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ARTICLE

The moderation of institutional mimicry on eco-innovation performance: evidence from Brazil

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ABSTRACT

The moderating force that institutional pressures can exert on the relationship between eco-innovation and performance has received little attention. In In this context, the present study aims to investigate the relationship between eco-innovation and environmental and financial performance, as well as the moderating role of institutional mimetic pressure in this relationship. We surveyed 175 brazilian companies from the organic production sector. For the analysis, we used Structural Equation Modeling to verify the relationship between the variables. The main results point to (i) a positive relationship between eco-innovation and environmental performance; (ii) the relationship between eco-innovation and financial performance does not occurs directly, but indirectly, due to environmental performance; and (iii) mimetic pressure attenuates the influence of eco-innovation on environmental and financial performance. This finding had not yet been verified in the literature on innovation, an unprecedented contribution of this work. Therefore, business managers can use the findings to implement innovation management systems under eco-innovative perspectives to produce goods with less environmental impact.

KEYWORDS: Eco-innovation; Institutional mimicry; Environmental performance; Financial performance

1. Introduction

Innovation has become a strategy for the development of sustainability in the academic community since sustainable development is an issue that requires immediate action by the government, industrial sector, and society (SILVESTRE; ŢÎRCĂ, 2019). Thus, innovation under an environmental perspective, such as eco-innovation, is a good response to responsible economic growth. Eco-innovation means innovation with an advanced environmental perspective, with practices, processes, management, and marketing for the improvement of the environmental performance of enterprises (LI et al., 2017).

According to Lin et al. (2019a), companies that implement eco-innovation strategies have been able to improve their market value, increasing their competitive potential. In addition, improved eco-innovation performance can further motivate CEOs to adopt these strategies for their companies' production systems (ONG et al., 2019; ORTEGA-LAPIEDRA et al., 2019).

In this study, we analyzed three important constructs relate to eco-innovations: (1) environmental performance, (2) financial performance, and (3) competitiveness strength, operationalized through the institutional mimetic force.

Most recent studies in the literature on the first construct - environmental performance - points to a positive and significant relationship with the implementation of eco-innovation, that is, companies that implement eco-innovation improve their environmental performance (LIAO; ZHANG, 2020; ABU SEMAN et al., 2019; YENIPAZARLI; VAKHARIA; BALA, 2020; KHURSHID; PARK; CHAN, 2019). This work seeks to reaffirm, or even contrast, these results to motivate managers in the decision-making process for implementing eco-innovation.

Studies on the second construct - financial performance of eco-innovations - need to be better tested for different sectors and perspectives (CILLO et al., 2019). On the one hand, several studies show evidence of a positive relationship between eco-innovation and

financial performance (ANDRIES; STEPHAN, 2019); (BACINELLO; TONTINI; ALBERTON, 2019; LIN et al., 2019b; LIN et al., 2019a; ONG et al., 2019; ORTEGA-LAPIEDRA et al., 2019; REZENDE et al., 2019; XUE; BOADU; XIE, 2019). On the other hand, many studies indicate a negative relationship between eco-innovation and financial performance (AGUILERA-CARACUEL; ORTIZ-DE-MANDOJANA, 2013; DRIESSEN et al., 2013; PALMER; OATES; PORTNEY, 1995). Few authors have explored the mediating relationship of environmental performance for eco-innovation and financial performance, with the exception of the findings of Li (2014) and Cai and Li (2018).

Studies on the third construct - institutional pressure and eco-innovation - have devoted mostly to antecedent factors of institutional pressures for implementing eco-innovation (LI, 2014; CHEN et al., 2018; WANG et al., 2020). However, the moderating force that institutional pressures can exert on the relationship between eco-innovation and performance has received less attention. Therefore, this study aims not only to test the relationship of eco-innovation with performance (environmental and financial) but also to investigate the competitiveness strength (i.e., institutional mimetic pressure) moderating role, observing whether this force can influence this relationship.

The institutional mimicry used in the study comes from the mimetic isomorphism defined by DiMaggio and Powell (1983), explains the occurrence of imitation or copying of practices established in other organizations motivated by uncertainty, without coercion.

Competitive institutional pressure refers to competition in the organizational environment based on socially instituted norms and values that ensure permanence and legitimacy in the environmental context, allowing better access to material and economic resources (Scott, 1995). Institutional pressures force companies to assume the role of social actors, their strategies go beyond basic issues such as: price, reliability, innovation and so on. Their competitive strategies also start to be guided by social interests and expectations institutionalized by their stakeholders (SCOTT, 2001, 2014).

