also preventing the company's reputation from being associated with any environmental damage (Schwens & Wagner, 2019). In a systematic review, Glienke and Guenther (2016) found evidence that corporate climate change mitigation actions positively influence stock returns for US and European Union companies. Miroshnychenko et al. (2017) also found that pollution prevention correlates with corporate financial performance not only for US firms, but also across other countries, confirming that reduced pollution increases firms' internal performance and profitability. The market will tend to recognize organizations that adopt pollution prevention initiatives because they are associated with efficiency. Therefore, organizations that adopt pollution prevention strategies are more likely to achieve superior financial performance.

Hypothesis 1: The pollution prevention strategy will be positively related to organizational financial performance.

The pollution prevention strategy is represented by several practices and actions that organizations adopt, such as reducing gas emissions and waste, developing risk and disaster mitigation strategies, and measuring the outcomes of the pollution prevention strategies. Thus, the following secondary hypotheses are posed:

H1a: The concern with overall critical emissions and waste is positively related to organizational financial performance.

H1b: The reduction of gas emissions, liquid effluents, and waste is positively related to organizational financial performance.

H1c: The commitment, scope, and disclosure of pollution prevention initiatives are positively related to organizational financial performance.

H1d: Mitigation management is positively related to organizational financial performance.

H1e: The development of managerial systems of mitigation initiatives is positively related to organizational financial performance.

H1f: The outcomes of pollution prevention policies are positively related to organizational financial performance.

Product stewardship extends the scope of the pollution prevention strategy from production and operations to supply chain and product lifecycle. Hart (1995) explains that product stewardship includes external environmental perspectives in the operations chain to reduce economic and social costs. Competitive advantage can be achieved through product stewardship because companies can gain exclusive access to resources and processes and be the first movers in specific markets by also raising barriers, such as setting rules and regulations that favor the company's capabilities (Barney et al., 2001).

Broadly, the environmental supply chain ranges from green purchasing to green logistics and customer involvement. Shi et al. (2012) explain that green purchasing requires the company to work closely with its suppliers to raise awareness about the importance of the environmental concern, support them to develop their own green strategies, and, later, pressure them to be environmentally friendly. Companies may also choose to buy only from environmentally certified suppliers. Green logistics entails sustainable distribution practices

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such as efficient transportation to reduce greenhouse gas emissions, as well as packaging redesign (Gauthier, 2018). Collaboration with customers allows companies to modify their production processes, products, and services guided by their clients' needs and expectations, improving environmental and financial performance (Vachon & Klassen, 2008).

In a longitudinal study in China, Cheng (2020) used the knowledge-based view lenses to find that green suppliers' involvement as co-creators and as knowledge sources generates green organizational performance. In other words, organizations with a sustainable orientation are superior in terms of green performance, as their suppliers get involved in the process as a knowledge source or as co-creators. Other studies have advanced the need for organizations to expand their environmental concern to redesign products and services in the entire production chain. Fraj et al. (2013) identified that the redesign of products and processes, for example via material substitution and green logistics implementation, requires significant changes, but increases environmental performance. Indeed, to implement the product stewardship strategy, there is a constant need for technological development of both products and raw materials, in partnership with suppliers, customers, and other stakeholders (Fowler & Hope, 2007).

Organizations that handle complex collaboration systems in the supply chain are more likely to achieve competitive advantage because they have operational benefits, achieve innovative solutions, and, consequently, do better financially (Vachon & Klassen, 2008). Yunus and Michalisin (2016) argue that the gain of efficiency with environmental supply chain management under the NRBV approach increases revenues, expanding market share. Corbett and Klassen (2006) posit that superior environmental performance causes better financial performance because it reflects good management and well-managed strategies. Miroshnychenko et al. (2017) found that green supply chain management impacts not only stock price, but also increases a company's valuation in the future as well. The market tends to reward these efforts by placing a higher value on the stock price of environmentally responsible companies (Bhupendra & Sangle, 2018; Corbett & Klassen, 2006; Derwall et al., 2005). Therefore, organizations that adopt the product stewardship NRBV strategy are more likely to do better in terms of financial performance.

Hypothesis 2: The product stewardship strategy will be positively related to organizational financial performance.

Product stewardship comprises different practices and policies organizations develop regarding production processes, relationships with suppliers, consumers and clients, and managerial systems in terms of the production and consumption of environmental resources. Thus, the following secondary hypotheses are posed:

H2a: Administrative requirements and production processes geared towards environmental sustainability will be positively related to organizational financial performance.

H2b: Green management and monitoring of the value chain will be positively related to organizational financial performance.

H2c: Sustainable supplier certifications will be positively related to organizational financial performance.

H2d: The conscious consumption of environmental resources will be positively related to organizational financial performance.