Mimicry is a promising field of study. It is an institutional pressure that does not offer materiality, such as laws and regulations that require environmental changes; however, it becomes a strong element for changes in a firm's behavior in a competitive market. The literature shows that scant research has explored how institutional mimicry can influence environmental performance (ARUNDEL; KEMP, 2009). Moreover, empirical studies were conducted at a regional level, which requires further investigation in different environments, especially in developing countries, where normative pressures are more evident (ARUNDEL; KEMP, 2009).

Given the importance of recognizing the relationship between eco-innovation and environmental and financial performance, and the contradiction of the results of studies on the subject, the question that will guide this research is: what is the relationship between eco-innovation and environmental and financial performance, as well as the moderating role of institutional mimetic pressure in this relationship?

In order to answer the research question, the main objective of this study is to investigate the relationship between eco-innovation, environmental and financial performance, further exploring the moderating role of institutional mimetic pressures in these relationships.

This study greatly contributes to the enhancement of scientific research on Brazilian companies that have gone green, presenting tangible benefits through an agro-industrial sector of organic production that has a strong relationship with eco-innovation.

2. Eco-innovation, performance, and institutional pressure

The literature evaluates the performance of eco-innovation practices with potential enterprise benefits, based on dimensions of financial performance, competitive advantage, environmental performance, among others (TARIQ et al., 2017).

Despite several terms in the literature for environmental innovation, there was an important overlap between them, if not a centralization. Most definitions consider that these innovations are explained by the environmental performance of the innovation (CARRILLO-HERMOSILLA; DEL RÍO; KÖNNÖLÄ, 2010). Environmental performance is related to potential benefits that companies obtain with the adoption of eco-innovation, which means reducing consumption of energy and natural resources, as well as decreasing waste production and emission of pollutants, and greater responsiveness to socio-environmental expectations (ETZION, 2007; HART, 1995), in addition to reducing the disposal of harmful substances and materials to the environment (KLASSEN; MCLAUGHLIN, 1996).

Despite the benefits of eco-innovation, there are questions about the evidence of these benefits, as companies do not easily adopt green practices (TARIQ et al., 2017), since their adoption involves allocation of human resources (GROVER; PURVIS; SEGARS, 2007; ROGERS, 1962), requiring qualified personnel skills to incorporate technologies. However, human capital can positively influence eco-innovation results (ORTEGA-LAPIEDRA et al., 2019).

Recent studies on eco-innovation and performance have been developed on two major theories: the resource-based view and the stakeholder theory (MUNODAWAFA; JOHL, 2019). The stakeholder theory focuses on the influence of stakeholders on eco-innovation practices (HUANG; DING; KAO, 2009; WENG; CHEN; CHEN, 2015). Based on this theory, Liao and Zhang (2020) built a model to investigate the relationships between responsible leadership, eco-innovation, and environmental performance in manufacturing companies, and found a positive influence between eco-innovation (incremental and radical) and environmental performance.

Regarding the natural-resource-based view (NRBV), Singh et al. (2020) found that ecological management of human resources indirectly influences the company's environmental performance through eco-innovation. Another study, also focusing on the NRBV, analyzed the mediating effect of eco-innovation on the relationship between green

culture and environmental performance, providing empirical evidence that eco-innovation acts as a mediating variable in the relationship between these two variables (GARCÍA-MACHADO; MARTÍNEZ-ÁVILA, 2019).

There is no consensus on how to measure environmental performance and eco-innovation practices. Although the independent and mediating variables analyzed in the literature are diverse, recent studies show a positive relationship between eco-innovation and environmental performance. Liao and Zhang (2020) found a positive relationship between incremental and radical eco-innovations linked to green practices in a company's environmental performance. Seman et al. (2019) also found a significant and positive relationship between the management of the green supply chain, green innovation, and environmental performance. Yenipazarli, Vakharia and Bala (2020) highlight that eco-innovation in the use stage not only improves the environmental performance of the product in use, but it also increases product value for consumers by reducing the cost of use. Khurshid, Park and Chan. (2019) suggested that previous experience in eco-innovation and knowledge on outsourcing play an important role in improving environmental performance.

Thus, in this work, practices of eco-innovations are expected to have a positive association with environmental performance and, therefore, the first hypothesis is proposed.

H 1 – Implementation of eco-innovation has a positive and significant relationship with environmental performance

The financial return of eco-innovation is a performance indicator as it shows how efforts of this innovation type reflect on company finances. Literature on innovation highlights that research diverges on the relationship between these two constructs. On the one hand, studies have reported that this relationship is negative (AGUILERA-CARACUEL; ORTIZ-DE-MANDOJANA, 2013; DRIESSEN et al., 2013; PALMER; OATES; PORTNEY, 1995), while, on the other hand, a stream of researchers show a positive and significant relationship between the constructs (ANDRIES; STEPHAN, 2019; BACINELLO;

TONTINI; ALBERTON, 2019; LIN et al., 2019a, b; ONG et al., 2019; ORTEGA-LAPIEDRA et al., 2019; REZENDE et al., 2019; XUE; BOADU; XIE, 2019).

The relationship between eco-innovation intensity and financial performance of multinational companies operating in Brazil shows that the financial impact is positive after the first year, and it is more significant after the second year of implementation. Return on eco-innovation has a direct link with the operation time of eco-innovation in enterprises and not with the internationalization of these companies (REZENDE et al., 2019).

Implementation of eco-innovation practices has a positive impact on the financial, environmental, and operational performance of companies. The absorptive capacity moderates positively the relationship between eco-innovation and performance, according to Xue, Boadu e Xie (2019). The more the company can absorb outside knowledge to innovate and the more managers are concerned with management processes of environmental issues, the greater the performance of companies in implementing eco-innovation (XUE; BOADU; XIE, 2019). The absorptive capacity can be understood as the ability to identify and acquire knowledge in the external environment, assimilate, internalize, transform and apply knowledge, resulting in products and services accepted by the market (COHEN AND LEVINTHAL, 1990).

A systematic review of the literature, encompassing 69 publications in the most relevant journals in the field of innovation, highlights the importance of more research to assess financial impacts of eco-innovation on enterprises (CILLO et al., 2019). Therefore, as the results are still divergent on the relationship between eco-innovation and performance, more research on this subject is needed. In this work, it is assumed that this relationship is positive and two other hypotheses are proposed.

H 2a – Implementation of eco-innovation has a positive and significant relationship with financial performance

The financial performance as a result of the implementation of eco-innovations makes the company more competitive (ASTUTI et al.,

2018). However, this achievement may not be directly linked to the application of eco-innovations, as firms can only observe the financial results after the environmental performance is present. Few studies point to this mediation (CAI; LI, 2018; LI, 2014), thus requiring further research to confirm this perspective. Hence, hypothesis 2b follows:

H 2b – Implementation of eco-innovation has a positive and significant relationship with the financial performance, however, mediated by the environmental performance

A comprehensive literature review regarding environmental activities and financial performance underscores that the greatest potential of studies and research in this field concerns the identification of contingencies that affect the environment, such as institutional pressures (BERCHICCI; KING, 2007).

Dimaggio and Powell (1983) use three categories to define institutional pressures: coercive, normative, and mimetic pressures. The mimetic institutional pressure is assumed as an analysis variable to relate to eco-innovation in the organizational field. That is, companies use the strategy of analyzing trends of their competitors to become competitive.

Studies that seek to assess the role of institutional pressures in contexts of environmental innovations have been conducted in different enterprise contexts (LI, 2014; LIAO, 2018; SHAFIQUE; ASGHAR; RAHMAN, 2017; CHEN et al., 2018).

Li (2014) shows that pressure from customers outside China presents a positive and significant impact on environmental innovation practices; however, this pressure for environmental innovation was not significant in relation to domestic customers. In our study, mimicry was tested as a predecessor force for eco-innovation implementation and consequent achievement of performance (LI, 2014).

Mimetic, normative, and coercive institutional pressures are studied as predecessors for knowledge acquisition and subsequent eco-innovation implementation. Tsai and Liao (2017) refer to mimicry as a cognitive force and the results of this force were not significant for knowledge acquisition and subsequent eco-innovation implementation.

The authors analyzed 263 companies in the industrial sector in China and the study showed that coercive and normative pressures are predecessor forces for knowledge acquisition and play a partial mediating role on eco-innovation.

Based on Porter's theory of competitive strategies and the resource-based view (RBV) theory, Chen et al. (2018) analyzed the role of institutional pressures in corporate green innovation, revealing that both coercive and regulatory pressures have significant effects on green innovation, validating Porter's hypothesis. However, they did not take into account the mimetic pressure. Further, they showed that resource slack is a moderating factor in the relationship between institutional pressures and corporate green innovation (CHEN et al., 2018).