H2e: The adaptation and modernization of organizational systems towards environmental sustainability will be positively related to organizational financial performance.

H2f: The elimination of risks to consumers and third parties will be positively related to organizational financial performance.

H2g: Diffuse risk reduction will be positively related to organizational financial performance.

H2h: The availability of consumer information will be positively related to organizational financial performance.

H2i: Supply chain performance geared towards environmental sustainability will be positively related to organizational financial performance.

H2j: Customer concern will be positively related to organizational financial performance.

The third NRBV strategy is sustainable development. Pollution prevention is related to how companies can reduce their carbon footprints in raw material and in the production process, such as reducing waste. Product stewardship has to do with evaluating the product lifecycle and improving all production chains (supply chain). And the sustainable development strategy is even broader in scope because it involves a long-term commitment to global development (Hart, 1995).

According to Hart and Dowell (2011), the sustainable development strategy has ended up focusing on two distinct areas: the base of the pyramid (BoP) and clean technology. The latter refers to how companies create competencies and position themselves in the renewable and clean energy market. These companies invest heavily in research and disruptive innovation. The former, the BoP area, is a derivation of the discussion about Northern-Southern Hemisphere inequalities, and it is committed to the reduction of world poverty. In sum, companies from rich countries (Northern Hemisphere), which operate in developing countries, are socially responsible for local communities. These companies may engage in co-creation and entrepreneurial initiatives to leverage the local economy, and, consequently, living conditions (Hart et al., 2016).

A recent example comes from the green hydrogen agreement signed between the German and Brazilian governments (Eletrobras, 2021). Germany's government and companies are investing in promoting Brazilian green hydrogen generation and storage. The investments include knowledge and technology transfer, research development, economic analysis, regulation decision-making, and technological support (grid operations, power utilities, and so forth). As a result, the state of Minas Gerais in Brazil has launched the Minas Hydrogen Program (Federação das Indústrias do Estado de Minas Gerais, 2021), and the state of Ceará received about US$ 8 million to build the first green hydrogen power plant in Brazil (Herculano, 2021).

Corporate social responsibility is multidimensional, including not only the natural environment, but also human rights, corporate governance, fair operating practices, labor conditions, and community involvement. Schrempf-Stirling et al. (2016) explain that society also views organizations as potential protectors of the environment and protectors of human rights. The authors add that companies caught in environmental incidents and illegitimate behaviors find it difficult to retain and attract stakeholders. On the other hand, organizations that translate sustainable development into explicit environmental and social strategies enjoy a better reputation, drawing the attention of customers and stakeholders who are concerned with corporate responsibilities to global development.

In this sense, responsible organizations are more likely to achieve superior financial performance, as stakeholders become aware of the managerial policies and practices that promote social equity, environmental sustainability, and economic prosperity (Green et al., 2015). For example, Hussain et al. (2018) found that organizational commitment to sustainable development leads to superior financial development in that sustainable initiatives are positively linked to financial performance. Chakroun et al. (2020) explored whether the companies listed on the Paris stock exchange that adopted the ISO 26000 social responsibility standard perform better financially. They concluded that good environmental management has a positive impact on financial performance. Thus, organizations that are committed to global development and are socially responsible are more likely to present superior financial performance (Cronin et al., 2011; Menguc & Ozanne, 2005).

> Hypothesis 3: The sustainable development strategy will be positively related to organizational financial performance.

Considering that sustainable development is the broader strategy of the NRBV approach, we posed several secondary hypotheses to embrace its complexity. The secondary hypotheses include general and specific environmental commitment, sustainable policies, corporate strategy, legal issues, and so forth, as follows:

H3a: Areas of permanent preservation and conservation and rural registry obedience will be positively related to organizational financial performance.

H3b: Environmental liability will be positively related to organizational financial performance.

H3c: Legal proceedings regarding the local environment will be positively related to organizational financial performance.

H3d: Planning broad environmental strategies will be positively related to organizational financial performance.

H3e: Commitment to biodiversity and ecosystem services will be positively related to organizational financial performance.

H3f: Corporate strategy and risk management geared towards sustainability will be positively related to organizational financial performance.

H3g: Growth balanced with sustainable policies will be positively related to organizational financial performance.

H3h: Fundamental commitment to sustainability will be positively related to organizational financial performance.

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H3i: Voluntary commitment to sustainability will be positively related to organizational financial performance.

H3j: Consistency of commitments to sustainability will be positively related to organizational financial performance.

H3k: An environmental policy of engagement will be positively related to organizational financial performance.

H3l: Disclosure will be positively related to organizational financial performance.

H3m: Participation in public policies will be positively related to organizational financial performance.

H3n: Community support will be positively related to organizational financial performance.

Table 1 summarizes the main literature related to the environmental strategies of pollution prevention, product stewardship, and sustainable development and their overall aspects. In sum, the pollution prevention aspects include critical emissions and waste, the level of environmental commitment and initiatives, and mitigation management. Product stewardship is related to the management and monitoring of the value chain and the modernization and adaptation of supply chain systems. Sustainable development translates the company's commitment to biodiversity and ecosystem services, the voluntary nature of the commitment, and its consistency over time.

Finally, the financial outcomes resulting from the adoption of environmental strategies are associated with

legal cost reductions, reputation, stock returns, market share, and financial performance.

3 Methodology

We tested the hypotheses using the Corporate Sustainability Index (ISE) of the São Paulo stock exchange. The São Paulo stock exchange, named the B3, is the official Brazilian financial trading market, and it is among the 20 largest stock exchanges in the world by market capitalization. The B3 had about 330 companies listed in 2020, with a total market capitalization of 897 billion US dollars (B3, 2020).

The Corporate Sustainability Index was created in 2005 to meet the global trend for sustainable development, setting apart companies that seek corporate environmental sustainability. The ISE index allows a comparison of the companies' performance regarding environmental concerns, corporate governance, social justice, and economic efficiency. With the support of the International Finance Corporation (IFC) of the World Bank, the Sustainability Research Center of the Fundação Getúlio Vargas (FGVCes) developed the index methodology, and it is responsible for updating and assessing the ISE annually. Currently, the entire ISE process takes place through B3 (B3, 2022). The governance of the ISE index is assured by a governing board of eleven members from key institutions, such as the Ethos Institute, the UN Environment Programme, the Ministry of the Economy, the B3, and other financial associations. The consulting company KPMG provides accreditation.

Table 1
Summary of environmental strategies, overall apects, and related studies

Environmental strategies	Overall aspects	Related studies
Pollution Prevention	Critical emissions and waste, environmental commitment and initiatives, mitigation management	Hart (1995); Klassen and Whybark (1999); Sharma (2000); Aragón-Correa and Sharma (2003); Vachon and Klassen (2008); Dixon-Fowler et al. (2013); Graham and McAdam (2016); Almada and Borges (2018)
Product Stewardship	Value chain management and monitoring, systems modernization and adaptation	Hart (1995); Vachon and Klassen (2008); Barney et al. (2001); Shi et al. (2012); Fraj et al. (2013); Gauthier (2018)
Sustainable Development	Commitment to biodiversity and ecosystem services, voluntary nature of the commitment, consistency of the commitment	Hart (1995); Hart and Dowell (2011); Hart et al. (2016); Schrempf-Stirling et al. (2016)
Environemental Financial Outcomes	Legal cost reductions, reputation, stock returns, market share, financial performance	Menguc and Ozanne (2005); Corbett and Klassen (2006); Cronin et al. (2011); Green et al. (2015); Glienke and Guenther (2016); Yunus and Michalisin (2016); Bhupendra and Sangle (2018); Hussain et al. (2018); Schwens and Wagner (2019); Chakroun et al. (2020)

In December 2019, the ISE index had 27 companies with 459.40 billion dollars in market value (market capitalization), representing 12 economic sectors: construction (25.02%), personal hygiene and cleaning products (16.76%), trading (14.62%), machinery and equipment (14.05%), electricity (12.27%), transportation (11.80%), wood and paper (11.76%), telecommunications (9.40%), financial intermediaries (9.09%), diversified financial services (7.31%), pharmaceutical and medical products (7.12%), and chemicals (6.65%) (B3, 2019).

To be eligible for the ISE index, the prospective companies must fill in a questionnaire and send corporate documents that show the level of commitment to sustainable development. The analysis takes into account several strategies and practices related to corporate sustainability. The questionnaire has seven dimensions: general, type of product, corporate governance, environmental, economic-financial, social, and climate change (BM&FBovespa, 2014). Each dimension is divided into categories. For example, the environmental, social, climate change, and economic-financial dimensions are assessed by four categories (performance, compliance, management, the impact of product consumption, and policy). The companies incorporated in the ISE index have to resubmit the questionnaire and the documents every year, so that the governing board can reevaluate them, removing some and adding others. The full version of the questionnaire is also available to the public on the websites of the B3 (B3, 2013, 2022).

Although the ISE index was not developed based on the NRBV as a foundation, we decided to test the hypotheses using this index because of the robustness and reliability of the database which is used in the market at the B3, developed by the FGV and IFC, and accredited by the consulting company KPMG. We also believe that exploring the ISE index under the NRBV approach provides an opportunity to empirically test how environmental initiatives, represented by the three strategies, lead to superior financial performance in terms of market value. After this consideration, the researchers formally contacted the Sustainability Research Center to ask for the data. In response, we were granted free access to the questionnaires of the ISE portfolio from 2013 to 2017. The five-year period was selected due to its consistency in terms of the portfolio since companies can be included or removed from the ISE index each year. We followed the suggestion of Silva and Lucena (2019) to analyze only companies that stayed in the index for more than two years.