Shafique, Asghar and Rahman (2017) suggest that institutional pressure plays a moderating role between green supply chain management practices and enterprise performance. Concerning the mimetic pressure, a component of institutional theory, Hazarika and Zhang (2019) raised the hypothesis that the higher the managerial consent, the greater the adoption of innovative practices, suggesting that regulatory instruments, management and enterprises concerns positively influence the adoption of eco-innovation practices by companies. These practices have a strong relationship between regulatory instruments and management concerns for eco-innovation adoption, even though this may demand greater financial investment (HAZARIKA; ZHANG, 2019).

Although Wang et al. (2020) do not address the institutional theory, the authors consider environmental pressures on corporate behavior as environmental regulation, concluding that market-based environmental regulation has a significant mediating role, while voluntary environmental regulation does not play a mediating role between carbon emissions and eco-innovation.

To date, studies have considered institutional pressures, more specifically mimetic pressure, as a predecessor for eco-innovation implementation (LI, 2014; CHEN et al., 2018; WANG et al., 2020), or even as a predecessor for knowledge acquisition and subsequent eco-

innovation implementation (TSAI; LIAO, 2017). Shafique, Asghar and Rahman (2017), however, treats institutional pressure as a moderator for the relationship between eco-innovation and performance, but without specifying the pressures (coercive, normative, and mimetic) separately, considering the institutional pressure construct as a whole. Other studies have not yet proposed to analyze these pressures as a moderating variable for eco-innovation and performance.

Therefore, our research takes mimicry as an important key to understand competition strength, seeking to elucidate whether competitive forces can moderate the relationship between eco-innovation and environmental performance, a relevant scientific contribution never tested before. Tsai and Liao (2017) state that firms keep track of trends of the organizational field in which are inserted, mainly of relevant strategies of their competitors, observing how competitors attract customers and obtain a competitive advantage with the implementation of innovation. Thus, the third and most relevant hypothesis of this research is proposed.

H 3 – Mimetic institutional pressure moderates by attenuating the relationship between eco-innovation and environmental performance.

3. Method

3.1 Sample and data collection

We surveyed 175 companies from the organic production sector. The choice for this sector was based on its strong relationship with eco-innovations. The data was gathered through telephone and online survey interviews with owners and operation managers, one source per company. We contacted 330 companies; however, only 192 agreed to participate. Eleven responses were excluded due to missing data. Further, outlier cases were analyzed using the Mahalanobis distance test and six cases were removed, as they had p-values lower than 0.001

and thus were considered outliers in this database. The final sample consisted of 175 cases, resulting in a response rate of 53%. This sample size is larger than the recommended by the "ten times rule" (HAIR JUNIOR et al., 2014), which states that the sample size should be ten times greater than the higher number of paths directed at a single construct in the model (environmental performance = 3).

Regarding the characterization of the companies present in the sample, 88.4% (n = 167) of them have worked with organic agro-industrial production for more than 5 years, 6.9% (n = 13) of them have worked for 4 to 5 years in this sector and 4.8% (n = 9) of them works for 1 to 3 years. The companies had a minimum of 1 employee and a maximum of 1500 employees working directly in the company, with an average of 91 employees per company. In relation to employees working indirectly in the company, there were cases where there were no indirect employees to cases where there were 5000 indirect employees, with an average of 174 indirect employees per company.

3.2 Description of variables

The variables investigated in this work, namely environmental innovation, environmental performance, financial performance, and competitive institutional pressure, were based on the validated scales from Li (2014). Environmental innovation measures examined the extent to which companies had practices (EI_1), certifications (EI_2), cross-functional cooperation (EI_3), product development (EI_4 and EI_5), and waste management (EI_6) aimed to improve environmental outcomes. Environmental performance measured reduction in waste emissions (EP_1), harmful substances (EP_2), frequency of environmental accidents (EP_3), as well as improvement of company environmental image (EP_4). Financial performance assessed the improvement of capacity utilization (FP_1), decrease in penalty costs for environmental accidents (FP_4) and fees for waste treatment (FP_2), as well as profit increase due to the selling of scrap and used equipment (FP_3). Finally, competitive institutional pressure evaluated the extent companies

resorted to the green concept to create a competitive advantage over competitors (CIP_1, CIP_2, and CIP_3).