The researchers had to sign a confidentiality agreement committing to not disclose the data or any data analysis for each company separately. In return, we were authorized to use the database and publicly communicate the results in the form of a research paper. Therefore, we were able to access the data for all the companies that compose the ISE index for each year.

Table 2 shows the ISE portfolio for the five years analyzed in terms of stocks, companies, sectors represented, market value, and percentage of the ISE market value in the Bovespa index, which is the leading performance index of the Brazilian stock exchange (B3).

When we started to analyze the ISE database, we had to make two cuts to ensure consistency and comparability. First, we selected only the companies that were part of the ISE index in all five years analyzed, because Silva and Lucena (2019) found a significant relationship between the Brazilian ISE and profitability only in companies that stayed more than two years in the ISE portfolio. Second, we excluded from the analysis companies from the financial sector because they were asked to answer a different questionnaire to assess the environmental dimension. This left us with 18 companies in the dataset.

Table 2
ISE portfolio performance in five years

Year	Equities	Companies	Sectors	Market Value	% market value of ibovespa
2017	38	34	16	US$ 405.41 billion	52.06
2016	38	34	16	US$ 348.57 billion	54.66
2015	50	39	19	US$ 246.24 billion	60.43
2014	51	40	18	US$ 420.88 billion	61.27
2013	51	37	16	US$ 472.82 billion	58.61

Source: B3 website.

3.1 Variables

The questionnaires for the five years analyzed are composed of 286 categories in seven dimensions: general (45), type of product (25), corporate governance (43), environmental (17), economic-financial (54), social (66), and climate change (36). However, only 48 categories remained invariant in the five years, giving the other 238 categories the status of being removed, added, or having their content significantly modified in each year. Of the 48 items, the content of 31 was consistent with the variables pollution prevention (6), product stewardship (11), and sustainable development (14). In sum, of the seven dimensions, we analyzed the content of 48 items and selected 38 of them based on their relationship to the NRBV strategies. The researchers performed a content validity analysis based on a bibliographic review and face validity, checking with experts the correspondence between the measured items and the NRBV strategies. We followed the suggestion of Hardesty and Bearden (2004) and the results of these analyses are available in the Appendix A. The Appendix A shows the content of the categories, their items, and the dimension for each variable, and the code we attributed to run the analysis.

Finally, the dependent variable financial performance is represented by the market value of the 18 ISE companies for each year. The market value represents the value of each company's stock traded in the market (B3) per year. This information is available from the Economatica database. Dixon-Fowler et al. (2013) found that market-based performance has a stronger relationship to environmental performance, in comparison to other financial indicators. Following the examples of Jacobs et al. (2010) and Silva and Lucena (2019), we used market value to assess financial performance. We used the natural logarithm of market value (coded as VMEListG_log), following the reference of the Nobel Prize winners Robert Merton and Myron Scholes in collaboration with Fisher Black, which is also recommended in other publications about quantitative methods in finance (DeFusco et al., 2015). The logarithmic transformation is used because of the number of decimal places reported in the absolute numbers. According to Gujarati and Porter (2017), the logarithmic transformation can be done without biasing the data.

Therefore, we characterized this study as explanatory, quantitative, and longitudinal research that uses secondary data (Babbie, 2016; Creswell & Creswell,

2018). The official B3 documents compose the data along with the ISE database.

4 Findings

The independent variables were measured using different scales, depending on the complexity and correspondent dimension of the indicator. Each dimension is weighted 100 and the indicators receive different weights depending on their relevance in the current context of business and society's demands. To allow comparisons, the indicators were weighted ranging from 0 to 10, with high scores showing that the 18 researched companies of the ISE index launched initiatives and practices related to the three environmental strategies. Table 3 shows the descriptive results of each item per year. The findings indicate that the companies seem to enhance their environmental strategies in all three dimensions in each year: 2013 (M=6.20, SD=2.2), 2014 (M=6.70, SD=2.47), 2015 (M=7.14, SD=2.28), 2016 (M=7.28, SD=2.18), and 2017 (M=7.51, SD=2.03). When comparing the three strategies in the five years, we can conclude that the researched companies do better in the sustainable development strategy (M=7.20, SD=2.39), followed by the product stewardship strategy (M=7.13, SD=2.00). Curiously, the results indicate that the 18 ISE companies have lower scores regarding the pollution prevention strategy (M=6.12, SD=2.28).

Panel data analysis was employed to test the hypotheses. Panel data analysis is a particular analysis of combined data and a type of regression that includes temporal series and different cross-sectional data across time, enabling a matrix analysis (Fávero & Belfiore, 2017; Gujarati & Porter, 2017). The general form of representation of the panel data equation is (Equation 1):

$$y_{it} = \beta_{it} + \sum_{k=1}^{k} \beta_{it} X_{it} + \epsilon_{it} \qquad (1)$$

Where:

y_{it} is the dependent variable for all individuals (i) across all time periods (t);

β_{it} is the coefficient across groups and time;

X_{it} is the observation for all individuals (i) across all time periods (t);

ϵ_{it} is the stochastic error term.

We used the Gretl 2017 software to perform the analyses. The results of the model specification test

Table 3
Descriptive analysis of the independent variables

Variable	Item	2013		2014		2015		2016		2017	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Pollution Prevention	Overall critical emissions and waste	4.93	2.81	6.76	3.37	7.43	2.86	7.26	2.91	6.12	3.02
	Gas emissions, liquid effluents, and waste	5.87	1.27	6.56	1.11	7.02	1.32	7.76	1.67	7.86	1.60
	Commitment, scope, and disclosure of PP initiatives	6.29	2.28	7.20	2.01	7.80	1.89	7.93	1.59	7.46	1.62
	Mitigation management	5.45	2.46	5.87	1.57	7.28	1.48	5.69	0.98	4.62	1.55
	Managerial system of mitigation initiatives	3.24	2.40	5.27	3.66	6.83	3.21	7.54	2.66	8.05	1.93
	Outcomes - pollution policies	2.62	2.74	3.35	3.46	4.47	3.37	3.62	2.53	5.38	2.92
Product Stewardship	Administrative requirements, production processes	7.86	2.82	8.22	2.35	8.26	2.33	8.50	2.06	8.02	3.17
	Management and monitoring - value chain	4.61	2.03	6.66	2.65	6.74	1.74	8.06	1.77	8.57	1.08
	Certification of suppliers	2.55	2.54	3.14	2.87	2.99	2.96	4.32	2.63	4.87	2.41
	Consumption of environmental resources - input	6.47	1.67	6.45	1.34	7.00	1.26	6.92	1.27	7.25	1.46
	Adaptation/modernization systems	5.23	1.27	7.99	2.54	8.84	2.59	7.40	2.65	6.87	2.34
	Risks to the consumer and third parties	10.00	0.00	10.00	0.00	10.00	0.00	10.00	0.00	10.00	0.00
	Diffuse risks	9.56	1.04	9.56	0.98	9.58	0.93	9.48	1.09	9.72	0.75
	Observance of the precautionary principle	9.22	2.26	8.06	3.26	8.17	3.13	7.83	3.33	7.39	3.48
	Consumer information	8.39	2.79	8.06	3.39	8.39	2.79	7.28	3.80	7.44	3.67
	Supply chain performance	2.53	1.45	2.71	2.07	3.75	2.46	4.29	2.87	4.10	2.41
	Consumers and clients	5.41	1.78	5.49	1.86	6.69	1.98	7.56	1.52	7.81	1.38
Sustainable Development	Areas of permanent preservation and rural registry	4.96	2.95	7.34	3.41	7.41	2.90	6.98	2.89	7.81	2.62
	Environmental liability	4.86	3.64	4.86	3.73	5.28	3.88	6.60	2.73	7.02	2.02
	Legal proceedings - local environment	8.26	2.10	7.71	2.30	8.33	1.70	8.57	1.30	8.41	1.97
	Planning environmental strategies	8.29	1.50	8.39	1.83	8.41	0.98	7.83	1.60	8.51	1.01
	Commitment: biodiversity and ecosystem services	5.24	2.91	4.40	3.05	4.01	2.49	6.52	2.30	7.39	2.33
	Corporate strategy and risks	7.09	2.34	7.76	2.29	7.99	2.21	6.28	2.84	7.13	2.35
	Growth balanced with sustainable policies	1.11	3.23	2.59	4.13	3.41	4.81	5.12	5.05	5.75	4.65
	Fundamental commitment	8.27	0.86	8.25	1.30	8.42	1.03	8.56	1.22	8.58	1.14
	Voluntary commitment	6.67	2.85	7.19	3.17	7.26	3.00	7.80	2.61	8.34	2.12
	Consistency of commitments	5.72	2.35	6.34	2.89	6.50	2.84	6.99	2.97	7.63	2.13
	Environmental policy of engagement	7.58	3.78	7.82	3.72	8.19	3.17	8.23	2.90	8.77	1.79
	Disclosure	7.97	2.00	8.72	1.97	9.15	1.77	9.46	1.05	9.27	1.36
	Participation in public policies	7.93	2.56	7.39	2.82	7.81	2.71	7.60	1.85	8.89	1.51
	Community support	7.98	1.61	7.55	1.42	7.88	1.04	7.65	1.00	7.79	1.19

Source: Research data.

indicate that, of the three panel data analysis models (fixed effects, random effects, and pooled ordinary least squares), the pooled ordinary least squares (OLS) model should be used to test the data [$F(17,42) = .80$, $p = .68$]. To test the homoscedasticity of the data, we ran the White's test, and the results confirm the homogeneity of the sample [$\chi^2(2) = 2.37$, $p = .31$].