3.3 Statistical methods.

As all measures were self-reported by the same source in this study, we carried out the Harman's single-factor test to evaluate the possibility of common method bias in this data set. The results demonstrated that the first factor explained 31.72% of the variance, indicating that the common method bias was not detected in this study (PODSAKOFF et al., 2003). The data was then verified for normality through the Kolmogorov-Smirnov test. This test is used to verify if the data collected through our survey conforms to a normal distribution. The analysis indicated that the variables did not conform to a normal distribution. Considering the limited sample size and the non-normality of data, the partial least squares structural equation modeling (PLS-SEM) was selected to conduct the hypothesis testing, using the SmartPLS 3 software. The PLS-SEM seeks to maximize the explanation of dependent variables, while it offers greater assumption flexibility regarding data distribution for the analysis (HAIR JUNIOR et al., 2014). Besides, this approach is commonly applied in more explorative models (HAIR JUNIOR et al., 2014) and is often used in the literature on eco-innovation (BACINELLO; TONTINI; ALBERTON, 2020; HAZARIKA; ZHANG, 2019; ONG et al., 2019).

To evaluate the proposed model, based on the method of structural equations, we followed previous suggestions in the literature and performed the two-step approach (ANDERSON; GERBING, 1988). The two step approach consists of first, the analysis of the measurement model, and second, the analysis of the structural model. The analysis of the measurement model seeks to examine whether the proposed scales to measure the constructs of interest have actually managed to capture them. Thus, in the first step, we assessed reliability and validity of the measurement model. Reliability was evaluated through composite reliability scores (CR). The convergent validity of constructs

was measured using the average variance extracted (AVE), while the discriminant validity was assessed through the Fornell and Larcker (1981) criteria. Moreover, multicollinearity was checked using the variance inflation factor (VIF).

After validating the scales, we proceed to the second step, that is, the analysis of the structural model, which seeks to understand the relationships between the model's constructs. Thus, we examined the relationships of constructs based on the structural model. The PLS analysis was used to estimate the path coefficients for the proposed relationships.In this sense, it is worth noting that the PLS-SEM method ends up overestimating the relationships of the measurement model and underestimating the relationships of the structural model, thus being considered a method bias (HAIR JUNIOR et al., 2014).

4. Results

4.1 Measurement model

The first step of the model assessment was to examine the indicator loadings on each construct. Although all loadings were significant ($p<0.05$), four items ($EP_{1,}$ FP_1, $EI_{1,}$ and EI_2) had loadings below the acceptable value of 0.5 (HAIR JUNIOR et al., 2014) and thus were removed (Table 1). The next step of the analysis assessed reliability and convergent and discriminant validity of measures. The results show that all constructs had CR above the recommended value of 0.7 (ranging from 0.77 to 0.92), demonstrating the all measures had an adequate reliability level. Regarding the model convergent validity, all AVE values were higher than the suggested threshold of 0.5 (ranging from 0.54 to 0.79), suggesting that indicators of constructs shared a larger proportion of the construct variance (HAIR JUNIOR et al., 2014; NUNALLY; BERNSTEIN, 1994). Further, to examine the discriminant validity of the model, we checked whether the square

root of AVE of constructs were higher than their correlations with other latent measures (FORNELL; LARCKER, 1981). The results displayed in Table 2 indicate that all constructs reached an adequate level of discriminant validity, as each one of them reflected different concepts. Finally, the multicollinearity assessment showed that all VIF values remained below the recommended threshold of 5, meaning that,

TABLE 1
Indicators loadings

Construct	Item	Indicator loading
Environmental Innovation	EI1	*
	EI2	*
	EI3	0.67
	EI4	0.77
	EI5	0.80
	EI6	0.75
Environmental Performance	EP1	*
	EP2	0.51
	EP3	0.85
	EP4	0.81
Financial Performance	FP1	*
	FP2	0.76
	FP3	0.67
	FP4	0.87
Competitive Institutional Pressures	CIP1	0.84
	CIP2	0.91
	CIP3	0.92

*Indicator removed due to value below the threshold of 0.5.