Table 4 shows the results of the panel analysis using the pooled OLS model. The results indicate that the NRBV strategies pollution prevention, product stewardship, and sustainable development explain 61% of the variation in the market value of the listed firms ($R^2 = .61$). Of the 31 indicators that represent the NRBV strategies, nine influence the market value of the firms [$F(7,82) = 13.51$, $p < .001$], supporting the propositions of Jeon et al. (2016) and Hart & Dowell (2011).

Three prevention of pollution indicators are related to market value in the ISE index. The first is overall

Table 4
Results of panel analysis for market value

NRVB strategies	Indicators	Coefficient	SE	t-value
	Constant	12.127	.03	398***
Pollution Prevention	Overall critical emissions and waste	.003	.001	2.27*
	Commitment, scope, and disclosure of PP initiatives	-.006	.002	2.62*
	Mitigation management	-.013	.002	6.10***
Product Stewardship	Management and monitoring - value chain	.008	.002	4.27***
	Adaptation/modernization systems	-.006	.001	3.67***
Sustainable Development	Global commitment: biodiversity and ecosystem services	.007	.001	4.21***
	Fundamental commitment	-.010	.003	2.72**
	Voluntary commitment	.004	.001	2.75**
	Consistency of commitments	.004	.001	2.57*

*$p < .05$; **$p < .01$; ***$p < .001$. Source: Research data.

critical emissions and waste (PP_OCEW), which assesses critical emissions and waste management regarding the health of workers, the public, and the global environment (H1a). The second indicator is the commitment to, scope, and disclosure of pollution prevention initiatives (PP_CSD), and it measures how and to what extent the organization communicates its policies related to pollution prevention and climate change (H1c). The third is the mitigation management indicator (PP_MM), which measures corporate policies and practices regarding the reduction of greenhouse gas emissions, following the Kyoto Protocol and other international (ISO 14064-1) and national (ABNT NBR ISO 14064-1:2007) standards and guidelines (H1d).

The first hypothesis (H1), which states that the pollution prevention NRBV strategy is positively related to organizational financial performance, was partially supported. The PP_OCEW indicator was positively associated with the companies' market value, suggesting that organizations that have policies and practices that deal with critical emissions and waste management are more likely to achieve superior financial performance (PP_OCEW = .03, $p < .05$).

On the other hand, the other two indicators partially supported H1, in that although there is a significant relationship between them, the nature of the relationship is negative. This result suggests that they potentially reduce the likelihood of the organization achieving superior financial performance. This means that the more the company communicates its pollution prevention and climate change practices, the lower its chance of performing better financially, which translates into a reduction in market value (PP_CSD = -.006, $p < .05$). Similarly, corporate policies and practices

involving greenhouse gas emission reductions (mitigation management) negatively influence market value (PP_MM = -.013, $p < .001$).

The second hypothesis (H2), which states that the product stewardship strategy will be positively related to organizational financial performance, was also partially supported because while one indicator (PS_MM) was positively associated with market value, the other was negatively related (PS_AMM). The management and monitoring systems indicator reflects the effectiveness of the company's actions that generate a positive environmental impact or reduce the carbon footprint of its products and services in the entire supply chain (H2b). The results suggest that high efficacy of organizational efforts leads to better financial performance (PS_MM = .008, $p < .001$). The indicator that was negatively related to market value measures the level of adaptation and modernization management (PS_AMM = -.006, $p < .001$). The adaptation and modernization management items assess whether the companies are addressing the vulnerabilities of climate change and their potential to affect companies' products and services, and the business itself. The results suggest that organizations that seek solutions to reduce the vulnerability of their product and service concerning climate change are less likely to achieve superior financial performance (H2e).

Finally, the third hypothesis (H3), which states that organizations that engage in sustainable development NRBV strategies are more likely to present superior financial performance, was also partially supported. Of the four indicators that influence market value, only one negatively affects the dependent variable. The global commitment item of biodiversity and ecosystem services assesses how organizations respect and engage in actions

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geared towards biodiversity protection (H3e). This indicator is positively related to market value, suggesting that organizations committed to protecting biodiversity are more likely to achieve superior financial performance (SD_GCBE = .007, $p < .001$).

Fundamental commitment is the only indicator of the sustainable development strategy that negatively influences market value (SD_FC = -.010, $p < .01$). Fundamental commitment represents the company's actions and involvement in building policies that enhance sustainable development and how the company publicizes these policies. The findings indicate that the more companies engage in the building and communication of sustainable development policies, the less likely they are to achieve superior financial performance (H3h).

Voluntary commitment (SD_VC = .004, $p < .01$) and the consistency of commitments (SD_CC = .004,

$p < .05$) positively affect market value. Voluntary commitment measures the level of voluntary actions regarding sustainable development and the extent of that commitment across all branches and units (H3i). The consistency of commitments addresses whether the company has a formal committee (board) to deliberate about sustainability or corporate social responsibility, the level of representativeness of several stakeholders on that committee, and the selection of the subjects and themes (H3j). Therefore, the results of the panel analysis indicate that companies that have voluntary actions and practices geared towards sustainable development and have well-organized committees to deal with sustainable development are more likely to perform better financially.

Table 5 summarizes the results for the secondary hypotheses, indicating whether they were supported, partially supported, or not supported. The indicators

Table 5
Results of the secondary hypotheses

Variable	Item	Hypothesis	Result
Pollution Prevention	Overall critical emissions and waste	H1a	Supported
	Gas emissions, liquid effluents, and waste	H1b	Not supported
	Commitment, scope, and disclosure of PP initiatives	H1c	Partially supported
	Mitigation management	H1d	Partially supported
	Managerial system of mitigation initiatives	H1e	Not supported
	Outcomes - pollution policies	H1f	Not supported
Product Stewardship	Administrative requirements, production processes	H2a	Not supported
	Management and monitoring - value chain	H2b	Supported
	Certification of suppliers	H2c	Not supported
	Consumption of environmental resources - input	H2d	Not supported
	Adaptation/modernization systems	H2e	Partially supported
	Risks to the consumer and third parties	H2f	Not supported
	Diffuse risks	H2g	Not supported
	Observance of the precautionary principle	H2h	Not supported
	Consumer information	H2i	Not supported
	Supply chain performance	H2j	Not supported
	Consumers and clients	H2k	Not supported
Sustainable Development	Areas of permanent preservation and rural registry	H3a	Not supported
	Environmental liability	H3b	Not supported
	Legal proceedings - local environment	H3c	Not supported
	Planning environmental strategies	H3d	Not supported
	Commitment: biodiversity and ecosystem services	H3e	Supported
	Corporate strategy and risks	H3f	Not supported
	Growth balanced with sustainable policies	H3g	Not supported
	Fundamental commitment	H3h	Partially supported
	Voluntary commitment	H3i	Supported
	Consistency of commitments	H3j	Supported
	Environmental policy of engagement	H3k	Not supported
	Disclosure	H3l	Not supported
	Participation in public policies	H3m	Not supported
	Community support	H3n	Not supported

Source: Research data.

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found to influence financial performance in a negative direction, in contrast to what was initially hypothesized, received the label of partially supported. The discussion and implications of these findings are presented in the next section.

5 Discussion and implications

This study aimed to analyze whether the three natural resource-based view (NRBV) strategies—pollution prevention, product stewardship, and sustainable development—are related to financial performance, represented by market value, in the Brazilian stock exchange Corporate Sustainability Index (ISE). We used five years' of data from 18 companies that compose the ISE index and ran panel data analysis in this longitudinal study.

The results of this research show that all three NRBV strategies lead to superior financial performance in different ways. Our results suggest that organizational policies that focus on critical emissions and waste management lead to superior financial performance, in terms of companies' market value. They add evidence to the literature that claims the pollution prevention NRBV strategy leads to positive financial outcomes (Aragón-Correa & Sharma, 2003; Dixon-Fowler et al., 2013; Graham & McAdam, 2016; Vachon & Klassen, 2008). We found that organizational management and monitoring systems that generate positive environmental actions concerning products and services across the supply chain affect the company's market value, thereby supporting previous research that positively links product stewardship and financial performance (Bhupendra & Sangle, 2018; Corbett & Klassen, 2006; Derwall et al., 2005; Yunus & Michalisin, 2016). Regarding the positive relationship between sustainable development and financial performance stated by Chakroun et al. (2020), Hussain et al. (2018), and Cronin et al. (2011), we found that companies committed to environmental issues do better financially. Commitment positively affects the company's market value in three ways: through global commitment to biodiversity protection, voluntary commitment, and consistency of the commitment to policies and actions.

However, contradicting the literature reviewed, we also found negative relationships between the NRBV strategies analyzed and market value. In this study, we identified four initiatives that may lower the company's market value: (i) extensive communication of pollution prevention and climate change policies, (ii) mitigation management of greenhouse gas emissions, (iii) investments in adaptation and modernization to reduce environmental-related vulnerability, and (iv) public disclosure of commitments to enhancing sustainable development.