TABLE 2
Reliability, Convergent and Discriminant Validity

Construct	CR	AVE	EI	EP	FP	CIP
Environmental Innovation (EI)	0.83	0.56	*0.74*			
Environmental Performance (EP)	0.77	0.54	0.71	*0.77*		
Financial Performance (FP)	0.82	0.60	0.46	0.46	*0.75*	
Competitive Institutional Pressures (CIP)	0.92	0.79	0.48	0.40	0.31	*0.89*

Note: CR denotes Composite Reliability, AVE denotes average variance extracted. Italic numbers indicate the square root of constructs AVE.

no problems with multicollinearity among measures occurred in the model. Moreover, multicollinearity was checked using the variance inflation factor (VIF) (Table 3).

TABLE 3
VIF values among constructs

Construct	EP	FP
Environmental Innovation (EI)	1.23	1.26
Environmental Performance (EP)	-	1.26
Competitive Institutional Pressures (CIP)	1.13	-
Financial Performance (FP)	-	-

4.2 Structural model

To explore the proposed hypothesis of this work, we performed the PLS path modeling analysis in the structural model. This method uses a bootstrapping procedure to calculate significance levels for each path in the model. The path coefficients of constructs relationships (direct, moderating, and indirect effects), statistical significance, and the explained variance of endogenous constructs (R^2) are shown in Figure 1. As R^2 states the amount of variance in a construct that is explained by the exogenous

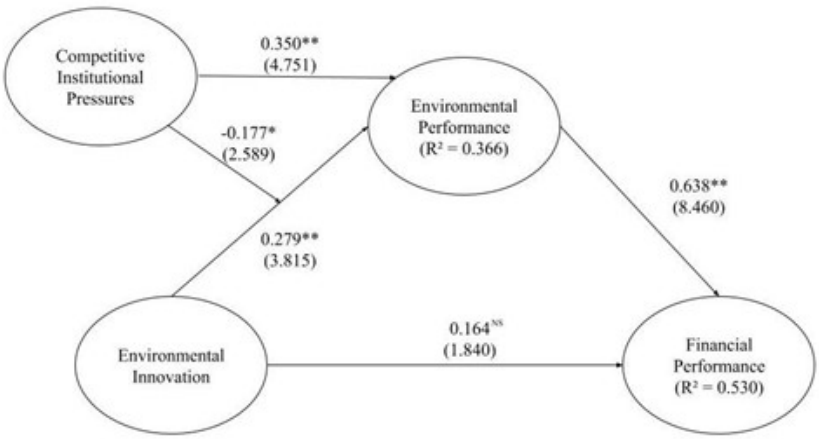

FIGURE 1
Structural Model. Notes - * indicates p<0.01, ** indicates p<0.001, NS indicates a non-significant relationship. t-scores are shown between parentheses.

measures in the model, the analysis indicates that both environmental innovation and competitive institutional pressures accounted for 36.6% of the variance in the environmental performance construct. Further, environmental innovation and environmental performance explained together 53% of the total variance of financial performance.

Considering the path coefficients in the model, the findings indicated that environmental innovation had a positive relationship with environmental performance ($\beta = 0.279$, $p < 0.01$, $t=3.815$); however, its impact on financial performance was not significant ($\beta = 0.164$, $p > 0.05$, $t=1.840$). Competitive institutional pressures also had a positive influence on environmental performance ($\beta = 0.350$, $p < 0.001$, $t=4.751$). The findings also highlighted a significant negative interaction effect between environmental innovation and competitive institutional pressures on environmental performance ($\beta = -0.177$, $p < 0.01$, $t=2.589$). For a better understanding of this interaction, a simple slope analysis was performed (Figure 2). The analysis demonstrates the negative

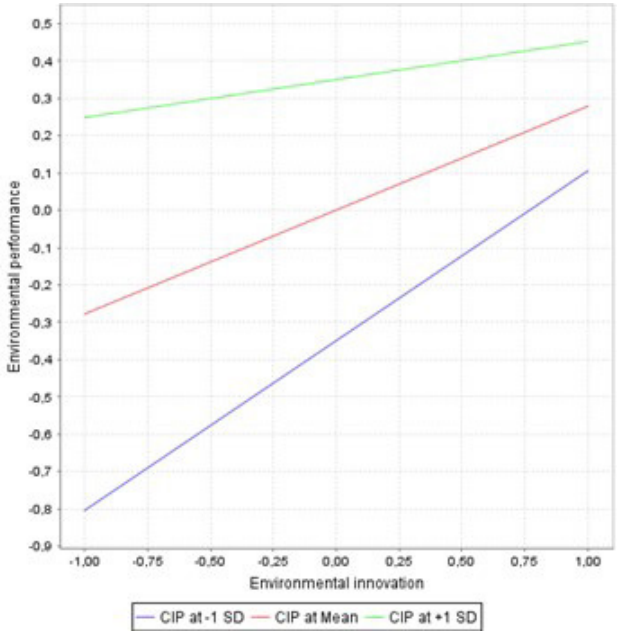

FIGURE 2
Simple slope analysis of the interaction effect of environmental innovation and competitive institutional pressures on environmental performance. Notes – CIP denotes competitive institutional pressures. Axis scales represent constructs standard deviations.

interaction between these two constructs: for companies at lower levels of competitive institutional pressures, environmental innovation has a stronger influence on environmental performance, whereas this effect is attenuated at higher levels of the proposed moderator. Further, the results indicated that environmental performance had a positive effect on financial performance ($\beta = 0.638$, $p < 0.001$, $t=8.460$).

The final stage in the structural model assessment explored the indirect effects in the model. The findings indicated that the environmental performance acted as a mediator in the indirect effect of environmental innovation on financial performance ($\beta = 0.178$, 95%CI = [0.087, 0.298], $p < 0.001$). Importantly, the results also showed that environmental performance mediated the interaction effect between these two constructs ($\beta = -0.113$, 95%CI = [-0.219, -0.040], $p < 0.05$). These results highlight the mediation role of environmental performance in the relationship between environmental innovations and financial performance.

5. Discussion

Hypothesis 1 was confirmed in this research, showing that eco-innovation has a positive and significant relationship with environmental performance. These results corroborate reports in the literature on innovation regarding the positive and significant environmental results of eco-innovation implementation (LIAO; ZHANG, 2020; ABU SEMAN et al., 2019; YENIPAZARLI; VAKHARIA; BALA, 2020; KHURSHID; PARK; CHAN, 2019). In other words, enterprises that plan and introduce eco-innovation systems can achieve environmental performance.

The innovation theory highlights that innovations are the main economic drivers of modernity (SCHUMPETER, 1934). Several environmental conferences and government documents, such as the Stockholm Conference (1972), the Brundtland Report (1987), the Rio Conference (1992), the Rio +10 Conference (2002), and even

the Rio +20 Conference (2012), show that exponential growth of production and consumption of natural resources has resulted in major environmental impacts. Therefore, our results show that it is possible for enterprises to produce and, at the same time, reduce environmental impacts and with positive and significant environmental performance with the implementation of production systems under the premises of eco-innovation.

Managers can use the research findings and implement innovation management systems with eco-innovative perspectives to obtain results with less impact on the environment. The reduction of environmental impacts can improve the company image and increase its market value (LIN et al., 2019a). Managers (XUE; BOADU; XIE, 2019) in the green marketing strategy (MUKONZA; SWARTS, 2019) can also explore eco-innovation implementation and thus increase or explore demanding market niches with environmental awareness (KRABBENHOFT; MANENTE; KASHIAN, 2019).

The results of the relationship between eco-innovation and performance were positive and significant; therefore, managers can use them as a motivating factor in the process of converting from a conventional company to a green-production company, since human capital can positively influence the eco-innovation results (ORTEGA-LAPIEDRA et al., 2019)

Regarding the effect of financial performance with the eco-innovation implementation, studies in the literature on innovation diverge. In our study, the relationship between eco-innovation and financial performance was expected to have a positive and significant effect (H2a); however, this hypothesis was not confirmed, showing a direct, non-significant relationship between eco-innovation and financial performance. This result contributes to the literature on innovation, providing empirical subsidies on the phenomenon. Several studies report a positive relationship between these two constructs (ANDRIES; STEPHAN, 2019; BACINELLO; TONTINI; ALBERTON, 2019; LIN et al., 2019a, b; ONG et al., 2019; ORTEGA-LAPIEDRA et al., 2019; REZENDE et al., 2019; XUE; BOADU; XIE, 2019). However,

other studies report no direct and positive relationship (AGUILERA-CARACUEL; ORTIZ-DE-MANDOJANA, 2013; DRIESSEN et al., 2013; PALMER; OATES; PORTNEY, 1995), corroborated by this research.

In addition to testing the direct effects of the relationship between eco-innovation and financial performance, we also examined the mediation role of environmental performance (H2b), indicating a total mediation through environmental performance in the relationship between eco-innovation and financial performance. These results are consistent with Li (2014) and Cai and Li (2018), which showed that environmental performance also mediated the relationship between eco-innovation and financial performance. Therefore, our results reinforce the hypothesis that eco-innovation does not have a direct effect on financial performance, but an indirect effect through environmental performance.