These counterintuitive results find some explanation in the conceptual economic tradeoff argument. Dixon-Fowler et al. (2013) explain that the negative financial effects derive from some environmental initiatives that demand high investments and are considered unprofitable. Ramanathan (2018) argues that managerial efficiency may be compromised, resulting in lower profits, when companies move away from core business areas because they are focused on environmental performance. Our findings suggest that the Brazilian market may undervalue some environmental actions, showing a need for further research to investigate some of the subdimensions of the NRBV approach and its relationship with financial outcomes. Miroshnychenko et al. (2017) posit that consumers in developing countries are less likely to pay extra for low-emission products, which might explain the lack of financial benefits associated with environmental practices.

For practitioners, the result of this research shows that it pays to be green, in that the market recognizes companies that invest in environmental strategies. To start with, firms should design pollution prevention strategies that reduce critical emissions and waste, later moving forward in the supply chain by managing and monitoring the effectiveness of strategies that reduces the carbon footprints of their products and services. Finally, managers must show real commitment to sustainable development as they establish formal committees to deliberate and systematically take actions related to environmental and social responsibilities. On the other hand, some strategies that require more substantial investments, such as modernization and adaptation to reduce greenhouse gas emissions and pollution mitigation management, may not be translated into market value.

5.1 Limitations

The main limitation of this research is the use of secondary data. The advantage is that we accessed

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the official questionnaires the companies answered to be part of the ISE portfolio. The disadvantage is that the questions were not designed to precisely measure the NRBV strategies. Future research could test these hypotheses using primary data and even case studies to analyze the NRBV strategies implemented in the companies. Another limitation is the sample since we had to remove the financial companies from the analysis as they answer different questions about environmental performance. Future research could investigate how NRBV strategies affect the market value of the companies from the financial sector that compose the ISE index.

The major contribution of this research is it addresses all three strategies of the NRBV to investigate if it pays to be green in terms of market value. As Hart and Dowell (2011) argue, besides focusing only on pollution prevention, the literature is missing the question of whether companies profit or lose money by investing in environmental strategies. This study also addresses the call for longitudinal research on financial outcomes since most environmental investments take time, and cross-sectional data fail to capture the long-term outcomes. Finally, we conclude that not all environmental strategies lead to superior financial performance in the Brazilian market. Companies should invest in specific strategies if the aim is to increase market value because some actions may end up achieving the opposite outcome.

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APPENDIX A - VARIABLES, ITEMS, CATEGORIES, AND DIMENSIONS

Variable	Item	Category	Dimension	Code
Pollution Prevention	Overall critical emissions and waste	Performance	Environmental	PP_OCEW
	Gas emissions, liquid effluents, and waste	Performance	Environmental	PP_GLW
	Commitment, scope, and disclosure of pollution prevention initiatives	Policy	Climate change	PP_CSD
	Mitigation management	Management	Climate change	PP_MM
	Managerial system of mitigation initiatives	Management	Climate change	PP_MS
	Outcomes - pollution policies	Performance	Climate change	PP_OUT
Product Stewardship	Administrative requirements of production processes	Compliance	Environmental	PS_AR
	Management and monitoring - value chain	Management	Environmental	PS_MM
	Certification of suppliers	Management	Environmental	PS_CERT
	Consumption of environmental resources - input (suppliers)	Performance	Environmental	PS_CERI
	Adaptation/modernization systems	Management	Climate change	PS_AMM
	Risks to the consumer and third parties	Impact of product consumption	Type of product	PS_RCTP
	Diffuse risks	Impact of product consumption	Type of product	PS_DR
	Observance of the precautionary principle	Impact of product consumption	Type of product	PS_OPP
	Consumer information	Compliance	Type of product	PS_CI
	Supply chain performance	Performance	Social	PS_SC
	Consumers and clients	Management	Social	PS_CC
Sustainable Development	Areas of permanent preservation and rural registry	Compliance	Environmental	SD_APPRR
	Environmental liability	Compliance	Environmental	SD_EL
	Legal proceedings - local environment	Compliance	Environmental	SD_LP
	Planning environmental strategies	Management	Environmental	SD_P
	Global commitment: biodiversity and ecosystem services	Management	Environmental	SD_GCBES
	Corporate strategy and risks	Policy	Economic-financial	SD_CER
	Growth balanced with sustainable policies	Performance	Economic-financial	SD_GB
	Fundamental commitment	Commitment	General	SD_FC
	Voluntary commitment	Commitment	General	SD_VC
	Consistency of commitments	Alignment	General	SD_CC
	Environmental policy of engagement	Alignment	General	SD_PES
	Disclosure	Report	Climate change	SD_D
	Participation in public policies	Policy	Social	SD_PPP
	Community support	Management	Social	SD_CS

Source: Research data.

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