The mediating effects of environmental performance to attain financial performance from eco-innovation implementation seems to indicate that the financial benefits of implementing eco-innovation are linked to time, with greater potential from the second year onward after implementing eco-innovation, as reported by Rezende et al. (2019).

As for institutional pressures, the results showed that competitive institutional pressure (mimetic) negatively moderates the relationship between eco-innovation and environmental performance (H3). The confirmation of this hypothesis is a scientific contribution not yet captured in the literature on innovation. Previous studies evaluated the predecessor perspective of institutional mimetic pressure on eco-innovation implementation (LI, 2014; CHEN et al., 2018; WANG et al., 2020), the predecessor perspective for knowledge acquisition and subsequent eco-innovation implementation (TSAI; LIAO, 2017), or the moderation perspective considering all institutional pressures as a single variable. Nevertheless, the mimetic effect had not been tested separately, as we did here in this study.

The results show that greater mimetic pressures in an organizational field result in higher environmental performance of the eco-innovation implemented. Thus, it is understood that competitiveness increases

environmental performance and, therefore, CEOs should observe the best practices of competitors and leading companies in the sector to absorb knowledge as well as seek eco-innovation. The more CEOs adhere to mimicry and competition, the greater the environmental performance. However, it is important to note that high levels of mimicry lead to less influence of eco-innovation on environmental performance.

Competitiveness, which is the central argument for mimicry in the organizational field, has been studied and shown to be a driver for eco-innovation. Studies show that eco-innovation influences the company performance (CHOU et al., 2018), that customer pressures are significant for eco-innovation (CHU et al., 2018; HOJNIK; RUZZIER, 2016), and that eco-innovation occurs more in competitive markets than in monopoly markets (YALABIK; FAIRCHILD, 2011). Despite not reflecting on the institutional theory, these studies show that competitiveness is an essential factor in the process of implementing innovative processes to improve environmental conditions in the corporate world.

6. Final remarks

In this research, we aimed to elucidate whether companies that implement eco-innovations achieve performance as well as the moderating role of competitive institutional pressure (mimetic) in this relationship. We highlight three important contributions: (i) confirmation of the positive relationship between eco-innovation and environmental performance, corroborating the positive relationship outlined by studies in the innovation literature; (ii) evidence that the financial performance of eco-innovation does not occur directly, but indirectly, due to environmental performance (the positive relationship only occurs mediated by environmental performance), the results of previous studies show that the relationship between eco-innovation and financial performance is divergent (some studies contend that

such relationship is positive, while others claim it is a non-significant association); and (iii) mimetic pressure moderates the relationship between eco-innovation and environmental performance. This finding had not yet been reported in the literature on innovation, an unprecedented contribution of this work.

From a managerial viewpoint, this research shows the power of the mimetic force, that is, of competition and competitors. This pressure moderates the relationship between eco-innovation and environmental performance. In other words, in the industrial organic production sector in Brazil, mimetic forces drive eco-innovation implementation, because greater institutional mimetic pressure leads to higher environmental performance of eco-innovations.

Moreover, our study highlights that having an eco-innovation program is encouraging for enterprises since the implementation of eco-innovation can present positive environmental performance, namely reduction of gas emissions, and reduction of water and solid waste (ETZION, 2007; HART, 1995). Besides, eco-innovation decreases the consumption of hazardous toxic materials (KLASSEN; MCLAUGHLIN, 1996), the frequency of environmental accidents, while improving the company's environmental image. Eco-innovation can present positive financial results over time, mediated by environmental performance. Firms could explore this as green marketing since by serving more demanding consumers (environmental awareness), eco-innovative companies have better market value.

This study sample was explicitly aimed at the industrialized sector of organic products in Brazil, which may be a limiting factor for data generalization. This study was carried out transversally; however, it does not cease to suggest the continuity of the theme discussed here in order to obtain longitudinal conclusions regarding the constructs of eco-innovation, competition (mimicry), and performance (environmental and financial).

Future studies should examine the moderation of absorptive capacity for the relationship between eco-innovation and environmental performance, and eco-innovation and financial performance. It is also

suggested that studies explore the theory of networks as a predecessor for eco-innovation implementation, as well as the predecessor force of institutional pressures, focusing on competitive (mimetic) pressures for eco-innovation implementation.

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